

**Southeast Alaska Sac Roe Herring Fishery, 2005**

by

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Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries



## Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used without definition in the following reports by the Divisions of Sport Fish and of Commercial Fisheries: Fishery Manuscripts, Fishery Data Series Reports, Fishery Management Reports, and Special Publications. All others, including deviations from definitions listed below, are noted in the text at first mention, as well as in the titles or footnotes of tables, and in figure or figure captions.

| <b>Weights and measures (metric)</b> |    | <b>General</b>           |                                  | <b>Measures (fisheries)</b>      |                         |
|--------------------------------------|----|--------------------------|----------------------------------|----------------------------------|-------------------------|
| centimeter                           | cm | Alaska Administrative    |                                  | fork length                      | FL                      |
| deciliter                            | dL | Code                     | AAC                              | mid-eye-to-fork                  | MEF                     |
| gram                                 | g  | all commonly accepted    |                                  | mid-eye-to-tail-fork             | METF                    |
| hectare                              | ha | abbreviations            | e.g., Mr., Mrs.,<br>AM, PM, etc. | standard length                  | SL                      |
| kilogram                             | kg |                          |                                  | total length                     | TL                      |
| kilometer                            | km | all commonly accepted    |                                  |                                  |                         |
| liter                                | L  | professional titles      | e.g., Dr., Ph.D.,<br>R.N., etc.  |                                  |                         |
| meter                                | m  | at                       | @                                | <b>Mathematics, statistics</b>   |                         |
| milliliter                           | mL | compass directions:      |                                  | <i>all standard mathematical</i> |                         |
| millimeter                           | mm | east                     | E                                | <i>signs, symbols and</i>        |                         |
|                                      |    | north                    | N                                | <i>abbreviations</i>             |                         |
|                                      |    | south                    | S                                | alternate hypothesis             | H <sub>A</sub>          |
|                                      |    | west                     | W                                | base of natural logarithm        | <i>e</i>                |
|                                      |    | copyright                | ©                                | catch per unit effort            | CPUE                    |
|                                      |    | corporate suffixes:      |                                  | coefficient of variation         | CV                      |
|                                      |    | Company                  | Co.                              | common test statistics           | (F, t, $\chi^2$ , etc.) |
|                                      |    | Corporation              | Corp.                            | confidence interval              | CI                      |
|                                      |    | Incorporated             | Inc.                             | correlation coefficient          |                         |
|                                      |    | Limited                  | Ltd.                             | (multiple)                       | R                       |
|                                      |    | District of Columbia     | D.C.                             | correlation coefficient          |                         |
|                                      |    | et alii (and others)     | et al.                           | (simple)                         | r                       |
|                                      |    | et cetera (and so forth) | etc.                             | covariance                       | cov                     |
|                                      |    | exempli gratia           |                                  | degree (angular)                 | °                       |
|                                      |    | (for example)            | e.g.                             | degrees of freedom               | df                      |
|                                      |    | Federal Information      |                                  | expected value                   | <i>E</i>                |
|                                      |    | Code                     | FIC                              | greater than                     | >                       |
|                                      |    | id est (that is)         | i.e.                             | greater than or equal to         | ≥                       |
|                                      |    | latitude or longitude    | lat. or long.                    | harvest per unit effort          | HPUE                    |
|                                      |    | monetary symbols         |                                  | less than                        | <                       |
|                                      |    | (U.S.)                   | \$, ¢                            | less than or equal to            | ≤                       |
|                                      |    | months (tables and       |                                  | logarithm (natural)              | ln                      |
|                                      |    | figures): first three    |                                  | logarithm (base 10)              | log                     |
|                                      |    | letters                  | Jan, ..., Dec                    | logarithm (specify base)         | log <sub>2</sub> , etc. |
|                                      |    | registered trademark     | ®                                | minute (angular)                 | '                       |
|                                      |    | trademark                | ™                                | not significant                  | NS                      |
|                                      |    | United States            |                                  | null hypothesis                  | H <sub>0</sub>          |
|                                      |    | (adjective)              | U.S.                             | percent                          | %                       |
|                                      |    | United States of         |                                  | probability                      | P                       |
|                                      |    | America (noun)           | USA                              | probability of a type I error    |                         |
|                                      |    | U.S.C.                   | United States                    | (rejection of the null           |                         |
|                                      |    |                          | Code                             | hypothesis when true)            | α                       |
|                                      |    |                          | use two-letter                   | probability of a type II error   |                         |
|                                      |    |                          | abbreviations                    | (acceptance of the null          |                         |
|                                      |    |                          | (e.g., AK, WA)                   | hypothesis when false)           | β                       |
|                                      |    |                          |                                  | second (angular)                 | "                       |
|                                      |    |                          |                                  | standard deviation               | SD                      |
|                                      |    |                          |                                  | standard error                   | SE                      |
|                                      |    |                          |                                  | variance                         |                         |
|                                      |    |                          |                                  | population                       | Var                     |
|                                      |    |                          |                                  | sample                           | var                     |

### Weights and measures (English)

|                       |                    |
|-----------------------|--------------------|
| cubic feet per second | ft <sup>3</sup> /s |
| foot                  | ft                 |
| gallon                | gal                |
| inch                  | in                 |
| mile                  | mi                 |
| nautical mile         | nmi                |
| ounce                 | oz                 |
| pound                 | lb                 |
| quart                 | qt                 |
| yard                  | yd                 |

### Time and temperature

|                    |     |
|--------------------|-----|
| day                | d   |
| degrees Celsius    | °C  |
| degrees Fahrenheit | °F  |
| degrees kelvin     | K   |
| hour               | h   |
| minute             | min |
| second             | s   |

### Physics and chemistry

|                       |           |
|-----------------------|-----------|
| all atomic symbols    |           |
| alternating current   | AC        |
| ampere                | A         |
| calorie               | cal       |
| direct current        | DC        |
| hertz                 | Hz        |
| horsepower            | hp        |
| hydrogen ion activity | pH        |
| (negative log of)     |           |
| parts per million     | ppm       |
| parts per thousand    | ppt,<br>‰ |
| volts                 | V         |
| watts                 | W         |

***FISHERY MANAGEMENT REPORT NO. 05-05***

**SOUTHEAST ALASKA SAC ROE HERRING FISHERY, 2005**

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## **INTRODUCTION**

Southeast Alaska commercial herring fisheries occur during the winter when herring are harvested for use primarily as bait, and also during the spring when herring are harvested for their roe. The roe harvest includes the traditional sac roe fisheries (set gillnet and purse seine) and, in recent years, spawn-on-kelp pound fisheries. This management plan provides an overview of the 2005 sac roe herring fisheries for Southeast Alaska including expected harvest levels and management strategy. Separate management plans for the northern and southern Southeast Alaska spawn-on-kelp pound fisheries will be available at local department area offices.

Southeast Alaska roe herring are commercially harvested by purse seine and set gillnet gear types, both of which are included in the limited entry system. There are currently five sac roe herring fishing areas in Southeast Alaska consisting of two exclusive purse seine and three exclusive gillnet areas (Figure 1). Starting in the spring of 2004, a new area, Section 1-E/Section 1-F (West Behm Canal) will be open on alternate years for set gillnet and purse seine gear when the threshold level is met.

Approximately 11,280 tons of herring were harvested in commercial sac roe herring fisheries conducted in Southeast Alaska during 2004. A harvest of approximately 12,300 tons is anticipated for the 2005 season.

## **REGULATIONS**

Commercial herring fishing regulations are outlined by the Alaska Department of Fish and Game (ADF&G) in the Commercial Herring Fishing Regulations booklet. Copies of the 2004-2005 Supplemental Commercial Herring Fishing Regulations edition may be obtained at any Department of Fish and Game office. The Sitka Sound Commercial Sac Roe Herring Fishery Management Plan adopted in January of 2002 is now included in this booklet [5 AAC 27.195]. All regulations adopted by the Alaska Board of Fisheries during the January 2003 meeting will be in effect during the 2005 sac roe fisheries. These regulations will include new alternating year gillnet and seine sac roe fisheries in the West Behm Canal area [5 AAC 27.197], and minor modifications of Buyer and Tender Reporting Requirements for Sac Roe [5 AAC 27.162]. ADF&G staff listed at the conclusion of this plan is available to provide further details.

## **VESSEL CHECK-IN, CHECK-OUT, AND REPORTING PROCEDURE**

Buyers or buyer's agents shall register all vessels employed in transporting and processing herring with ADF&G prior to commencing with those activities and make daily reports of herring purchased from fishers as specified by a local representative of ADF&G [5 AAC 27.162(a)]. ADF&G requests that tenders and fishing vessels not previously registered through buyers or buyer's agents, check-in and check-out of the fishing areas with department personnel located on the fishing grounds to facilitate timely and complete assessment of herring landings.

Fish tickets must be provided to the Commercial Fisheries Entry Commission (CFEC) permit holder at the time of delivery to the first buyer or buyer's agent [5 AAC 27.162(c)]. This means that there must be a separate fish ticket for each delivery to a tender before the tender leaves the fishing grounds to make a landing. At the request of the CFEC permit holder, on-the-grounds weight and roe content shall both be recorded on the fish ticket. Operators who will transport fish out of Alaska before processing must submit a fish ticket before departing the state [5 AAC 39.130(c)]. Fully completed fish tickets with updated accurate and final weights and roe

percentages must be submitted to ADF&G within 10 days after the termination of buying operations, unless otherwise specified by ADF&G [5 AAC 27.162(a)(3)].

### **REPORTING PROCEDURES FOR FLOATING FISH PROCESSORS**

Operators of floating fish processing vessels are required to report in person, by radio, or telephone, to the local department representative in the management area of intended operation before processing begins [5 AAC 39.130 (g)]. The report must include the location and date of intended operation.

### **ANNOUNCEMENT OF OPENINGS AND CLOSURES**

Fishery openings and closures will be implemented via department emergency order. Announcements will be issued through normal news release channels and on the fishing grounds over VHF radio. The VHF radio frequency for receiving field announcements will be indicated on the fishing grounds. Harvesters should expect short notification of opening and closing times. This is necessary to provide fishing opportunities prior to major spawning and to maintain the harvest at desired levels.

ADF&G will monitor herring in advance of the expected fishery opening dates. Fisheries will be placed on a two-hour notice prior to the first opening. During the Sitka fishery, ADF&G will try to give the industry a 36-hour advance warning of a decision to place the fishery on two-hour notice. However, if spawning is either earlier or heavier than anticipated and waiting 36 hours could result in loss of fishing opportunity, this much advance notice will not be given. During the Seymour Canal and Hobart/Houghton gillnet fisheries, ADF&G will provide the industry with a 12-hour advance notice of a decision to place the fishery on two-hour notice. The 12-hour notice helps limit the amount of time vessels must remain on the fishing grounds prior to the start of the fishery.

### **MANAGEMENT STRATEGY**

The harvest strategy for Southeast Alaska herring sac roe fisheries is based on the availability of mature herring containing quality roe (at least 10% mature roe), total biomass, age structure, recruitment, growth characteristics, and past spawning success. Southeast Alaska herring generally reach maturity at a standard length (tip of the snout to the end of the hypural plate) of 185 mm (8 inches), a size achieved by some three- and most four-year-old fish.

Herring populations are assessed annually to determine whether individual spawning stocks are above threshold and to determine the appropriate harvest rate (see Sliding Scale Harvest Rate on next page). As specified in 5 AAC 27.190 HERRING MANAGEMENT PLAN FOR STATISTICAL AREA A, harvest of a particular spawning stock is not allowed unless an assessment of the abundance and general condition of that spawning stock has been conducted and the estimated biomass is above the minimum spawning biomass threshold level.

The threshold level is the herring biomass needed to meet minimum spawning and/or allocation requirements. The established threshold levels for the herring sac roe fishing areas are:

| <b>Fishing Area</b> | <b>Threshold Level</b> |
|---------------------|------------------------|
| Seymour Canal       | 3,000 tons             |
| Revilla Channel     | 6,000 tons             |
| Lynn Canal          | 5,000 tons             |
| Sitka Sound         | 20,000 tons            |
| Hobart/Houghton     | 2,000 tons             |
| West Behm Canal     | 6,000 tons             |

Varieties of methods have been used to assess the status of herring populations in Southeast Alaska. Before 1970, herring abundance was assessed through visual estimates made from vessels using depth sounders and sonar immediately prior to spawning or on wintering aggregations. In addition, miles of spawn were documented with aerial or skiff surveys. A computer-assisted hydro acoustic survey method was developed in the early 1970s and used extensively during the late 1970s to the mid-1980s. Spawn deposition surveys were first used in 1976 and continue to be a key component of current assessment methods. The spawn deposition method combines diver estimates of herring egg deposition on the spawning grounds along with estimates of total area receiving spawn and average fecundity, to yield an estimate of spawning biomass. The estimates of spawning biomass from one year may be used as a basis to forecast and to set harvest quotas for individual spawning stocks for the following year. This method was used to establish a forecast for the Hobart/Houghton spawning stock.

Beginning in 1994, ADF&G began using age-structured analysis (ASA) to forecast abundance for selected spawning stocks with sufficient historic stock information. The ASA method relies on a time series of herring population assessment data (e.g., spawning biomass as determined by egg deposition surveys and fecundity, age composition and weight-at-age from samples of spawning herring, catch age composition and weight-at-age, and weight-at-age from winter test sampling) to forecast herring biomass for those spawning stocks. This method applies estimates of recruitment, growth, maturation, and natural mortality to an estimate of spawning escapement from one year to forecast biomass for the next year. This is an important development because gains in herring biomass due to recruitment and growth are often not equal to the loss of biomass due to natural mortality. The ASA method is currently used to forecast herring abundance for the Sitka, Revilla Channel, West Behm Canal, Seymour Canal, Craig/Klawock, and Tenakee Inlet fisheries.

### **SLIDING SCALE HARVEST RATE**

The allowable harvest is based on a graduated scale that allows for higher harvest rates as a herring population increases relative to the threshold level. This approach maintains annual harvest rates between 10% and 20% of the forecast spawning stock in excess of established threshold levels. When the spawning stock biomass is at the minimum threshold level, a 10% harvest is allowed. The allowable harvest increases an additional 2% for every spawning stock biomass increase of an amount equal to the threshold level and reaches a maximum of 20% when the population is six-times the threshold level.

The percent harvest rate for any multiple of the threshold level from one to six can be estimated from Figure 2, or by performing the following calculation:

$$\text{Percent Harvest Rate} = 8 + 2 \left[ \frac{\text{Forecast Spawning Population Size}}{\text{Threshold Level}} \right] \quad (1)$$

An exception to the harvest rate formula now applies to the Sitka Sound sac roe herring fishery based on Board of Fisheries action taken at the 1997 meeting in Sitka. For the Sitka fishery, the new harvest rate is calculated as follows using a 20,000-ton threshold (Figure 3):

$$\text{Percent Harvest Rate} = 2 + 8 \left[ \frac{\text{Forecast Spawning Population Size}}{\text{Threshold Level}} \right] \quad (2)$$

## **ROE QUALITY**

Sac roe herring fisheries are managed in compliance with regulation 5 AAC 27.059 MANAGEMENT GUIDELINES FOR COMMERCIAL HERRING SAC ROE FISHERIES. This regulation outlines ways ADF&G can manage sac roe fisheries to enhance value. To determine the best time to fish, ADF&G samples prespawning herring populations in cooperation with harvesters and trained industry technicians. All test-fishing activities must be authorized by department biologists on the fishing grounds.

## **GILLNET FISHERIES**

There are three exclusive set gillnet sac roe fishing areas in Southeast Alaska: the Revilla Channel fishery in regulatory Section 1-F, the Seymour Canal fishery in Section 11-D, and the Hobart-Houghton fishery in District 10. During the 2003 Alaska Board of Fisheries meeting in Sitka the board adopted a new sac roe gillnet fishery for West Behm Canal. The new gillnet fishery will operate on alternate years with a purse seine sac roe fishery. The board specified that the gillnet fishery would be implemented first but could not begin until 2004. A summary of historical harvest and fishing time information for each fishery is shown in Table 1. Gillnetters are reminded that regulations require identification tags, issued by ADF&G, to be placed on one buoy at each end of a herring set gillnet [5 AAC 27.131 (g)].

### **REVILLA CHANNEL**

Set gillnet sac roe fisheries have occurred in the Revilla Channel area (Section 1-F) since 1976 (Table 1). Seasonal landings have ranged from a low of 171 tons in 1978 to a high of 3,250 tons in 1983. In 1990, and from 2000 through 2004, the minimum threshold level was not reached and no fishery was permitted. In 1999, a Guideline Harvest Limit (GHL) of 870 tons was established. However, due to on-grounds concern over the lack of herring located in Alaska waters, the fishery was not opened and no herring were harvested.

In 2004, no herring spawn was observed in the Kah Shakes/Cat Island area. Therefore, no sac roe herring fishery will take place there in 2005. ADF&G will, however, continue to monitor the status of the Revilla Channel herring. Spawning will be mapped, samples will be taken for age class distribution, and dive surveys will be conducted to estimate the spawning biomass. The population estimate determined in 2005 will be used to set the harvest level for 2006.

## **WEST BEHM CANAL**

The Alaska Board of Fisheries passed regulations in January 2003 to open the West Behm Canal area (Section 1-E and portions of Section 1-F) for sac roe herring fishing and also for bait pound operation. Elements of the commercial herring fishery plan include:

1. Annual, alternating fishing schedule between set gillnet and purse seine gear in years which the threshold level is met with the first fishery in 2004 being set gillnet;
2. A cooperative purse seine fishery in years when the purse seine fishing gear is allowed;
3. Closed waters in the Clover Passage and Tongass Narrows area, and;
4. The establishment of a bait pound fishery which is allocated 10% of the GHL for the West Behm Canal spawning population (5 AAC 27.160).

The 2004 ASA forecast of mature spawning biomass for the West Behm Canal herring population was 9,366 tons, establishing a GHL for the sac roe herring fishery of 940 tons. However, due to on-grounds concerns over the lack of herring in West Behm Canal, the fishery was not opened and no herring were harvested. The actual spawning biomass observed in 2004 was 416 tons, much lower than the forecast. The 2005 ASA forecast for West Behm Canal is only 446 tons, which is far below the threshold level of 6000 tons. This means there will be no sac roe herring fishery in West Behm Canal for 2005.

## **SEYMOUR CANAL**

Set gillnet fisheries have occurred intermittently in Seymour Canal (Section 11-D) since the fishery was changed from a seine area to a gillnet area in 1980. Annual landings during years fished by gillnets have ranged from a low of 302 tons in 1987 to a high of 1,519 tons in 2003.

The ASA forecast of the mature spawning biomass for the Seymour Canal herring stock is approximately 7,040 tons. Using the sliding scale harvest rate, this biomass allows a harvest rate of 12.7% of the population and a GHL of 894 tons for the 2005 fishing season. The forecast indicates that the spawning stock will consist of primarily age-5 herring.

Opening dates for the Seymour Canal gillnet fishery have ranged from April 26 to May 16. Since 1980, spawning has started as early as April 19 and as late as May 15. Department personnel will begin to monitor the Seymour Canal area in mid-April. Initially, monitoring will be limited to aerial surveys. Depending on observed herring activity, vessels with department personnel will be on the fishing grounds by late April or early May.

Set gillnet buoy stickers must be obtained and placed on buoys prior to fishing. Identification stickers will be available free of charge from the Douglas, Ketchikan, and Petersburg Fish and Game offices prior to the time that ADF&G's vessel is on the fishing grounds; thereafter, identification stickers can only be obtained from ADF&G's vessel. The stickers will only be issued to valid permit holders and proper picture identification will be required. If during the course of the fishery a buoy sticker is lost, a replacement sticker must be obtained from ADF&G before fishing is resumed.

Buoy stickers issued for the Hobart/Houghton fishery will be valid for the Seymour Canal fishery. Fishermen must still register with ADF&G upon reaching the Seymour Canal fishing area.

Legal gear for the Seymour Canal fishery is one 50-fathom net, with a minimum mesh size of 2 1/8 inches stretched mesh and a maximum depth of 120 meshes.

Regulations require a one-hour grace period for nets to be removed from the water following the announced closure time. No gillnet may be reset after the closure time. Additionally, ADF&G has been given the authority to open the fishery for one hour or less without a grace period. An opening of this nature could occur if, after the initial opening, a small but manageable amount of herring is left on the GH. The department will announce if a grace period will not be allowed due to an opening of one hour or less.

## **HOBART/HOUGHTON**

The Alaska Board of Fisheries adopted a regulation in January 1997 that allocates any unharvested portion of the GH for the Hobart/Houghton winter food and bait fishery to the sac roe gillnet fishery [5 AAC 27.160 (f)]. Sac roe harvests occurred in 1997 through 1999. In 2000, the GH was harvested in the winter bait fishery (Table 1). No harvest occurred in 2001 through 2004.

The 2005 ASA forecast of mature spawning biomass for the Hobart/Houghton herring spawning stock is 2,189 tons. This is above the minimum threshold level of 2,000 tons. Using the sliding scale harvest rate, this biomass allows a harvest rate of 10.2% of the population and a GH of 223 tons for the 2004/2005 Hobart/Houghton Winter Bait Fishery. To date, no herring have been harvested in the bait fishery that will close February 28, 2005. The GH for the gillnet sac roe fishery will be announced by ADF&G following the closure of the winter bait fishery. If no herring are harvested in the food and bait fishery, a 223 ton GH would be set for the Hobart/Houghton sac roe fishery.

During the past ten years, the average peak spawning date at Hobart/Houghton has been April 25. During those years, spawning started as early as April 15 and as late as April 30. In 1997 the gillnet fishery occurred on April 28, in 1998 it occurred on April 20 and in 1999 it occurred on April 25. ADF&G personnel will begin monitoring the Hobart/Houghton area in mid-April. Initially, monitoring will be limited to aerial surveys. Depending on the observed herring activity, vessels with Department personnel on board will be on the fishing grounds in mid or late April and will remain there until the fishery is closed.

Set gillnet buoy stickers must be obtained and placed on buoys prior to fishing. Identification stickers will be available free of charge from the Petersburg and Douglas Fish and Game offices prior to the time ADF&G's vessel is on the fishing grounds; thereafter, identification stickers can only be obtained from ADF&G's vessel. The stickers will only be issued to valid permit holders and proper picture identification will be required. If during the course of the fishery a buoy sticker is lost, a replacement sticker must be obtained from ADF&G before fishing is resumed.

Buoy stickers issued for the Hobart/Houghton fishery will be valid for the Seymour Canal fishery. Fishermen must still register with ADF&G upon reaching the Hobart/Houghton fishing area.

Legal gear for the Hobart/Houghton fishery is one 50-fathom net, with a minimum mesh size of 2 1/8 inches stretched mesh and a maximum depth of 120 meshes.

Regulations require a one-hour grace period for nets to be removed from the water following the announced closure time. No gillnet may be reset after the closure time. Additionally, ADF&G has been given the authority to open the fishery for one hour or less without a grace period. An

opening of this nature could occur if, after the initial opening, a small but manageable amount of herring is left on the GHL. ADF&G will announce if a grace period will not be allowed due to an opening of one hour or less.

## **PURSE SEINE FISHERIES**

There are two exclusive purse seine herring sac roe areas in Southeast Alaska: Lynn Canal and Sitka Sound. Commercial fishing will be allowed only in Sitka Sound during the 2005 season. A summary of harvest and fishing time information for each fishery is shown in Table 2. During the 2003 Alaska Board of Fisheries meeting in Sitka, the board adopted a new sac roe purse seine fishery for West Behm Canal. The new seine fishery will operate on alternate years with a gillnet sac roe fishery in years when the threshold level is met.

### **LYNN CANAL**

The Lynn Canal herring sac roe fishing area encompasses regulatory Sections 15-B, 15-C, and that portion of Section 11-A north of the Shrine of St. Therese.

The Lynn Canal fishery has not been open since 1982. Aerial and on-the-grounds surveys conducted in the Lynn Canal fishing area during the spring of 2004 indicated that the population was below the spawning threshold level of 5,000 tons. Therefore, this fishery will not open in 2005.

### **WEST BEHM CANAL**

The Alaska Board of Fisheries passed regulations in January 2003 that allowed for a cooperative purse seine fishery on alternate years in which the threshold level is met. Since in 2004 the West Behm Canal threshold level was not met, there will be no sac roe herring fishery there in 2005.

### **SITKA SOUND**

The Sitka Sound sac roe fishing area encompasses the waters of Section 13-B north of the latitude of Aspid Cape, excluding the waters of Whale and Necker bays.

The preliminary 2005 forecast for the Sitka Sound herring spawning biomass was 53,701 tons, announced on November 15, 2004. This biomass provides for a harvest rate of 20% and a preliminary GHL of 10,740 tons. This estimate was the result of applying stock specific ASA model for the Sitka Sound herring population using time series of spawn deposition data, spawning age composition, and commercial age composition.

Based on size-at-age data from winter samples collected in Sitka Sound on January 13, 2005, the GHL for the 2005 sac roe herring fishery has been revised to a final GHL of 11,192 tons. The GHL is based on a biomass forecast of 55,962 tons and a 20% harvest rate.

The ASA forecasting model indicates the 2005 spawning population will consist of 9% age-3, 2% age-4, 40% age-5, 19% age-6, 13% age-7, and 17% age-8+ herring. Applying expected age structure and 2005 winter weight-at-age measurements to the population forecast in numbers of fish, yields an overall average weight of 132 grams.

Herring distribution and roe quality will be monitored prior to and during the fishing period. Monitoring methods for 2005 will include aerial surveys, hydroacoustic surveys, and test fishing. In 2005, ADF&G will continue to coordinate the test boat program through a fisherman-coordinator who will assign daily test fishing boats requested by ADF&G. Prior to making test sets, the identified test boats will contact ADF&G biologists on the grounds to monitor set

locations and to plan for transport of herring samples to a central location for analysis by industry technicians. The areas open to fishing will depend on the distribution of herring, the need to provide for a fishery that will harvest good quality herring, and the need to provide a reasonable opportunity for subsistence.

In order to help ADF&G to ensure that a reasonable opportunity is provided for subsistence, a Memorandum of Agreement (MOA) was signed by ADF&G and the Sitka Tribe of Alaska (STA) on November 4, 2002, and finalized by the Alaska Board of Fisheries on December 17, 2002. This agreement brings consideration of potential impacts of the commercial sac roe herring fishery on the subsistence herring fishery in Sitka Sound to the ADF&G fishery manager through an in-season consultation process. An in-season task force will provide recommendations concerning proposed management actions at a minimum prior to each announcement of a commercial opening after considering potential impacts on the subsistence fishery and the commercial fishery. The three task force members will include the in-season Tribal liaison from STA, a permit holder, and the Sitka Fish and Game Advisory Committee. ADF&G will also consider any in-season recommendations from buyers or processing stakeholders, but no individual processing representative will be designated as a task force representative who may speak for other processors. Members would be available on short notice to review proposed decisions of the fishery manager. In the event of dissenting recommendations, the fishery manager would be the final arbiter after having considered all input from the task force. During or following each season, the ADF&G Subsistence Division will work cooperatively with the Sitka Tribe of Alaska to determine the amount and quality of the subsistence harvest, and would indicate whether the amount necessary for subsistence had been successfully harvested, and therefore, whether a reasonable opportunity for subsistence had been provided.

ADF&G is requesting registration information for all fishing boats, tenders, and processors prior to the fishery. Registration is greatly simplified if coordinated and provided by each processing company. Processing companies should contact the Sitka Fish and Game office for a registration form. In addition, each processor should update the Sitka Fish and Game office with expected daily (24-hour) processing capacity and/or exporting plans. Company affiliations and processing capacities will be considered confidential.

ADF&G held a Southeast Alaska sac roe fisheries pre-season planning meeting through teleconference on February 10, 2005. Invited to participate in this meeting were all permit holders, all buyers, representatives of STA, personnel from both state and federal enforcement programs, and the appropriate department biologists. Primary to the discussions was consideration of the details of a harvesting approach for the 2005 season. These discussions considered the size of quota, freezing capacity, tending and export capacity, and methods to maximize roe content and fishery exvessel value. Based on the discussions at the meeting it was generally agreed the harvest strategy would be to harvest the 11,192-ton GHJ in three or four openings with at least one day between openings. The day between openings is to allow time for processing and tendering capacity to be available to handle additional harvest. This will serve as a general plan of approach for the 2005 fishery. It will be necessary to remain flexible and adapt specific opening target harvest levels to in-season assessment of herring distribution and quality, to changes in available processing and tendering capacity, and to input from industry representatives. A general pre-fishery meeting immediately prior to the fishery will be held in Sitka when the fishery is being placed on 2-hour notice.

In order to provide a reasonable opportunity for subsistence, ADF&G must consider whether it is necessary to distribute the harvest time and area in the commercial fishery.

Mechanisms of consideration for distribution of commercial harvest may include the following:

1. Considering recommendations from in-season task force members,
2. Choosing dispersal of time and area by selecting appropriate in-season options, and
3. Limiting harvest in the highest frequency spawning area along the Halibut Point Road shoreline in proportion to historical use patterns established by past commercial competitive fisheries (50–55% of the GHL).

The general approach would be to act on opportunities for openings outside of the high frequency spawning area as they arise, yet to recognize the probability that fishing within this area may be necessary in order to provide an opportunity for the commercial fishery to harvest and to reach the season's GHL.

During the 2004 fishery, a collision of seine vessels occurred causing significant damage to one of the vessels. The incident was investigated by the United States Coast Guard (USCG) Marine Safety Detachment. The conclusion of the investigation was that violations of Coast Guard "Rules of the Road" regulations had occurred during the incident and therefore fines have been levied against the operators of the vessels. At the pre-season planning meeting, a representative of the USCG made a presentation to inform fishery participants of the application of "Rules of the Road" during the fishery. The USCG representative made it implicit that vessels participating in the fishery are subject to citation and fines if "Rules of the Road" are violated during the conduct of the fishery. The USCG is planning to have assets on the grounds during the 2005 fishery to enforce USCG rules and regulations. For further information regarding the application of "Rules of the Road" during the conduct of the fishery, contact the USCG Marine Safety Detachment at 966-5454.

The Magnuson-Stevens Fishery Conservation and Management Act restricts the use of foreign vessels outside of internal waters and the port of Sitka. Fishery openings outside of internal waters and the port of Sitka are possible. Operators of foreign vessels wanting to participate in the Sitka Sound herring sac roe fishery are encouraged to contact the National Marine Fisheries Service at (907) 747-6940 for more details.

## LIST OF MANAGEMENT CONTACTS

The following ADF&G, Division of Commercial Fisheries personnel may be contacted regarding this management plan:

|   |  |
|---|--|
| Scott Kelley<br>Region I Supervisor<br>Douglas Regional Office                                      | P.O. Box 240020<br>Douglas, Alaska 99824<br>(907) 465-4250                 |
| Bill Davidson<br>Region I Management Coordinator<br>Sitka Area Office                               | 304 Lake St. Rm. 103<br>Sitka, Alaska 99835<br>(907) 747-6688              |
| Kevin Monagle and David Harris<br>Area Management Biologists<br>Douglas Regional Office             | P.O. Box 240020<br>Douglas, Alaska 99824<br>(907) 465-4250                 |
| Marc Pritchett<br>Herring Research Biologist<br>Douglas Regional Office                             | P.O. Box 240020<br>Douglas, Alaska 99824<br>(907) 465-4250                 |
| Phil Doherty, Justin Breese, and Bo Meredith<br>Area Management Biologists<br>Ketchikan Area Office | 2030 Sea Level Dr., Suite 205<br>Ketchikan, Alaska 99901<br>(907) 255-5195 |
| William Bergmann and Troy Thynes<br>Area Management Biologists<br>Petersburg Area Office            | P.O. Box 667<br>Petersburg, Alaska 99833<br>(907) 772-3801                 |
| Bill Davidson and Dave Gordon<br>Area Management Biologists<br>Sitka Area Office                    | 304 Lake St. Rm. 103<br>Sitka, Alaska 99835<br>(907) 747-6688              |
| Scott Forbes<br>Assistant Area Management Biologist<br>Wrangell Area Office                         | P.O. Box 200<br>Wrangell, Alaska 99929<br>(907) 874-3822                   |

## **TABLES AND FIGURES**

**Table 1.**—Southeast Alaska gillnet sac roe herring fisheries information summary, 1976–2004.

| Year | Seymour Canal <sup>a</sup>     |              |                                |                | Revilla Channel                |              |                                |                    |
|------|--------------------------------|--------------|--------------------------------|----------------|--------------------------------|--------------|--------------------------------|--------------------|
|      | Guideline Harvest Level (Tons) | Catch (Tons) | Date Two Hour Notice Effective | Opening Dates  | Guideline Harvest Level (Tons) | Catch (Tons) | Date Two Hour Notice Effective | Opening Dates      |
| 1976 | 200                            | 195          |                                | May 9          | 300                            | 426          | March 23                       | April 2            |
| 1977 | 500                            | 485          | May 4                          | May 9          | 800                            | 820          | March 29                       | April 1            |
| 1978 | 500                            | 729          | May 2                          | May 8          | 680                            | 171          | March 26                       | April 4            |
| 1979 | 250                            | 269          | May 3                          | May 3          | 585                            | 528          | March 28                       | March 29           |
| 1980 | --                             | --           | Fishery Not Open               | --             | 1,100                          | 1,140        | March 25                       | March 25           |
| 1981 | 600                            | 615          | April 28                       | April 28       | 1,550                          | 1,840        | March 20                       | March 20           |
| 1982 | --                             | --           | Fishery Not Open               | --             | 1,700                          | 2,279        | March 20                       | March 26           |
| 1983 | --                             | --           | Fishery Not Open               | --             | 2,500                          | 3,250        | March 23                       | March 24           |
| 1984 | 375                            | 518          | April 20                       | April 26       | 2,100                          | 2,182        | March 20                       | March 29           |
| 1985 | --                             | --           | Fishery Not Open               | --             | 2,300                          | 2,161        | March 28                       | March 29           |
| 1986 | 300                            | 339          | May 5                          | May 10         | 1,100                          | 1,536        | March 29                       | March 31           |
| 1987 | 419                            | 302          | May 1                          | May 5, 6       | 1,200                          | 1,440        | March 24                       | March 26, 27       |
| 1988 | 530                            | 586          | April 20                       | April 26-May 1 | 953                            | 1,087        | March 24                       | March 25           |
| 1989 | 332                            | 547          | April 21                       | April 28       | 647                            | 592          | March 20                       | March 20, 21       |
| 1990 | 312                            | 359          | April 21                       | April 28-29    | --                             | --           | --                             | --                 |
| 1991 | --                             | --           | Fishery Not Open               | --             | 680                            | 660          | March 28                       | April 8-11         |
| 1992 | --                             | --           | Fishery Not Open               | --             | 1,200                          | 1,256        | April 1                        | April 3            |
| 1993 | --                             | --           | Fishery Not Open               | --             | 717 <sup>b</sup>               | 737          | March 31                       | April 10           |
| 1994 | 368                            | 382          | April 28                       | April 29       | 880 <sup>b</sup>               | 749          | April 9                        | April 9,11         |
| 1995 | 316                            | 319          | April 30                       | May 14         | 630                            | 626          | April 11                       | April 12           |
| 1996 | --                             | --           | Fishery Not Open               | --             | 871                            | 605          | April 8                        | April 10           |
| 1997 | -                              | -            | Fishery Not Open               | --             | 912                            | 1,137        | April 6                        | April 6            |
| 1998 | 633                            | 585          | April 30                       | May 1-4        | 620                            | 616          | April 1                        | April 1, 2         |
| 1999 | 595                            | 706          | April 30                       | April 30       | 870                            | 0            | No Fishery                     | Fishery Not Opened |
| 2000 | 346                            | 394          | May 3                          | May 5          | 0                              | 0            | No Fishery                     | Fishery Not Opened |
| 2001 | 474                            | 620          | May 6                          | May 11-12      | 0                              | 0            | No Fishery                     | Fishery Not Opened |
| 2002 | 1,096                          | 1,066        | May 12                         | May 16-17      | 0                              | 0            | No Fishery                     | Fishery Not Opened |
| 2003 | 1,712                          | 1,518        | Apr 28                         | Apr 29-May 2   | 0                              | 0            | No Fishery                     | Fishery Not Opened |
| 2004 | 838                            | 804          | May 1                          | May 3          | 0                              | 0            | No Fishery                     | Fishery Not Opened |

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**Table 1.**—(Page 2 of 2)

| Year | Hobart-Houghton                             |              |         |                                | Opening Dates                       | West                           | Behm         | Canal                          | Opening Dates      |
|------|---|--------------|---------|--------------------------------|-------------------------------------|--------------------------------|--------------|--------------------------------|--------------------|
|      | Guideline Harvest Level <sup>d</sup> (Tons) | Catch (Tons) |         | Date Two Hour Notice Effective |                                     | Guideline Harvest Level (Tons) | Catch (Tons) | Date Two Hour Notice Effective |                    |
|      |   | Bait         | Sac Roe |                                |                                     | Bait/Sac Roe                   |              |                                |                    |
| 1977 | 0   | 40           | 0       |                                | October 1                           |                                |              |                                |                    |
| 1978 | 0   | 0            | 0       |                                | Fishery Not Open                    |                                |              |                                |                    |
| 1979 | 0   | 0            | 0       |                                | Fishery Not Open                    |                                |              |                                |                    |
| 1980 | 0   | 0            | 0       |                                | Fishery Not Open                    |                                |              |                                |                    |
| 1981 | 0   | 0            | 0       |                                | Fishery Not Open                    |                                |              |                                |                    |
| 1982 | 0   | 0            | 0       |                                | Fishery Not Open                    |                                |              |                                |                    |
| 1983 | 0   | 0            | 0       |                                | Fishery Not Open                    |                                |              |                                |                    |
| 1984 | 0   | 0            | 0       |                                | Fishery Not Open                    |                                |              |                                |                    |
| 1985 | 0   | 0            | 0       |                                | Fishery Not Open                    |                                |              |                                |                    |
| 1986 | 0   | 0            | 0       |                                | Fishery Not Open                    |                                |              |                                |                    |
| 1987 | 0   | 0            | 0       |                                | Fishery Not Open                    |                                |              |                                |                    |
| 1988 | 0   | 0            | 0       |                                | Fishery Not Open                    |                                |              |                                |                    |
| 1989 | 0   | 0            | 0       |                                | Fishery Not Open                    |                                |              |                                |                    |
| 1990 | 0   | 0            | 0       |                                | Fishery Not Open                    |                                |              |                                |                    |
| 1991 | 0   | 0            | 0       |                                | Fishery Not Open                    |                                |              |                                |                    |
| 1992 | 200   | 0            | 0       |                                | January 13, 1992                    |                                |              |                                |                    |
| 1993 | 500   | 0            | 0       |                                | January 12, 1993                    |                                |              |                                |                    |
| 1994 | 230   | 140          | 0       |                                | October 17, 1993                    |                                |              |                                |                    |
| 1995 | 250   | 229          | 0       |                                | October 1, 1994                     |                                |              |                                |                    |
| 1996 | 700   | 230          | 0       |                                | October 15, 1995                    |                                |              |                                |                    |
| 1997 | 550   | 100          | 442     | April 19                       | October 1, 1996-April 28            |                                |              |                                |                    |
| 1998 | 260   | 0            | 351     | April 19                       | October 1, 1997-April 20            |                                |              |                                |                    |
| 1999 | 436   | 0            | 506     | April 25                       | October 14, 1998-April 26           |                                |              |                                |                    |
| 2000 | 418   | 432          | 0       | No Fishery                     | December 1, 1999-Gillnet not opened |                                |              |                                |                    |
| 2001 | 0   | 0            | 0       | No Fishery                     | Fishery Not Opened                  |                                |              |                                |                    |
| 2002 | 0   | 0            | 0       | No Fishery                     | Fishery Not Opened                  |                                |              |                                |                    |
| 2003 | 0   | 0            | 0       | No Fishery                     | Fishery Not Opened                  |                                |              |                                |                    |
| 2004 | 0   | 0            | 0       | No Fishery                     | Fishery Not Opened                  | 0                              | 0            | No Fishery                     | Fishery Not Opened |

<sup>a</sup> Seymour Canal was a purse seine fishing area prior to 1980.

<sup>b</sup> Quota reduced by 150 tons as an allocation for the Annette Island sac roe harvest.

<sup>c</sup> Hobart Bay was opened to Gillnet Sac Roe Fishing in 1997.

<sup>d</sup> Gillnet quota is the portion left after the winter bait fishery is completed.

**Table 2.**—Southeast Alaska purse seine sac roe herring fisheries information summary, 1976–2003.

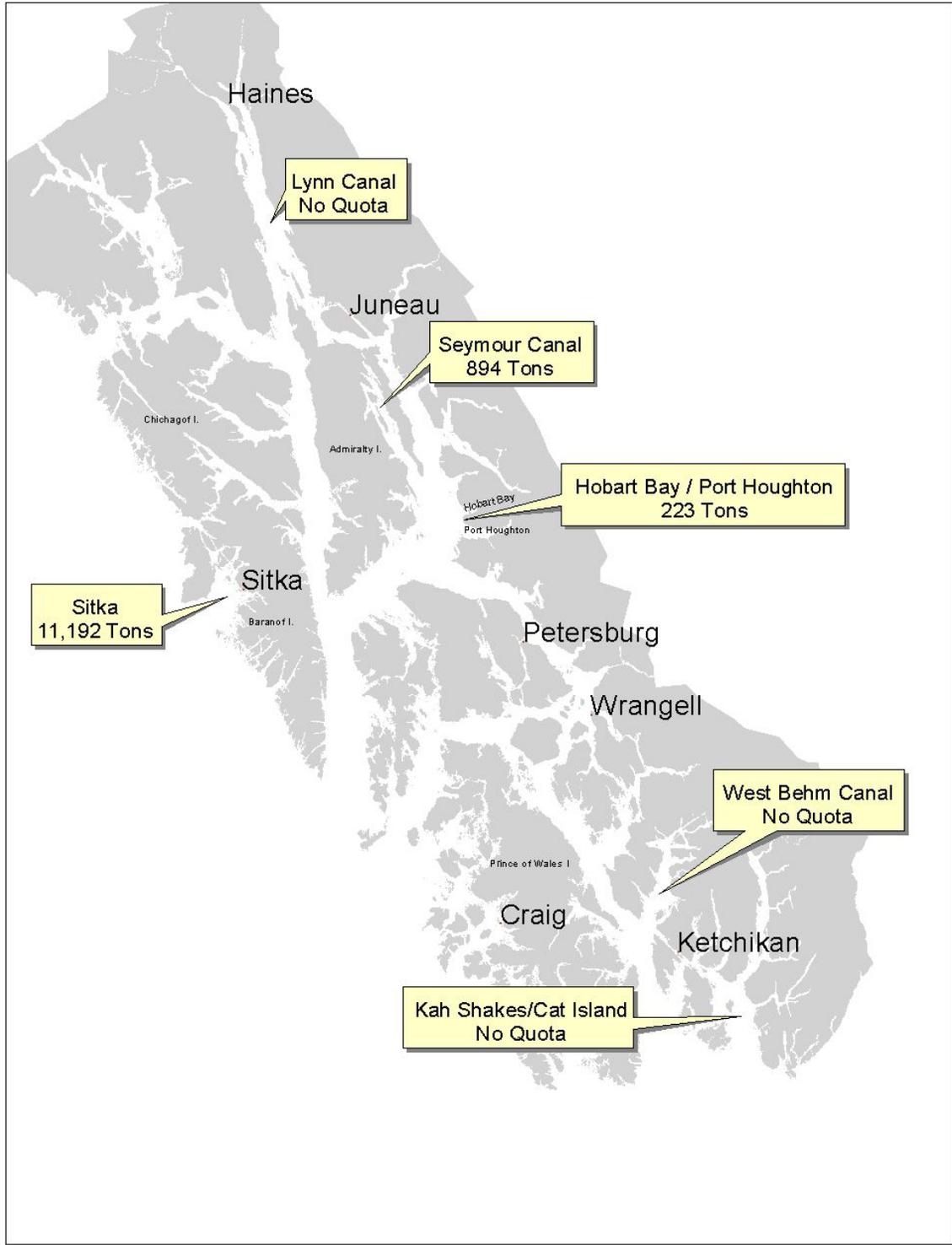
| Year | Juneau <sup>a</sup> -Lynn Canal |              |                                  |               | Sitka Sound                    |              |                                  |                           |
|------|---------------------------------|--------------|----------------------------------|---------------|--------------------------------|--------------|----------------------------------|---------------------------|
|      | Guideline Harvest Level (Tons)  | Catch (Tons) | Date 2-Hour Notice Was Effective | Opening Dates | Guideline Harvest Level (Tons) | Catch (Tons) | Date 2-Hour Notice Was Effective | Opening Dates             |
| 1976 | 750                             | 432          | Seine                            | April 26      | 780                            | 800          | April 10                         | April 16                  |
| 1977 | 875                             | 124          | Gillnet                          | April 29      | --                             | --           | Fishery Not Open                 | --                        |
|      |                                 | 709          | Seine                            | April 19      |                                |              |                                  |                           |
| 1978 | 500                             | 217          | Gillnet                          | April 20      | 250                            | 175          | April 4                          | April 5                   |
|      |                                 | 602          | Seine                            | April 19      |                                |              |                                  |                           |
|      | 200                             | 346          | Gillnet                          | April 21      |                                |              |                                  |                           |
| 1979 | --                              | --           | Fishery Not Open                 | --            | 2,000                          | 2,250        | April 7                          | April 12                  |
| 1980 | 600                             | 975          | Seine                            | April 13      | 4,000                          | 4,385        | April 4                          | April 4, 5                |
| 1981 | 725                             | 761          | Seine                            | April 17      | 2,700                          | 3,506        | March 23                         | March 24, 26              |
| 1982 | 375                             | 551          | Seine                            | April 30      | 3,000                          | 4,363        | March 26                         | March 30                  |
| 1983 | --                              | --           | Fishery Not Open                 | --            | 5,500                          | 5,463        | March 23                         | March 26, 29              |
| 1984 | --                              | --           | Fishery Not Open                 | --            | 5,000                          | 5,711        | March 22                         | March 26, 27, 28          |
| 1985 | --                              | --           | Fishery Not Open                 | --            | 7,700                          | 7,475        | March 24                         | March 29, April 1, 5      |
| 1986 | --                              | --           | Fishery Not Open                 | --            | 5,029                          | 5,443        | March 28                         | April 2, 8                |
| 1987 | --                              | --           | Fishery Not Open                 | --            | 3,600                          | 4,216        | March 23                         | March 31                  |
| 1988 | --                              | --           | Fishery Not Open                 | --            | 9,200                          | 9,573        | March 25                         | April 4 - 14              |
| 1989 | --                              | --           | Fishery Not Open                 | --            | 11,700                         | 11,831       | March 23                         | March 31 - April 8        |
| 1990 | --                              | --           | Fishery Not Open                 | --            | 4,146                          | 3,804        | April 4                          | April 5, 6                |
| 1991 | --                              | --           | Fishery Not Open                 | --            | 3,200                          | 1,908        | March 29                         | April 10 - April 13       |
| 1992 | --                              | --           | Fishery Not Open                 | --            | 3,356                          | 5,368        | March 30                         | April 6                   |
| 1993 | --                              | --           | Fishery Not Open                 | --            | 9,691                          | 10,186       | March 26                         | March 27 - April 3        |
| 1994 | --                              | --           | Fishery Not Open                 | --            | 4,432                          | 4,753        | March 28                         | March 29, 31              |
| 1995 | --                              | --           | Fishery Not Open                 | --            | 2,609                          | 2,908        | March 23                         | March 25, 27              |
| 1996 | --                              | --           | Fishery Not Open                 | --            | 8,144                          | 8,144        | March 23                         | March 23, March 31-Apr. 9 |

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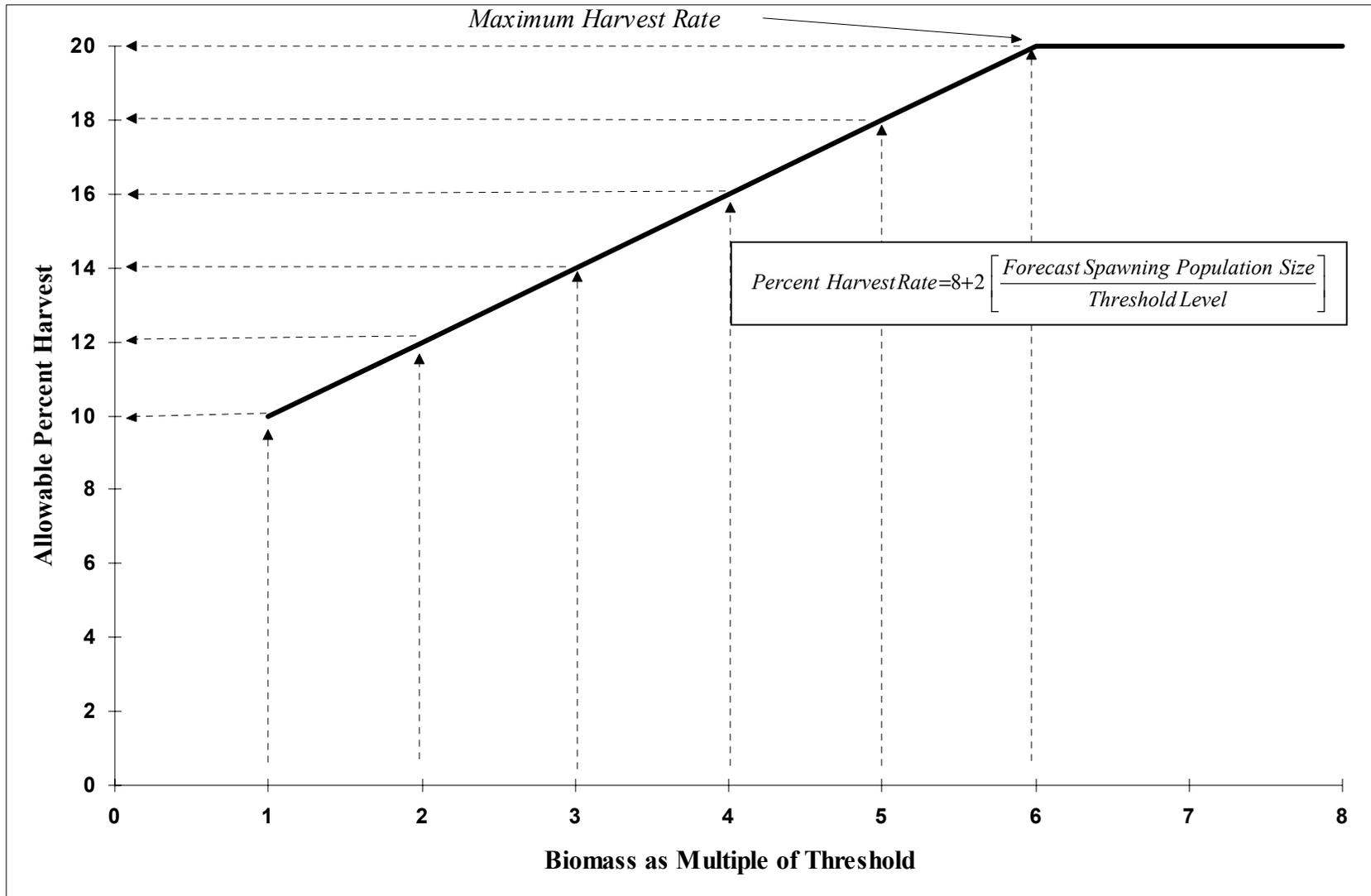
**Table 2--(Page 2 of 2)**

| Year | Juneau <sup>a</sup> -Lynn Canal |              |                                  |               | Sitka Sound                    |              |                                  |                                       |
|------|---------------------------------|--------------|----------------------------------|---------------|--------------------------------|--------------|----------------------------------|---------------------------------------|
|      | Guideline Harvest Level (Tons)  | Catch (Tons) | Date 2-Hour Notice Was Effective | Opening Dates | Guideline Harvest Level (Tons) | Catch (Tons) | Date 2-Hour Notice Was Effective | Opening Dates                         |
| 1997 | --                              | --           | Fishery Not Open                 | --            | 10,900                         | 11,147       | March 18                         | March 18-March 23                     |
| 1998 | --                              | --           | Fishery Not Open                 | --            | 6,900                          | 6,705        | March 16                         | March 16, 18, 19                      |
| 1999 | --                              | --           | Fishery Not Open                 | --            | 8,476                          | 9,136        | March 19                         | March 22, 24, 26-27                   |
| 2000 | --                              | --           | Fishery Not Open                 | --            | 5,120                          | 4,572        | March 13                         | March 19, 22                          |
| 2001 | --                              | --           | Fishery Not Open                 | --            | 10,597                         | 12,034       | March 15                         | March 22, 26, 27<br>March 27, 29, 31, |
| 2002 | --                              | --           | Fishery Not Open                 | --            | 11,042                         | 9,885        | March 25                         | April 2, April 12-15                  |
| 2003 | --                              | --           | Fishery Not Open                 | --            | 6,969                          | 7,051        | March 20                         | March 22, 23, 26                      |
| 2004 | --                              | --           | Fishery Not Open                 | --            | 10,618                         | 10,479       | March 19                         | March 21, 25, 27                      |

<sup>a</sup> The Juneau fishery was both a gillnet and seine area prior to 1980.



**Figure 1.**—Southeast Alaska sac roe herring areas and Guideline Harvest Levels for 2005.



**Figure 2.**—Generalized harvest strategy for Southeast Alaska herring. The allowable percent annual harvest is plotted against the estimated biomass of mature herring expressed as a multiple of the established harvest threshold level.

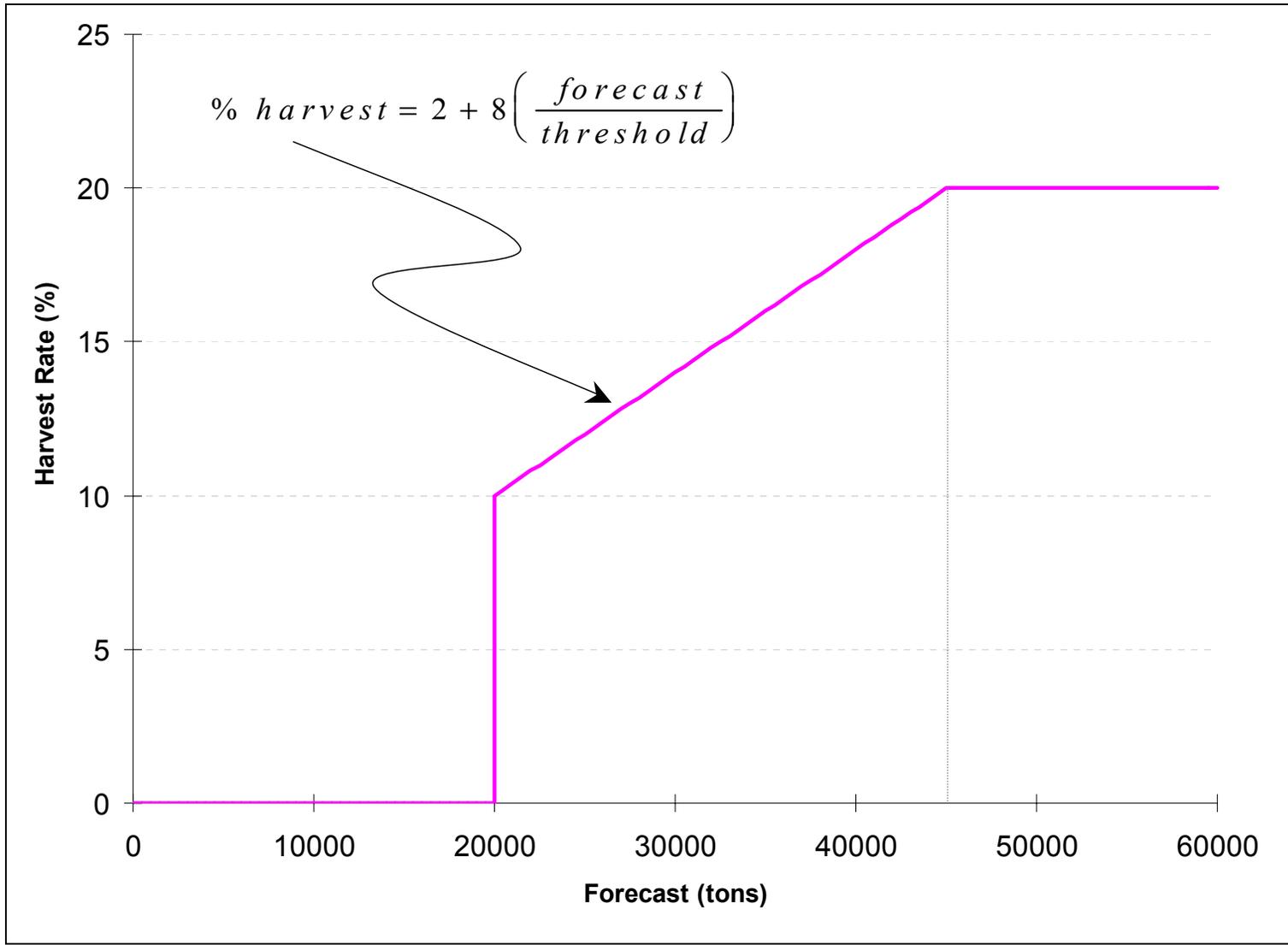


Figure 3.—Harvest rate and formula for Sitka Sound under 20,000 ton minimum threshold level [5 AAC 27.160 (g)].