

Fishery Management Report No. 17-62

**2017 Report to the Alaska Board of Fisheries on the
Status of the Allocation of Hatchery-Produced Salmon
in the Southeast Alaska Region**

by

Flip Pryor

December 2017

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.

Weights and measures (metric)		General		Mathematics, statistics	
centimeter	cm	Alaska Administrative Code	AAC	<i>all standard mathematical signs, symbols and abbreviations</i>	
deciliter	dL	all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.	alternate hypothesis	H_A
gram	g	all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.	base of natural logarithm	e
hectare	ha	at	@	catch per unit effort	CPUE
kilogram	kg	compass directions:		coefficient of variation	CV
kilometer	km	east	E	common test statistics	(F, t, χ^2 , etc.)
liter	L	north	N	confidence interval	CI
meter	m	south	S	correlation coefficient	
milliliter	mL	west	W	(multiple)	R
millimeter	mm	copyright	©	correlation coefficient (simple)	r
		corporate suffixes:		covariance	cov
Weights and measures (English)		Company	Co.	degree (angular)	$^\circ$
cubic feet per second	ft ³ /s	Corporation	Corp.	degrees of freedom	df
foot	ft	Incorporated	Inc.	expected value	E
gallon	gal	Limited	Ltd.	greater than	>
inch	in	District of Columbia	D.C.	greater than or equal to	\geq
mile	mi	et alii (and others)	et al.	harvest per unit effort	HPUE
nautical mile	nmi	et cetera (and so forth)	etc.	less than	<
ounce	oz	exempli gratia	e.g.	less than or equal to	\leq
pound	lb	(for example)		logarithm (natural)	ln
quart	qt	Federal Information Code	FIC	logarithm (base 10)	log
yard	yd	id est (that is)	i.e.	logarithm (specify base)	log ₂ , etc.
		latitude or longitude	lat or long	minute (angular)	'
Time and temperature		monetary symbols (U.S.)	\$, ¢	not significant	NS
day	d	months (tables and figures): first three letters	Jan, ..., Dec	null hypothesis	H_0
degrees Celsius	$^\circ\text{C}$	registered trademark	®	percent	%
degrees Fahrenheit	$^\circ\text{F}$	trademark	™	probability	P
degrees kelvin	K	United States (adjective)	U.S.	probability of a type I error (rejection of the null hypothesis when true)	α
hour	h	United States of America (noun)	USA	probability of a type II error (acceptance of the null hypothesis when false)	β
minute	min	U.S.C.	United States Code	second (angular)	"
second	s	U.S. state	use two-letter abbreviations (e.g., AK, WA)	standard deviation	SD
Physics and chemistry				standard error	SE
all atomic symbols				variance	
alternating current	AC			population	Var
ampere	A			sample	var
calorie	cal				
direct current	DC				
hertz	Hz				
horsepower	hp				
hydrogen ion activity (negative log of)	pH				
parts per million	ppm				
parts per thousand	ppt, ‰				
volts	V				
watts	W				

FISHERY MANAGEMENT REPORT NO. 17-62

**2017 REPORT TO THE ALASKA BOARD OF FISHERIES ON THE
STATUS OF THE ALLOCATION OF HATCHERY-PRODUCED SALMON
IN THE SOUTHEAST ALASKA REGION**

by
Flip Pryor
Alaska Department of Fish and Game, Division of Commercial Fisheries, Douglas

Alaska Department of Fish and Game
Division of Sport Fish, Research and Technical Services
333 Raspberry Road, Anchorage, Alaska, 99518-1565

December 2017

This investigation was partially financed by the Federal Aid in Sport Fish Restoration Act (16 U.S.C. 777-777K) under Project F-10.

The Fishery Management Reports series was established in 1989 by the Division of Sport Fish for the publication of an overview of management activities and goals in a specific geographic area, and became a joint divisional series in 2004 with the Division of Commercial Fisheries. Fishery Management Reports are intended for fishery and other technical professionals, as well as lay persons. Fishery Management Reports are available through the Alaska State Library and on the Internet: <http://www.adfg.alaska.gov/sf/publications/>. This publication has undergone regional peer review.

*Flip Pryor,
Alaska Department of Fish and Game, Division of Commercial Fisheries,
802 3rd Street, Douglas, Alaska, USA*

This document should be cited as follows:

Pryor, Flip. 2017. 2017 Report to the Alaska Board of Fisheries on the status of the allocation of hatchery-produced salmon in the Southeast Alaska region. Alaska Department of Fish and Game, Fishery Management Report No. 17-62, Anchorage.

The Alaska Department of Fish and Game (ADF&G) administers all programs and activities free from discrimination based on race, color, national origin, age, sex, religion, marital status, pregnancy, parenthood, or disability. The department administers all programs and activities in compliance with Title VI of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, Title II of the Americans with Disabilities Act (ADA) of 1990, the Age Discrimination Act of 1975, and Title IX of the Education Amendments of 1972.

If you believe you have been discriminated against in any program, activity, or facility please write:

ADF&G ADA Coordinator, P.O. Box 115526, Juneau, AK 99811-5526

U.S. Fish and Wildlife Service, 4401 N. Fairfax Drive, MS 2042, Arlington, VA 22203

Office of Equal Opportunity, U.S. Department of the Interior, 1849 C Street NW MS 5230, Washington DC 20240

The department's ADA Coordinator can be reached via phone at the following numbers:

(VOICE) 907-465-6077, (Statewide Telecommunication Device for the Deaf) 1-800-478-3648,

(Juneau TDD) 907-465-3646, or (FAX) 907-465-6078

For information on alternative formats and questions on this publication, please contact:

ADF&G Division of Sport Fish, Research and Technical Services, 333 Raspberry Road, Anchorage AK 99518 (907) 267-2375

TABLE OF CONTENTS

	Page
LIST OF FIGURES	i
LIST OF APPENDICES	ii
ABSTRACT	1
INTRODUCTION	1
BRIEF HISTORY OF THE ALLOCATION PLAN	2
DESTRPTION OF THE ALLOCATION PLAN	2
ADJUSTMENT MECHANISMS	2
ALLOCATION STATUS	3
FACTORS AFFECTING THE ALLOCATION	3
Hatchery production and limitations	4
Price	4
Chum salmon	4
Coho salmon	5
King salmon	6
Sockeye salmon	6
Pink salmon	6
Actions taken by the regional planning team	6
FIGURES	9
APPENDICES	19

LIST OF FIGURES

Figure	Page
1. Percent of Southeast Alaska hatchery-produced salmon harvest value by gear group in five-year rolling averages.	10
2. Value of hatchery-produced salmon harvest in Southeast Alaska.	11
3. Value of hatchery-produced salmon harvest by gear group.	11
4. Percent of total Southeast Alaska hatchery-produced salmon harvest value by species.	12
5. Hatchery-produced chum salmon harvest value by gear group.	12
6. Seine harvest of hatchery-produced chum salmon and price per pound, 1985–2016.	13
7. Gillnet harvest of hatchery-produced chum salmon and price per pound, 1985–2016.	13
8. Hatchery-produced chum salmon releases and marine survivals from NSRAA, SSRAA, and DIPAC.	14
9. Hatchery-produced coho salmon harvest value by gear group.	15
10. Troll harvest of hatchery-produced coho salmon and price per pound, 1985–2013.	15
11. Southeast Alaska hatchery-produced coho salmon releases and marine survivals from NSRAA, SSRAA and DIPAC.	16
12. Hatchery-produced king salmon harvest value by gear group.	16
13. Troll harvest of hatchery-produced king salmon and price per pound, 1985–2016.	17
14. Hatchery-produced king salmon releases and marine survivals from NSRAA, SSRAA, and DIPAC.	17

LIST OF APPENDICES

Appendix	Page
A. 5 AAC 33.364. Southeastern Alaska Area Enhanced Salmon Allocation Management Plan.....	19
B. ALASKA BOARD OF FISHERIES, Finding #94-148-FB	21

ABSTRACT

This report summarizes the development and implementation of the Southeastern Alaska Area Enhanced Salmon Allocation Management Plan [5 AAC 33.364], and the status of the allocation of hatchery-produced salmon among the three commercial gear groups in the Southeast Region: drift gillnet, purse seine, and troll through 2016.

Key words: Hatchery-produced salmon, allocation, gillnet, seine, troll, chum salmon, king salmon, coho salmon, Alaska Board of Fisheries, Regional Planning Team, and Southeast Alaska.

INTRODUCTION

Since the *Southeastern Alaska Area Enhanced Salmon Allocation Management Plan* [5 AAC 33.364] was adopted in 1994, The Alaska Department of Fish and Game (department) has written a report to the Alaska Board of Fisheries (board) every three-year board cycle giving an update on the status of allocation of hatchery-produced salmon among the three commercial gear groups in the Southeast Region: drift gillnet, seine, and troll. This report summarizes the development and implementation of the plan and monitors trends in harvest, price per pound, marine survival, and releases for the three most valuable hatchery-produced species: chum, coho, and king salmon. A series of graphs appear in the Figures section of this report to visually display trends in the data from 1985 to 2016. Trend lines on the graphs are three-point polynomials. Marine survival by brood year was provided by Southern Southeast Regional Aquaculture (SSRAA), Northern Southeast Regional Aquaculture (NSRAA), and Douglas Island Pink and Chum, Incorporated (DIPAC). Due to multiple return years of different species, complete marine survival data are available for brood year 2010 king salmon, brood year 2011 chum salmon, and brood year 2013 coho salmon. The value data used in this report includes finalized data from 1985 to 2015 and preliminary 2016 data. In December 2017, private non-profit (PNP) operators will finalize 2016 fish contribution numbers with updates in their 2017 annual reports. In the spring of 2018, Commercial Fisheries Entry Commission (CFEC) will produce preliminary 2017 price and weight data and finalize 2016 price data. In April 2018, the department will present finalized 2016 allocation values and preliminary 2017 allocation values to the Joint RPT.

At the present time, the allocation of hatchery-produced salmon does not conform to the allocation ranges defined in the plan. The value of hatchery-produced salmon harvested by the drift gillnet fleet is above their allocation range, and the values of hatchery-produced salmon harvested by the purse seine and troll fleets are below their allocation ranges. Since 1985, chum and coho salmon releases have been increasing as a way to address the allocation imbalance. Since 2012, net gear access to several special harvest areas has been manipulated in an attempt to balance the allocation. Two factors outside of regulatory control, marine survival and price paid to fishermen, have exerted substantial influence on the distribution of benefits from the enhancement program.

BRIEF HISTORY OF THE ALLOCATION PLAN

In early 1991, the board asked the commercial fishermen of Southeast Alaska, through the two regional aquaculture associations, to develop a plan for the equitable sharing of the hatchery-produced salmon harvest. The Southeast Allocation Task Force (SATF) was formed to draft a plan. The SATF consisted of six voting members with three members from NSRAA and three members from SSRAA, and equal representation from each of the three commercial gear groups. Non-voting members included department staff, regional aquaculture association staff, and a non-regional aquaculture association staff representative from DIPAC. The allocation plan was developed through a lengthy public process, and in 1994 the board approved the plan, which is now *Southeastern Alaska Area Enhanced Salmon Allocation Management Plan* (Appendix A). As set forth in Findings of the Alaska Board of Fisheries #94-148-FB (Appendix B), and adopted as *Southeast Alaska* [5 AAC 40.345], the Joint Northern Southeast and Southern Southeast Regional Planning Team (Joint RPT) reviews the allocation of hatchery-produced salmon each spring and makes recommendations to the Commissioner on hatchery production changes to comply with the allocation plan. The Joint RPT also makes recommendations to the board concerning board proposals and fisheries adjustments within special harvest areas that may affect allocation values.

DESCRIPTION OF THE ALLOCATION PLAN

The *Southeastern Alaska Area Enhanced Salmon Allocation Management Plan* defines percentage ranges of the commercial harvest value that should be realized by each commercial gear group. Established ranges are as follows: seine 44–49%; hand and power troll 27–32%; and drift gillnet 24–29%. Harvest value is derived from the following: 1) the number of hatchery-produced fish harvested by each commercial gear group, based primarily on marking or tagging programs, reported by hatchery operators, 2) average price per pound by gear type, computed by the Commercial Fisheries Entry Commission (CFEC), and 3) average weights, calculated by CFEC and published in the annual ADF&G report to the board (*Overview of Southeast Alaska and Yakutat Commercial, Personal Use, and Subsistence Salmon Fisheries: Reports to the Alaska Board of Fisheries*) with the exception of SSRAA chum salmon weights, which are provided by the operator. Allocation percentages are evaluated as five-year rolling averages. If a gear group is out of its allocation range for three consecutive five-year averages, adjustment in production or adjustment of harvest opportunity within special harvest areas may be implemented to bring a gear group back into its range.

Findings of the Alaska Board of Fisheries #94-148-FB are associated with the allocation management plan. It provides a detailed explanation of the plan development process, the Report of the Southeast Alaska Allocation Task Force for Enhanced Salmon, and guidelines for plan implementation.

ADJUSTMENT MECHANISMS

The tools for making adjustments in order to achieve allocation percentage targets are: special harvest area management adjustments, new hatchery production, and modification of existing hatchery production (Guideline #13 in Findings of the Alaska Board of Fisheries #94-148-FB). Special harvest area management adjustments are used for short-term corrections. New production or modification of existing production are long-term remedies, and can be initiated by

hatchery organizations requesting permit changes or by the Joint RPT making recommendations to the Commissioner.

ALLOCATION STATUS

The status of the allocation of hatchery-produced salmon through 2016 is shown in Figure 1. All three gear groups have been out of their allocation ranges for more than three consecutive years. Since 1995, troll harvest value has been below their allocation range. Since 2004, drift gillnet harvest value has been above their allocation range. Since 2005, seine harvest value has been below their allocation range.

FACTORS AFFECTING THE ALLOCATION

The overall value of hatchery-produced salmon in Southeast Alaska trended upward from 2002 until a peak in 2012, and has been on a downward trend since then (Figure 2). The value of chum salmon is the primary driver of this trend.

The allocation of hatchery-produced salmon between the three gear groups is relative to the total value ($A+B+C=100\%$). An increase of value percentage in one gear group will mean a corresponding decrease in one or both of the other two gear groups (if A increases, then $(B+C)$ must decrease by the same amount). For this reason, it is possible for a gear group to lose allocation percentage even if the value of hatchery-produced salmon caught by that group increases year after year. An example of this can be seen when troll value trended upward from 2002 through 2013 (Figure 3), yet their percentage of allocation value decreased simultaneously.

Chum salmon continue to be the dominant contributor to the value of hatchery-produced salmon in Southeast Alaska (Figure 4). The latest 10-year average shows chum salmon make up 78% of the hatchery-produced value, followed by coho salmon at 12%, king salmon at 6%, and pink and sockeye salmon at 2% each. This is significantly different from the base years, 1985–1993, when chum salmon was 51% of the hatchery-produced value, coho salmon 26%, sockeye salmon 9%, king salmon 8%, and pink salmon 6%. Details of how each species affects the overall value of hatchery-produced salmon can be found later in this report.

Since the allocation plan was adopted in 1994, the Joint RPT has annually reviewed the allocation of hatchery-produced salmon and made recommendations on hatchery production to the Commissioner. The Joint RPT has also made recommendations to the board. Additional detail of the Joint RPT can be found in the *Action Taken by the Regional Planning Team* section below.

The inherent risk of adjusting production to correct an imbalance is the lag times from egg take to harvest. This is especially true for king and chum salmon due to their longer life cycle. A decision to modify production numbers in a given brood year will take four years before the majority of fish return for chum salmon, and five years for king salmon. In a worst-case scenario, a decision to *increase* production results in little or no increased harvest value, if survivals and prices decline. A decision to *decrease* production could result in a magnified drop in harvest value, if survivals and prices decline. Additionally, changes in production may not always benefit the target gear group. For example, increasing coho salmon releases to benefit the troll fleet could negatively impact the troll fleet if returning adults migrate through a traditional net fishery or the troll harvest rate is low and the net fisheries “clean up” the return in the terminal harvest area.

HATCHERY PRODUCTION AND LIMITATIONS

Southeast Alaska hatcheries have production limitations in the form of freshwater availability and the physical footprint needed for freshwater rearing. Large numbers of salmon eggs can be incubated in hatchery buildings and reared to the fry stage using a relatively small amount of water and physical space. Freshwater rearing, usually in round ponds or raceways, uses significantly more water and requires a large amount of flat space. Pink and chum salmon can be ponded as fry straight out of the hatchery building into saltwater net pens and reared to the smolt stage (two to four grams) in just a few months. The short rearing time and small release size keep costs down. This explains why large numbers of pink and chum salmon can be raised relatively cheaply (pennies per smolt). King, coho, and sockeye salmon require a full year of freshwater rearing in relatively high flow raceways before they can be moved to saltwater net pens and be reared to their smolt stage (20 to 30 grams). The limitation of rearing space, the larger size at release, and the high cost associated with a full year of rearing, including food, explains why much smaller numbers of these species can be raised and at a much higher cost (dollars per smolt). Southeast hatcheries are very close to maximum production of king and coho salmon without major upgrades to infrastructure or building new hatcheries. Some increases in production may come from experimental rearing practices such as zero-check rearing programs, which utilize water temperature manipulation, photoperiod manipulation, and manipulation of diet to increase growth to the smolt stage in just a few months. Several hatcheries in Southeast Alaska have experimented with zero-check king salmon programs; however, success of these programs has been limited.

PRICE

Prices in this report come from CFEC. On an annual basis, CFEC calculates estimates of salmon exvessel prices using the department's Commercial Operator's Annual Reports (COAR) and fish tickets. The CFEC provides the department with preliminary price data for the Southeast area by species and gear group at the end of each calendar year. Final prices are determined the following year. The seine and drift gillnet prices are for whole fish. All troll prices are for gutted, head-on fish, except chum salmon prices, which are for whole fish.

CHUM SALMON

Chum salmon are the dominant contributor to the overall value of hatchery-produced salmon, making up 78% of the value over the last 10 years. The two net gear groups receive the majority of hatchery-produced chum salmon value (Figure 5). In 2012, both of the net fleets caught a record high value of hatchery-produced chum salmon due to large catches and a high price. In 2013, the troll fleet caught a record high value of hatchery-produced chum salmon due to a record catch at a relatively high price. Since those highs, value has trended downward for all three gear groups due to lower prices and lower catches.

The most recent 10-year average harvest of seine caught hatchery-produced chum salmon is 2.9 million fish, with an average value of \$15.5 million. In 2012, the seine fleet harvested 4.2 million hatchery-produced chum salmon which had a record setting value of approximately \$33 million. That harvest was only the eighth largest harvest in numbers of hatchery-produced chum salmon since the allocation plan was adopted in 1994, but it was coupled with the second highest price (Figure 6). Also in 2012, the average Southeast seine harvested chum salmon was 9 pounds, which is significantly larger than the previous 10-year average of 8.3 pounds. In 2013, the seine

fleet harvested 4.5 million hatchery-produced chum salmon worth \$18 million. The reduction in value is due to a decrease in price from \$0.86 in 2012 to \$0.52 in 2013 and a significant decrease in weight to 7.8 pounds.

The most recent 10-year average harvest of drift gillnet caught hatchery-produced chum salmon is 2.5 million fish, with an average value of \$14.1. The most recent 10-year average includes nine of the top 10 drift gillnet harvests of hatchery-produced chum salmon on record (Figure 7). The most recent 10-year average price for drift gillnet caught chum salmon is \$0.63. Like the seine fleet, the drift gillnet fleet has benefitted from 9 of the top 10 prices since the allocation plan was adopted in 1994. Like the seine fleet, the drift gillnet fleet benefits significantly when harvesting larger fish.

The troll fleet has shown that it can be effective at targeting chum salmon in some years. The most recent 10-year average harvest of troll caught hatchery-produced chum salmon is 376,000 fish, with an average value of \$2.3 million. In 2013, approximately 936,000 hatchery-produced chum salmon were harvested with a record value of \$5 million. In both 2011 and 2012, the value of troll-caught hatchery-produced chum salmon was the highest value of all troll-caught hatchery-produced species. Since 2009, the value of troll-caught hatchery-produced chum salmon has exceeded the value of troll-caught hatchery-produced king salmon. Targeting hatchery-produced chum salmon has led to a significant increase in troll value but will not necessarily lead to an increase in troll allocation percentage. Currently, the troll fleet does not harvest significantly larger chum salmon or receive a significantly larger price; therefore, any gains in allocation percentage will need to come from an increased harvest of the overall number of hatchery-produced chum salmon. Currently, the 10-year average harvest of 376,000 fish represents 3.7% of the 10-year average of 5.8 million hatchery-produced chum salmon harvested by all three fleets.

Marine survival can also play an important role in determining value to a gear group (Figure 8). When considering marine survival by brood year for SSRAA, NSRAA, and DIPAC combined, the most recent 10-year average is 2.6%, which is consistent with the 1985 through 2011 average of 2.8%. However, when comparing the three associations within brood years, the differences can affect the allocation percentages. In the late 1990s, high marine survivals, particularly at Hidden Falls Hatchery, which primarily benefits the seine fleet, coupled with larger than average weights more than compensated for prices under \$0.30 resulting in a high economic return that pushed the seine fleet above their allocation range. More recently, high marine survivals of chum salmon returning to Macaulay Salmon Hatchery, which primarily benefit the drift gillnet fleet, coupled with low marine survivals at Hidden Falls Hatchery, have helped push the drift gillnet fleet above their allocation range, while keeping the seine fleet below their allocation range. Chum salmon production continues to increase as a way to address the allocation imbalance.

COHO SALMON

Coho salmon are the second largest contributor to the value of hatchery-produced salmon but only make up 12% of the overall value for the last 10 years. The troll fleet receives the majority of value from hatchery-produced coho salmon (Figure 9). The troll fleet not only catches the majority of these fish but also receives a significantly higher price per pound than the net fleets. The most recent 10-year average price is \$1.63/pound. These prices are significantly higher than the 1994 to 2003 average troll-caught price of \$0.88/pound when low price offset increased harvest rates (Figure 10). In 2013, the troll harvest of hatchery-produced coho salmon was a

record 680,000 fish, which was followed by the second highest catch of 578,000 fish in 2014. While these catches contributed over \$6 million to the troll fleet in each of those years, it only slightly improved the troll percentage of allocation. The primary reason for troll fleet gains in percentage of allocation in those years had to do with the drop in hatchery-produced chum salmon value, which allowed hatchery-produced coho salmon value to become a larger percentage of the total value (15% and 22% respectively). Releases of coho salmon have consistently increased as a way to address allocation imbalance (Figure 11). Brood year 2013 coho salmon, which returned in 2016, had a marine survival of 2.1% which is significantly lower than the previous 10-year average of 5.9%. Even with this low marine survival, brood year 2013 contributed the 5th highest troll catch of hatchery-produced coho salmon since the allocation plan was adopted in 1994.

KING SALMON

King salmon are the third largest contributor to the value of hatchery-produced salmon, making up 6% of the overall value for the last 10 years. The troll fleet receives the majority of value from hatchery-produced king salmon, but the value to the net fleets can be significant in some years (Figure 12). Increased harvest of hatchery-produced king salmon will raise the value to the troll fleet, but may not necessarily lead to an increase in the troll percentage of allocation, primarily due to the small percentage of overall value contributed by king salmon production. Additionally, increased restraints imposed by the Pacific Salmon Treaty have limited the amount of fishing time for the troll fleet, which reduces the troll catch and allows more fish to return to the terminal areas where they are harvested by the net fleets. In 2016, the troll caught price of king salmon was \$6.15/pound, which is up from the most recent 10-year average of \$5.00/pound (Figure 13). The 2016 troll harvest of 13,000 hatchery-produced king salmon is below the previous 10-year average of 22,000 hatchery-produced king salmon. The brood year 2010 release of 6.5 million king salmon is higher than the previous 10-year average of 5.5 million (Figure 14). The most recent 10-year average marine survival is 1.7%.

SOCKEYE SALMON

Sockeye salmon have contributed 2% of the value of hatchery-produced salmon over the last 10 years. The only hatchery currently producing sockeye salmon is DIPAC's Snettisham Hatchery. The most recent 10-year average of total hatchery-produced sockeye salmon value is approximately \$850,000. The drift gillnet fleet harvests the majority of these fish, with a recent 10-year average of approximately \$775,000. The seine fleet harvests the rest of the hatchery-produced sockeye salmon with a recent 10-year average of approximately \$75,000.

PINK SALMON

Pink salmon have contributed 2% of the value of hatchery-produced salmon over the last 10 years. The only hatchery currently producing pink salmon is the Armstrong-Keta Incorporated, Port Armstrong Hatchery. The most recent 10-year average of total hatchery-produced pink salmon value is \$621,000. The seine fleet harvests almost all of these fish.

ACTIONS TAKEN BY THE REGIONAL PLANNING TEAM

Two of the most influential factors affecting allocation are marine survival and price per pound, which are factors outside the control of the associations, the department, and the board. The Joint

RPT has never suggested that the present allocation imbalance is due to failure of the associations to follow board allocation guidelines.

Joint RPT meetings are a forum to discuss hatchery production changes, and possible modifications of the harvest of hatchery-produced fish to address the allocation imbalance¹. The Joint RPT believes the intent of the allocation plan has always been to try to increase targeted production and/or harvest opportunity of the gear group below its allocation range using measures that do not significantly and directly penalize the historical harvest opportunities of the gear group that is above its target range.

The Joint RPT has recommended to the Commissioner that hatcheries continue to increase production, if possible, to help the gear group that is below its target allocation range. The Joint RPT continues to support chum and coho salmon production increases as a way to address the allocation imbalance.

During the 1999/2000 board cycle, the Joint RPT submitted two proposals which were intended to increase opportunity for the troll fleet to harvest hatchery-produced king, coho, and chum salmon. The first proposal eliminated the 20% chum salmon cap during the spring king salmon fishery near Hidden Falls Hatchery. The second proposal allowed the department to extend the length of the weekly Snow Passage spring fishery based on hatchery-produced coho salmon harvest. Although both of these proposals may have increased value to the troll fleet, neither change has significantly affected the allocation percentages.

During the 2008/2009 board cycle, the Joint RPT submitted a proposal to change from a 2:1 to a 1:1 ratio for drift gillnet and seine openings in the Deep Inlet Terminal Harvest Area for 2009, 2010, and 2011. Additionally, the Joint RPT submitted the “Industry Consensus 12/9/08” letter as a Record Copy. The industry consensus letter was a recommendation from the industry members who were present at the fall 2008 RPT meeting, was unanimously supported by the Joint RPT, and included a list of both long-term suggestions (increases in chum and coho salmon production) and short-term suggestions (recommendations on board proposals) for how to address the allocation imbalances. The board accepted the industry consensus letter and followed the guidelines regarding enhanced salmon allocation proposals. The proposals adopted by the board had some impact on the allocation values but not enough to solve the percentage imbalance. The long-term solutions of increased production mentioned in the letter may have impacted allocation values but have yet to solve the percentage imbalance.

During the 2011/2012 board cycle, the Joint RPT submitted two proposals: a proposal to continue the 1:1 time ratio for drift gillnet and seine openings in the Deep Inlet THA through 2017, and a proposal to continue a 1:1 time ratio for drift gillnet and seine openings at the Anita Bay THA through 2017. The Joint RPT also submitted “Industry Consensus 12/8/11,” which was written by industry representatives and unanimously supported by the Joint RPT. The consensus letter modified the sunset dates on their two proposals to 2014.

During the 2014/2015 board cycle, the Joint RPT submitted three “placeholder” board proposals: a proposal to set time ratio for drift gillnet and seine openings in Deep Inlet THA through an unspecified sunset date, a proposal to set time ratio for drift gillnet and seine openings at Anita

¹ The role of the Joint RPT in making recommendations relative to allocation poses a unique situation for the three ADF&G representatives on the team. ADF&G staff provides technical input and participates in team discussions, but only the six industry representatives on the Joint RPT vote on recommendations or proposals submitted to the Board of Fisheries.

Bay THA through an unspecified sunset date, and a proposal to continue the District 12 and 14 hatchery chum salmon troll fishery management plan through an unspecified sunset date. The Joint RPT also submitted recommendations to the board through written public comment. The letter withdrew the two Joint RPT proposals on THA rotations, supported the Joint RPT proposal to continue the District 12 and 14 chum salmon troll fishery with an amended sunset of 2017, and gave recommendations on 19 other proposals.

FIGURES

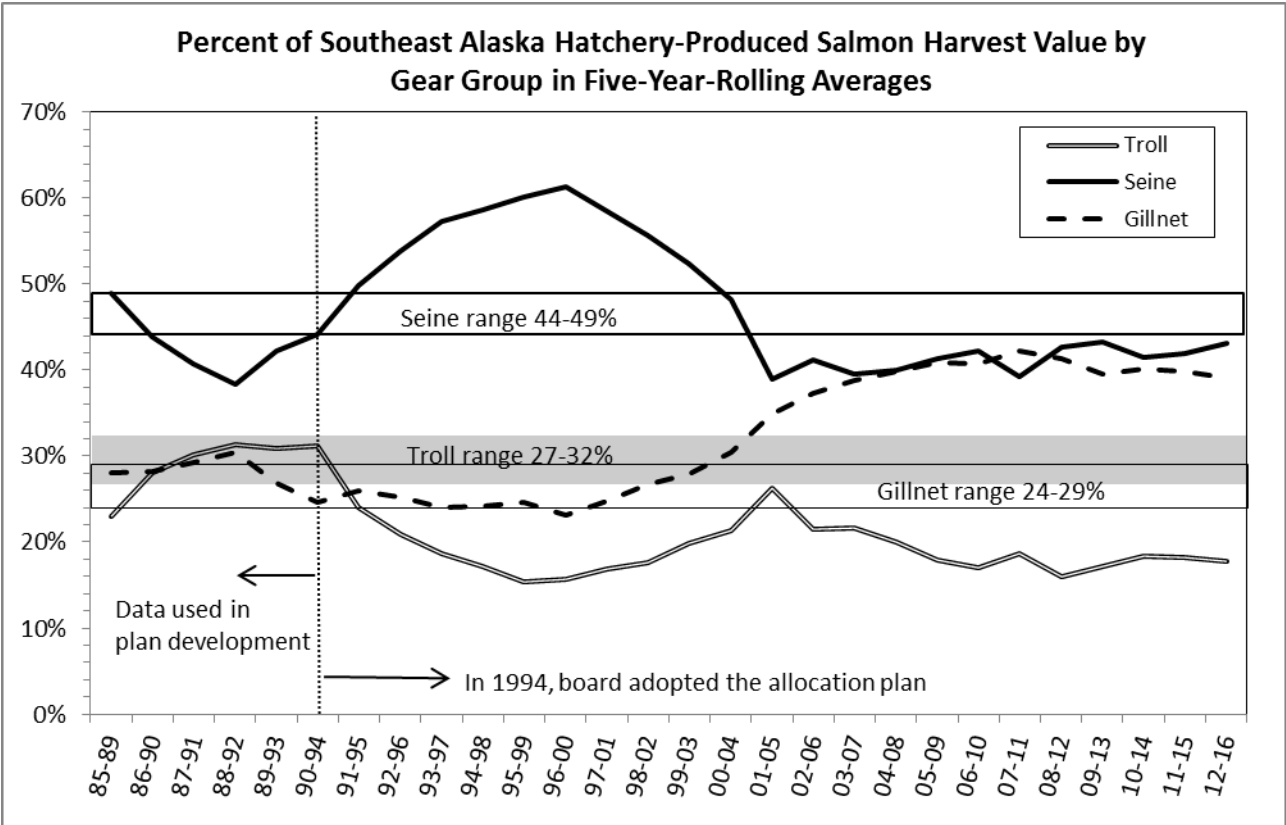


Figure 1.—Percent of Southeast Alaska hatchery-produced salmon harvest value by gear group in five-year rolling averages.

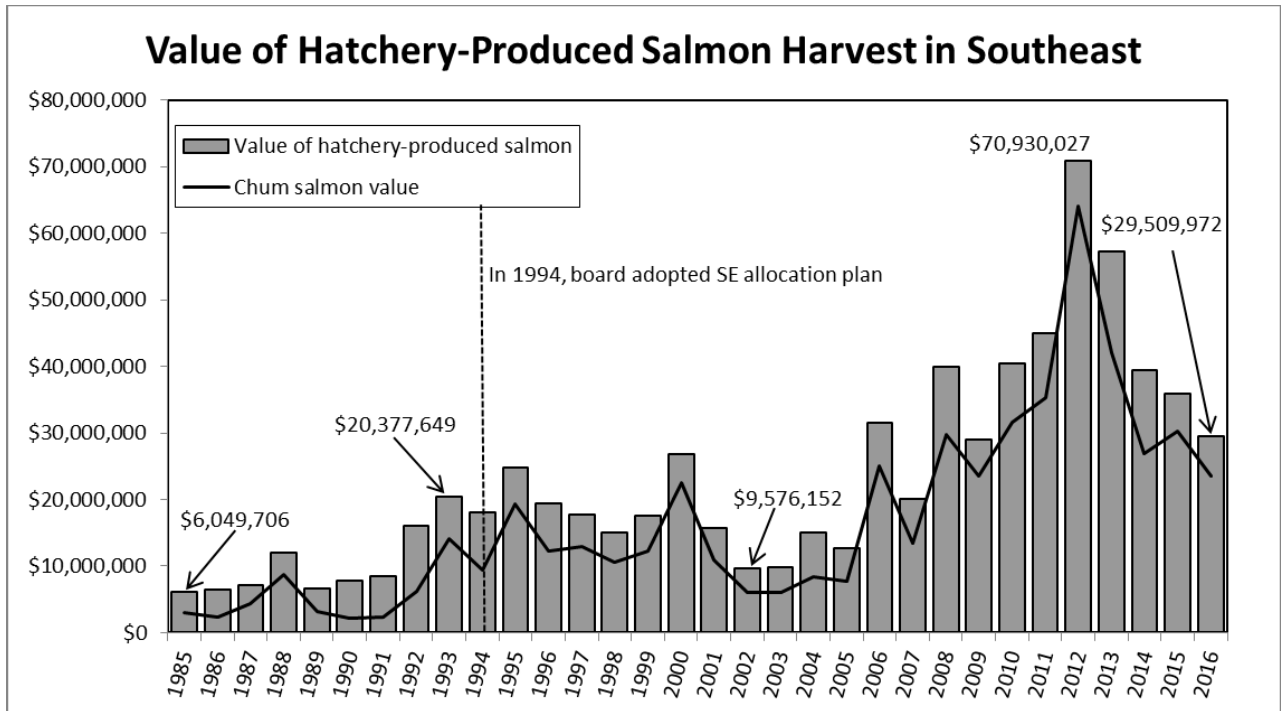


Figure 2.—Value of hatchery-produced salmon harvest in Southeast Alaska.

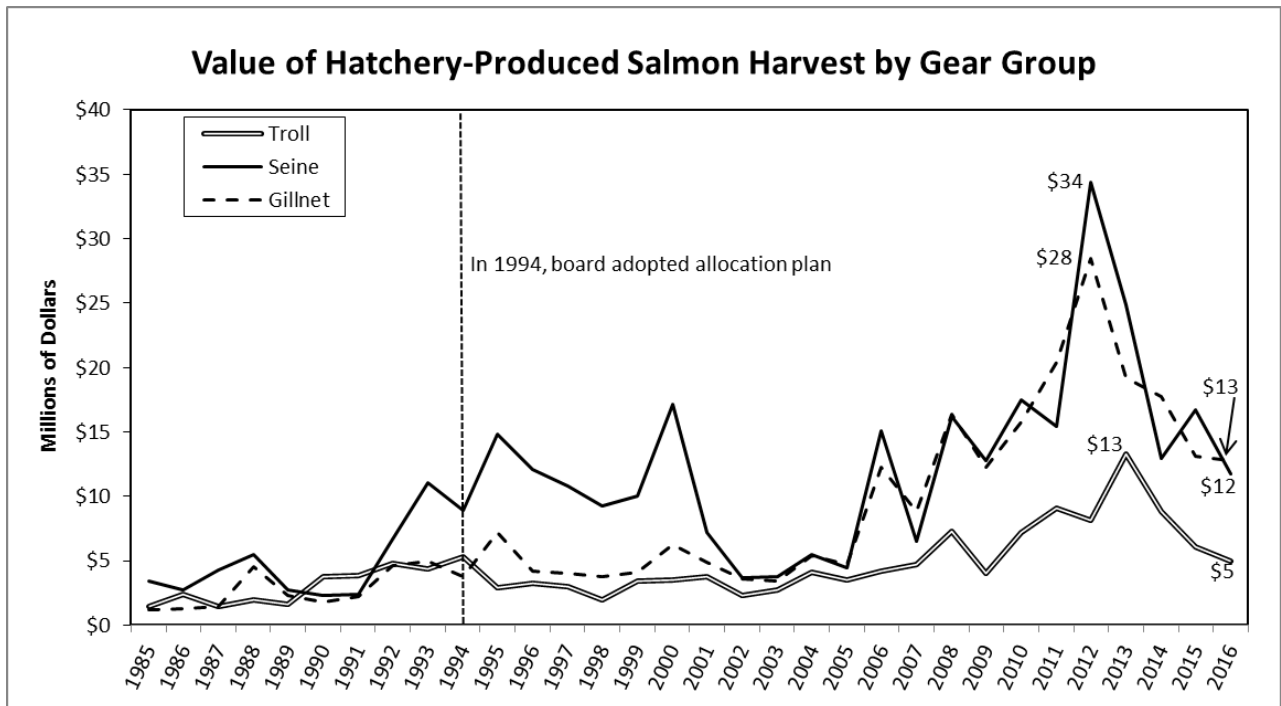


Figure 3.—Value of hatchery-produced salmon harvest by gear group.

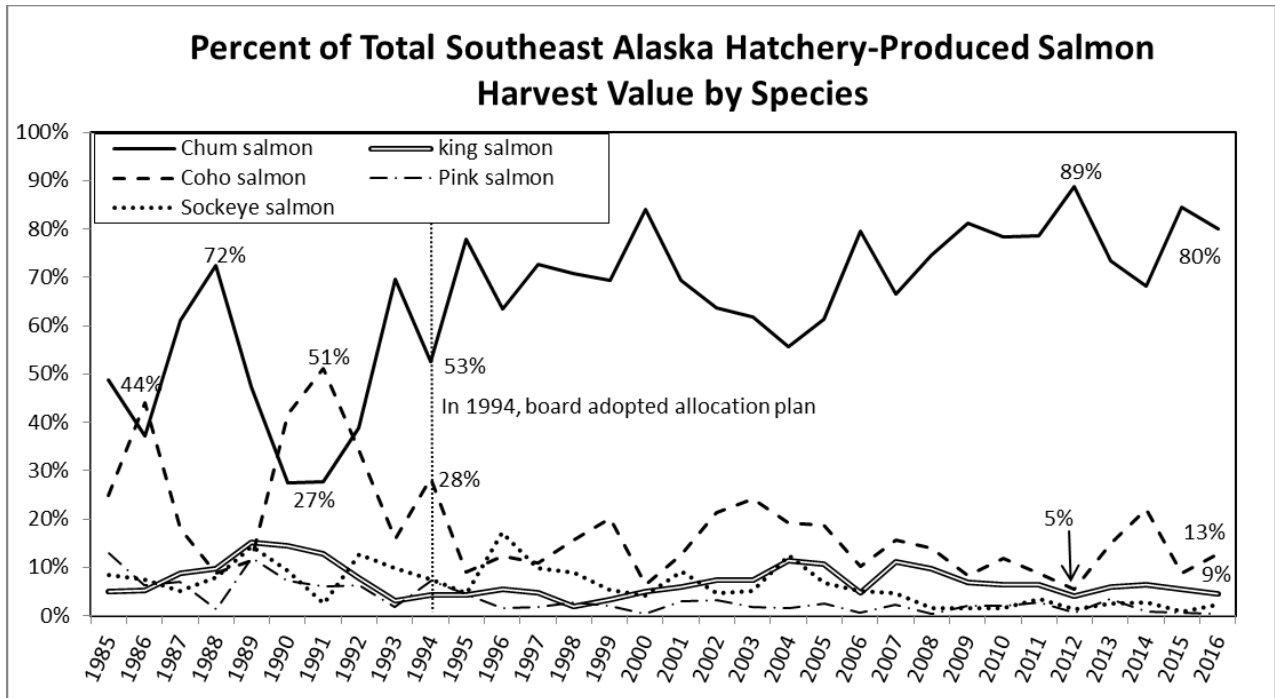


Figure 4.—Percent of total Southeast Alaska hatchery-produced salmon harvest value by species.

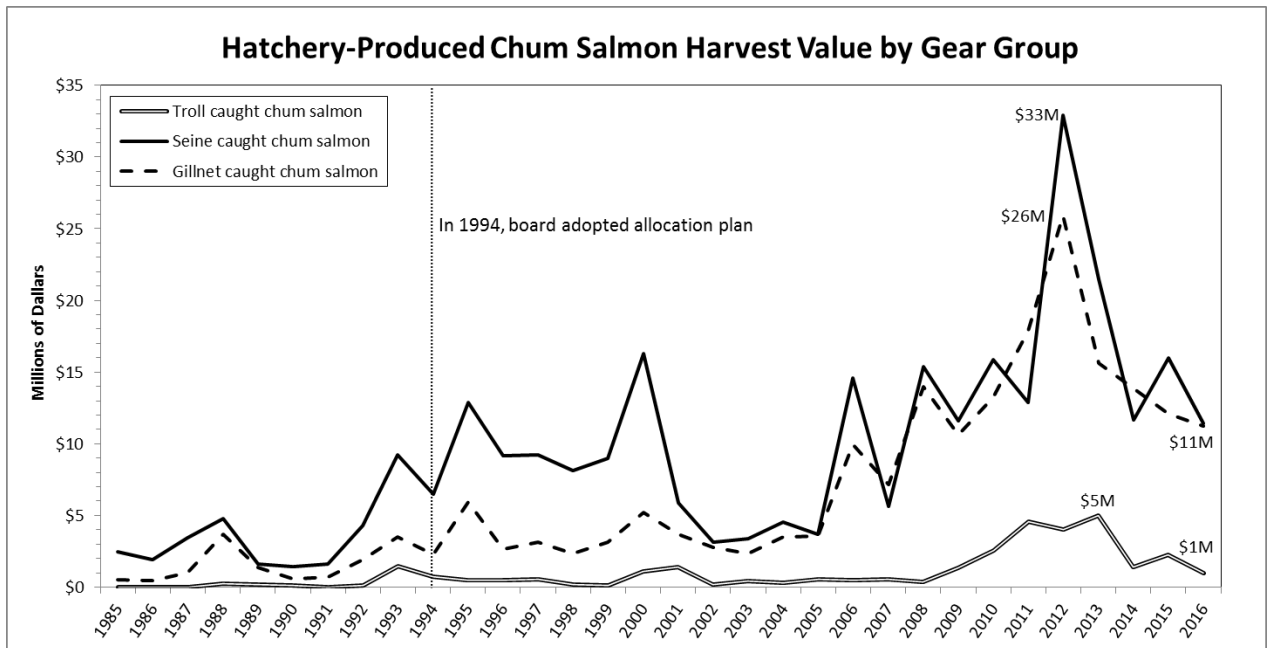


Figure 5.—Hatchery-produced chum salmon harvest value by gear group.

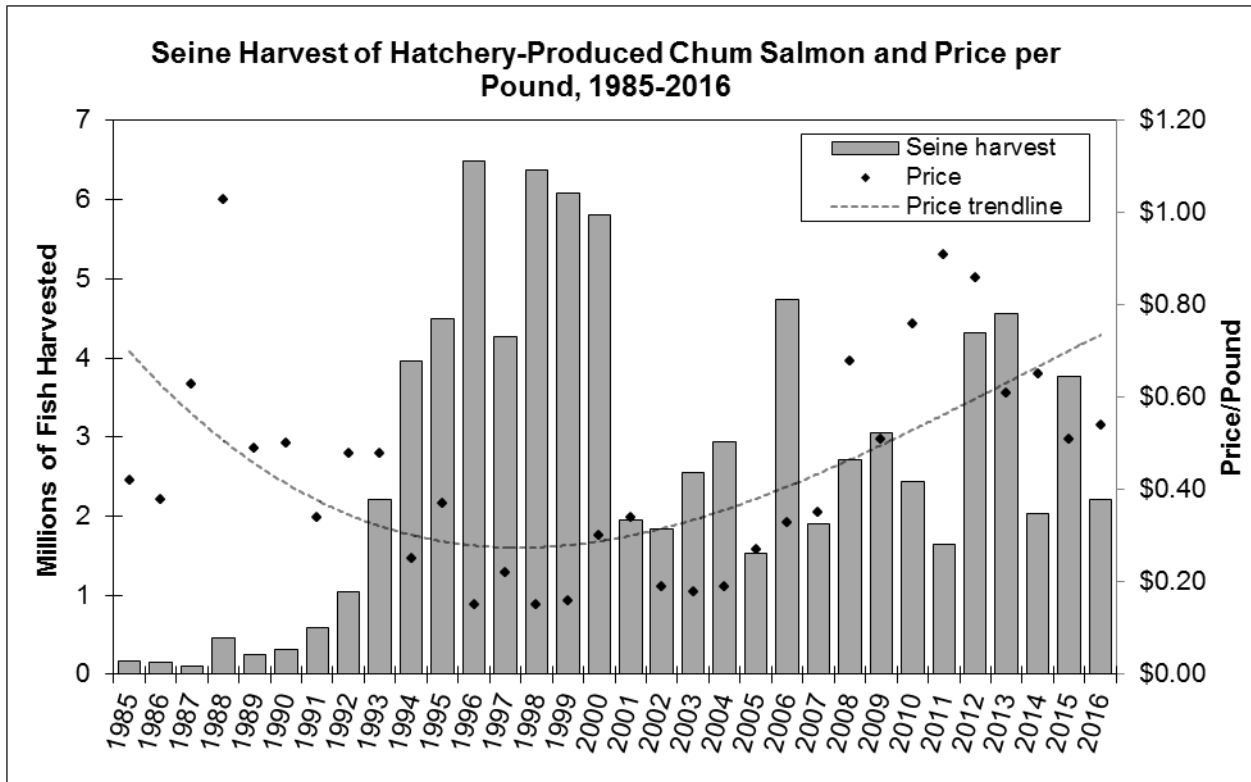


Figure 6.—Seine harvest of hatchery-produced chum salmon and price per pound, 1985–2016.

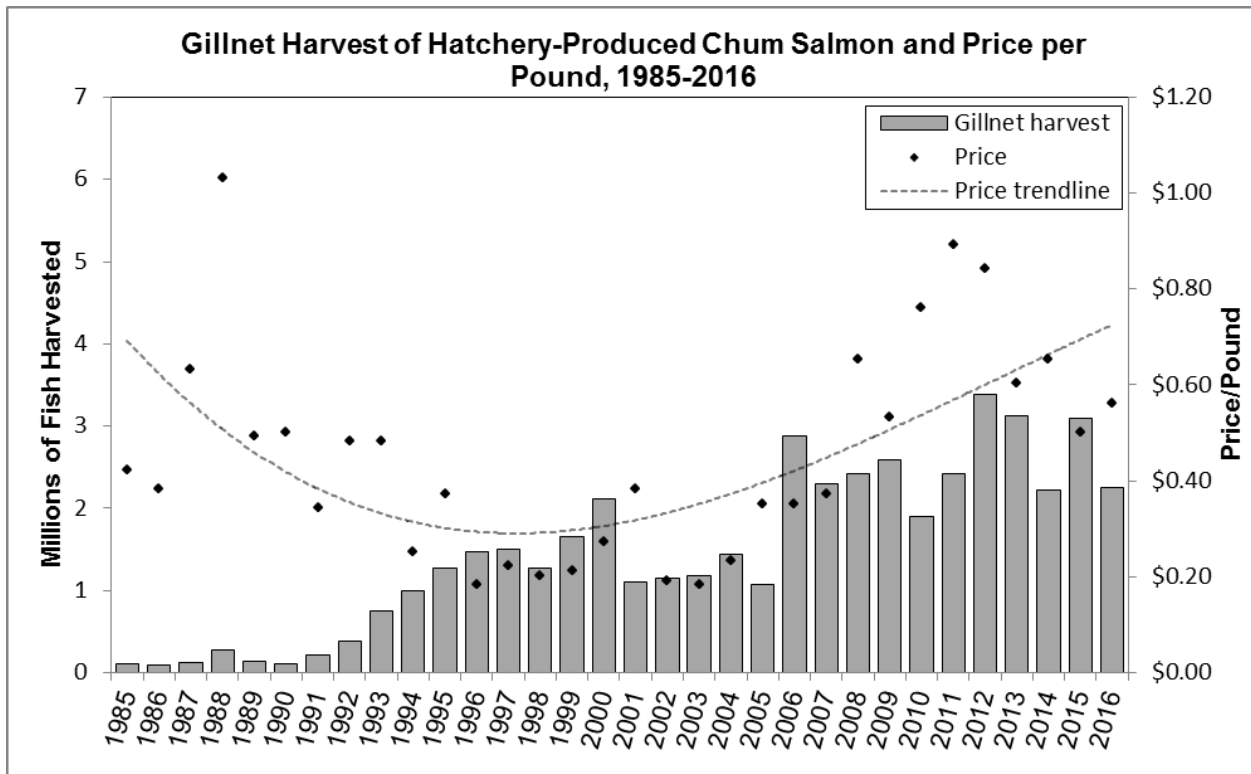


Figure 7.—Gillnet harvest of hatchery-produced chum salmon and price per pound, 1985–2016.

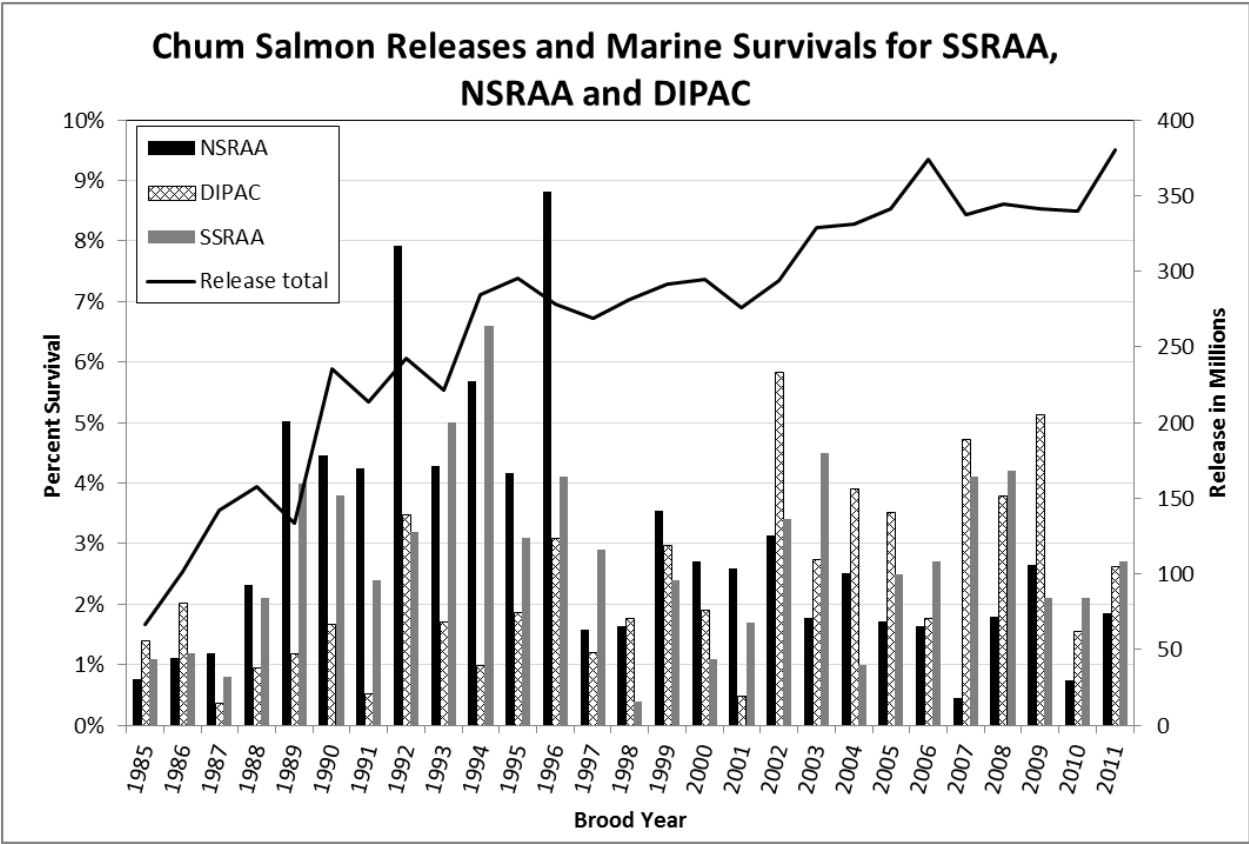


Figure 8.—Hatchery-produced chum salmon releases and marine survivals from NSRAA, SSRAA, and DIPAC.

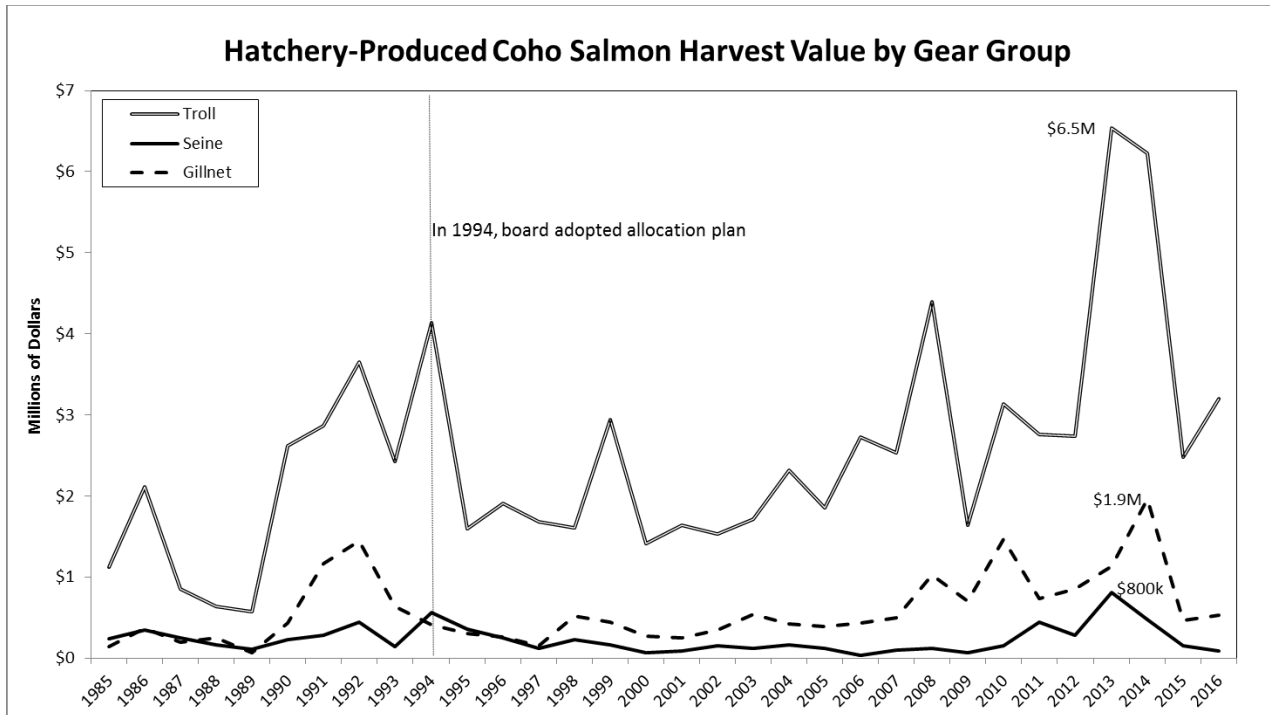


Figure 9.—Hatchery-produced coho salmon harvest value by gear group.

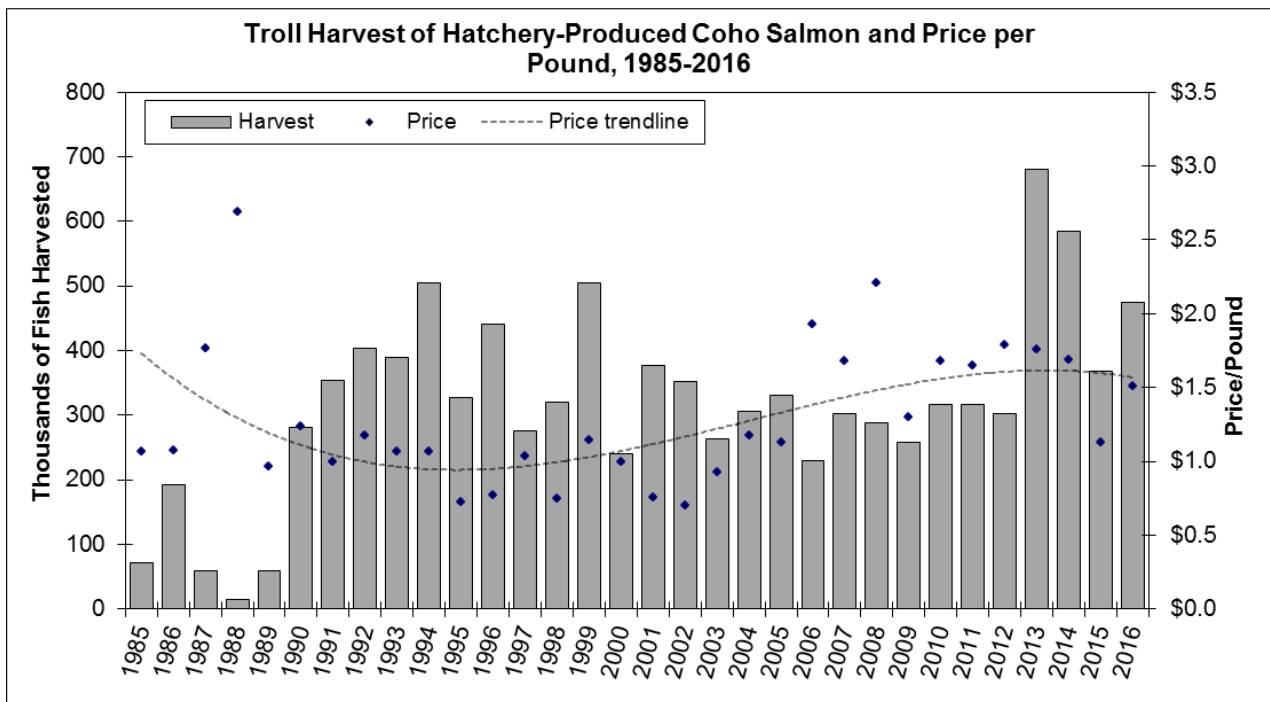


Figure 10.—Troll harvest of hatchery-produced coho salmon and price per pound, 1985–2013.

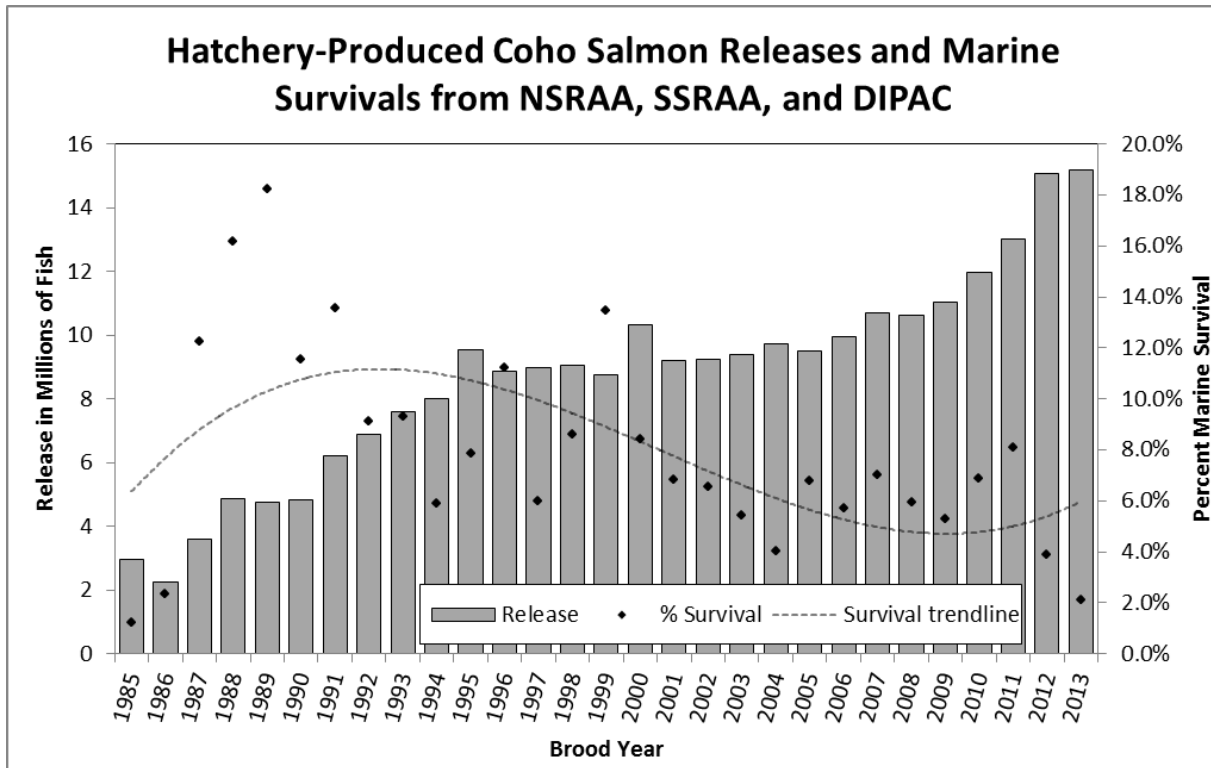


Figure 11.—Southeast Alaska hatchery-produced coho salmon releases and marine survivals from NSRAA, SSRAA, and DIPAC.

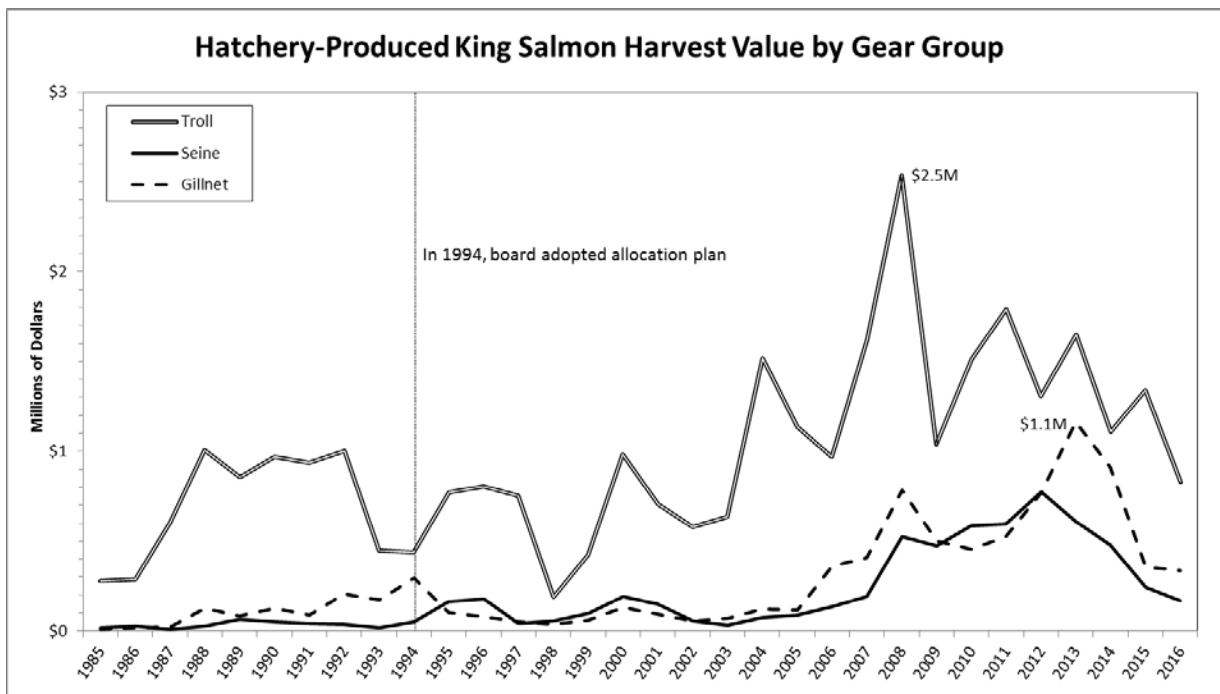


Figure 12.—Hatchery-produced king salmon harvest value by gear group.

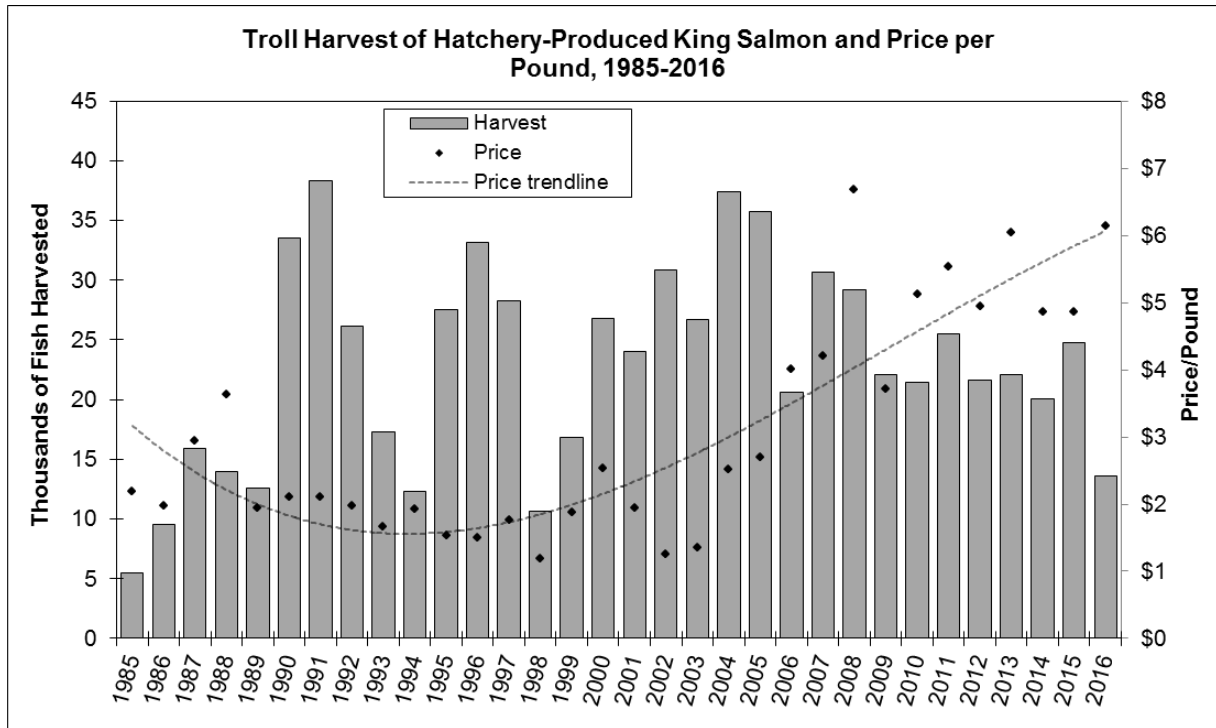


Figure 13.—Troll harvest of hatchery-produced king salmon and price per pound, 1985–2016.

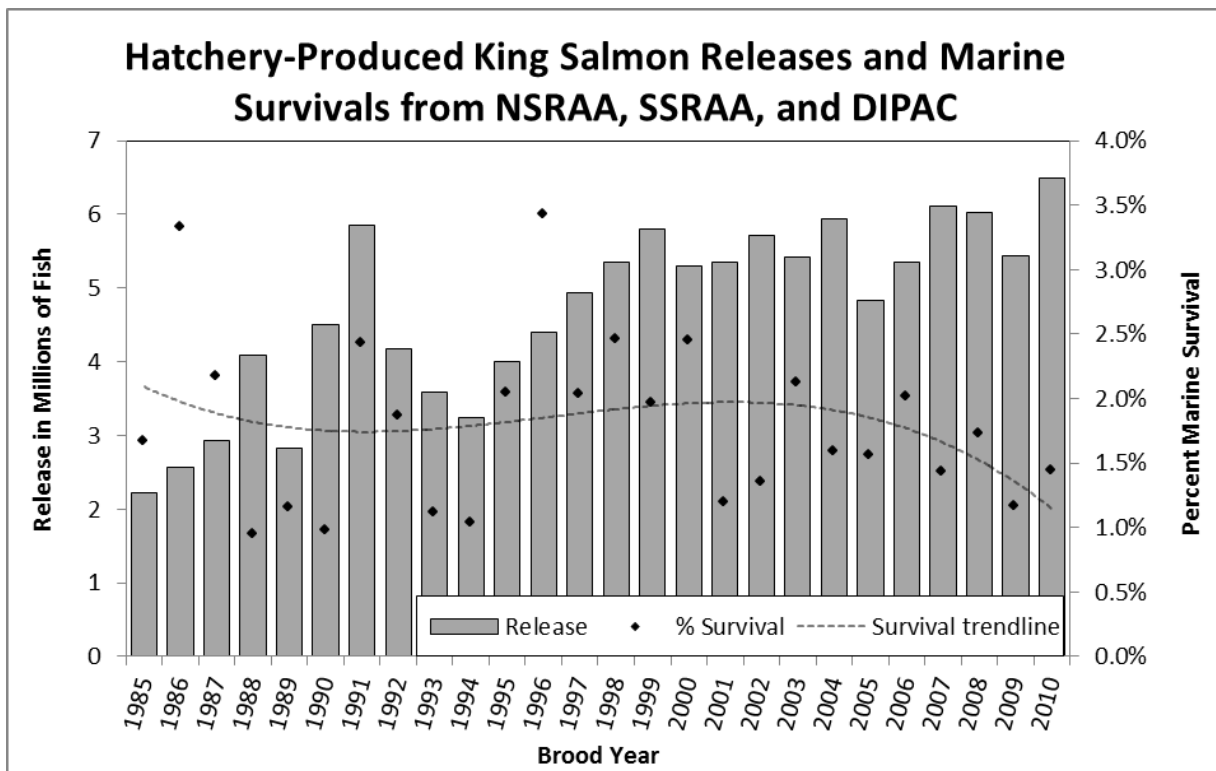


Figure 14.—Hatchery-produced king salmon releases and marine survivals from NSRAA, SSRAA, and DIPAC.

APPENDICES

Appendix A.-5 AAC 33.364. Southeastern Alaska Area Enhanced Salmon Allocation Management Plan.

(a) The purpose of the management plan contained in this section is to provide a fair and reasonable distribution of the harvest of salmon from enhancement projects among seine, troll, and drift gillnet commercial fisheries, and to reduce conflicts among these users, in the Southeastern Alaska Area. The Board of Fisheries establishes the following value allocations:

- (1) seine—44 percent to 49 percent;
- (2) hand and power troll—27 percent to 32 percent;
- (3) drift gillnet—24 percent to 29 percent.

(b) The department shall evaluate the annual harvest of salmon stocks from enhancement projects to determine whether the distribution of the value of enhanced salmon taken in the seine, troll, and drift gillnet fisheries in the Southeastern Alaska Area is consistent with the allocation established in (a) of this section. The evaluation of allocation percentages shall be based on five-year increments, beginning with 1985. The value of the enhanced salmon harvested each year shall be determined by the department based on data from the Commercial Fisheries Entry Commission.

(c) If the value of the harvest of enhanced salmon stocks by a gear group listed in (a) of this section is outside of its allocation percentages for three consecutive years, the board will, in its discretion, adjust fisheries within special harvest areas to bring the gear group within its allocation percentage.

(d) The department may not make inseason adjustments or changes in management in or out of the special harvest areas to achieve the allocation percentages established in (a) of this section.

(Eff. 5/29/94, Register 130)

Authority: AS 16.05.251 AS 16.05.730 AS 16.10.440

(Previously finding #94-02-FB)

Southeastern Alaska Area Enhanced Salmon Allocation Management Plan (5 AAC 33.364)

Background: In March 1991, Mike Martin Chairman of the Board of Fisheries asked the Northern Southeast Regional Aquaculture Association (NSRAA) and the Southern Southeast Regional Aquaculture Association (SSRAA) to coordinate the development of the southeast wide allocation plan for all enhanced salmon.

The issue concerned the benefits of commercial fishermen received from the enhancement activities especially in relation to the amount of the 3% Salmon Enhancement Tax (SET) paid. The issue was different between the Regional Associations and could not be resolved. Numerous proposals have been submitted to the Board of Fisheries to resolve the issue but none were acted upon. Chairman Martin requested that the two Regional Associations consider an all-Southeast Alaska Allocation Plan to include all enhancement activities: Fish and Game FRED division, independent non-profit aquaculture corporations, and regional aquaculture associations.

The Board of Directors of NSRAA and SSRAA agreed to accept the challenge. They formed a group that first met on March 29, 1991, in Ketchikan. The group called itself the Southeast Allocation Task Force (SATF). The SATF is composed of six voting members, three each from NSRAA and SSRAA, and each association provided one seine, one troll, and one drift gillnet representative for a total of two people from each gear type on SATF. All decisions were by consensus. No meeting was held without six voting members present.

There were two non-voting members on the SATF, one each from the FRED Division and a representative from the independent non-profit aquaculture corporations. DIPAC represented the independent seat. Also, each Regional Association provided one staff member. Pete Esquiro represented NSRAA and Don Amend represented SSRAA. The staff and non-voting members are resource people who provided technical input and comments when appropriate. The SATF also has had technical input from the NMFS at Auke Bay, the Limited Entry Commission, and other people as needed.

All meetings were publicly held. Announcements were made southeast wide in newspapers and radios. Public attendance was minimal, but a few showed up at each meeting. These people were allowed to address the SATF as recognized by the chair. There were no appointed sport representative, but these interests were present at a few meetings. There were a total of five meetings.

The SATF developed the number of fish caught and this was reviewed by scientists at the Auke Bay Laboratory. The value of the fish was provided by the Limited Entry Commission. The data does not include enhancement activities by the National Marine Fisheries Service (NMFS), Metlakatla Indian Community (MIC) on Annette Island, or the U.S. Forest Service (USFS). The production at NMFS is small and experimental. Although the production by the MIC is significant and they also harvest Alaska Enhanced fish, this was not included because their harvest and production cannot be controlled by the State. The USFS conducts many habitat enhancement activities but the numbers cannot be verified or evaluated. All of Southeast Alaska was included (Districts 1–15), but the Yakutat area was excluded.

-continued-

The base period for data analysis was 1985. Production prior to 1985 was not significant and most projects were just coming online. The data were evaluated through 1990 and will be updated annually as they become available. Averages were based on this period when production was still increasing and changing. Estimates were made based upon all currently permitted capacity when at full production. Future production was based on planned increases in capacity, but not yet permitted or operational.

The development of the agreement was based on catches by power and hand trollers, purse seiners, and drift gillnetters. Set nets were not included and are not used in the areas analyzed. Sport, sport charter, subsistence, and personal use were not included. The agreement was based only upon those who pay the 3% SET. No allocation was suggested for these other groups. The belief was that they are restricted by bag limits and an allocation of enhanced fish is inappropriate.

The guidelines will be submitted to the Board of Fisheries and may be set in regulation, or developed into policy. The guidelines will be used by the Regional Planning Teams (RPTs) as one element in the evaluation of permit requests and proposed production changes. The Commissioner of Fish and Game will consider the guidelines when evaluating permits or establishing special harvest areas. The Commissioner of Commerce, Community, and Economic Development will consider them in determining salmon enhancement loans for changes in production. The Board of Fisheries will use it to make decisions concerning gear group disagreements that involve enhanced fish production. The guidelines are viewed as goals to achieve and remain flexible for changing conditions, such as management changes, treaty changes, gear changes, legislative changes, etc. It was not intended for Fish and Game management to use in managing the common property fishery, except in a very few special instances.

REPORT OF THE SOUTHEAST ALASKA ALLOCATION TASK FORCE (SATF) FOR ENHANCED SALMON.

Following are the fourteen (14) guiding principles that were developed along with rationale statements of each:

1). The primary goal of the Southeast Alaska salmon enhancement program is to provide additional fishing opportunities and revenue to traditional common property fisheries.

(A) Performance Goals: Hatchery program plans and performance, over time, should provide a 70% contribution (after broodstock) to common property fisheries. Out of recognition for those hatcheries not receiving any salmon enhancement tax (SET) revenues, a 60% contribution (after broodstock) to common property fisheries is an acceptable goal. This goal should be expanded to 70% when these non-association hatcheries retire their existing debt obligation to the State of Alaska.

(B) Operators of hatcheries and other enhancement projects will use these performance goals in designing the annual management plans they submit to the joint Regional Planning Team (RPT) for review prior to approval by the Commissioner.

-continued-

(C) It is recommended that enhancement programs that achieve these performance goals be given priority from the Department of Commerce, Community, and Economic Development on the requests for funding from the Fisheries Enhancement Revolving Loan Fund.

(D) Common property fisheries means those fisheries available to the people for common use.

Rationale: The enhancement programs are primarily for the benefit of the common property fishery and not for the benefit of private and state ownership. To assure the emphasis is on the common property fisheries, the 70% and 60% performance goals specified in 1A shall be used in evaluating projects. Although contributions to the common property fisheries will vary from year to year depending on run strength, survival rates, and management, the long term benefit must be to the common property fisheries. No penalty for failures is suggested. However, hatchery proformas should include these production goals and, if not achieved over time, it is intended that management changes be made to assure these goals.

Broodstock are not included because they were viewed the same as escapement goals. Broodstock do not financially benefit anyone directly and are essential for continued production (see number 3).

2). Management of traditional “wildstock” fisheries are not to be restricted by cost-recovery needs (economic escapement) of hatcheries.

Rationale: This concept is embodied in Alaska Statutes (AS 16.05.730). The SATF could not envision any circumstance where a wildstock fishery should be interrupted to assure a cost-recovery harvest.

3). Restrictions on conduct of traditional “wildstock” fisheries to meet broodstock needs should be absolutely minimal and should be clearly documented by adequate production and harvest data. Protection of broodstock should only occur in close proximity to terminal areas. (Consistent with AS 16.05.730, and regulations 5 AAC 40.005 and 5 AAC 40.220.)

Rationale: The SATF recognizes the importance of broodstock. However, broodstock alone should not drive a common property fishery. Protection of broodstock should only occur in close proximity to terminal areas and only when the wildstocks can be adequately harvested in another area. The need for protection of broodstock in any area must be documented by showing that broodstock goals are adversely affected and the area contains significant broodstock. However, it is not intended that an operator manipulate activities just to ask for broodstock protection (for example, by conducting cost-recovery harvest without taking proper steps to assure broodstock collection).

4). Enhancement projects should include tagging or marking that will allow determination of the amount of production harvested in the various fisheries.

Rationale: It is recommended that adequate tagging programs be required under the Commissioner’s authority (AS 16.10.400). Operator estimates are not adequate for estimating contribution to common property fisheries. Tagging or marking programs are essential; however, because the technology for marking fish is still evolving, no method is recommended. It is assumed that the most reliable and cost effective method will be used.

5). The State of Alaska should commit to an adequate mark recovery program for all enhanced salmon to provide harvest and production data.

Rationale: It is recommended that those responsible for enhancing fish should pay for the marking, but only the state has the resources to conduct the tag recovery program. The allocation agreement will not work unless the state commits to a mark recovery program. Also, there was evidence that the tag recovery program was not being conducted equally among the gear types or species harvested. For example, troll king salmon fisheries have been more intensively sampled, whereas the seine harvest has been sampled the least of the groups. The tag recovery program should be designed to provide an equal level of confidence in the contribution of enhanced salmon to each gear type.

6). Habitat enhancement and restoration projects where marking is not feasible will not be counted. Other field projects where marking is feasible and economically acceptable will be counted.

Rationale: Lake fry plants, stream bioenhancement, stream rehabilitation, and other enhancement strategies are frequently conducted with small numbers of fish in remote areas. It may not be practical or economically feasible to mark the fish. These enhancement and restoration projects are encouraged and it is recognized that they contribute to the common property fisheries, but they will not be counted in the allocation percentages. However, where feasible, marking should be conducted.

7). The allocation percentage goals will be used to provide a fixed target for production.

Rationale: Enhancement projects and production goals have frequently been established based on political expediency or the economic viability of the operator. However, whenever fish are released and the returning adults harvested, an allocation is made. The allocation can become disproportionate based on the number of fish and where they are released.

It is desirable that new production or revised existing production contribute to achieving the allocation percentage goals established. This however, should not be the only criteria used to judge the desirability of new or revised production. If such new or revised production is “projected” to unbalance the distribution of enhanced salmon, and the change in production is otherwise considered desirable, the RPT will evaluate the overall enhancement program to determine what adjustments may be necessary to bring distribution of the harvest into compliance with the allocation percentage goals and make recommendations to the Commissioner.

8). Allocation percentage goals will be long term.

Rationale: It is recognized that survival rates can vary considerably within and among enhancement projects throughout Southeast Alaska. Also, variations in the management of the common property fisheries influence the harvest rates. The allocation percentage goals are not expected to be attained each year, but should be attained over the long term. Any change in the production takes two to five years to impact a fishery. Therefore, allocation percentage goals should be based on a minimum of five year increments (see number 9).

9). Overall contribution of revenue from salmon enhancement projects should be evaluated using the most recent five year average. Adjustments should be implemented only after discrepancies are determined to exist in the five-year average for three consecutive years.

Rationale: See number 8 above. The distribution of enhanced fish is expected to vary widely from year to year. A five year rolling average was used because it constitutes a production cycle and levels year to year variation. It is recognized that a single abnormal year can change the five-year average outside the range of the allocation percentage goals; therefore, the guidelines establish a three-year period of consistent discrepancy before any change is made.

10). The joint RPT will evaluate current enhanced salmon production and the distribution of harvest revenues and update this on an annual basis.

- (A) Each facility should be evaluated after a minimum five years of operation to determine whether the 70% or 60% common property contribution, referred to in guiding principle 1A, is being achieved or to determine the realistic production and common property contribution for the facility.
- (B) The joint RPT will conduct an evaluation to determine when the allocation percentages are not being achieved and adjustments are necessary.
- (C) The joint RPT will recommend to the Commissioner adjustments to facilities' annual operating plans as necessary to accomplish the desired allocation goal.

Rationale: The SATF believes the joint RPT is the appropriate body to review the contribution data. The joint RPT is responsible for establishing and maintaining the comprehensive salmon plan, under the Commissioner's authority, and is responsible for recommending the permit changes for production to the Commissioner.

11). Achieving these allocation percentage goals should not result in any modifications, in time or area, to the traditional "wildstock" fisheries. Minor modification may be considered to allow experimental or test fisheries that would not adversely impact wildstocks.

Rationale: The SATF strongly believed that the common property fisheries for wildstocks should not be manipulated in order to achieve the allocation percentage goals. However, this is not intended to preclude experimental or test fisheries, special hatchery access fisheries, or the establishment of new special harvest areas in order to access enhanced fish. For example, this could include the June troll fisheries for king salmon, or late season openings, or other special openings used to target enhanced fish as long as wildstocks are not adversely impacted.

It is recommended that the department allow targeted fisheries on enhanced stocks when they will not adversely impact sustained yield of wildstocks. The department should work closely with hatchery operators in establishing these fisheries, keeping in mind the 70% and 60% contribution goals. The harvest of enhanced salmon in a targeted wildstock fishery is considered incidental to the harvest of wild stocks.

12). There should be no inseason changes in management of enhanced salmon in or out of the special harvest areas to achieve the allocation percentage goals.

Rationale: These guidelines are established to reach long term allocation percentages. Inseason common property fisheries adjustments should not be considered to meet allocation goals. No adjustment of wildstock fisheries should be allowed in order to meet the allocation percentage goals.

13). When adjustments are deemed necessary to the distribution of the harvest to meet allocation percentage goals, the following tools should be used: (1) special harvest area management adjustments; (2) new enhanced salmon production; and (3) modification of enhancement projects production, including remote releases. Hidden Falls shall remain a seine/troll terminal harvest area. (Consistent with 5 AAC 33.374.)

(A) The joint RPT will make appropriate recommendations through the Commissioner to facility(s) annual operating plan(s) to attain allocation goals.

(B) Facilities may request changes in operating plans to meet allocation requirements.

Rationale: New production and facility modifications to meet the allocation percentage goals are long term changes and will take five to 10 years to have an impact. Changes in special harvest areas can be used in the short term to help modify any imbalances that occur.

For example, special harvest areas can be designated to only one gear group or the fishing time allowed to different gear groups could be adjusted. The effectiveness of this will also be contingent on the gear type and the targeted species. The SATF expects these adjustments will be reviewed by the joint RPT, and the joint RPT will make recommendations to the Commissioner as to the most appropriate action needed to achieve the allocation percentage goals. It is anticipated that short-term solutions such as special harvest area management adjustments will only be used until decisions concerning long-term adjustments can take effect. The allocation percentage goals will also be considered when reviewing permit alteration requests. If new production is not feasible or desirable, changes in remote releases can include new sites, change in species composition, change in the numbers of salmon released, or a combination of these.

(14). The allocative percentages will be:

Note: The following percentages refer to the total value (nominal dollars) of enhanced salmon. These percentages are not intended to apply to wildstock allocations.

Seine–44% to 49%

Troll–27% to 32%

Gillnet–24% to 29%