

ADF&G GROUND FISH OBSERVERS FOR ADF-FLATFISH PROJECT
FINAL REPORT

Submitted to:

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November 21, 1989

ABSTRACT

ADF&G groundfish observers monitored the bycatch rates of halibut and crab in AFDF's flatfish demonstration project at Eagle Fisheries in Kodiak, Alaska. During August 1988 to July 1989, 32 observer trips were conducted, for an overall observer coverage of 19.3 % of bottom trawl trips made by vessels fishing for Eagle Fisheries. Most of these vessels targeted on deepwater flatfish species (principally rex and Dover sole), although other species were caught as well (pollock, Pacific cod, sablefish). The bycatch rate of halibut in the flatfish fishery was slightly lower for Eagle vessels (3%) compared to the rate for all vessels targeting on flatfish (3.1%). The bycatch rate for halibut in the mixed fishery averaged 5.5% for Eagle vessels; slightly higher than the average rate of 4.7% for all vessels. The average bycatch of Tanner crab was .13% and less than .05% king crab were caught.

INTRODUCTION

Groundfish are Alaska's fastest growing fishery. Catches by U.S. fishermen have increased dramatically in recent years and now amount to about 1 million tons annually. In 1987 groundfish accounted for over 80% of the pounds landed and 29% of the ex-vessel value of all fish and shellfish species harvested in Alaskan waters.

Although most of the groundfish harvest is comprised of pollock, Pacific cod and sablefish, the catch of flatfish is increasing rapidly (Fig. 1). A variety of flatfish species are landed in the Central Gulf of Alaska (Fig. 2).

Program Objectives

ADF&G was contracted by AFDF on August 4, 1988, to provide observer coverage on fishing vessels participating in the AFDF-flatfish demonstration project at Eagle Fisheries in Kodiak. Objectives of the observer program were:

- (1) Document the fish harvested by vessels participating in the project, and
- (2) Determine catch rates of incidental species ("bycatch") caught along with the target flatfish species.

OBSERVER COVERAGE OF EAGLE FLEET

ADF&G observer coverage of Eagle Fisheries vessels increased substantially due to the AFDF contract. During the four quarters of this project, ADF&G monitored 16-20% of all flatfish landings at Eagle Fisheries compared to 2% in the two quarters prior to initiation of the contract (Fig. 3).

A total of 32 observer trips were made during the Eagle flatfish project, 29 of which yielded data (Table 1). An observer was on the ill-fated voyage of the FV Little Bear when it sank. Fortunately all personnel were saved, but the observer's data went down with the ship. Observer trips are listed in Appendix 1.

The distribution of observer trips per vessel is shown in Figure 4.

RESULTS

Bycatch rates for halibut during this project varied considerably (Fig.5). Shown below are the bycatch rates (based on the weight of halibut per metric ton of landed weight as reported on the fish ticket for each vessel trip):

Fishery	Eagle Fisheries Observed Vessels					All Observed Vessels
	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	All Qtrs.	1987-89 ¹
Mixed	10.1	8.5	1.8	4.0	5.5	4.7
All Flatfish	3.0	7.4	1.5	*	3.0	4.0
Deep Water	10.1	7.8	1.5	2.6	2.5	2.6
Shallow Water	0.2	8.5	11.1	*	7.1	5.5
All Roundfish	37.6	10.8	2.9	13.2	16.5	4.9

*No data

¹Source: ADF&G Westward Region Observer Database through 11-1-89.

Although the overall mixed fishery bycatch rate for the project was 5.5%, quarterly bycatch rates varied from 1.8 to 10.1%. Some of this variation was to be expected, based on ADF&G's on-going observer program in the Kodiak area (Fig. 6). Bycatch rates in bottom trawl fisheries tend to be lowest from February through July (ave. 2.4%) and highest from August through January (ave. 6.7%). These values were derived from shore-based bottom trawlers targeting on varied species, including but not limited to the Eagle flatfish trips (Craig et al. 1989). The results of the Eagle vessels follow the same seasonal bycatch patterns noted for the larger data set (Fig. 7).

The high bycatch rates for the Eagle vessels during some months was exacerbated, in part, by two other factors. First, there was incomplete reporting of total catches on the fish ticket. Based on the observer's estimates of the total catch that came aboard ship, we calculate that over half the catch was discarded (at sea or at the processing plant) and not reported. Such

incomplete reporting automatically increases the bycatch rate because the calculation of the rate is based on the landed weight of the catch, as mentioned above.

The second factor was that the Eagle vessels did not always target on flatfish. During the first quarter (August-September 1988), some vessels also sought pollock, and in doing so, increased their bycatch of halibut. The bycatch rate during this period was 3.0% when the vessels fished for flatfish and 37.6% when they fished for pollock. Together, the result was 10.1% for the quarter. During the fourth quarter (April-July 1989), some vessels targeted Pacific cod and increased their halibut bycatch. The bycatch rate during this period was 2.6% when vessels targeted flatfish and 13.2% when they targeted Pacific cod. Overall, the rate was 4.0% for the quarter.

Tables 2-19 present quarterly summaries of species composition and bycatch rates on observed vessels during this project. Tables 20-24 summarize bycatch and species composition data for all four quarters combined. Overall, the primary commercial species groups were flatfish (52.9%) followed by pollock (14%), Pacific cod (10.7%) and sablefish (9.3%). The bycatch of crab was very low during this project. The Tanner crab bycatch rate averaged 1.3 kg/mt; red king crab averaged less than .05 kg/mt.

DISCUSSION

As mentioned earlier, an important feature of the emerging flatfish fishery at Eagle Fisheries is that flatfish are not only caught and delivered as primary targets but as secondary targets or even as bycatch. As with the larger data set, bycatch rates derived from the Eagle Fisheries data set appear to be driven by specific groundfish targets. For this reason, we believe that the flatfish fishery at Eagle is a subcomponent (of varying size depending on factors such as market, plant operations, etc.) of the mixed bottom trawl fishery off of Kodiak Is. It has been necessary for Eagle vessels to periodically target roundfish species such as pollock and Pacific cod (and indirectly, sablefish), either by haul or by trip. During the study period, observers monitored 3.7 million pounds of landed catch from Eagle vessels. Although 74% of the landed catch was flatfish (with a halibut bycatch rate of 3%), the remaining 26% of the landed catch was roundfish (with a halibut bycatch rate of 16.5%). These two rates are inextricably linked because there are trips that contain flatfish and roundfish as targets. Evaluation of halibut bycatch rates borne from a flatfish fishery that is not yet clearly defined (mixed targets within trips, for example) is difficult.

Overall, data from this study indicates that, seasonally, there may be discrete flatfish fisheries in the Kodiak area that can be effectively prosecuted with resultant lower halibut bycatch rates than in mixed fisheries. Due in part, to the AFDF study, the North Pacific Fishery Management Council (Stock Assessment and Fishery

Evaluation Document (SAFE) for the 1990 Gulf of Alaska Groundfish Fishery - Part B.) has excised deep water flatfish from the overall mixed bottom trawl fishery, primarily for purposes of halibut bycatch monitoring. This is particularly encouraging in light of the current high level of available flatfish biomass (722,000 mt in 1987). What remains to be seen is, whether or not flatfish can be effectively targeted during certain seasons without incurring high halibut bycatches. Data from the upcoming NMFS Observer Program should provide adequate data to refute or validate the AFDF study.

ACKNOWLEDGMENTS

We thank Mel Monson and AFDF for their support of ADF&G's observer program and Alaska's groundfish resources.

LITERATURE CITED

Craig, P., D. Owen, L. Watson, and J. Blackburn. 1989. Halibut bycatch in domestic groundfish fisheries in the Central Gulf of Alaska, 1987-1989. Alaska Dept. Fish and Game, Regional Info. Rep. No. 4K89-19.

Appendix 1. Raw Data From Observer Trips

Copies of the observer's raw data for completed trips are listed below. The data are organized by trip number, but the vessel names and identification numbers have been deleted as required by state confidentiality regulations (SEC 16.05.815).

<u>Trip No.</u>	<u>Date Data Sent to AFDF</u>
8837	10/7/88
8838	"
8839	"
8842	"
8844	1/6/89
8846	"
8847	"
8849	"
8852	"
8857	"
8860	"
8861	"
8865	"
8871	"
8914	4/20/89
8925	"
8926	"
8927	"
8928	"
8930	"
8931	"
8929	(vessel sank; data lost)
8932	8/15/89
8935	"
8938	"
8942	" /
8944	(no hauls made)
8945	"
8946	"
8956	"
8961	"

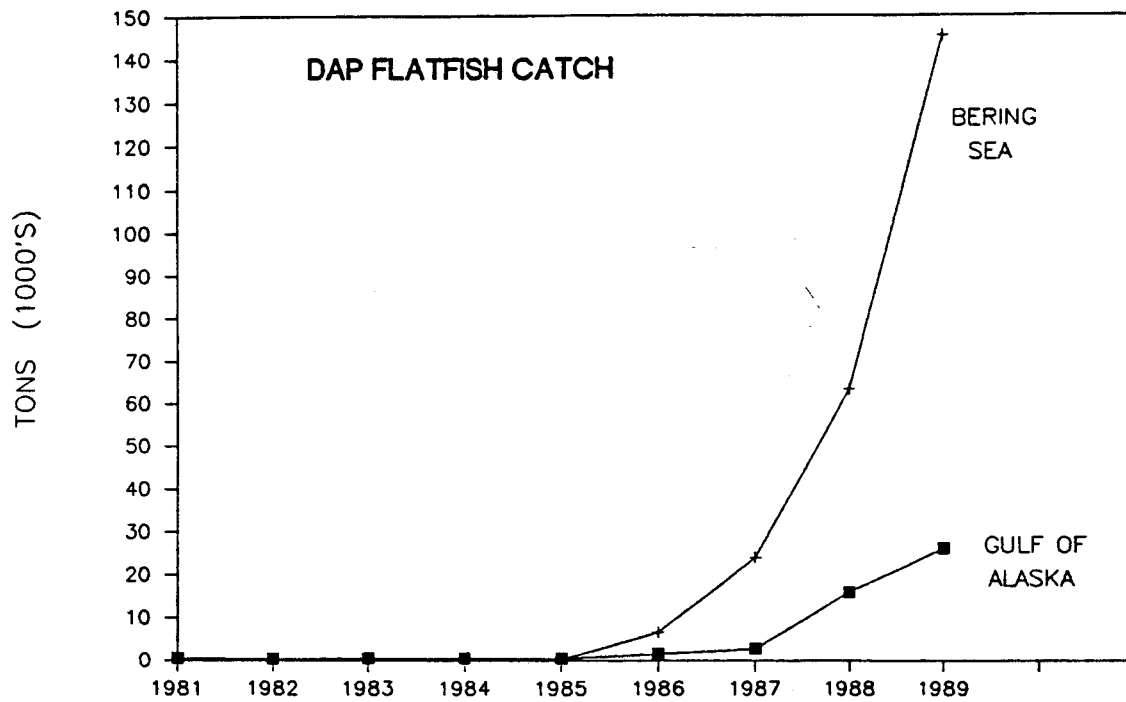


Figure 1. Yearly domestic catches (DAP) of flatfish in the Gulf of Alaska and Bering Sea. Values for 1989 are quotas. Source: PACFin

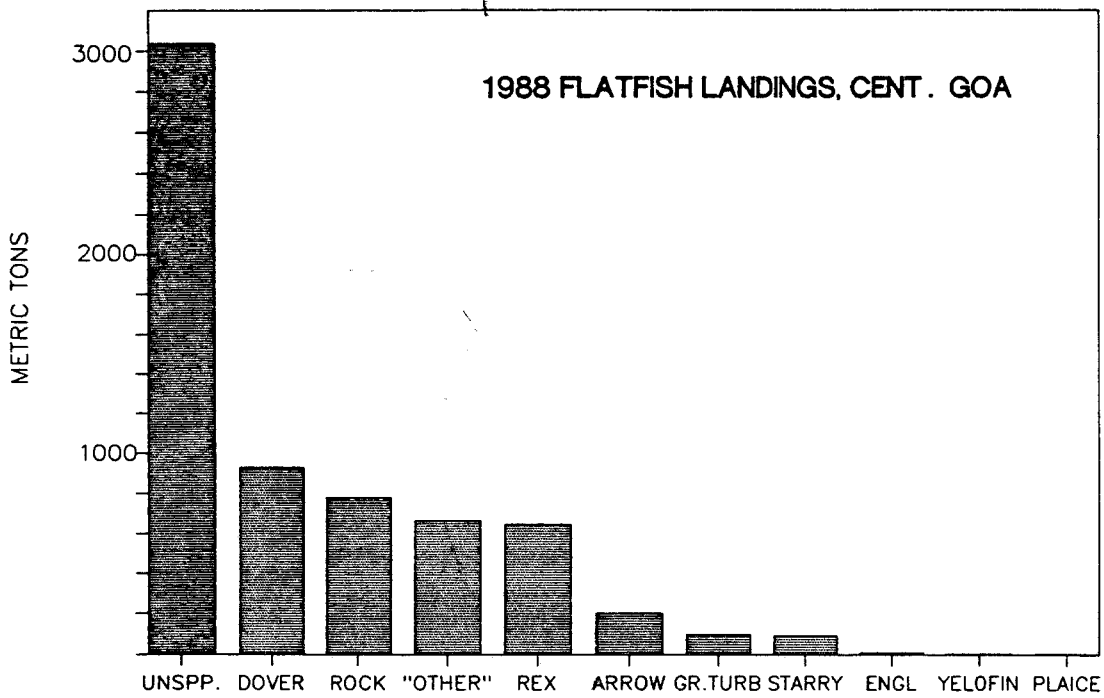


Figure 2. 1988 domestic catches of flatfish species in the Central Gulf of Alaska (FMP area).
Source: PACFin

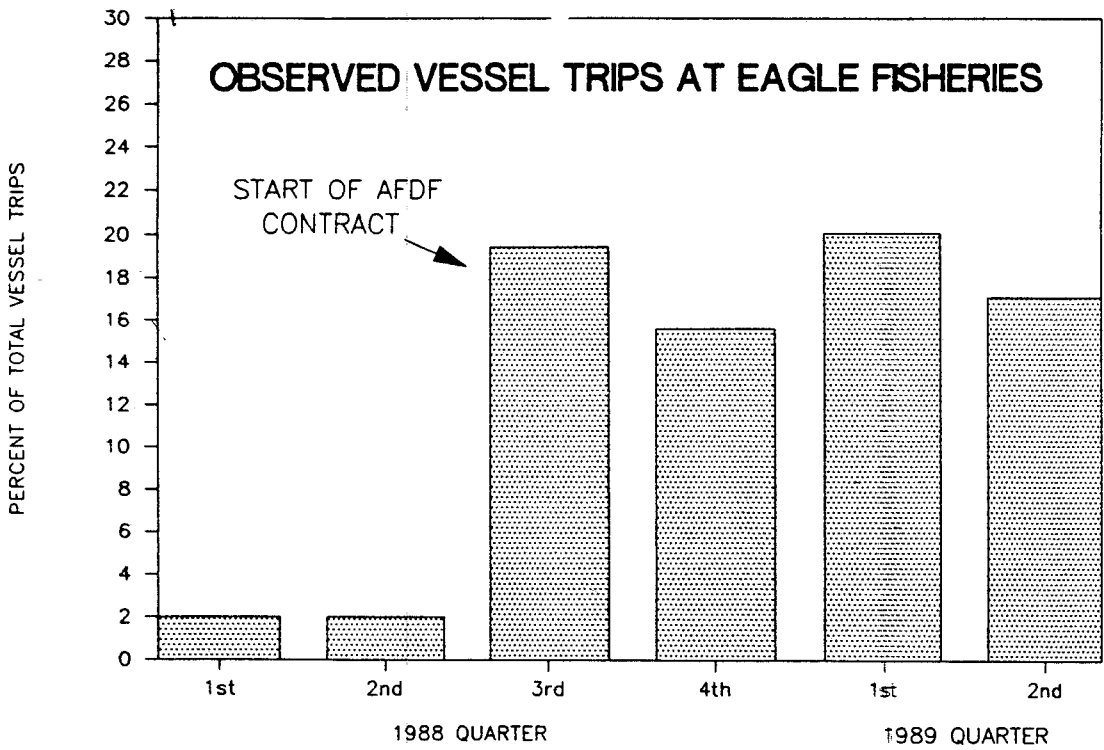


Figure 3. Groundfish landings monitored by on-board observers on vessels delivering to Eagle Fisheries in 1988-89.

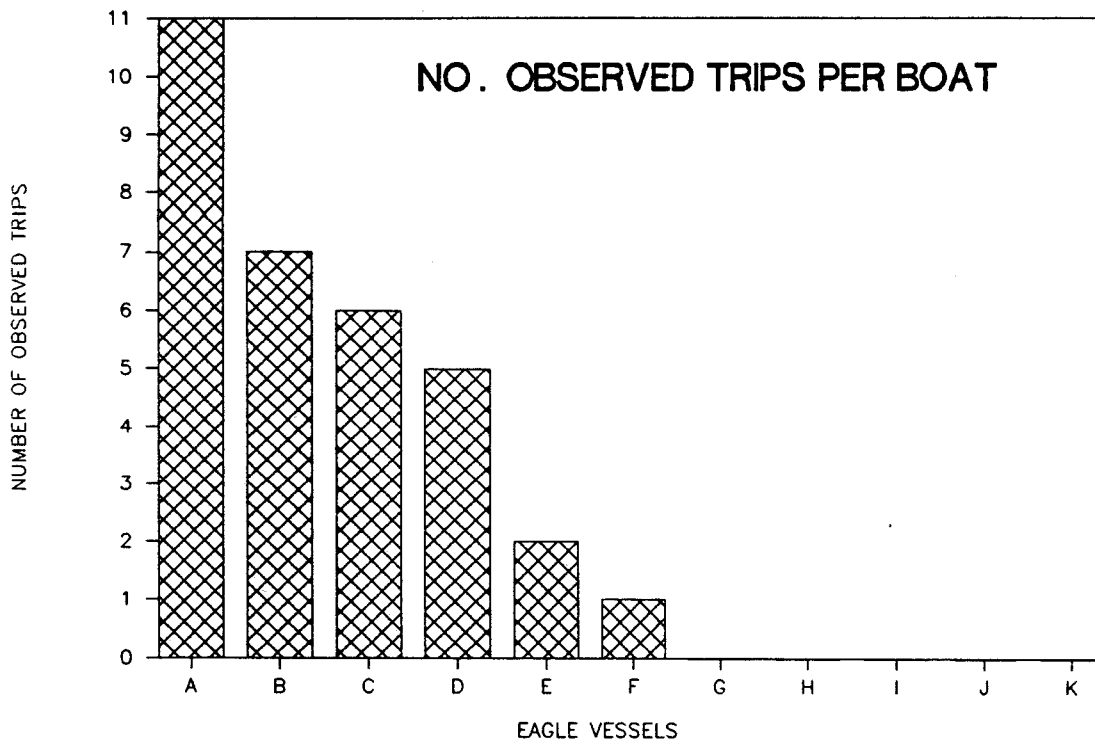


Figure 4. Number of times each Eagle vessel was monitored by an on-board observer.

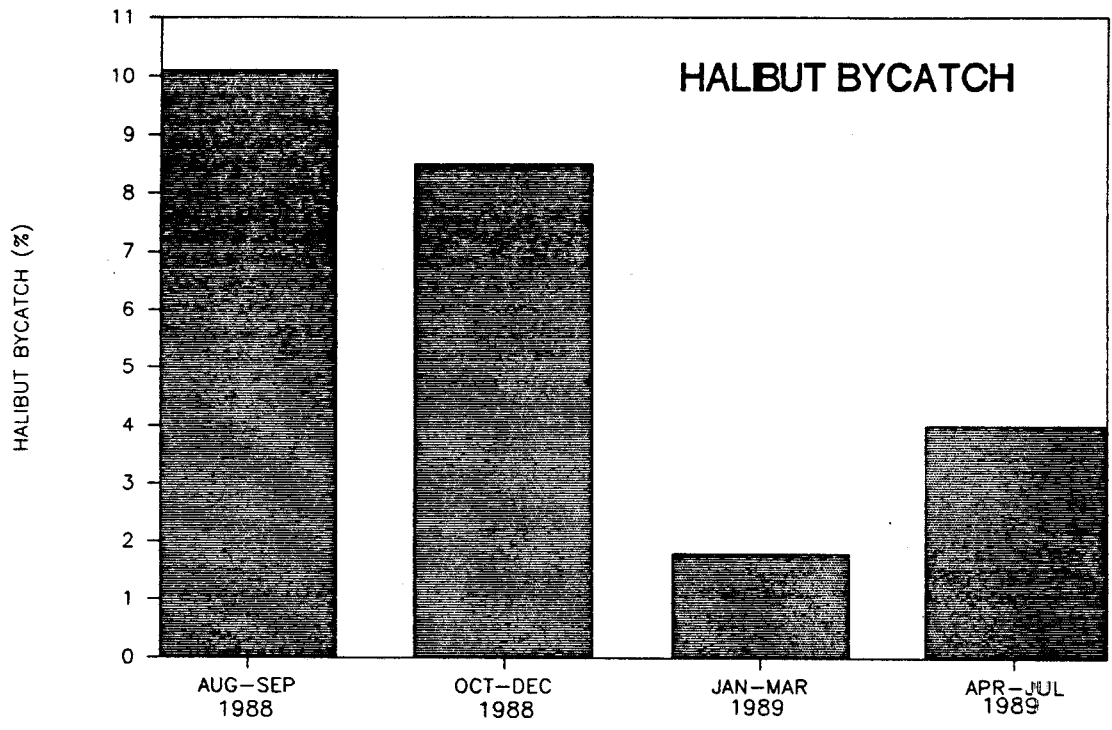


Figure 5. Halibut bycatch rates for Eagle vessels, 1988-89. During 1989, the NPFMC assumed bycatch rate of halibut is 4.5% for trawlers in the Gulf of Alaska.

HALBUT BYCATCH

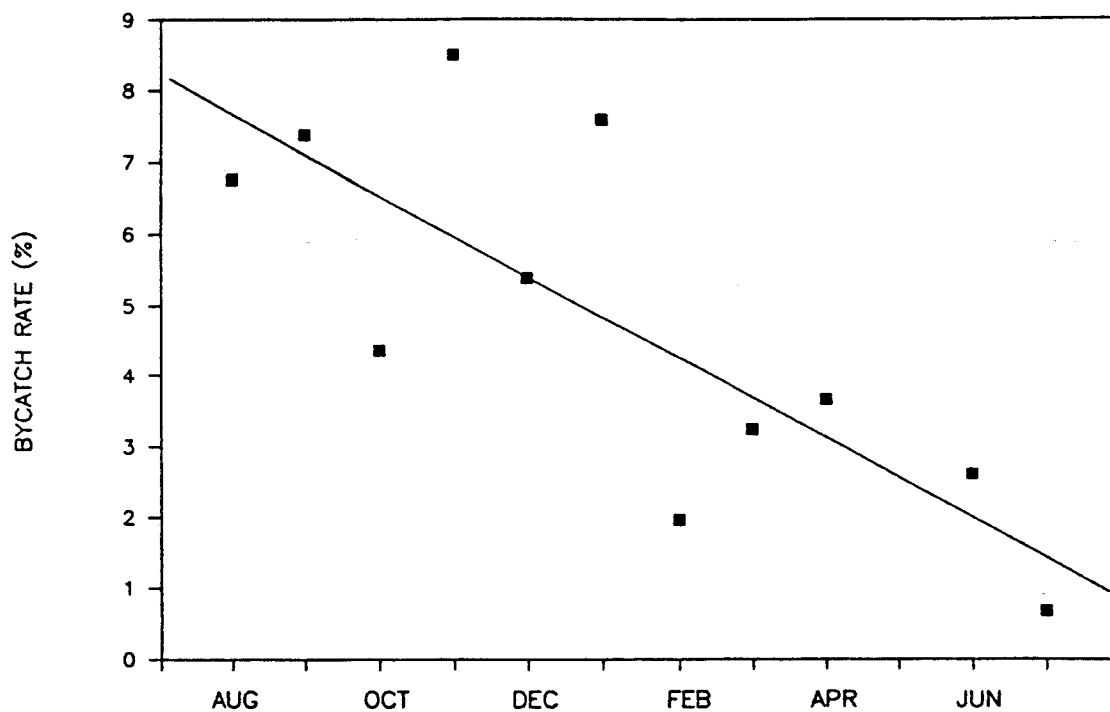


Figure 6. Monthly variation in halibut bycatch (% by weight) for DAP shore-based bottom trawl fisheries in the Kodiak Island area. Symbols represent monthly averages for all vessel trips over a multi-year period (1987-89), without regard to target species in directed bottom trawl fisheries. Source: Craig et al. 1989.

HALBUT BYCATCH

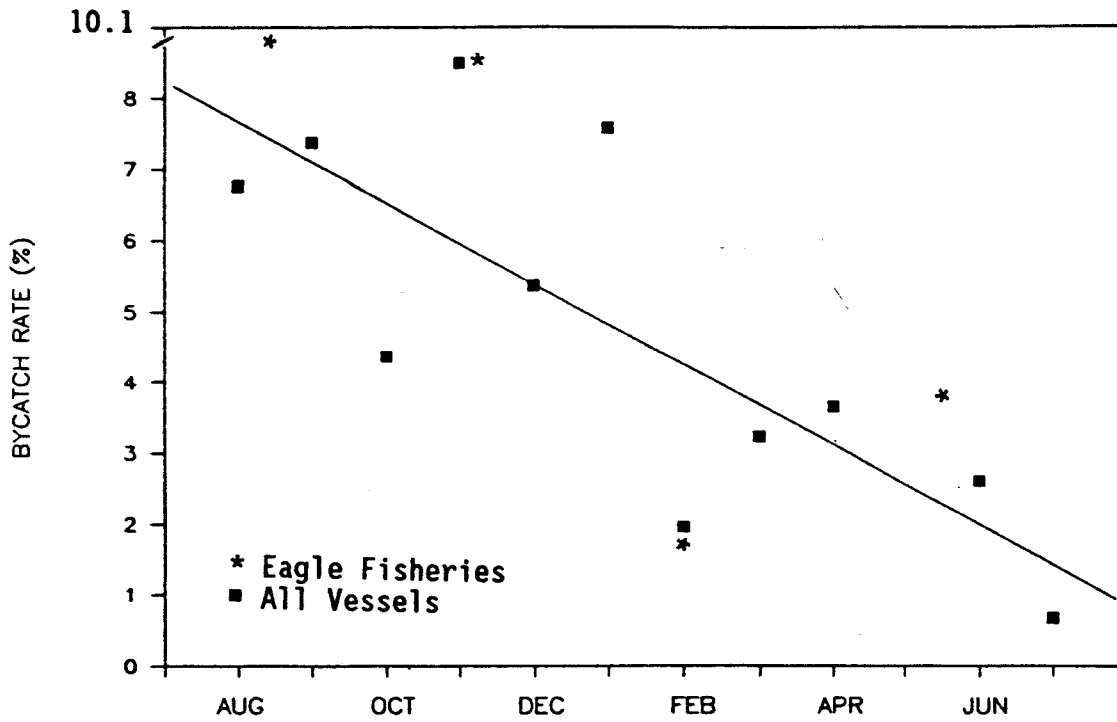


Figure 7. Monthly variation in halibut bycatch (% by weight) for DAP shore-based bottom trawl fisheries in the Kodiak Island area compared to quarterly halibut bycatch rates from vessels fishing for Eagle Fisheries. Symbols represent monthly averages for all vessel trips over a multi-year period (1987-89), without regard to target species in directed bottom trawl fisheries. Source: Craig et al. 1989.

Table 1. Quarterly summary of AFDF-flatfish observer project: number of vessel trips and man-days at sea on vessels delivering to Eagle Fisheries.

<u>DATE</u>	<u>No. observer trips</u>	<u>No. sea-days</u>
Aug 4 - Sep 30, 1988	8	26
Oct 1 - Dec 31, 1988	7	26
Jan 1 - Mar 31, 1989	8	27
Apr 1 - Jul 31, 1989	9	23
Totals	<u>32</u>	<u>102</u>

Table 2. Bycatch rate of prohibited species and species composition in domestic commercial fisheries as observed by the Alaska Department of Fish and Game. (First Quarter)

Catch Details	Species	1	2	
		Catch (%)	---Bycatch---	---
			No./mt	Kg/mt
	Prohibited			
Area: Eastside Kodiak Is	Halibut	4.9	9.1	100.5
Gear: Bottom Trawl	Tanner crab	T	0.5	0.2
Target Species: Mixed	R.king crab	T	T	T
Inclusive Dates:	Salmon	T	0.1	0.2
4 Aug - 30 Sep 1988	Herring	0.0	0.0	0.0
	Commercial			
Vessels Observed: 3	Pacific cod	2.7		
Trips Observed: 8	Pollock	24.1		
Hauls/Sets Observed: 55	Flounder	50.0		
Total Landing: 230.5 mt	Sablefish	11.9		
Stat. Areas Observed:	Rockfish	4.2		
495730 495800 505730	Other	2.2		
505800 515630 515700				
525600 525630 525702				

1. Catch (%) refers to total catch brought on deck and is based on the observed weight of fish caught or, for longline and pot gear, the number of fish caught. Species proportions in individual trawl tows (or sets of longline/pot gear) were determined by observer's samples and expanded to the total tow weight which was visually estimated by the skipper or observer.
2. Bycatch = kg or no. per metric ton of landed fish (whole fish, all species, including landed discard) as listed on the fish ticket. Longline and pot gear kg/mt was generated from the average weight of those fish which were weighed.

T = trace, less than 0.05

0.0 = no catch.

Sum of visually estimated catch = 473.34 mt.

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Table 3. Bycatch rate of prohibited species and species composition in domestic commercial fisheries as observed by the Alaska Department of Fish and Game. (First Quarter)

Catch Details	Species	1	2	
		Catch (%)	---Bycatch---	----
			No./mt	Kg/mt
	Prohibited			
Area: Eastside Kodiak Is	Halibut	1.7	2.6	30.1
Gear: Bottom Trawl	Tanner crab	T	0.1	T
Target Species: Flatfish	R.king crab	T	T	T
Inclusive Dates:	Salmon	0.0	0.0	0.0
4 Aug - 30 Sep 1988	Herring	0.0	0.0	0.0
	Commercial			
Vessels Observed: 3	Pacific cod	1.5		
Trips Observed: 8	Pollock	7.6		
Hauls/Sets Observed: 41	Flounder	64.0		
Total Landing: 186.0 mt	Sablefish	16.2		
Stat. Areas Observed:	Rockfish	6.4		
495730 495800 505730	Other	2.6		
505800 515630 515700				
525600				

1. Catch (%) refers to total catch brought on deck and is based on the observed weight of fish caught or, for longline and pot gear, the number of fish caught. Species proportions in individual trawl tows (or sets of longline/pot gear) were determined by observer's samples and expanded to the total tow weight which was visually estimated by the skipper or observer.
2. Bycatch = kg or no. per metric ton of landed fish (whole fish, all species, including landed discard) as listed on the fish ticket. Longline and pot gear kg/mt was generated from the average weight of those fish which were weighed.

T = trace, less than 0.05

0.0 = no catch.

Sum of visually estimated catch = 322.33 mt.

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Table 4. Bycatch rate of prohibited species and species composition in domestic commercial fisheries as observed by the Alaska Department of Fish and Game. (First Quarter)

Catch Details	Species	1	2	
		Catch (%)	---Bycatch---	---
			No./mt	Kg/mt
	Prohibited			
Area: Eastside Kodiak Is	Halibut	5.1	9.0	101.1
Gear: Bottom Trawl	Tanner crab	T	0.5	0.2
Target Species: Deep Water	R.king crab	T	T	T
Flatfish	Salmon	T	0.1	0.2
Inclusive Dates:	Herring	0.0	0.0	0.0
4 Aug - 30 Sep 1988	Commercial			
Vessels Observed: 3	Pacific cod	2.7		
Trips Observed: 7	Pollock	24.8		
Hauls/Sets Observed: 53	Flounder	49.0		
Total Landing: 227.1 mt	Sablefish	11.6		
Stat. Areas Observed:	Rockfish	4.5		
495730 495800 505730	Other	2.4		
515630 515700 525600				
525630 525702				

1. Catch (%) refers to total catch brought on deck and is based on the observed weight of fish caught or, for longline and pot gear, the number of fish caught. Species proportions in individual trawl tows (or sets of longline/pot gear) were determined by observer's samples and expanded to the total tow weight which was visually estimated by the skipper or observer.
2. Bycatch = kg or no. per metric ton of landed fish (whole fish, all species, including landed discard) as listed on the fish ticket. Longline and pot gear kg/mt was generated from the average weight of those fish which were weighed.

T = trace, less than 0.05

0.0 = no catch.

Sum of visually estimated catch = 451.57 mt.

deepshal.gr1

Table 5. Bycatch rate of prohibited species and species composition in domestic commercial fisheries as observed by the Alaska Department of Fish and Game. (First Quarter)

Catch Details	Species	1	2	
		Catch (%)	---Bycatch---	---
			No./mt	Kg/mt
	Prohibited			
Area: Eastside Kodiak Is	Halibut	0.2	0.9	1.6
Gear: Bottom Trawl	Tanner crab	0.0	0.0	0.0
Target Species: Shallow	R.king crab	0.0	0.0	0.0
Water Flatfish	Salmon	0.0	0.0	0.0
Inclusive Dates:	Herring	0.0	0.0	0.0
4 Aug - 30 Sep 1988	Commercial			
Vessels Observed: 1	Pacific cod	3.0		
Trips Observed: 1	Pollock	20.3		
Hauls/Sets Observed: 1	Flounder	15.7		
Total Landing: 3.4 mt	Sablefish	58.9		
Stat. Areas Observed:	Rockfish	1.9		
515700	Other	0.0		

1. Catch (%) refers to total catch brought on deck and is based on the observed weight of fish caught or, for longline and pot gear, the number of fish caught. Species proportions in individual trawl tows (or sets of longline/pot gear) were determined by observer's samples and expanded to the total tow weight which was visually estimated by the skipper or observer.
2. Bycatch = kg or no. per metric ton of landed fish (whole fish, all species, including landed discard) as listed on the fish ticket. Longline and pot gear kg/mt was generated from the average weight of those fish which were weighed.

T = trace, less than 0.05

0.0 = no catch.

Sum of visually estimated catch = 3.63 mt.

deepshal.qrl

Table 6. Bycatch rate of prohibited species and species composition in domestic commercial fisheries as observed by the Alaska Department of Fish and Game. (First Quarter)

Catch Details	Species	1	2	
		Catch (%)	---Bycatch---	---
			No./mt	Kg/mt
	Prohibited			
Area: Eastside Kodiak Is	Halibut	11.1	34.1	376.1
Gear: Bottom Trawl	Tanner crab	T	2.1	0.6
Target Species: Pollock and	R.king crab	0.0	0.0	0.0
	Pacific cod			
	Salmon	T	0.3	0.8
Inclusive Dates:	Herring	0.0	0.0	0.0
4 Aug - 30 Sep 1988	Commercial			
Vessels Observed: 1	Pacific cod	5.1		
Trips Observed: 4	Pollock	61.5		
Hauls/Sets Observed: 14	Flounder	19.1		
Total Landing: 44.4 mt	Sablefish	1.8		
Stat. Areas Observed:	Rockfish	T		
495800 515700 525630	Other	1.3		
525702				

1. Catch (%) refers to total catch brought on deck and is based on the observed weight of fish caught or, for longline and pot gear, the number of fish caught. Species proportions in individual trawl tows (or sets of longline/pot gear) were determined by observer's samples and expanded to the total tow weight which was visually estimated by the skipper or observer.
2. Bycatch = kg or no. per metric ton of landed fish (whole fish, all species, including landed discard) as listed on the fish ticket. Longline and pot gear kg/mt was generated from the average weight of those fish which were weighed.

T = trace, less than 0.05

0.0 = no catch.

Sum of visually estimated catch = 151.01 mt.

afdf.qx1

Table 7. Bycatch rate of prohibited species and species composition in domestic commercial fisheries as observed by the Alaska Department of Fish and Game. (Second Quarter)

Catch Details	Species	1	2	
		Catch (%)	---Bycatch---	---
			No./mt	Kg/mt
	Prohibited			
Area: Eastside Kodiak Is	Halibut	4.8	15.7	84.5
Gear: Bottom Trawl	Tanner crab	0.4	19.3	7.8
Target Species: Mixed	R.king crab	0.0	0.0	0.0
Inclusive Dates: 1 Oct - 31 Dec 1988	Salmon	T	0.1	0.4
	Herring	0.0	0.0	0.0
	Commercial			
Vessels Observed: 3	Pacific cod	13.2		
Trips Observed: 6	Pollock	37.1		
Hauls/Sets Observed: 46	Flounder	37.4		
Total Landing: 158.8 mt	Sablefish	2.6		
Stat. Areas Observed:	Rockfish	1.3		
505700 505800 515700	Other	3.2		
515730 515802 525702				
525807 535602				

1. Catch (%) refers to total catch brought on deck and is based on the observed weight of fish caught or, for longline and pot gear, the number of fish caught. Species proportions in individual trawl tows (or sets of longline/pot gear) were determined by observer's samples and expanded to the total tow weight which was visually estimated by the skipper or observer.
2. Bycatch = kg or no. per metric ton of landed fish (whole fish, all species, including landed discard) as listed on the fish ticket. Longline and pot gear kg/mt was generated from the average weight of those fish which were weighed.

T = trace, less than 0.05

0.0 = no catch.

Sum of visually estimated catch = 280.32 mt.

afdf.qr2

Table 8. Bycatch rate of prohibited species and species composition in domestic commercial fisheries as observed by the Alaska Department of Fish and Game. (Second Quarter)

Catch Details	Species	1	2	
		Catch (%)	---Bycatch---	---
			No./mt	Kg/mt
	Prohibited			
Area: Eastside Kodiak Is	Halibut	6.1	15.0	74.2
Gear: Bottom Trawl	Tanner crab	T	0.2	0.1
Target Species: Flatfish	R.king crab	0.0	0.0	0.0
Inclusive Dates:	Salmon	T	0.1	0.5
1 Oct - 31 Dec 1988	Herring	0.0	0.0	0.0
	Commercial			
Vessels Observed: 3	Pacific cod	15.9		
Trips Observed: 6	Pollock	11.5		
Hauls/Sets Observed: 30	Flounder	57.5		
Total Landing: 109.5 mt	Sablefish	1.1		
Stat. Areas Observed:	Rockfish	2.4		
505700 505800 515730	Other	5.5		
515802 525702 525807				

1. Catch (%) refers to total catch brought on deck and is based on the observed weight of fish caught or, for longline and pot gear, the number of fish caught. Species proportions in individual trawl tows (or sets of longline/pot gear) were determined by observer's samples and expanded to the total tow weight which was visually estimated by the skipper or observer.
2. Bycatch = kg or no. per metric ton of landed fish (whole fish, all species, including landed discard) as listed on the fish ticket. Longline and pot gear kg/mt was generated from the average weight of those fish which were weighed.

T = trace, less than 0.05

0.0 = no catch.

Sum of visually estimated catch = 132.72 mt.

afdf.qx2

Table 9. Bycatch rate of prohibited species and species composition in domestic commercial fisheries as observed by the Alaska Department of Fish and Game. (Second Quarter)

Catch Details	Species	1	2	
		Catch (%)	---Bycatch---	---
			No./mt	Kg/mt
	Prohibited			
Area: Eastside Kodiak Is	Halibut	9.9	18.7	78.3
Gear: Bottom Trawl	Tanner crab	T	0.2	0.1
Target Species: Deep Water	R.king crab	0.0	0.0	0.0
Flatfish	Salmon	0.1	0.2	0.4
Inclusive Dates:	Herring	0.0	0.0	0.0
1 Oct - 31 Dec 1988	Commercial			
Vessels Observed: 1	Pacific cod	5.6		
Trips Observed: 3	Pollock	7.6		
Hauls/Sets Observed: 5	Flounder	57.0		
Total Landing: 21.8 mt	Sablefish	3.2		
Stat. Areas Observed:	Rockfish	7.2		
505700 505800 515802	Other	9.4		

1. Catch (%) refers to total catch brought on deck and is based on the observed weight of fish caught or, for longline and pot gear, the number of fish caught. Species proportions in individual trawl tows (or sets of longline/pot gear) were determined by observer's samples and expanded to the total tow weight which was visually estimated by the skipper or observer.
2. Bycatch = kg or no. per metric ton of landed fish (whole fish, all species, including landed discard) as listed on the fish ticket. Longline and pot gear kg/mt was generated from the average weight of those fish which were weighed.

T = trace, less than 0.05

0.0 = no catch.

Sum of visually estimated catch = 17.23 mt.

deepshal.qr2

Table 10. Bycatch rate of prohibited species and species composition in domestic commercial fisheries as observed by the Alaska Department of Fish and Game. (Second Quarter)

Catch Details	Species	1	2	
		Catch (%)	---Bycatch---	---
			No./mt	Kg/mt
	Prohibited			
Area: Eastside Kodiak Is	Halibut	4.4	14.6	84.7
Gear: Bottom Trawl	Tanner crab	0.5	22.3	9.0
Target Species: Shallow	R.king crab	0.0	0.0	0.0
Water Flatfish	Salmon	T	0.1	0.4
Inclusive Dates:	Herring	0.0	0.0	0.0
1 Oct - 31 Dec 1988	Commercial			
Vessels Observed: 3	Pacific cod	13.9		
Trips Observed: 6	Pollock	39.2		
Hauls/Sets Observed: 41	Flounder	35.8		
Total Landing: 137.0 mt	Sablefish	2.6		
Stat. Areas Observed:	Rockfish	0.9		
505800 515700 515730	Other	2.7		
515802 525702 525807				
535602				

1. Catch (%) refers to total catch brought on deck and is based on the observed weight of fish caught or, for longline and pot gear, the number of fish caught. Species proportions in individual trawl tows (or sets of longline/pot gear) were determined by observer's samples and expanded to the total tow weight which was visually estimated by the skipper or observer.
2. Bycatch = kg or no. per metric ton of landed fish (whole fish, all species, including landed discard) as listed on the fish ticket. Longline and pot gear kg/mt was generated from the average weight of those fish which were weighed.

T = trace, less than 0.05

0.0 = no catch.

Sum of visually estimated catch = 263.09 mt.

deepshal.qr2

Table 11. Bycatch rate of prohibited species and species composition in domestic commercial fisheries as observed by the Alaska Department of Fish and Game. (Second Quarter)

Catch Details	Species	1	2	
		Catch (%)	---Bycatch---	---
			No./mt	Kg/mt
	Prohibited			
Area: Eastside Kodiak Is	Halibut	3.6	15.6	107.5
Gear: Bottom Trawl	Tanner crab	0.8	61.2	24.6
Target Species: Pollock	R.king crab	0.0	0.0	0.0
and Pacific cod	Salmon	T	0.1	0.3
Inclusive Dates:	Herring	0.0	0.0	0.0
1 Oct - 31 Dec 1988	Commercial			
Vessels Observed: 2	Pacific cod	10.4		
Trips Observed: 4	Pollock	58.0		
Hauls/Sets Observed: 16	Flounder	21.8		
Total Landing: 49.3 mt	Sablefish	4.2		
Stat. Areas Observed:	Rockfish	0.2		
515700 515730 515802	Other	0.9		
525702 535602				

1. Catch (%) refers to total catch brought on deck and is based on the observed weight of fish caught or, for longline and pot gear, the number of fish caught. Species proportions in individual trawl tows (or sets of longline/pot gear) were determined by observer's samples and expanded to the total tow weight which was visually estimated by the skipper or observer.
2. Bycatch = kg or no. per metric ton of landed fish (whole fish, all species, including landed discard) as listed on the fish ticket. Longline and pot gear kg/mt was generated from the average weight of those fish which were weighed.

T = trace, less than 0.05

0.0 = no catch.

Sum of visually estimated catch = 147.6 mt.

afdf.qx2

Table 12. Bycatch rate of prohibited species and species composition in domestic commercial fisheries as observed by the Alaska Department of Fish and Game. (Third Quarter)

Catch Details	Species	1	2	
		Catch (%)	---Bycatch---	---
			No./mt	Kg/mt
	Prohibited			
Area: Eastside Kodiak Is	Halibut	1.1	2.9	17.8
Gear: Bottom Trawl	Tanner crab	T	0.1	0.1
Target Species: Mixed	R.king crab	0.0	0.0	0.0
Inclusive Dates:	Salmon	T	0.1	0.2
1 Jan - 31 March 1989	Herring	0.0	0.0	0.0
	Commercial			
Vessels Observed: 5	Pacific cod	17.7		
Trips Observed: 7	Pollock	1.5		
Hauls/Sets Observed: 55	Flounder	61.1		
Total Landing: 263.6 mt	Sablefish	8.9		
Stat. Areas Observed:	Rockfish	5.5		
505700 505730 505800	Other	4.4		
515600 515630 515700				
525600 535602				

1. Catch (%) refers to total catch brought on deck and is based on the observed weight of fish caught or, for longline and pot gear, the number of fish caught. Species proportions in individual trawl tows (or sets of longline/pot gear) were determined by observer's samples and expanded to the total tow weight which was visually estimated by the skipper or observer.
2. Bycatch = kg or no. per metric ton of landed fish (whole fish, all species, including landed discard) as listed on the fish ticket. Longline and pot gear kg/mt was generated from the average weight of those fish which were weighed.

T = trace, less than 0.05

0.0 = no catch.

Sum of visually estimated catch = 445.21 mt.

afdf.qr3

Table 13. Bycatch rate of prohibited species and species composition in domestic commercial fisheries as observed by the Alaska Department of Fish and Game. (Third Quarter)

Catch Details	Species	1	2	
		Catch (%)	---Bycatch---	Kg/mt
	Prohibited			
Area: Eastside Kodiak Is	Halibut	0.9	1.9	14.8
Gear: Bottom Trawl	Tanner crab	T	0.1	T
Target Species: Flatfish	R.king crab	0.0	0.0	0.0
Inclusive Dates:	Salmon	T	0.1	0.2
1 Jan - 31 March 1989	Herring	0.0	0.0	0.0
	Commercial			
Vessels Observed: 5	Pacific cod	1.4		
Trips Observed: 7	Pollock	1.8		
Hauls/Sets Observed: 45	Flounder	70.9		
Total Landing: 223.4 mt	Sablefish	12.3		
Stat. Areas Observed:	Rockfish	7.0		
505700 505730 505800	Other	5.7		
515600 515630 515700				
525600				

1. Catch (%) refers to total catch brought on deck and is based on the observed weight of fish caught or, for longline and pot gear, the number of fish caught. Species proportions in individual trawl tows (or sets of longline/pot gear) were determined by observer's samples and expanded to the total tow weight which was visually estimated by the skipper or observer.
2. Bycatch = kg or no. per metric ton of landed fish (whole fish, all species, including landed discard) as listed on the fish ticket. Longline and pot gear kg/mt was generated from the average weight of those fish which were weighed.

T = trace, less than 0.05

0.0 = no catch.

Sum of visually estimated catch = 370.36 mt.

afdf.qx3

Table 14. Bycatch rate of prohibited species and species composition in domestic commercial fisheries as observed by the Alaska Department of Fish and Game. (Third Quarter)

Catch Details	Species	1	2	
		Catch (%)	---Bycatch---	---
			No./mt	Kg/mt
	Prohibited			
Area: Eastside Kodiak Is	Halibut	1.0	2.4	15.3
Gear: Bottom Trawl	Tanner crab	T	0.1	0.1
Target Species: Deep Water	R.king crab	0.0	0.0	0.0
Flatfish	Salmon	T	T	0.1
Inclusive Dates:	Herring	0.0	0.0	0.0
1 Jan - 31 March 1989	Commercial			
Vessels Observed: 5	Pacific cod	19.0		
Trips Observed: 7	Pollock	1.7		
Hauls/Sets Observed: 52	Flounder	57.9		
Total Landing: 255.9 mt	Sablefish	9.7		
Stat. Areas Observed:	Rockfish	6.0		
505700 505730 505800	Other	4.6		
515600 515630 515700				
525600 535602				

1. Catch (%) refers to total catch brought on deck and is based on the observed weight of fish caught or, for longline and pot gear, the number of fish caught. Species proportions in individual trawl tows (or sets of longline/pot gear) were determined by observer's samples and expanded to the total tow weight which was visually estimated by the skipper or observer.
2. Bycatch = kg or no. per metric ton of landed fish (whole fish, all species, including landed discard) as listed on the fish ticket. Longline and pot gear kg/mt was generated from the average weight of those fish which were weighed.

T = trace, less than 0.05

0.0 = no catch.

Sum of visually estimated catch = 408.93 mt.

deepshal.qr3

Table 15. Bycatch rate of prohibited species and species composition in domestic commercial fisheries as observed by the Alaska Department of Fish and Game. (Third Quarter)

Catch Details	Species	1	2	
		Catch (%)	---Bycatch---	---
			No./mt	Kg/mt
	Prohibited			
Area: Eastside Kodiak Is	Halibut	1.4	27.8	111.3
Gear: Bottom Trawl	Tanner crab	0.0	0.0	0.0
Target Species: Shallow	R.king crab	0.0	0.0	0.0
Water Flatfish	Salmon	T	0.7	2.4
Inclusive Dates:	Herring	0.0	0.0	0.0
1 Jan - 31 March 1989	Commercial			
Vessels Observed: 1	Pacific cod	0.9		
Trips Observed: 1	Pollock	0.1		
Hauls/Sets Observed: 3	Flounder	95.9		
Total Landing: 4.2 mt	Sablefish	0.0		
Stat. Areas Observed:	Rockfish	0.0		
505800	Other	1.6		

1. Catch (%) refers to total catch brought on deck and is based on the observed weight of fish caught or, for longline and pot gear, the number of fish caught. Species proportions in individual trawl tows (or sets of longline/pot gear) were determined by observer's samples and expanded to the total tow weight which was visually estimated by the skipper or observer.
2. Bycatch = kg or no. per metric ton of landed fish (whole fish, all species, including landed discard) as listed on the fish ticket. Longline and pot gear kg/mt was generated from the average weight of those fish which were weighed.

T = trace, less than 0.05

0.0 = no catch.

Sum of visually estimated catch = 32.42 mt.

deepshal.qr3

Table 16. Bycatch rate of prohibited species and species composition in domestic commercial fisheries as observed by the Alaska Department of Fish and Game. (Third Quarter)

Catch Details	Species	1	2	
		Catch (%)	---Bycatch---	---
			No./mt	Kg/mt

	Prohibited			
Area: Eastside Kodiak Is	Halibut	1.5	8.1	28.8
Gear: Bottom Trawl	Tanner crab	T	0.4	0.2
Target Species: Pacific cod	R.king crab	0.0	0.0	0.0
Inclusive Dates:	Salmon	T	0.1	0.3
1 Jan - 31 March 1989	Herring	0.0	0.0	0.0
	Commercial			
Vessels Observed: 3	Pacific cod	83.9		
Trips Observed: 3	Pollock	0.2		
Hauls/Sets Observed: 10	Flounder	14.0		
Total Landing: 36.7 mt	Sablefish	0.0		
Stat. Areas Observed:	Rockfish	T		
505730 505800 535602	Other	0.3		

1. Catch (%) refers to total catch brought on deck and is based on the observed weight of fish caught or, for longline and pot gear, the number of fish caught. Species proportions in individual trawl tows (or sets of longline/pot gear) were determined by observer's samples and expanded to the total tow weight which was visually estimated by the skipper or observer.
2. Bycatch = kg or no. per metric ton of landed fish (whole fish, all species, including landed discard) as listed on the fish ticket. Longline and pot gear kg/mt was generated from the average weight of those fish which were weighed.

T = trace, less than 0.05

0.0 = no catch.

Sum of visually estimated catch = 70.99001 mt.

afdf.qx3

Table 17. Bycatch rate of prohibited species and species composition in domestic commercial fisheries as observed by the Alaska Department of Fish and Game. (Fourth Quarter)

Catch Details	Species	1	2	
		Catch (%)	---Bycatch---	Kg/mt
	Prohibited			
Area: Eastside Kodiak Is	Halibut	2.8	8.3	40.2
Gear: Bottom Trawl	Tanner crab	T	0.2	T
Target Species: Mixed	R.king crab	T	T	T
Inclusive Dates:	Salmon	T	0.1	0.2
1 April - 31 July 1989	Herring	0.0	0.0	0.0
	Commercial			
Vessels Observed: 4	Pacific cod	10.7		
Trips Observed: 8	Pollock	2.4		
Hauls/Sets Observed: 78	Flounder	57.4		
Total Landing: 347.1 mt	Sablefish	10.9		
Stat. Areas Observed:	Rockfish	7.4		
495730 495800 505700	Other	8.3		
505730 505800 515630				
515730 515802 535602				

1. Catch (%) refers to total catch brought on deck and is based on the observed weight of fish caught or, for longline and pot gear, the number of fish caught. Species proportions in individual trawl tows (or sets of longline/pot gear) were determined by observer's samples and expanded to the total tow weight which was visually estimated by the skipper or observer.
2. Bycatch = kg or no. per metric ton of landed fish (whole fish, all species, including landed discard) as listed on the fish ticket. Longline and pot gear kg/mt was generated from the average weight of those fish which were weighed.

T = trace, less than 0.05

0.0 = no catch.

Sum of visually estimated catch = 498.93 mt.

afdf.qr4

Table 18. Bycatch rate of prohibited species and species composition in domestic commercial fisheries as observed by the Alaska Department of Fish and Game. (Fourth Quarter)

Catch Details	Species	1	2	
		Catch (%)	---Bycatch---	---
		No./mt	Kg/mt	
	Prohibited			
Area: Eastside Kodiak Is	Halibut	1.8	2.2	25.5
Gear: Bottom Trawl	Tanner crab	T	T	T
Target Species: Deep Water	R.king crab	T	T	T
Flatfish	Salmon	T	T	T
Inclusive Dates:	Herring	0.0	0.0	0.0
1 April - 31 July 1989	Commercial			
Vessels Observed: 3	Pacific cod	1.1		
Trips Observed: 7	Pollock	2.0		
Hauls/Sets Observed: 66	Flounder	64.0		
Total Landing: 300.3 mt	Sablefish	12.7		
Stat. Areas Observed:	Rockfish	8.7		
495730 495800 505700	Other	9.7		
505730 505800 515630				
515802				

1. Catch (%) refers to total catch brought on deck and is based on the observed weight of fish caught or, for longline and pot gear, the number of fish caught. Species proportions in individual trawl tows (or sets of longline/pot gear) were determined by observer's samples and expanded to the total tow weight which was visually estimated by the skipper or observer.
2. Bycatch = kg or no. per metric ton of landed fish (whole fish, all species, including landed discard) as listed on the fish ticket. Longline and pot gear kg/mt was generated from the average weight of those fish which were weighed.

T = trace, less than 0.05

0.0 = no catch.

Sum of visually estimated catch = 424.51 mt.

afdf.qx4

Table 19. Bycatch rate of prohibited species and species composition in domestic commercial fisheries as observed by the Alaska Department of Fish and Game. (Fourth Quarter)

Catch Details	Species	1	2	
		Catch (%)	---Bycatch---	---
			No./mt	Kg/mt
	Prohibited			
Area: Eastside Kodiak Is	Halibut	8.3	47.8	132.3
Gear: Bottom Trawl	Tanner crab	T	1.1	0.2
Target Species: Pacific cod	R.king crab	0.0	0.0	0.0
Inclusive Dates:	Salmon	0.1	0.4	1.6
1 April - 31 July 1989	Herring	0.0	0.0	0.0
	Commercial			
Vessels Observed: 2	Pacific cod	75.2		
Trips Observed: 2	Pollock	3.6		
Hauls/Sets Observed: 12	Flounder	12.5		
Total Landing: 46.7 mt	Sablefish	T		
Stat. Areas Observed:	Rockfish	0.0		
505800 515730 515802	Other	0.3		
535602				

1. Catch (%) refers to total catch brought on deck and is based on the observed weight of fish caught or, for longline and pot gear, the number of fish caught. Species proportions in individual trawl tows (or sets of longline/pot gear) were determined by observer's samples and expanded to the total tow weight which was visually estimated by the skipper or observer.
2. Bycatch = kg or no. per metric ton of landed fish (whole fish, all species, including landed discard) as listed on the fish ticket. Longline and pot gear kg/mt was generated from the average weight of those fish which were weighed.

T = trace, less than 0.05

0.0 = no catch.

Sum of visually estimated catch = 74.42 mt.

afdf.qx4

Table 20. Bycatch rate of prohibited species and species composition in domestic commercial fisheries as observed by the Alaska Department of Fish and Game. (All Quarters)

Catch Details	Species	1	2	
		Catch (%)	---Bycatch---	---
			No./mt	Kg/mt
	Prohibited			
Area: Eastside Kodiak Is	Halibut	3.3	8.2	55.1
Gear: Bottom Trawl	Tanner crab	0.1	3.3	1.3
Target Species: Mixed	R.king crab	T	T	T
Inclusive Dates:	Salmon	T	0.1	0.2
4 Aug 1988 - 3 Aug 1989	Herring	0.0	0.0	0.0
	Commercial			
Vessels Observed: 7	Pacific cod	10.8		
Trips Observed: 28	Pollock	14.0		
Hauls/Sets Observed: 233	Flounder	52.7		
Total Landing: 1000.0 mt	Sablefish	9.3		
Stat. Areas Observed:	Rockfish	5.1		
495730 495800 505700	Other	4.8		
505730 505800 515600				
515630 515700 515730				
515802 525600 525630				
525702 525807 535602				

1. Catch (%) refers to total catch brought on deck and is based on the observed weight of fish caught or, for longline and pot gear, the number of fish caught. Species proportions in individual trawl tows (or sets of longline/pot gear) were determined by observer's samples and expanded to the total tow weight which was visually estimated by the skipper or observer.
2. Bycatch = kg or no. per metric ton of landed fish (whole fish, all species, including landed discard) as listed on the fish ticket. Longline and pot gear kg/mt was generated from the average weight of those fish which were weighed.

T = trace, less than 0.05

0.0 = no catch.

Sum of visually estimated catch = 1679.66 mt.

allafdf

Table 21. Bycatch rate of prohibited species and species composition in domestic commercial fisheries as observed by the Alaska Department of Fish and Game. (All Quarters)

Catch Details	Species	1	2	
		Catch (%)	---Bycatch---	---
		No./mt	Kg/mt	
	Prohibited			
Area: Eastside Kodiak Is	Halibut	2.0	3.9	30.1
Gear: Bottom Trawl	Tanner crab	T	0.1	T
Target Species: Flatfish	R.king crab	T	T	T
Inclusive Dates:	Salmon	T	T	0.1
4 Aug 1988 - 3 Aug 1989	Herring	0.0	0.0	0.0
	Commercial			
Vessels Observed: 6	Pacific cod	2.9		
Trips Observed: 27	Pollock	4.4		
Hauls/Sets Observed: 181	Flounder	65.1		
Total Landing: 822.8 mt	Sablefish	12.3		
Stat. Areas Observed:	Rockfish	7.0		
495730 495800 505700	Other	6.3		
505730 505800 515600				
515630 515700 515730				
515802 525600 525702				
525807				

1. Catch (%) refers to total catch brought on deck and is based on the observed weight of fish caught or, for longline and pot gear, the number of fish caught. Species proportions in individual trawl tows (or sets of longline/pot gear) were determined by observer's samples and expanded to the total tow weight which was visually estimated by the skipper or observer.
2. Bycatch = kg or no. per metric ton of landed fish (whole fish, all species, including landed discard) as listed on the fish ticket. Longline and pot gear kg/mt was generated from the average weight of those fish which were weighed.

T = trace, less than 0.05

0.0 = no catch.

Sum of visually estimated catch = 1235.64 mt.

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Table 22. Bycatch rate of prohibited species and species composition in domestic commercial fisheries as observed by the Alaska Department of Fish and Game. (All Quarters)

Catch Details	Species	1	2	
		Catch (%)	---Bycatch---	Kg/mt
	Prohibited			
Area: Eastside Kodiak Is	Halibut	1.6	2.5	24.5
Gear: Bottom Trawl	Tanner crab	T	0.1	T
Target Species: Deep Water	R.king crab	T	T	T
Flatfish	Salmon	T	T	0.1
Inclusive Dates:	Herring	0.0	0.0	0.0
4 Aug 1988 - 3 Aug 1989	Commercial			
Vessels Observed: 6	Pacific cod	1.5		
Trips Observed: 24	Pollock	3.6		
Hauls/Sets Observed: 152	Flounder	65.1		
Total Landing: 727.5 mt	Sablefish	13.7		
Stat. Areas Observed:	Rockfish	7.8		
495730 495800 505700	Other	6.6		
505730 505800 515600				
515630 515700 515802				
525600				

1. Catch (%) refers to total catch brought on deck and is based on the observed weight of fish caught or, for longline and pot gear, the number of fish caught. Species proportions in individual trawl tows (or sets of longline/pot gear) were determined by observer's samples and expanded to the total tow weight which was visually estimated by the skipper or observer.
2. Bycatch = kg or no. per metric ton of landed fish (whole fish, all species, including landed discard) as listed on the fish ticket. Longline and pot gear kg/mt was generated from the average weight of those fish which were weighed.

T = trace, less than 0.05

0.0 = no catch.

Sum of visually estimated catch = 1084.1 mt.

deepshal.all

Table 23. Bycatch rate of prohibited species and species composition in domestic commercial fisheries as observed by the Alaska Department of Fish and Game. (All Quarters)

Catch Details	Species	1	2	
		Catch (%)	---Bycatch---	---
			No./mt	Kg/mt
	Prohibited			
Area: Eastside Kodiak Is	Halibut	4.4	13.2	70.7
Gear: Bottom Trawl	Tanner crab	T	0.2	0.1
Target Species: Shallow	R.king crab	0.0	0.0	0.0
Water Flatfish	Salmon	T	0.2	0.6
Inclusive Dates:	Herring	0.0	0.0	0.0
4 Aug 1988 - 3 Aug 1989	Commercial			
Vessels Observed: 5	Pacific cod	13.6		
Trips Observed: 7	Pollock	9.7		
Hauls/Sets Observed: 29	Flounder	64.7		
Total Landing: 95.3 mt	Sablefish	2.0		
Stat. Areas Observed:	Rockfish	1.3		
505800 515700 515730	Other	4.1		
515802 525702 525807				

1. Catch (%) refers to total catch brought on deck and is based on the observed weight of fish caught or, for longline and pot gear, the number of fish caught. Species proportions in individual trawl tows (or sets of longline/pot gear) were determined by observer's samples and expanded to the total tow weight which was visually estimated by the skipper or observer.
2. Bycatch = kg or no. per metric ton of landed fish (whole fish, all species, including landed discard) as listed on the fish ticket. Longline and pot gear kg/mt was generated from the average weight of those fish which were weighed.

T = trace, less than 0.05

0.0 = no catch.

Sum of visually estimated catch = 151.54 mt.

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Table 24. Bycatch rate of prohibited species and species composition in domestic commercial fisheries as observed by the Alaska Department of Fish and Game. (All Quarters)

Catch Details	Species	1	2	
		Catch (%)	---Bycatch---	---
			No./mt	Kg/mt
	Prohibited			
Area: Eastside Kodiak Is	Halibut	6.6	27.2	165.1
Gear: Bottom Trawl	Tanner crab	0.3	17.9	7.1
Target Species: Roundfish	R.king crab	0.0	0.0	0.0
	Salmon	T	0.2	0.8
	Herring	0.0	0.0	0.0
	Commercial			
Vessels Observed: 4	Pacific cod	31.2		
Trips Observed: 13	Pollock	40.8		
Hauls/Sets Observed: 52	Flounder	18.1		
Total Landing: 177.2 mt	Sablefish	2.0		
Stat. Areas Observed:	Rockfish	0.1		
495800 505730 505800	Other	0.9		
515700 515730 515802				
525630 525702 535602				

1. Catch (%) refers to total catch brought on deck and is based on the observed weight of fish caught or, for longline and pot gear, the number of fish caught. Species proportions in individual trawl tows (or sets of longline/pot gear) were determined by observer's samples and expanded to the total tow weight which was visually estimated by the skipper or observer.
2. Bycatch = kg or no. per metric ton of landed fish (whole fish, all species, including landed discard) as listed on the fish ticket. Longline and pot gear kg/mt was generated from the average weight of those fish which were weighed.

T = trace, less than 0.05

0.0 = no catch.

Sum of visually estimated catch = 444.02 mt.

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