

CFEC Permits and Estimates of Gross Earnings in the  
Togiak Sac Roe Herring Purse Seine and Gillnet  
Fisheries, 1983-2017

CFEC Report 18-6N  
November 2018

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Commercial Fisheries Entry Commission  
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## **Abstract**

The Togiak District of Bristol Bay contains the largest herring fishery in Alaska, which is comprised of a sac roe herring purse seine fishery, a sac roe herring gillnet fishery, and a herring spawn-on-kelp fishery. This report examines permits for the herring sac roe purse seine fishery (G01T) and the herring sac roe gillnet fishery (G34T), including summary statistics for the number of permits, the number of unfished permits, new entrants into the fisheries, permit holder mean age, estimated gross earnings for permit holders, vessel characteristics, and industry participation in the fisheries. Some summary statistics are also presented by resident type of the permit holder. In recent years, low ex-vessel prices for sac roe herring may have resulted in reduced participation, condensed fleets, and fishery cooperatives. Additionally, fewer processors are now available to the fisheries, which likely limits participation and harvest capacity.

Prepared by Craig Farrington and Daniel Strong

## **Acknowledgements**

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## Contents

Abstract.....	i
Acknowledgements .....	i
Introduction .....	1
Permits for Togiak Sac Roe Herring Fisheries .....	5
Unfished Permits.....	6
First Time Participation.....	8
Age of Permit Holders .....	9
Harvest, Earnings and Participation.....	10
Fleet Size and Vessel Characteristics.....	17
Industry/Processors.....	20

## List of Tables

Table 1. Communities Local to the Togiak Herring Purse Seine and Gillnet Fisheries, as Indicated in the CFEC Census File.....	3
Table 2. Togiak Sac Roe Herring Purse Seine Unfished Permits, 1983-2017 .....	6
Table 3. Togiak Sac Roe Herring Gillnet Unfished Permits, 1983-2017 .....	6
Table 4. First Time Participation in the Togiak Herring Purse Seine Fishery, 1983-2017 .....	8
Table 5. First Time Participation in the Togiak Herring Gillnet Fishery, 1983-2017 .....	8
Table 6. Mean Age of Select CFEC Permit Holders and the General Alaskan Population, 1983-2017.....	9
Table 7. Earnings, Harvests, Permits Fished, and Vessels in the Togiak Sac Roe Herring Purse Seine and Gillnet Fisheries, 1983-2017.....	11
Table 8. Estimated Total Gross Earnings (Real and Nominal) for the Togiak Herring Purse Seine Fishery, With Average Earnings (Real) by Permit and Vessel, 1983-2017.....	12
Table 9. Estimated Total Gross Earnings (Real and Nominal) for the Togiak Herring Gillnet Fishery, With Average Earnings (Real) by Permit and Vessel, 1983-2017 .....	13
Table 10. Estimated Real Gross Earnings in the Togiak Herring Purse Seine Fishery by Resident Type, 1983-2017 ...	15
Table 11. Estimated Real Gross Earnings in the Togiak Herring Gillnet Fishery by Resident Type, 1983-2017.....	16
Table 12. Number of Vessels by Length Category in the Togiak Sac Roe Herring Purse Seine Fishery with Landings by Year, 1983-2017.....	18
Table 13. Number of Vessels by Length Category in the Togiak Sac Roe Herring Gillnet Fishery with Landings by Year, 1983-2017 .....	19
Table 14. Togiak Sac Roe Herring Purse Seine and Gillnet Processor Participation by Year, 1983-2017 .....	20

## List of Figures

Figure 1. Togiak Herring District, Bristol Bay Area .....	2
Figure 2. Number of Interim-Use Permits Issued in the Togiak Sac Roe Herring Fisheries, 1983 – 2017 .....	5
Figure 3. Togiak Sac Roe Herring Fisheries: Percent Unfished Permits, 1983-2017 .....	7
Figure 4. First Time Participation in the Togiak Herring Purse Seine and Gillnet Fisheries, 1984-2017 .....	9
Figure 5. Estimated Nominal and Real Gross Earnings for the Togiak Sac Roe Herring Purse Seine and Gillnet Fisheries, 1983-2017.....	14
Figure 7. Togiak Sac Roe Herring Purse Seine and Gillnet Processor Participation by Year, 1983-2017 .....	21

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## Introduction

Commercial fishing for Pacific herring (*Clupea pallasii*) in Alaska dates back to the 19th century and occurs from Alaska's southernmost boundary to as far north as Norton Sound. Following World War I, herring were caught commercially and used for human consumption as salted and pickled herring. Between the 1920s and the 1960s, herring was used primarily as food or rendered into fishmeal and oil. After herring reduction ended in the 1960s, herring use transitioned to roe or bait. Most roe fisheries did not take off until the early 1970s.

The herring fishery in Bristol Bay is the largest in Alaska. Herring are likely present throughout the Bristol Bay area, with ADF&G commercial fishing regulations pertaining to both the Togiak and Bay Districts. A major portion of the resource returns to the Togiak District each spring to spawn and is the focus of the fisheries. The Alaska Department of Fish and Game's Area Management Report<sup>1</sup> has more information on season length, openings and closings, size, and related topics for these fisheries.

The subject of this report is the two sac roe herring fisheries – purse seine and gillnet. Participation, harvest, and earnings data include a few fish tickets from eastside Bristol Bay but the vast majority (51,617) are from the Togiak Herring Fishing District. The sac roe herring fishery in Bristol Bay is typically referred to as the Togiak sac roe herring fishery. In this report, it may be called the Togiak sac roe herring fishery, the Togiak herring fishery, the Togiak fishery, or just Togiak.

The Togiak sac roe herring fishery began in 1967. Effort and harvest levels remained minimal until 1977 when interest increased, spurred by favorable market conditions and additional opportunities provided by the Fishery Conservation and Management Act of 1976 (the 200 mile limit). This resulted in a rapid expansion of the fishery, and major commercial harvest of sac roe herring has continued to the present. However, market conditions changed in the 1990s, and participation declined markedly. Beginning 2001, processors have utilized condensed gillnet and purse seine fleets. The condensed purse seine fleets consist of small cooperatives of several permit holders each.

The Togiak herring fisheries have not been limited to entry. All permits used for these fisheries are interim-use permits issued annually.

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<sup>1</sup> See 2018 Bristol Bay Area Annual Management Report ADF&G Fishery Management Report No. 18-11, May 2018.

## Togiak Herring Districts

The Bristol Bay registration area "T" is divided into three herring fishing districts: the Bay District including all waters east of the longitude of Cape Constantine; the Togiak District, including all waters between the longitude of Cape Newenham and the longitude of Cape Constantine; and the General District, including all waters west of the longitude of Cape Newenham. The Togiak District is further divided into six sections: Kulukak, Nunavachak, Togiak, Hagemeister, Pyrite Point, and Cape Newenham sections (5 AAC 27.805). Figure 1 shows the Togiak District and the six sections.

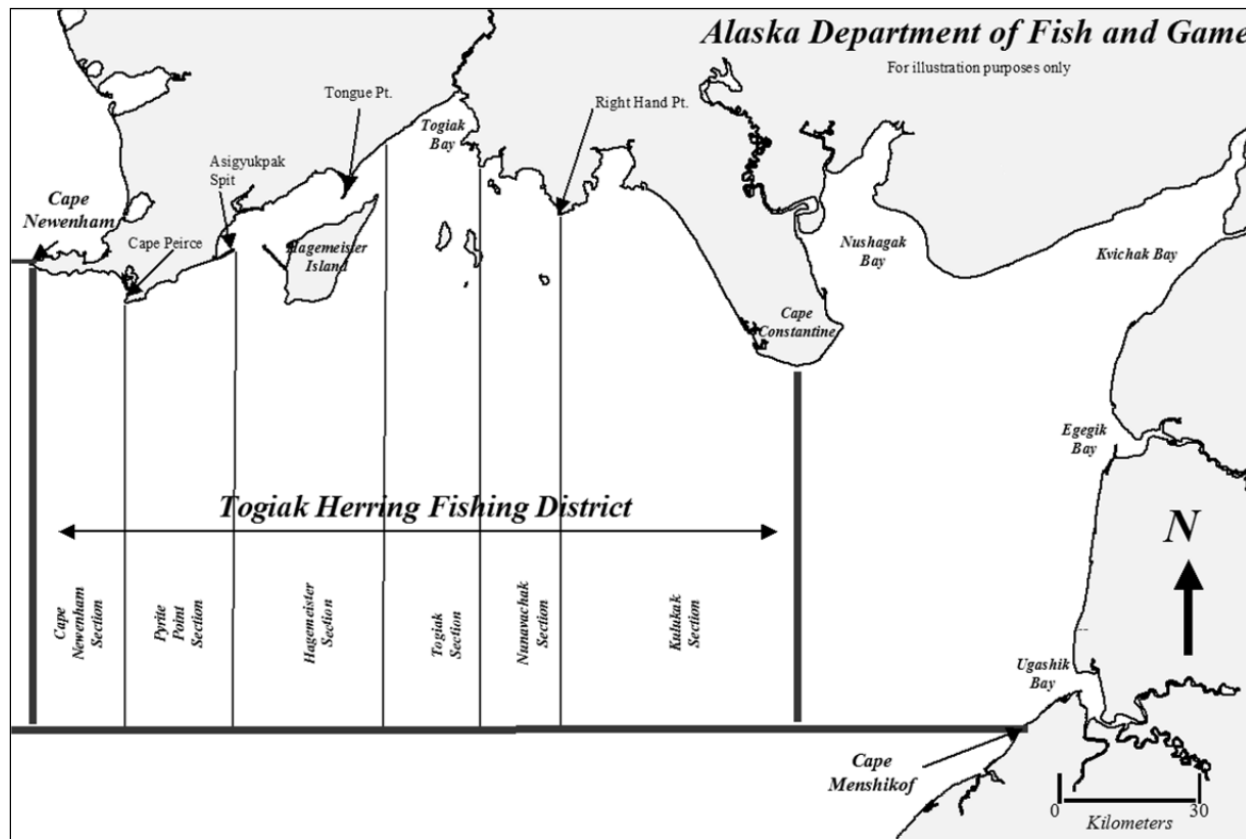


Figure 1. Togiak Herring District, Bristol Bay Area (from 2017 Bristol Bay Area Annual Management Report, ADF&G Fishery Management Report No. 18-11, May 2018).



## Description of the Data Files Used to Generate This Report

Four CFEC data files were used to generate the statistics in this report: the gross earnings file, the permit file, the vessel file, and the census file. The most recent updated data is included in this report. The following is a brief description of each file.

### CFEC Gross Earnings File

The CFEC gross earnings file is based on ADF&G fish tickets and is augmented with CFEC permit holder and other data. The ex-vessel value for herring in the CFEC gross earnings file largely come from the Commercial Operators Annual Report and ADF&G fish tickets with some additional information provided by processors.

### CFEC Permit File

The CFEC permit file contains data on persons who hold or have held CFEC permits. It originates from CFEC permit renewal and permit transfer forms. The permit file contains a data field indicating the declared residency of permit holders as well as their addresses.

In this report, resident status is categorized into three resident types:

- **Local** – permits held by persons residing locally to the Bristol Bay watershed
- **Nonlocal** – permits held by persons who reside in Alaska outside of the ADF&G management area (Bristol Bay Watershed)
- **Nonresidents** – permits held by persons who are not residents of Alaska

### CFEC Census File

CFEC maintains a computer file of places within Alaska where permit holders reside. Each community is annotated with information on its local or nonlocal status by permit fishery. Table 1 lists the communities that are currently designated as local to Bristol Bay in the Census file.

**Table 1. Communities Local to the Togiak Herring Purse Seine and Gillnet Fisheries, as Indicated in the CFEC Census File**

Aleknagik	Igiugig	Kvichak	Nunachuak	South Naknek
Cape Newenham	Igushik	Levelock	Nushagak	Togiak
Clarks Point	Iliamna	Manokotak	Pedro Bay	Twin Hills
Dillingham	Kashiagamiut	Nakeen	Pilot Point	Ugashik
Egegik	King Salmon	Naknek	Pope-Vannoy Ldg	Ungalikthluk
Ekuik	Koggiung	New Stuyahok	Port Alsworth	
Ekwok	Kokhanok	Newhalen	Port Heiden	
Hallersville	Koliganek	Nondalton	Portage Creek	

## **CFEC Vessel File**

CFEC maintains a computer file of vessel registration data. Commercial fishermen fill out a form and voluntarily provide data regarding the vessel they intend to use that fishing season.

## **Data Display**

Percentages are rounded to the nearest tenth of a percent where displayed. Dollars are rounded to whole dollars. As such, aggregates may appear to not total due to rounding. If you would like more precise figures then please contact the CFEC research unit. Some counts will vary from previous research projects insofar as the data has been corrected and updated.

## **Permit Data Prior to 1983**

The required CFEC interim-use permits have changed over time. In the earliest years of the purse seine fishery, statewide herring purse seine (H01B), Bristol Bay herring purse seine (H01T), and statewide herring other gear (H99B) permits were used to fish sac roe herring. Between 1978 and 1982, Westward herring sac roe purse seine (G01J) permits were issued. Beginning in 1983, and continuing to present, Bristol Bay herring sac roe purse seine (G01T) permits have been required for the Togiak purse seine fishery.

Beginning in 1977, the gillnet fishery required a Westward herring sac roe set gillnet (G04J) permit. Between 1980 and 1982, Westward herring sac roe gillnet (G34J) permits were issued. In 1983 the Bering Sea area and the Bristol Bay areas were separated and since then a Bristol Bay herring sac roe gillnet (G34T) permit has been required for the Togiak gillnet fishery.

Perhaps due to the many changes in the required interim-use permit, the early data from 1975 through 1982 have frequent occurrences of landings made with a gear type or delivery condition code inappropriate to the permit. For example, many landings of roe-on-kelp were documented on G04J gillnet permits. With the advent of G01T and G34T permits in 1983, the data are much 'cleaner' and appropriate to the permit. Given the appearance of widespread confusion over the use of appropriate permits prior to 1983, this analysis focuses on 1983 and later.

## Permits for Togiak Sac Roe Herring Fisheries

An interim-use permit is required and must be renewed annually from CFEC to participate in the Togiak sac roe herring fisheries (20 AAC 05.425). The number of purse seine (G34T) and gillnet (G01T) permits issued for Togiak has been on a steady decline since the mid-1990s, as illustrated in Figure 2. For the purse seine fishery, the peak was 488 G01T permits issued in 1989. Only 20 G01T permits were issued in 2017. The gillnet fishery showed a similar pattern, with 1,156 G34T permits issued in 1983 and only 31 G34T permits issued in 2017.

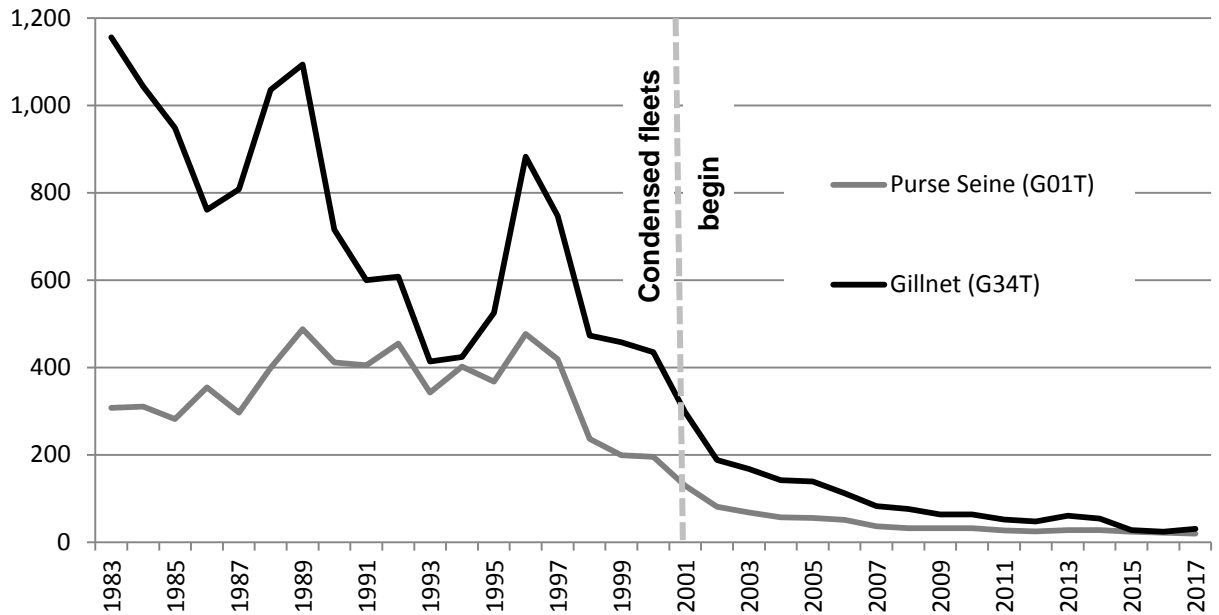


Figure 2. Number of Interim-Use Permits Issued in the Togiak Sac Roe Herring Fisheries, 1983 – 2017

## Unfished Permits

Tables 2 and 3 show the total number of viable G01T and G34T permits issued each year, the number of permits fished (with commercial landings), and the remaining unfished permits (as a percentage). The rate of annual unfished permits is depicted in Figure 3. There are many reasons why an individual might not fish in any given year. These tables and figure do not explain any of the reasons. However, since 2001 the fishery has operated with condensed fleets (see *Industry/Processors* on page 20); only individuals associated with those processors operating the condensed fleets have a market to be able to sell their catch.

**Table 2. Togiak Sac Roe Herring Purse Seine Unfished Permits, 1983-2017**

Year	Permits		Percent not Fished
	Issued	Fished	
1983	308	198	35.7%
1984	311	203	34.7%
1985	282	198	29.8%
1986	355	217	38.9%
1987	297	182	38.7%
1988	399	204	48.9%
1989	488	295	39.5%
1990	412	195	52.7%
1991	405	235	42%
1992	455	241	47%
1993	343	174	49.3%
1994	402	267	33.6%
1995	368	267	27.4%
1996	477	330	30.8%
1997	419	274	34.6%
1998	237	136	42.6%
1999	199	112	43.7%
2000	196	119	39.3%
2001	130	80	38.5%
2002	81	45	44.4%
2003	68	45	33.8%
2004	57	37	35.1%
2005	56	42	25%
2006	51	33	35.3%
2007	37	20	45.9%
2008	32	23	28.1%
2009	32	23	28.1%
2010	32	27	15.6%
2011	27	23	14.8%
2012	25	16	36%
2013	28	26	7.1%
2014	28	18	35.7%
2015	24	17	29.2%
2016	22	17	22.7%
2017	20	19	5%

**Table 3. Togiak Sac Roe Herring Gillnet Unfished Permits, 1983-2017**

Year	Permits		Percent not Fished
	Issued	Fished	
1983	1,156	364	68.5%
1984	1,043	289	72.3%
1985	949	356	62.5%
1986	761	257	66.2%
1987	808	285	64.7%
1988	1,036	442	57.3%
1989	1,094	404	63.1%
1990	716	319	55.4%
1991	600	275	54.2%
1992	608	344	43.4%
1993	414	98	76.3%
1994	424	183	56.8%
1995	525	301	42.7%
1996	883	625	29.2%
1997	747	435	41.8%
1998	473	239	49.5%
1999	458	254	44.5%
2000	435	256	41.1%
2001	298	150	49.7%
2002	188	85	54.8%
2003	168	83	50.6%
2004	142	59	58.5%
2005	139	66	52.5%
2006	112	50	55.4%
2007	83	25	69.9%
2008	76	29	61.8%
2009	64	33	48.4%
2010	64	37	42.2%
2011	52	28	46.2%
2012	48	18	62.5%
2013	61	39	36.1%
2014	54	25	53.7%
2015	28	6	78.6%
2016	24	1-3	-
2017	31	11	64.5%

- Where fewer than four individuals made landings, data are masked for confidentiality.

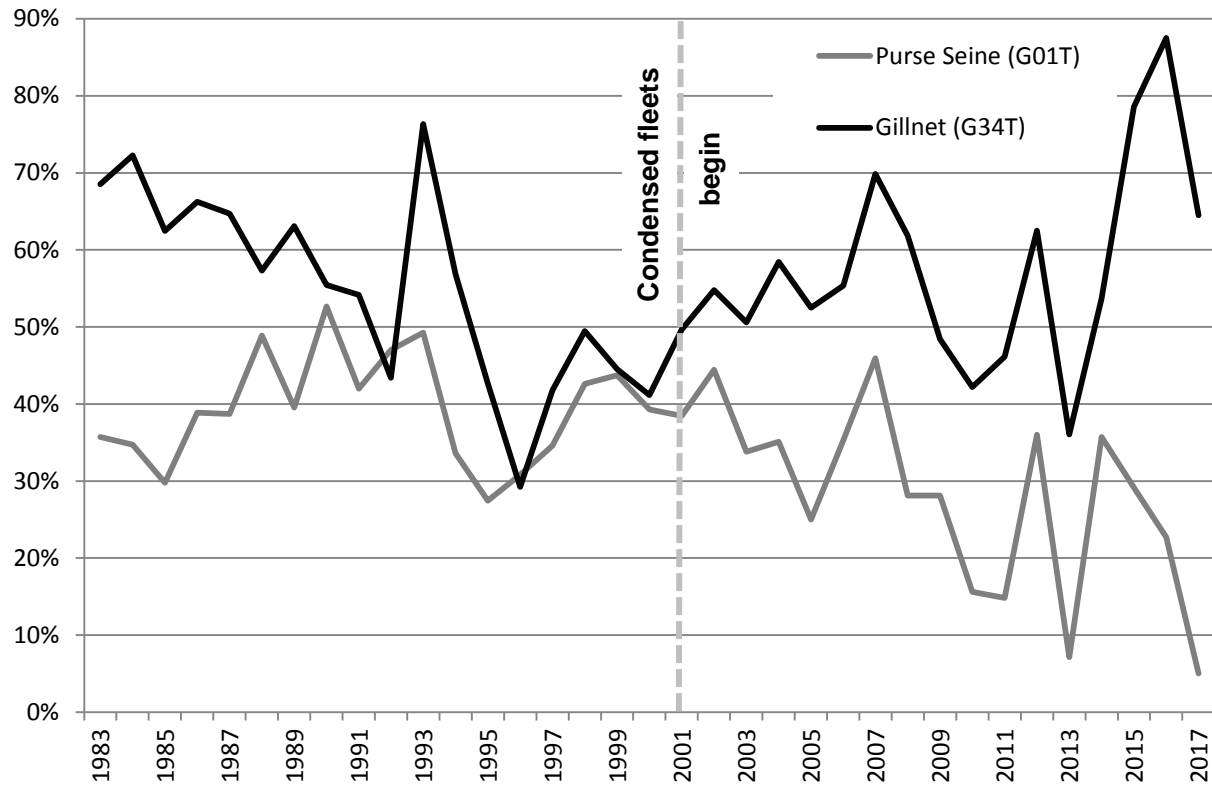


Figure 3. Togiak Sac Roe Herring Fisheries: Percent Unfished Permits, 1983-2017

## First Time Participation

New entrants are defined herein as individuals who, for the first time, record a landing on a purse seine (G01T) or gillnet (G34T) permit. G01T and G34T permits were first issued in 1983, but most individuals participated in the fishery prior to then.

Tables 4 and 5, and Figure 4, describe individuals rather than permits. Some individuals may enter and exit the fishery many times over the years. Individuals are only counted once as a new entrant and only in the year in which they made their first documented landing.

**Table 4. First Time Participation in the Togiak Herring Purse Seine Fishery, 1983-2017**

Year	Individuals w/Landings	New Entrants	
		Count	Percent
1983	198	-	-
1984	203	38	18.7%
1985	198	30	15.2%
1986	217	46	21.2%
1987	182	22	12.1%
1988	204	30	14.7%
1989	295	77	26.1%
1990	195	24	12.3%
1991	235	26	11.1%
1992	241	37	15.4%
1993	174	8	4.6%
1994	267	35	13.1%
1995	267	30	11.2%
1996	330	57	17.3%
1997	274	27	9.9%
1998	136	5	3.7%
1999	112	7	6.3%
2000	119	5	4.2%
2001	80	1-3	**
2002	45	1-3	**
2003	45	.	0%
2004	37	.	0%
2005	42	.	0%
2006	33	.	0%
2007	20	.	0%
2008	23	.	0%
2009	23	1-3	**
2010	27	1-3	**
2011	23	.	0%
2012	16	.	0%
2013	26	1-3	**
2014	18	.	0%
2015	17	.	0%
2016	17	.	0%
2017	19	.	0%

\*\* Where fewer than four individuals made landings, data are masked for confidentiality.

**Table 5. First Time Participation in the Togiak Herring Gillnet Fishery, 1983-2017**

Year	Individuals w/Landings	New Entrants	
		Count	Percent
1983	364	-	-
1984	289	55	19%
1985	356	104	29.2%
1986	257	38	14.8%
1987	285	81	28.4%
1988	442	170	38.5%
1989	404	106	26.2%
1990	319	57	17.9%
1991	275	55	20%
1992	344	87	25.3%
1993	98	10	10.2%
1994	183	30	16.4%
1995	301	74	24.6%
1996	625	248	39.7%
1997	435	75	17.2%
1998	239	17	7.1%
1999	254	32	12.6%
2000	256	22	8.6%
2001	150	13	8.7%
2002	85	7	8.2%
2003	83	11	13.3%
2004	59	1-3	**
2005	66	7	10.6%
2006	50	0	0%
2007	25	4	16%
2008	29	0	0%
2009	33	1-3	**
2010	37	1-3	**
2011	28	0	0%
2012	18	0	0%
2013	39	4	10.3%
2014	25	1-3	**
2015	6	0	0%
2016	1-3	0	0%
2017	11	1-3	**

\*\* Where fewer than four individuals made landings, data are masked for confidentiality.

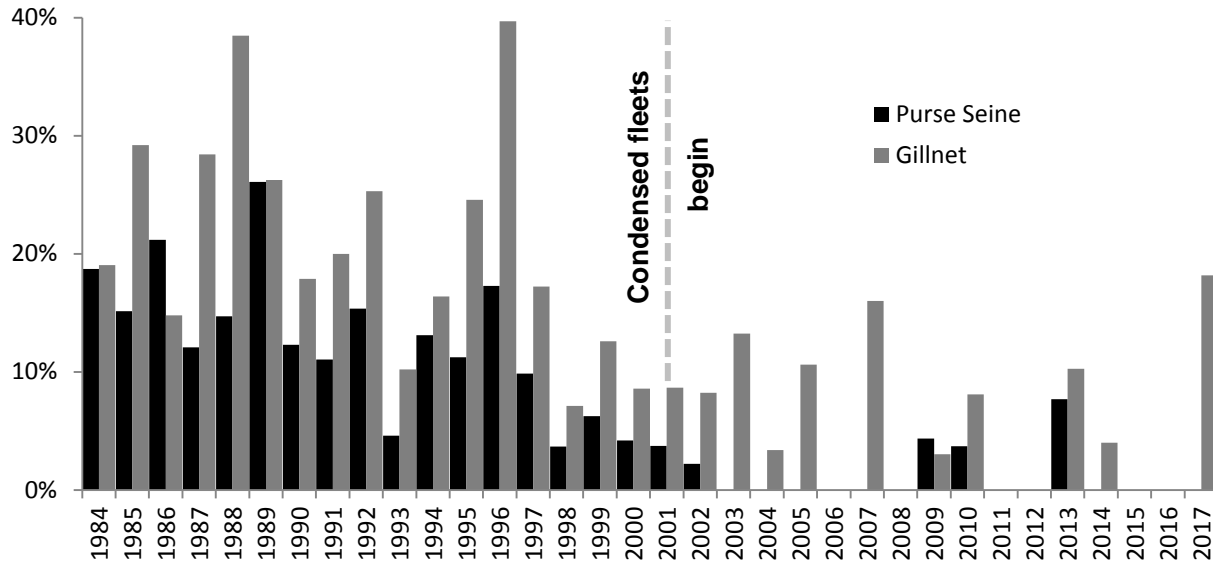


Figure 4. First Time Participation in the Togiak Herring Purse Seine and Gillnet Fisheries, 1984-2017

### Age of Permit Holders

Table 6 shows the annual mean age of four different groups of individuals: 1) Togiak herring purse seine (G01T) permit holders; 2) Togiak herring gillnet (G34T) permit holders; 3) all CFEC limited entry permit holders; and 4) the Alaskan worker age population.

Some individuals hold permits in more than one fishery. In these cases, the age of the permit holder is counted once for each permit that he or she holds.

The mean age of the Alaskan worker age population has increased 5.9 years between 1983 and 2017, which represents a 17.5% increase. The percent change in ages over the same period for all CFEC permit holders increased by 27.6% (11.1 years).

During the same 34 year period, the mean age of G01T permit holders increased 55.1% (20.7 years), while G34T permit holder's mean age increased 54.9% (20.2 years).

Note: Mean AK Worker Age is the annual average age of all Alaskans age 16-64 as reported by the Alaska Department of Labor and Workforce Development, Research and Analysis Section.

Table 6. Mean Age of Select CFEC Permit Holders and the General Alaskan Population, 1983-2017

Year	G01T	G34T	All Limited Permits	Mean AK Worker Age
1983	37.6	36.8	40.2	33.7
1984	38.0	37.5	40.4	33.8
1985	38.1	37.9	40.8	34.0
1986	38.6	38.0	41.0	34.2
1987	39.1	38.5	40.9	34.5
1988	40.1	38.0	41.2	34.9
1989	39.7	38.0	41.5	35.3
1990	40.7	40.7	42.0	35.5
1991	41.2	42.0	42.5	35.9
1992	41.7	41.9	42.9	36.2
1993	42.5	43.4	43.5	36.5
1994	42.8	44.0	44.0	36.7
1995	43.5	43.7	44.4	37.0
1996	43.3	42.4	44.8	37.2
1997	43.8	43.7	45.1	37.4
1998	45.0	45.9	45.6	37.6
1999	46.4	46.1	46.0	37.8
2000	46.2	47.1	46.4	37.9
2001	47.2	48.2	46.9	38.1
2002	47.6	49.3	47.4	38.3
2003	48.5	49.1	47.9	38.4
2004	49.6	50.0	48.2	38.6
2005	50.7	49.5	48.4	38.7
2006	50.8	50.9	48.7	38.8
2007	50.2	50.8	48.9	38.9
2008	50.1	52.4	49.0	39.0
2009	50.6	53.8	49.3	39.1
2010	52.8	52.9	49.5	39.2
2011	54.3	53.9	49.6	39.4
2012	53.7	54.6	49.8	39.4
2013	53.3	53.6	50.0	39.5
2014	55.3	53.5	50.2	39.5
2015	55.8	58.2	50.6	39.5
2016	56.3	58.4	50.9	39.6
2017	58.3	57.0	51.3	39.6

## **Harvest, Earnings and Participation**

The Togiak sac roe fisheries are not limited to entry, and consequently fishing effort levels may vary considerably from year to year. In addition, herring roe market fluctuations often result in substantial changes to ex-vessel prices. These two factors often result in dramatic oscillations in harvest tons and earnings.

The purse seine harvest increased dramatically from only 505 pounds in 1975 to nearly 42 million pounds eight years later in 1983. Table 7 presents the estimated value, harvest, permits fished and vessels in both Togiak herring fisheries from 1983 to 2017. The purse seine harvest peaked in 1994 with 44,771,385 total pounds landed, followed in 1995 with about 39 million pounds landed. Subsequent annual purse seine harvests have ranged between 23 million pounds in 2002 to 40.5 million pounds in 2015.

The gillnet fishery also saw dramatic harvest increases in the beginning years, from 6,695 total pounds harvested in 1975 to 10.7 million pounds in 1983. Similar to the purse seine fishery, the gillnet fishery had a large harvest in 1994 and several years following. Subsequent years have seen a high of 16,486,692 pounds harvested in 2013 and very low pounds in 2016.

The gillnet fishery had demonstrated less variability, particularly between 1992 and 2014, during which time the range between high years and low years was less than half of the range for purse seine. However, the last three years of gillnet harvests have been dramatically lower than prior years while purse seine harvests have remained relatively stable.



Table 7. Earnings, Harvests, Permits Fished, and Vessels in the Togiak Sac Roe Herring Purse Seine and Gillnet Fisheries, 1983-2017

Year	Purse Seine						Gillnet					
	Value	Pounds	Tons	Fished		Permits Issued	Value	Pounds	Tons	Fished		Permits Issued
				Permits	Vessels				Permits	Vessels		
1983	\$8,797,612	41,936,619	20,968	198	187	308	\$2,193,724	10,717,571	5,359	364	307	1,156
1984	\$5,807,945	28,800,007	14,400	203	190	311	\$1,384,617	9,727,349	4,864	289	269	1,043
1985	\$10,726,767	41,894,387	20,947	198	190	282	\$2,206,644	8,621,999	4,311	356	322	949
1986	\$6,359,467	25,337,677	12,669	217	210	355	\$2,452,493	6,925,183	3,463	257	246	761
1987	\$8,954,478	25,318,090	12,659	182	176	297	\$1,849,274	5,299,754	2,650	285	264	808
1988	\$11,443,731	20,832,556	10,416	204	197	399	\$3,018,660	7,157,739	3,579	442	398	1,036
1989	\$3,884,707	18,829,030	9,415	295	270	488	\$1,247,636	5,502,934	2,751	404	371	1,094
1990	\$5,987,684	18,310,666	9,155	195	187	412	\$2,067,724	6,143,587	3,072	319	304	716
1991	\$6,820,949	23,125,162	11,563	235	222	405	\$1,242,265	6,365,093	3,183	275	254	600
1992	\$6,920,104	38,813,794	19,407	241	235	455	\$1,670,511	10,050,091	5,025	344	319	608
1993	\$4,221,230	28,521,823	14,261	174	168	343	\$1,068,913	7,126,718	3,563	98	93	414
1994	\$6,529,188	44,771,385	22,386	267	261	402	\$2,559,966	14,813,185	7,407	183	173	424
1995	\$16,175,112	39,017,428	19,509	267	262	368	\$6,082,484	13,991,433	6,996	301	296	525
1996	\$12,017,532	34,279,212	17,140	330	319	477	\$5,447,060	13,613,498	6,807	625	588	883
1997	\$4,010,607	36,131,598	18,066	274	272	419	\$1,419,982	10,357,406	5,179	435	410	747
1998	\$4,998,116	32,245,909	16,123	136	134	237	\$1,892,766	11,904,180	5,952	239	233	473
1999	\$4,799,184	27,902,234	13,951	112	108	199	\$2,176,571	9,760,536	4,880	254	246	458
2000	\$2,723,873	28,977,370	14,489	119	116	196	\$1,154,485	10,891,367	5,446	256	257	435
2001	\$2,177,475	30,668,662	15,334	80	70	130	\$1,018,293	13,054,043	6,527	150	150	298
2002	\$1,686,171	23,098,237	11,549	45	41	81	\$791,417	10,418,347	5,209	85	86	188
2003	\$1,803,313	28,624,018	14,312	45	43	68	\$1,092,870	13,010,355	6,505	83	85	168
2004	\$1,843,451	26,335,021	13,168	37	33	57	\$727,110	9,960,404	4,980	59	60	142
2005	\$2,080,408	27,738,776	13,869	42	40	56	\$971,375	11,850,093	5,925	66	65	139
2006	\$2,109,054	31,478,414	15,739	33	32	51	\$1,069,746	14,263,261	7,132	50	52	112
2007	\$1,661,524	24,798,871	12,399	20	20	37	\$585,589	8,021,767	4,011	25	24	83
2008	\$1,957,178	31,066,320	15,533	23	22	32	\$773,061	9,663,266	4,832	29	29	76
2009	\$1,941,905	25,892,060	12,946	23	22	32	\$620,996	8,279,935	4,140	33	32	64
2010	\$2,294,872	37,014,072	18,507	27	26	32	\$1,175,032	15,064,514	7,532	37	37	64
2011	\$1,832,742	33,939,663	16,970	23	22	27	\$767,942	11,814,463	5,907	28	29	52
2012	\$2,754,649	25,987,254	12,994	16	16	25	\$926,279	8,054,592	4,027	18	18	48
2013	\$3,030,845	38,756,579	19,378	26	26	28	\$1,269,476	16,486,692	8,243	39	38	61
2014	\$977,175	39,087,002	19,544	18	19	28	\$300,806	12,032,170	6,016	25	25	54
2015	\$1,011,983	40,479,280	20,240	17	16	24	\$57,803	2,312,098	1,156	6	6	28
2016	\$1,627,856	29,597,379	14,799	17	17	22	**	**	**	1-3	1-3	24
2017	\$1,591,766	30,610,883	15,305	19	19	20	\$139,525	2,683,166	1,342	11	11	31

\*\* Where fewer than four individuals made landings, data are masked for confidentiality.

Table 8 reports the number of permits issued, permits and vessels with landings, and estimated gross earnings (nominal and inflation-adjusted) in the Togiak herring purse seine fishery from 1983 to 2017. Total gross earnings fluctuated a great deal in the 1980s, spiked in the mid-1990s and have been comparatively low since 2001. Average earnings have risen since 2001.

**Table 8. Estimated Total Gross Earnings (Real and Nominal) for the Togiak Herring Purse Seine Fishery, With Average Earnings (Real) by Permit and Vessel, 1983-2017**

Year	Permits Issued	Total Gross Earnings		Permits Fished	Average Real Earnings	Vessels With Landings	Average Real Vessel Earnings
		Nominal	Real				
1983	308	\$8,797,612	\$21,651,313	198	\$109,350	187	\$115,782
1984	311	\$5,807,945	\$13,702,056	203	\$67,498	190	\$72,116
1985	282	\$10,726,767	\$24,436,293	198	\$123,416	190	\$128,612
1986	355	\$6,359,467	\$14,222,924	217	\$65,543	210	\$67,728
1987	297	\$8,954,478	\$19,321,493	182	\$106,162	176	\$109,781
1988	399	\$11,443,731	\$23,711,642	204	\$116,234	197	\$120,364
1989	488	\$3,884,707	\$7,679,189	295	\$26,031	270	\$28,441
1990	412	\$5,987,684	\$11,229,542	195	\$57,587	187	\$60,051
1991	405	\$6,820,949	\$12,275,705	235	\$52,237	222	\$55,296
1992	455	\$6,920,104	\$12,090,206	241	\$50,167	235	\$51,448
1993	343	\$4,221,230	\$7,160,608	174	\$41,153	168	\$42,623
1994	402	\$6,529,188	\$10,799,154	267	\$40,446	261	\$41,376
1995	368	\$16,175,112	\$26,016,033	267	\$97,438	262	\$99,298
1996	477	\$12,017,532	\$18,774,617	330	\$56,893	319	\$58,855
1997	419	\$4,010,607	\$6,125,110	274	\$22,354	272	\$22,519
1998	237	\$4,998,116	\$7,516,185	136	\$55,266	134	\$56,091
1999	199	\$4,799,184	\$7,061,081	112	\$63,045	108	\$65,380
2000	196	\$2,723,873	\$3,877,327	119	\$32,583	116	\$33,425
2001	130	\$2,177,475	\$3,013,793	80	\$37,672	70	\$43,054
2002	81	\$1,686,171	\$2,297,467	45	\$51,055	41	\$56,036
2003	68	\$1,803,313	\$2,402,327	45	\$53,385	43	\$55,868
2004	57	\$1,843,451	\$2,392,095	37	\$64,651	33	\$72,488
2005	56	\$2,080,408	\$2,611,110	42	\$62,169	40	\$65,278
2006	51	\$2,109,054	\$2,564,342	33	\$77,707	32	\$80,136
2007	37	\$1,661,524	\$1,964,256	20	\$98,213	20	\$98,213
2008	32	\$1,957,178	\$2,228,225	23	\$96,879	22	\$101,283
2009	32	\$1,941,905	\$2,218,730	23	\$96,467	22	\$100,851
2010	32	\$2,294,872	\$2,579,700	27	\$95,544	26	\$99,219
2011	27	\$1,832,742	\$1,997,171	23	\$86,834	22	\$90,781
2012	25	\$2,754,649	\$2,940,929	16	\$183,808	16	\$183,808
2013	28	\$3,030,845	\$3,189,090	26	\$122,657	26	\$122,657
2014	28	\$977,175	\$1,011,782	18	\$56,210	19	\$53,252
2015	24	\$1,011,983	\$1,046,580	17	\$61,564	16	\$65,411
2016	22	\$1,627,856	\$1,662,535	17	\$97,796	17	\$97,796
2017	20	\$1,591,766	\$1,591,766	19	\$83,777	19	\$83,777

- Real values adjusted for inflation to 2017 dollars using U.S. Bureau of Labor Statistics Consumer Price Index.

Table 9 reports the number of permits issued, permits and vessels with landings, and estimated gross earnings (nominal and inflation-adjusted) in the Togiak herring gillnet fishery from 1983 to 2017. Total gross earnings fluctuated somewhat in the 1980s, spiked in the mid-1990s and have been comparatively low since 2001. Average earnings increased modestly between 2001 and 2013, and dropped in subsequent years.

**Table 9. Estimated Total Gross Earnings (Real and Nominal) for the Togiak Herring Gillnet Fishery, With Average Earnings (Real) by Permit and Vessel, 1983-2017**

Year	Permits Issued	Total Gross Earnings Nominal	Total Gross Earnings Real	Permits Fished	Average Real Earnings	Vessels With Landings	Average Real Vessel Earnings
1983	1,156	\$2,193,724	\$5,398,852	364	\$14,832	307	\$17,586
1984	1,043	\$1,384,617	\$3,266,576	289	\$11,303	269	\$12,143
1985	949	\$2,206,644	\$5,026,882	356	\$14,120	322	\$15,611
1986	761	\$2,452,493	\$5,484,991	257	\$21,342	246	\$22,297
1987	808	\$1,849,274	\$3,990,264	285	\$14,001	264	\$15,115
1988	1,036	\$3,018,660	\$6,254,724	442	\$14,151	398	\$15,715
1989	1,094	\$1,247,636	\$2,466,294	404	\$6,105	371	\$6,648
1990	716	\$2,067,724	\$3,877,893	319	\$12,156	304	\$12,756
1991	600	\$1,242,265	\$2,235,712	275	\$8,130	254	\$8,802
1992	608	\$1,670,511	\$2,918,572	344	\$8,484	319	\$9,149
1993	414	\$1,068,913	\$1,813,232	98	\$18,502	93	\$19,497
1994	424	\$2,559,966	\$4,234,136	183	\$23,137	173	\$24,475
1995	525	\$6,082,484	\$9,783,060	301	\$32,502	296	\$33,051
1996	883	\$5,447,060	\$8,509,772	625	\$13,616	588	\$14,472
1997	747	\$1,419,982	\$2,168,636	435	\$4,985	410	\$5,289
1998	473	\$1,892,766	\$2,846,348	239	\$11,909	233	\$12,216
1999	458	\$2,176,571	\$3,202,407	254	\$12,608	246	\$13,018
2000	435	\$1,154,485	\$1,643,364	256	\$6,419	257	\$6,394
2001	298	\$1,018,293	\$1,409,396	150	\$9,396	150	\$9,396
2002	188	\$791,417	\$1,078,334	85	\$12,686	86	\$12,539
2003	168	\$1,092,870	\$1,455,893	83	\$17,541	85	\$17,128
2004	142	\$727,110	\$943,511	59	\$15,992	60	\$15,725
2005	139	\$971,375	\$1,219,168	66	\$18,472	65	\$18,756
2006	112	\$1,069,746	\$1,300,676	50	\$26,014	52	\$25,013
2007	83	\$585,589	\$692,284	25	\$27,691	24	\$28,845
2008	76	\$773,061	\$880,121	29	\$30,349	29	\$30,349
2009	64	\$620,996	\$709,521	33	\$21,501	32	\$22,173
2010	64	\$1,175,032	\$1,320,871	37	\$35,699	37	\$35,699
2011	52	\$767,942	\$836,840	28	\$29,887	29	\$28,857
2012	48	\$926,279	\$988,918	18	\$54,940	18	\$54,940
2013	61	\$1,269,476	\$1,335,757	39	\$34,250	38	\$35,151
2014	54	\$300,806	\$311,459	25	\$12,458	25	\$12,458
2015	28	\$57,803	\$59,779	6	\$9,963	6	\$9,963
2016	24	**	**	1-3	**	1-3	**
2017	31	\$139,525	\$139,525	11	\$12,684	11	\$12,684

• Real values adjusted for inflation to 2017 dollars using U.S. Bureau of Labor Statistics Consumer Price Index.

\*\* Where fewer than four individuals made landings, data are masked for confidentiality.

Gross earnings are estimated from weighted average ex-vessel prices, and are primarily derived from the ADF&G Commercial Operators Annual Report and fish ticket values. Gross earnings shown in Figure 5 for the purse seine and gillnet fisheries reflect real dollars using the 2017 Consumer Price Index from the U.S. Bureau of Labor Statistics.

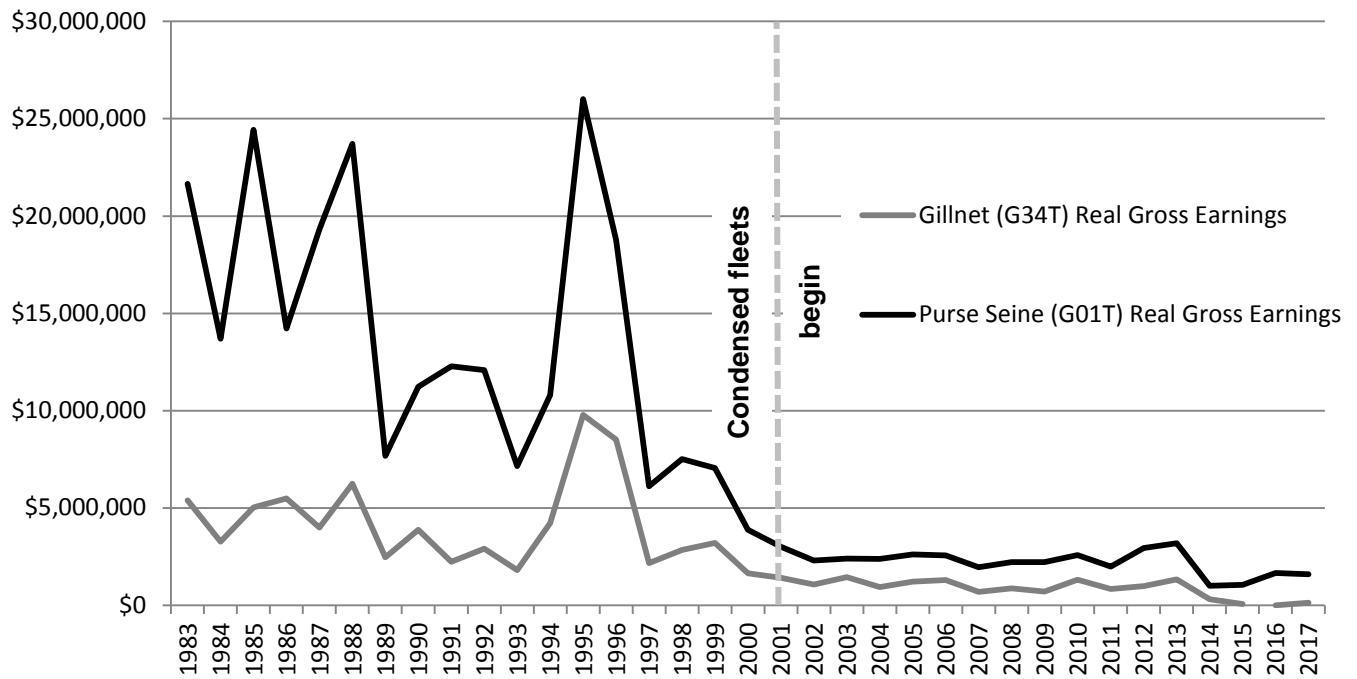


Figure 5. Estimated Real Gross Earnings for the Togiak Sac Roe Herring Purse Seine and Gillnet Fisheries, 1983-2017

Tables 10 and 11 report the number of people and estimated real (inflation-adjusted) gross earnings by resident type for the Togiak herring purse seine fishery and Togiak herring gillnet fishery, respectively.

**Table 10. Estimated Real Gross Earnings in the Togiak Herring Purse Seine Fishery by Resident Type, 1983-2017**

Year	Local			Nonlocal			Nonresident			Total		
	People	Average	Total	People	Average	Total	People	Average	Total	People	Average	Total
1983	13	\$42,928	\$558,068	148	\$114,933	\$17,010,097	37	\$110,355	\$4,083,147	198	\$109,350	\$21,651,313
1984	16	\$38,082	\$609,313	149	\$73,377	\$10,933,105	38	\$56,833	\$2,159,638	203	\$67,498	\$13,702,056
1985	11	\$98,103	\$1,079,131	149	\$125,385	\$18,682,397	38	\$123,020	\$4,674,765	198	\$123,416	\$24,436,293
1986	14	\$52,539	\$735,540	165	\$68,379	\$11,282,476	38	\$58,024	\$2,204,908	217	\$65,543	\$14,222,924
1987	19	\$56,305	\$1,069,803	127	\$115,799	\$14,706,506	36	\$98,477	\$3,545,184	182	\$106,162	\$19,321,493
1988	9	\$102,988	\$926,889	137	\$123,280	\$16,889,394	58	\$101,644	\$5,895,359	204	\$116,234	\$23,711,642
1989	23	\$21,142	\$486,277	182	\$28,254	\$5,142,263	90	\$22,785	\$2,050,649	295	\$26,031	\$7,679,189
1990	14	\$16,288	\$228,031	114	\$68,259	\$7,781,536	67	\$48,059	\$3,219,976	195	\$57,587	\$11,229,542
1991	31	\$27,522	\$853,170	128	\$61,802	\$7,910,667	76	\$46,209	\$3,511,867	235	\$52,237	\$12,275,705
1992	19	\$21,948	\$417,009	153	\$54,393	\$8,322,123	69	\$48,566	\$3,351,074	241	\$50,167	\$12,090,206
1993	31	\$12,595	\$390,455	89	\$45,999	\$4,093,900	54	\$49,560	\$2,676,253	174	\$41,153	\$7,160,608
1994	30	\$11,549	\$346,468	161	\$47,726	\$7,683,891	76	\$36,432	\$2,768,795	267	\$40,446	\$10,799,154
1995	24	\$22,068	\$529,623	168	\$105,088	\$17,654,826	75	\$104,421	\$7,831,585	267	\$97,438	\$26,016,033
1996	21	\$25,832	\$542,463	215	\$59,912	\$12,881,007	94	\$56,927	\$5,351,147	330	\$56,893	\$18,774,617
1997	19	\$8,952	\$170,087	181	\$23,610	\$4,273,389	74	\$22,725	\$1,681,634	274	\$22,354	\$6,125,110
1998	13	\$11,974	\$155,665	86	\$63,366	\$5,449,469	37	\$51,650	\$1,911,052	136	\$55,266	\$7,516,185
1999	11	\$14,207	\$156,281	68	\$70,407	\$4,787,680	33	\$64,155	\$2,117,120	112	\$63,045	\$7,061,081
2000	8	\$9,874	\$78,989	78	\$35,791	\$2,791,689	33	\$30,505	\$1,006,649	119	\$32,583	\$3,877,327
2001	5	\$7,599	\$37,993	54	\$42,875	\$2,315,246	21	\$31,455	\$660,554	80	\$37,672	\$3,013,793
2002	1-3	**	**	35	\$53,965	\$1,888,789	**	**	**	45	\$51,055	\$2,297,467
2003	1-3	**	**	33	\$60,490	\$1,996,171	**	**	**	45	\$53,385	\$2,402,327
2004	1-3	**	**	30	\$68,987	\$2,069,608	**	**	**	37	\$64,651	\$2,392,095
2005	1-3	**	**	33	\$70,559	\$2,328,444	**	**	**	42	\$62,169	\$2,611,110
2006	1-3	**	**	29	\$78,782	\$2,284,690	1-3	**	**	33	\$77,707	\$2,564,342
2007	1-3	**	**	17	\$104,495	\$1,776,423	1-3	**	**	20	\$98,213	\$1,964,256
2008	1-3	**	**	20	\$98,430	\$1,968,603	1-3	**	**	23	\$96,879	\$2,228,225
2009	1-3	**	**	19	\$98,346	\$1,868,569	1-3	**	**	23	\$96,467	\$2,218,730
2010	1-3	**	**	23	\$98,562	\$2,266,927	1-3	**	**	27	\$95,544	\$2,579,700
2011	1-3	**	**	20	\$88,738	\$1,774,759	1-3	**	**	23	\$86,834	\$1,997,171
2012	1-3	**	**	13	\$186,486	\$2,424,313	1-3	**	**	16	\$183,808	\$2,940,929
2013	1-3	**	**	21	\$121,346	\$2,548,270	**	**	**	26	\$122,657	\$3,189,090
2014	1-3	**	**	14	\$61,434	\$860,079	1-3	**	**	18	\$56,210	\$1,011,782
2015	1-3	**	**	11	\$70,543	\$775,975	**	**	**	17	\$61,564	\$1,046,580
2016	1-3	**	**	12	\$118,225	\$1,418,700	**	**	**	17	\$97,796	\$1,662,535
2017	1-3	**	**	15	\$87,650	\$1,314,748	1-3	**	**	19	\$83,777	\$1,591,766

• Adjusted for inflation to 2017 dollars using U.S. Bureau of Labor Statistics Consumer Price Index.  
 \*\* Where fewer than four individuals made landings, data are masked for confidentiality. The next smallest category is also masked for confidentiality.

Table 11. Estimated Real Gross Earnings in the Togiak Herring Gillnet Fishery by Resident Type, 1983-2017

Year	Local			Nonlocal			Nonresident			Total		
	People	Average	Total	People	Average	Total	People	Average	Total	People	Average	Total
1983	119	\$17,555	\$2,089,016	93	\$11,018	\$1,024,646	152	\$15,034	\$2,285,190	364	\$14,832	\$5,398,852
1984	131	\$11,960	\$1,566,732	57	\$10,916	\$622,201	101	\$10,670	\$1,077,642	289	\$11,303	\$3,266,576
1985	150	\$13,778	\$2,066,664	70	\$14,134	\$989,345	136	\$14,492	\$1,970,873	356	\$14,120	\$5,026,882
1986	141	\$19,078	\$2,690,007	50	\$22,339	\$1,116,928	66	\$25,425	\$1,678,055	257	\$21,342	\$5,484,991
1987	145	\$11,652	\$1,689,598	48	\$16,461	\$790,143	92	\$16,419	\$1,510,522	285	\$14,001	\$3,990,264
1988	206	\$12,177	\$2,508,416	86	\$14,921	\$1,283,174	150	\$16,421	\$2,463,134	442	\$14,151	\$6,254,724
1989	201	\$4,861	\$977,043	65	\$5,891	\$382,884	138	\$8,017	\$1,106,367	404	\$6,105	\$2,466,294
1990	185	\$9,220	\$1,705,658	54	\$13,485	\$728,184	80	\$18,051	\$1,444,051	319	\$12,156	\$3,877,893
1991	173	\$5,608	\$970,236	44	\$9,673	\$425,633	58	\$14,480	\$839,843	275	\$8,130	\$2,235,712
1992	186	\$5,759	\$1,071,126	62	\$7,940	\$492,272	96	\$14,116	\$1,355,174	344	\$8,484	\$2,918,572
1993	42	\$14,298	\$600,496	19	\$19,958	\$379,201	37	\$22,528	\$833,536	98	\$18,502	\$1,813,232
1994	75	\$16,664	\$1,249,769	31	\$18,903	\$585,984	77	\$31,148	\$2,398,383	183	\$23,137	\$4,234,136
1995	112	\$28,782	\$3,223,626	60	\$30,472	\$1,828,311	129	\$36,675	\$4,731,123	301	\$32,502	\$9,783,060
1996	205	\$11,039	\$2,263,031	170	\$12,253	\$2,083,034	250	\$16,655	\$4,163,707	625	\$13,616	\$8,509,772
1997	146	\$3,700	\$540,130	108	\$4,734	\$511,317	181	\$6,172	\$1,117,189	435	\$4,985	\$2,168,636
1998	99	\$8,983	\$889,346	42	\$12,665	\$531,933	98	\$14,542	\$1,425,069	239	\$11,909	\$2,846,348
1999	115	\$9,704	\$1,115,933	50	\$12,096	\$604,803	89	\$16,648	\$1,481,671	254	\$12,608	\$3,202,407
2000	105	\$5,043	\$529,469	43	\$7,392	\$317,857	108	\$7,371	\$796,039	256	\$6,419	\$1,643,364
2001	64	\$6,142	\$393,104	31	\$10,474	\$324,708	55	\$12,574	\$691,584	150	\$9,396	\$1,409,396
2002	31	\$7,527	\$233,343	13	\$12,437	\$161,679	41	\$16,666	\$683,311	85	\$12,686	\$1,078,334
2003	30	\$9,175	\$275,242	12	\$15,424	\$185,088	41	\$24,282	\$995,562	83	\$17,541	\$1,455,893
2004	18	\$10,191	\$183,437	4	\$15,767	\$63,070	37	\$18,838	\$697,004	59	\$15,992	\$943,511
2005	20	\$11,560	\$231,191	10	\$16,628	\$166,280	36	\$22,825	\$821,697	66	\$18,472	\$1,219,168
2006	18	\$15,042	\$270,757	7	\$21,135	\$147,943	25	\$35,279	\$881,976	50	\$26,014	\$1,300,676
2007	11	\$16,519	\$181,705	5	\$21,030	\$105,149	9	\$45,048	\$405,430	25	\$27,691	\$692,284
2008	**	**	**	1-3	**	**	13	\$41,062	\$533,805	29	\$30,349	\$880,121
2009	**	**	**	1-3	**	**	16	\$28,636	\$458,183	33	\$21,501	\$709,521
2010	11	\$21,933	\$241,263	4	\$49,109	\$196,435	22	\$40,144	\$883,172	37	\$35,699	\$1,320,871
2011	**	**	**	1-3	**	**	15	\$35,732	\$535,977	28	\$29,887	\$836,840
2012	**	**	**	1-3	**	**	8	\$65,397	\$523,177	18	\$54,940	\$988,918
2013	**	**	**	1-3	**	**	25	\$36,090	\$902,248	39	\$34,250	\$1,335,757
2014	5	\$7,709	\$38,546	5	\$14,606	\$73,031	15	\$13,325	\$199,882	25	\$12,458	\$311,459
2015	1-3	**	**	1-3	**	**	1-3	**	**	6	\$9,963	\$59,779
2016	1-3	**	**	1-3	**	**	0	\$0	\$0	1-3	**	**
2017	1-3	**	**	1-3	**	**	6	\$14,305	\$85,833	11	\$12,684	\$139,525

• Adjusted for inflation to 2017 dollars using U.S. Bureau of Labor Statistics Consumer Price Index.

\*\* Where fewer than four individuals made landings, data are masked for confidentiality. The next smallest category is also masked for confidentiality.

## **Fleet Size and Vessel Characteristics**

Because less than 1% of the gillnet fleet were greater than 45 feet in length, different length categories were used to look at the gillnet fleet than the purse seine fleet. Three length categories were created: less than 26 feet, 26 to 35 feet, and greater than 35 feet. Table 13 shows that vessels between 26 and 35 feet in length account for a majority of the fleet. Beginning in 2002, virtually all vessels used in the fishery fall into this length category. Vessels less than 26 feet in length or vessels greater than 35 feet in length have been utilized in the fishery but compose only a very small percentage of the fleet.

Over the 1983 to 2017 time period, by far the most popular vessel length for both fisheries was 32 feet. Of the 3,033 unique vessels used in the fishery, 1,410 (47%) were 32 feet in length. Most Togiak herring fishermen also participate in the Bristol Bay salmon fisheries<sup>2</sup>.

Small vessels less than 26 feet in length were utilized in the purse seine fishery mostly in early years, but they composed only a small fraction of the fleet. The Togiak purse seine fleet reached its largest size in 1996 with 319 vessels (Table 12). Since then the fleet has shown a dramatic decrease in the number of licensed vessels with landings. Over the most recent five years, the number of vessels with landings has ranged from 16 (2015) to 26 (2013).

In order to look more closely at purse seine vessel use in the fishery, three length categories were created: less than 36 feet, 36 to 45 feet, and greater than 45 feet in length. Table 12 shows a breakdown of the vessels by length category that made landings in the fishery. The number of vessels less than 36 feet in length used in the fishery has fluctuated, from as high as 140 in 1989 to as low as four in 2011 and 2012. The vessels less than 36 feet now comprise roughly one third of the fleet, most likely Bristol Bay salmon gillnet boats converted to use purse seine gear. The use of vessels 36 to 45 feet in length was highest in the 1980s, but has dropped off in recent years in number and percent of the total purse seine fleet.

Through the years, the use of vessels greater than 45 feet in length gained steadily in numbers until a peak of 113 vessels occurred in both 1996 and 1997. Following those years, the number of larger vessels declined as the number in the entire fleet declined. Percentage-wise, more than half of the fleet has consisted of the larger vessels beginning 2002, and consists mostly of regular seine boats originating from South Central Alaska.

The gillnet fleet reached its largest size in 1996 with 588 vessels (Table 13). Since 2002, the gillnet fleet has declined dramatically; in 2016, landings were made from fewer than four vessels.

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<sup>2</sup> 2017 Bristol Bay Area Management Report. Alaska Department of Fish and Game Fishery Management Report No. 18-11.

Table 12. Number of Vessels by Length Category in the Togiak Sac Roe Herring Purse Seine Fishery with Landings by Year, 1983-2017

Year	Purse Seine Vessel Category						Total Vessels
	Less than 36 ft.		Between 36 - 45 ft.		Greater than 45 ft.		
	Number	Percentage	Number	Percentage	Number	Percentage	
1983	66	35%	90	48%	28	15%	187
1984	60	32%	97	51%	30	16%	190
1985	64	34%	94	49%	30	16%	190
1986	72	34%	102	49%	35	17%	210
1987	65	37%	79	45%	32	18%	176
1988	76	39%	82	42%	39	20%	197
1989	140	52%	76	28%	54	20%	270
1990	96	51%	48	26%	43	23%	187
1991	126	57%	42	19%	54	24%	222
1992	104	44%	60	26%	71	30%	235
1993	93	55%	25	15%	50	30%	168
1994	121	46%	57	22%	83	32%	261
1995	118	45%	51	19%	93	35%	262
1996	113	35%	93	29%	113	35%	319
1997	96	35%	63	23%	113	42%	272
1998	51	38%	21	16%	62	46%	134
1999	44	41%	13	12%	51	47%	108
2000	47	41%	18	16%	51	44%	116
2001	29	41%	8	11%	33	47%	70
2002	15	37%	4	10%	22	54%	41
2003	16	37%	5	12%	22	51%	43
2004	12	36%	2	6%	19	58%	33
2005	12	30%	3	8%	25	63%	40
2006	7	22%	1	3%	24	75%	32
2007	6	30%	1	5%	13	65%	20
2008	6	27%	1	5%	15	68%	22
2009	7	32%	1	5%	14	64%	22
2010	5	19%	1	4%	20	77%	26
2011	4	18%	1	5%	17	77%	22
2012	4	25%	1	6%	11	69%	16
2013	5	19%	1	4%	20	77%	26
2014	5	26%	0	0%	14	74%	19
2015	6	38%	0	0%	10	63%	16
2016	7	41%	0	0%	10	59%	17
2017	5	26%	0	0%	14	74%	19

\*\* Where fewer than four vessels made landings, percentages are masked for confidentiality.



Table 13. Number of Vessels by Length Category in the Togiak Sac Roe Herring Gillnet Fishery with Landings by Year, 1983-2017

Year	Gillnet Vessel Category						Total Vessels
	Less than 26 ft.		Between 26 - 35 ft.		Greater than 35 ft.		
	Number	Percentage	Number	Percentage	Number	Percentage	
1983	7	2%	283	92%	5	2%	307
1984	2	1%	250	93%	6	2%	269
1985	5	2%	299	93%	5	2%	322
1986	8	3%	236	96%	2	1%	246
1987	8	3%	253	96%	2	1%	264
1988	15	4%	379	95%	4	1%	398
1989	11	3%	357	96%	2	1%	371
1990	16	5%	288	95%	0	0%	304
1991	13	5%	240	94%	1	0%	254
1992	11	3%	302	95%	6	2%	319
1993	2	2%	89	96%	2	2%	93
1994	3	2%	169	98%	1	1%	173
1995	2	1%	286	97%	8	3%	296
1996	4	1%	571	97%	13	2%	588
1997	5	1%	398	97%	7	2%	410
1998	3	1%	227	97%	3	1%	233
1999	1	0%	244	99%	1	0%	246
2000	3	1%	253	98%	1	0%	257
2001	1	1%	149	99%	0	0%	150
2002	0	0%	86	100%	0	0%	86
2003	0	0%	85	100%	0	0%	85
2004	0	0%	60	100%	0	0%	60
2005	0	0%	64	98%	1	2%	65
2006	0	0%	52	100%	0	0%	52
2007	0	0%	24	100%	0	0%	24
2008	0	0%	29	100%	0	0%	29
2009	0	0%	32	100%	0	0%	32
2010	0	0%	37	100%	0	0%	37
2011	0	0%	29	100%	0	0%	29
2012	0	0%	18	100%	0	0%	18
2013	0	0%	38	100%	0	0%	38
2014	0	0%	25	100%	0	0%	25
2015	0	0%	6	100%	0	0%	6
2016	0	0%	1-3	100%	0	0%	1-3
2017	0	0%	11	100%	0	0%	11

\*\* Where fewer than four vessels made landings, percentages are masked for confidentiality.

## Industry/Processors

Since 2001, processors have done business exclusively with cooperatives formed within the purse seine fleet. The arrangements vary, but typically a processor selects a limited number of seine vessel operators to deliver herring to them. Each cooperative may consist of three individual vessels and/or permit holders. The ex-vessel proceeds are then split equally among the permit holders or vessel owners present for each opening. Since this information is not captured on ADF&G fish tickets, the exact arrangements of cooperatives are not known with any degree of certainty. It is assumed that this type of business arrangement will continue for the foreseeable future due to depressed market conditions for sac roe herring and thin economic margins specific to Togiak herring.

Table 14 shows processors participating in the purse seine fishery from 1983 to 2017. The years during which condensed fleets were utilized are indicated with a bold border. Figure 7 depicts the same information without totals in graphical form. The processors listed are from the ADF&G ITO which reflects any changes in corporations. The gillnet fleet has not been formed into cooperatives as has been done in the purse seine fleet; however, processors want a certain number of vessels in their gillnet fleet and they may not accept landings from new vessels or fishermen.

**Table 14. Togiak Sac Roe Herring Purse Seine and Gillnet Processor Participation by Year, 1983-2017**

Year	Purse Seine	Gillnet	Total	Year	Purse Seine	Gillnet	Total
1983	27	33	45	2001	14	10	16
1984	24	30	42	2002	10	13	14
1985	24	37	47	2003	8	10	11
1986	28	25	43	2004	8	6	8
1987	27	31	41	2005	8	7	8
1988	26	18	29	2006	8	7	9
1989	25	22	29	2007	5	5	5
1990	31	20	34	2008	7	6	7
1991	23	21	26	2009	6	6	6
1992	30	20	33	2010	6	7	7
1993	30	20	33	2011	6	5	6
1994	30	17	32	2012	4	1-3	4
1995	27	24	35	2013	7	6	7
1996	26	24	29	2014	6	5	6
1997	26	24	28	2015	4	1-3	4
1998	24	22	27	2016	4	1-3	4
1999	10	12	14	2017	4	1-3	4
2000	13	13	14				

- When fewer than four processors participated, data are masked for confidentiality

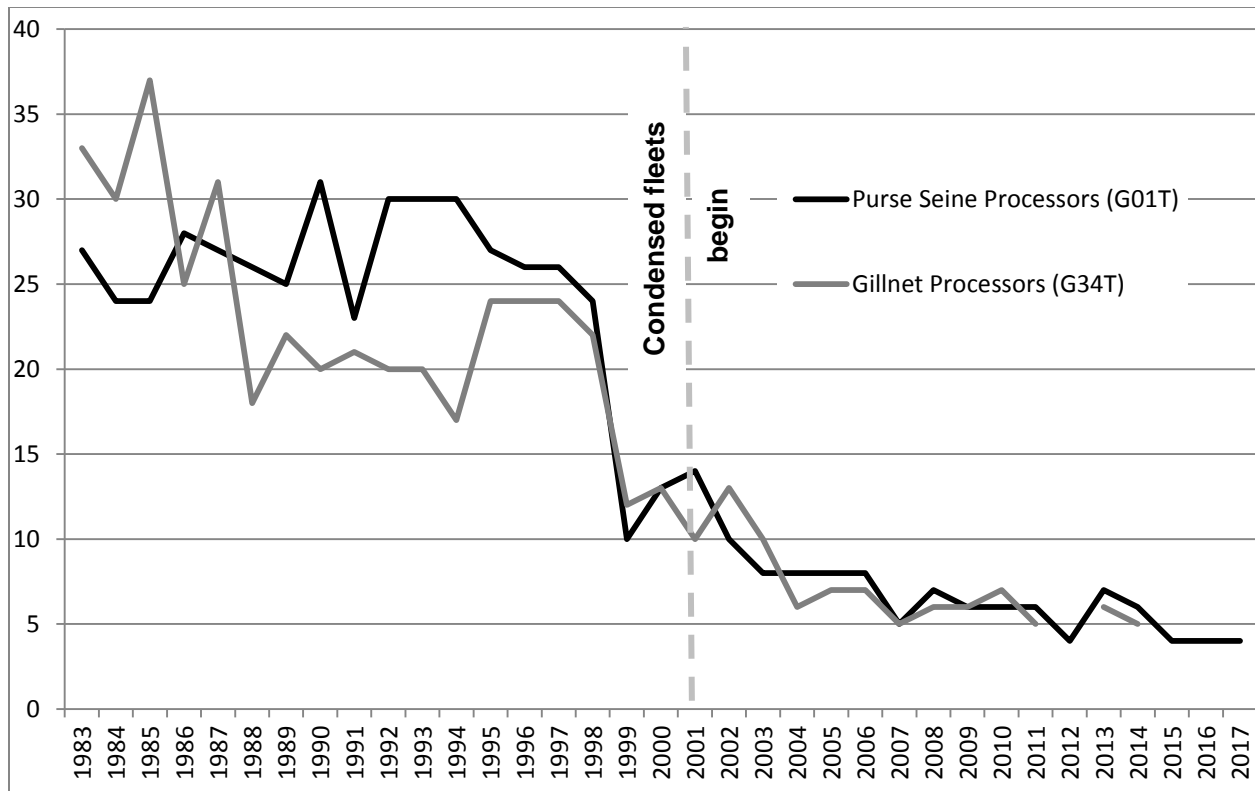


Figure 6. Togiak Sac Roe Herring Purse Seine and Gillnet Processor Participation by Year, 1983-2017

- When fewer than four processors participated, data are masked for confidentiality

The 2017 Bristol Bay Area Annual Management Report explains that processing companies manage their seine cooperative fleets such that they harvest enough fish to keep the processing lines running at full capacity after the daily gillnet harvest has been accounted for. Over the history of the Togiak sac roe herring fishery, the total daily processing capacity of processors has declined. Based on the processors registered for the Togiak fishery with ADF&G, processing capacity on the grounds has declined from a high of 4,850 tons per day in 1996 to a low of 1,420 tons per day in 2007. In 2017, the daily processing capacity was 1,900 tons per day.