Chapter 3
Tables

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Table 3.2-1. Summary of Bering Sea and Aleutian Islands Fishery Management Plan and amendment measures.

Bering Sea and Aleutian Islands (BSAI)	Fishery Management Plan (FMP) amendment measures	
Management and monitoring	*- Administrative measures.* *- Monitoring and reporting measures.* *- Measures to increase flexible, responsive management.*	
	FMP	•Reporting requirements for foreign and domestic.
	1	Authorize field orders to prevent gear conflict.
		Authorize field orders for time/area closures for conservation reasons.
	4	Establish Secretary of Commerce (SoC) authority to issue field orders adjusting time and/or area closures for conservation reasons (to protect jeopardized stocks).
	9	At-sea processing weekly catch reporting and check-in/check-out.
	10	Observer requirements for domestic Bristol Bay closed area exemption.
		Catcher/processor (C/P) requirements for weekly reporting (also includes definition of fish processing).
		Regional administrator (RA) discretionary authority for managing prohibited species catch (PSC) limit closures.
		RA authority to reallocate total allowable catch (TAC) from domestic annual processing (DAP) to joint venture processing (JVP) inseason.
		Improved authority to the RA to make inseason time/area adjustments to the fishery based on conservation reasons.
	11a	Large floating processor vessels required to record product transfer information and cargo log.
	12	Federal permit requirements.
		Remove resource assessment document deadline.
	13	Establish procedure to set annual fishing seasons by regulatory amendment.
		Establish a new recordkeeping and data reporting system.
		Establish a new frameworked observer program of up to 100% coverage of domestic industry.
	16	Define overfishing.
		Interim groundfish specifications.
		Specify legal fishing gear.
		New definition of pelagic trawl gear.
	16a	Authorize RA to temporarily close limited area inseason due to high bycatch (hotspot).
	17	Experimental fishing permits.
	19	Authority to use time/area closures to reduce PSC bycatch rates (hotspot).
		Redefine directed fishing standards for groundfish in the pelagic pollock trawl fishery and for rockfish.
		Consolidate target fishery definitions.
	21	Update FMP to allow trawl and non-trawl PSC limits to be changed by regulatory amendment.
		Authorize RA to apportion non-trawl PSC limit by specified fishery category; to apportion seasonally; to exempt some non-trawl fisheries.
		Update FMP so that the halibut trawl limit is also in terms of halibut bycatch mortality.
	22	Establish gear test areas.
	24	RA authority to allocate seasonally by trimester.
	27	Establish North Pacific Fisheries Research Plan and system of user fees to cover the costs of observer requirements.
	44	Redefine acceptable biological catch (ABC) and overfishing level (OFL).
	56	Redefine OFL.
Groundfish yield/ sustainability	*- Groundfish harvest levels.* *- Management categories.* *- Protection against localized depletion and sustainability concerns.*	
	FMP	•Establish groundfish harvest levels. •Exceeding foreign allocation in a mgmt unit (or sub-area where specific quotas apply) triggers closure.
	1	Establish multi-year, multi-species optimal yield (OY) for BSAI groundfish complex.
	4	Increase ABC, OY, and total allowable level of foreign fishing (TALFF) for Pacific cod.
	12	Rock Sole TAC.
	14	Implement a seasonal allowance schedule for Pollock.
	17	Establish Bogoslof District in Bering Sea (BS).
	28	Divide the Aleutian Islands (AI) management area into three districts for the purpose of spatially allocating TACs.

Table 3.2-1 (cont.). Summary of Bering Sea and Aleutian Islands Fishery Management Plan and amendment measures.

Bering Sea and Aleutian Islands (BSAI)	Fishery Management Plan (FMP) amendment measures	
Bycatch and incidental catch	*- Measures to minimize bycatch and incidental catch of prohibited species, non-target species and undersized target species.* *- Measures to minimize waste.* *- Measures to encourage full utilization.*	
	FMP	•Establish Bristol Bay Pot Sanctuary (BBPS) (foreign and domestic). •Establish Winter Halibut Savings Area (WHSA) (foreign and domestic). •Other foreign trawl closures. •Require off-bottom trawl gear.
	1	Exempt domestic trawl from BBPS, and also WHSA subject to 1% PSC halibut limit.
		Delete 'Misty Moon' area from WHSA.
	1a	Foreign fleet PSC limits for chinook salmon.
	3	Specification of foreign PSC limits that trigger area closures.
	4	Allow foreign fishing in areas of AI (alleviate restrictive measures placed on foreign fishery in areas not heavily utilized by United States [US] fisheries).
	7	Relax restrictions on foreign longlines in the winter halibut savings area up to an incidental take cap.
	8	PSC salmon limits for foreign trawl fishery for 1984 and 1985.
	10	Domestic (and foreign) trawl prohibited in BBPS.
		Bycatch limitation zones and corresponding PSC limits.
	11	Split-season apportionment of joint venture (JV) Pollock (40/60).
	12	PSC limits for fully-utilized groundfish.
	12a	Revise PSC limits for crab and halibut.
		Extension of Bristol Bay Crab and Halibut Protection Zone westward during March 15-June 15.
	14	Prohibit roe stripping.
	16	Revise PSC limits for crab and halibut.
		Provides for the imposition of sanctions on vessels with excessively high bycatch rates (i.e., vessel incentive program [VIP]).
		Require biodegradable panels on groundfish pots.
		Require halibut exclusion devices on groundfish pots.
	16a	Specify allocation of pollock TAC to bottom trawl.
		Establish frameworked PSC limit for herring, establish two summer (Alaska Peninsula) and one winter (central BS) savings areas.
	19	Expand VIP program.
		Delay start of BSAI fisheries.
		Establish halibut PSC limits for non-trawl fisheries.
		Specify PSC limit allocations by more specific trawl fisheries and groups.
	21a	Pribilof Islands Blue King Crab Habitat Conservation Area.
	21b	Chinook Salmon Savings Area.
	25	Eliminate primary halibut PSC limit that closes Zones 1 and 2H.
	26	Salmon Donation Program.
	35	Establish a Chum Salmon Savings Area during the pollock B season.
	37	Bristol Bay Red King Crab Savings Area year-round closure to non-pelagic trawl.
		Modify red king crab PSC limits in Zone 1 to establish a stairstep approach.
		Nearshore Bristol Bay Trawl Closure Area prohibits year-round trawling, except small seasonal open area for bottom trawling with 100% observer coverage.
	40	Establishment of C. opilio PSC limits, Bycatch Limitation Zone.
	41	Modify PSC limits for bairdi Tanner crab in Zones 1 and 2.
	49	Establish Improved Retention/Improved Utilization (IR/IU) Program: improved retention.
		Establish IR/IU Program: improved utilization.
	50	Establish Halibut Donation Program.
	57	Prohibit non-pelagic trawl gear for Pollock.
		Reduce PSC limit for halibut, red king, opilio, bairdi crab.
	58	Reduce chinook salmon bycatch cap.
		Non-pollock fisheries exempt from closure and those fisheries' chinook PSC bycatch would not be counted toward the PSC limit.
	75	Repeal of IR/IU for flatfish.

Table 3.2-1 (cont.). Summary of Bering Sea and Aleutian Islands Fishery Management Plan and amendment measures.

Bering Sea and Aleutian Islands (BSAI)	Fishery Management Plan (FMP) amendment measures	
Habitat	*- Measures to protect and conserve habitat.*	
	9	Implementation of National Marine Fisheries Service (NMFS) Habitat Conservation Policy.
	55	Define essential fish habitat.
		Define habitat area of particular concern (HAPC).
Seabirds and marine mammals	*- Measures to reduce incidental take of or injury to seabirds and marine mammals.* *- Measures to protect the prey base*	
	13	Close 3-12 miles around the Walrus Islands and Cape Peirce.
	17	Renew Walrus Islands 12 mile buffer zone.
	20	Steller sea lion (SSL) 10 nautical mile (nm) buffer zones around rookeries.
		SSL 20 nm buffer zones during pollock A season around 5 rookeries.
	36	Establish a forage fish category, as bycatch only.
Socioeconomic issues	*- Allocation between foreign and domestic fleets, between fleet sectors.* *- Gear conflict issues.* *- Vessel safety measures.*	
	FMP	•Establish longline sanctuary for foreign and domestic in AI.
	2	Increase domestic annual harvest (DAH) for yellowfin sole and other flatfish, apportion to JVP, and decrease TALFF accordingly.
	4	Increase groundfish DAH and decrease TALFF.
	9	Prohibit foreign trawling within 20 miles of the AI.
	13	Allocate sablefish by gear in BS and AI.
	15	Implement an individual fishing quota (IFQ) program for sablefish.
		Establish western Alaska community development quota (CDQ) program.
	18	Formula for pollock allocation in BSAI.
		Establish the Bering Sea Catcher Vessel Operational Area (CVOA).
		Designate western Alaska community quota for BSAI Pollock.
	22	Establish gear test areas.
	23	Moratorium.
	24	Pacific cod allocation by gear type; 3 year sunset.
	30	Sablefish CDQ program increased allocation.
	31	Sablefish IFQ modified block proposal.
	32	Sablefish IFQ modification of transfer restrictions on CDQ compensation quota shares (QS).
	33	Allow limited processing of non-IFQ species by IFQ sablefish qualified freezer vessels.
	34	Allocate up to 2% of eastern Aleutian Islands (EAI) Atka mackerel TAC to jig gear.
	38	Extend inshore/offshore pollock allocations.
		Reauthorize the pollock CDQ program.
		Adjustments to the CVOA.
	39	Establish the license limitation program (LLP).
		Establish a multi-species CDQ program.
	42	IFQ QS buydown.
	43	Increase IFQ sweep-up levels.
	45	Permanently extend pollock CDQ program at 7.5% of TAC.
	46	Pacific cod allocation.
	51	Extend the CVOA.
	53	Allocate shortraker/rougheye rockfish between trawl/non-trawl gear in AI.
	54	IFQ indirect ownership and use caps.
	59	Extension of Vessel Moratorium Program.
	60	Adjustments to the LLP.
	61	Establish sector and co-op allocations of Pollock.
		Define vessel/processor co-op linkages.
		Define American Fisheries Act (AFA) sideboards for BSAI fisheries.
	64	Pacific cod fixed gear allocations.
	66	Remove squid from CDQ.
	67	Pacific cod species and gear endorsements.
	69	AFA co-op leasing.
	72	IFQ vessel clearance.

Table 3.2-2. Summary of Gulf of Alaska Fishery Management Plan and amendment measures.

Gulf of Alaska (GOA)	Fishery Management Plan (FMP) amendment measures	
Management and monitoring	*- Administrative measures.* *- Monitoring and reporting measures.* *- Measures to increase flexible, responsive management.* *- Plan extensions.*	
	FMP	• Develop observer program aboard United States (US) trawlers; continue foreign observer program. • Provision for inseason adjustment of time and area, issuance of field orders.
	1	Extension of FMP time period until 1979.
	4	Relax domestic fish ticket delivery deadlines.
	7	Renew FMP 11/1979 to 10/1980.
	8	Change plan year and eliminate expiration date.
		Give Alaska region (AKR) Reg Dir authority to resolve foreign/domestic gear conflicts.
	14	Catcher/processor reporting system.
		Framework for establishing halibut prohibited species catch (PSC) limits in domestic and joint venture (JV) fisheries.
		Define directed fishing.
	15	Revised goals and objectives for GOA FMP.
		Adopt framework approach to setting target quotas as is done in Bering Sea and Aleutian Islands (BSAI) FMP; allow procedure for setting PSC limits for fully utilized US groundfish species.
		Catcher/processor requirements for weekly reporting (also includes definition of fish processing).
		Improved authority to the regional administrator (RA) to make inseason time/area adjustments to the fishery based on conservation reasons.
	16	Define prohibited species (only 'unallocated species' def in FMP).
		Redefine 'target species'.
		Specify legal GOA gear.
		Update FMP.
		Large floating processor vessels required to record product transfer information and cargo log.
	17	Federal permit requirements.
	18	Establish procedure to set annual fishing seasons by regulatory amendment.
		Establish a new recordkeeping and data reporting system.
		Establish a new frameworked observer program of up to 100% coverage of domestic industry.
	21	Define overfishing.
		Interim groundfish specifications.
		Update FMP to specify legal fishing gear.
		New definition of pelagic trawl gear.
	22	Experimental fishing permits.
	24	Consolidate target fishery definitions.
		Redefine directed fishing standards groundfish in pelagic pollock trawl fishery and rockfish.
	30	Establish North Pacific Fisheries Research Plan and system of user fees to cover the costs of observer requirements.
	34	Removes inadvertent inclusion of the community development quota (CDQ) program in the FMP.
	44	Redefine acceptable biological catch (ABC) and overfishing level (OFL).
	56	Redefine OFL.
Groundfish yield/ sustainability	*- Groundfish harvest levels.* *- Management categories.* *- Protection against localized depletion and sustainability concerns.*	
	FMP	•Determination of optimum yield (OY) for each species. •Apportion Gulf-wide OY over five International North Pacific Fisheries Commission (INPFC) statistical subareas (applies to foreign and domestic fishermen). •Exceeding of foreign allocation in a stat area triggers closure.
	4	Increase squid OY from 2,000 to 5,000 metric tons (mt).
		Increase Atka mackerel OY by 2,000 mt.
		Reduce regulatory areas from 5 to 3.

Table 3.2-2 (cont.). Summary of Gulf of Alaska Fishery Management Plan and amendment measures.

Gulf of Alaska (GOA)	Fishery Management Plan (FMP) amendment measures	
Groundfish yield/ sustainability (cont.)	5	Establish species category for rattails and grenadiers.
	7	Increase in Pacific cod and Atka mackerel OY.
		New category for idiot rockfish.
	8	Divide eastern Gulf into 3 districts for sablefish.
		Redistribute other species Gulf-wide and establish non-specified species category.
	10	Reduce Pacific Ocean perch (POP) ABC, OY, domestic annual harvest (DAH), total allowable level of foreign fishing (TALFF) and reserve.
	11	Increase pollock OY in central GOA.
		Reduce sablefish OY in GOA.
		Divide Yakutat district of eastern GOA into 2 for sablefish.
	13	Increase Western GOA and Central GOA pollock OY.
		Combine pollock OY in Western and Central Regulatory Areas.
	14	Reduce OY for western/central Gulf Pollock, POP, Atka, 'other rockfish', 'other species'.
		New regulatory district for 'other rockfish'; recognition of State of Alaska (AK) demersal shelf rockfish (DSR) mgmt. areas for State of AK registered vessels.
		Authority of the Secretary of Commerce (SoC) to split or combine species within the target species category.
	18	Establish Shelikof District in the Central Regulatory Area.
	19	Implement a seasonal allowance schedule for Pollock.
	21	Modify authorization language for DSR management.
	22	Rescind GOA statistical area 68.
	31	Establish Atka mackerel as separate target species category.
	32	Policy for rebuilding POP.
	38	Amend POP Rebuilding Plan so that recommended total allowable catch (TAC) becomes upper-bound limit.
	46	Remove black and blue rockfishes from FMP.
Bycatch and incidental catch	*- Measures to minimize bycatch and incidental catch of prohibited species, non-target species and undersized target species.* *- Measures to minimize waste.* *- Measures to encourage full utilization.*	
	FMP	•US trawl closure triggered in each stat area when incidental halibut catch reaches given point. •Foreign trawl closures to protect halibut. •Restrictions, during winter, on the use of bottom trawls for domestic and foreign. •Prohibit retention of certain kinds of animals.
	4	Remove domestic off bottom and tow restrictions on trawlers.
	8	Require biodegradable panels for sablefish pots.
	9	Close a contiguous Kodiak Gear Area to foreign trawling during the domestic crab season.
	10	Foreign fishery closure and pelagic trawl only area in eastern GOA.
	15	Time/area closures around Kodiak for non-pelagic trawl.
	18	Renew bottom trawl closures around Kodiak.
		Institute fixed PSC limits for 1990 fishing year.
	19	Prohibit roe stripping.
	21	Require biodegradable panels on groundfish pots.
		Require halibut exclusion devices on groundfish pots.
		Clarify PSC halibut framework to specifically apportion halibut PSC limits by season.
		Clarify PSC halibut framework to set halibut PSC limits by longline and pot gear groups.
		Implement a program to identify and penalize vessels with excessive rates of halibut bycatch (Vessel Incentive Program [VIP]).
	24	Delay start of GOA fisheries.
		Establish VIP Program.
	26	Permanent Kodiak Crab Protection Zone.
	29	Salmon Donation Program.
	45	Combining of GOA pollock 3rd/4th seasonal allowances.
	49	Establish Improved Retention/Improved Utilization (IR/IU) Program: improved retention.
		Establish IR/IU Program: improved utilization.
	50	Establish Halibut Donation Program.
	60	Prohibit use of non-pelagic trawl in federal waters of Cook Inlet.

Table 3.2-2 (cont.). Summary of Gulf of Alaska Fishery Management Plan and amendment measures.

Gulf of Alaska (GOA)	Fishery Management Plan (FMP) amendment measures	
Habitat	*- Measures to protect and conserve habitat.*	
	14	Incorporate National Marine Fisheries Service (NMFS) habitat conservation policy.
	55	Increase individual fishing quota (IFQ) sweep-up levels.
	59	Establish Sitka Pinnacles Marine Reserve.
Seabirds and marine mammals	*- Measures to reduce incidental take of or injury to seabirds and marine mammals.* *- Measures to protect the prey base.*	
	25	Steller sea lions (SSL) 10 nautical mile (nm) buffer zones around rookeries.
		Division of western GOA and central GOA regulatory area into 3 pollock management districts, rescission of Shelikof Strait mgmt district.
	39	Establish a forage fish category, as bycatch only.
Socioeconomic issues	*- Allocation between foreign and domestic fleets, between fleet sectors.* *- Gear conflict issues.* *- Vessel safety measures.*	
	FMP	•20% reserve of the various OYs to be allocated between US and foreign fishermen as season progresses and US needs become more clearly known. •Base DAH on the estimated catch by US fishermen to be delivered to US processors. •Formula for amount of each species to be available to foreign fishermen. •Davidson Bank closure to all foreign fishing to provide sanctuary for domestic fishery development. •Close the GOA east (E) of 140 west (W) to all foreign longlining. •Prohibit foreign longlining landward of 500 meters (m) isobath. •Establish 3 no-trawl areas for foreign fishermen off southeast (SE) AK. •Foreign trawl closures to prevent gear conflict.
	2	Reduce foreign pollock catch and increase the domestic reserve accordingly.
	3	Change foreign Pacific cod apportionment in Chirikof.
	4	Remove foreign area and season restrictions: adjust longline area restrictions, allow >25% TALFF between Dec and May.
		Separate foreign longliners from trawlers for quota closures.
	6	Adjust DAH down and TALFF up.
	7	Incorporation of processor preference amendment.
	8	Set schedule for release of reserves and DAH to TALFF.
	11	Domestic annual processing (DAP)/joint venture processing (JVP) framework adjustments.
	14	Allocate sablefish OY by gear type and regulatory area.
		New start date for sablefish.
	16	Incorporate vessel safety considerations as per the Magnuson-Stevens Fishery Conservation and Management Act (MSA) in FMP.
	20	Implement an IFQ program for sablefish.
	23	Formula for inshore/offshore pollock and Pacific cod allocations.
	27	Establish gear test areas.
	28	Moratorium.
	35	Sablefish IFQ modified block proposal.
	36	Sablefish IFQ modification of transfer restrictions on CDQ compensation quota share (QS).
	37	Allow limited processing of non-IFQ species by IFQ sablefish qualified freezer vessels.
	40	Extend pollock and Pacific cod inshore/offshore allocations.
	41	Establish the license limitation program (LLP).
	42	IFQ QS buydown.
	43	Increase IFQ sweep-up levels.
	51	Extend pollock and Pacific cod inshore/offshore allocations.
	54	IFQ indirect ownership and use caps.
	57	Extension of Vessel Moratorium Program.
	58	Adjustments to the LLP.
	61	Extend inshore/offshore allocations for pollock and Pacific cod.
		Institute American Fisheries Act (AFA) sideboards in GOA fisheries.
	64	IFQ vessel clearance.

Table 3.3-1. Physical properties of Gulf of Alaska waters.

Properties	Deep sea		
	Surface waters	Intermediate waters	Deep water
	<30 meters (m)	30 - 200 m	200 - 1,500 m
Temperature	3 degrees (°) - 12°	3° - 5°	<3° - 2.5°
Salinity (psu)	≤ 32.0	32.0 - 33.8	>33.8 - 34.4
Density (µg/L)	25	25 - 26.8	26.8 - 27.7

Source: Reed 1984
psu-practical salinity units
µg/L-micrograms per liter

Table 3.3-2. Properties of four oceanographic domains of the Eastern Bering Sea shelf, summer 1978.

Properties	Deep Bering	Outer domain	Middle	Inner domain
Salinity (psu)	32.66 - 33.35	32.45 - 33.03	31.53 - 31.91	29.18 - 31.09
Temperature (°C)	2.85 - 8.50	2.88 - 8.60	-0.13 - 7.80	4.72 - 11.0
Phosphate (µg/L)	0.82 - 2.57	0.46 - 2.22	0.11 - 1.72	0.10 - 0.29
Nitrate (µg/L)	2.5 - 32.2	0.05 - 28.4	0.0 - 8.9	0.0 - 0.07
Silicic acid (µg)	11.0 - 83.7	5.2 - 69.0	5.6 - 36.2	3.2 - 24.4

Source: Hattori and Goering 1986, Reed 1995.
psu-practical salinity units
°C-degrees Celsius
µg/L-micrograms per liter
µg-microgram

Table 3.3-3. Atmosphere-ocean variability time scales and forcing mechanisms[1].

Period	Forcing mechanism
Diurnal/semidiurnal	Lunar and solar tides
3 – 10 days	Atmospheric storms
Seasonal	Solar declination
Interannual (years)	
0.5 – 1+	Mesoscale ocean eddies
3 – 7	El Niño – Southern oscillation events
6 – 7	Mid-latitude atmospheric events
10+	"Regime shift"
11	Sunspots
18.6	Lunar declination
22	Sunspots

Notes: [1]After National Research Council 1996. The Bering Sea Ecosystem

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Table 3.4-1. Species listed as endangered or threatened under the Endangered Species Act and occurring in the Gulf of Alaska and/or Bering Sea and Aleutian Islands groundfish management areas, 2002.

Listed species	Population or distinct population segment (DPS)	Latin name	Status
Blue whale	North Pacific	*Balaenoptera musculus*	Endangered
Bowhead whale	Western Arctic	*Balaena mysticetus*	Endangered
Fin whale	Northeast Pacific	*Balaenoptera physalus*	Endangered
Humpback whale	Western and Central North Pacific	*Megaptera novaeangliae*	Endangered
Right whale	North Pacific	*Eubalaena japonica*	Endangered
Sei whale	North Pacific	*Balaenoptera borealis*	Endangered
Sperm whale	North Pacific	*Physeter macrocephalus*	Endangered
Steller sea lion	Western DPS	*Eumetopias jubatus*	Endangered
Steller sea lion	Eastern DPS	*Eumetopias jubatus*	Threatened
Chinook salmon	Puget Sound	*Oncorhynchus tshawytscha*	Threatened
	Lower Columbia River		Threatened
	Upper Columbia River (Spring)		Endangered
	Upper Willamette River		Threatened
	Snake River (Spring/Summer)		Threatened
	Snake River (Fall)		Threatened
Sockeye salmon	Snake River	*Oncorhynchus nerka*	Endangered
Steelhead	Upper Columbia River	*Oncorhynchus mykiss*	Endangered
	Middle Columbia River		Threatened
	Lower Columbia River		Threatened
	Upper Willamette River		Threatened
	Snake River Basin		Threatened
Leatherback sea turtle[1]		*Dermochelys coriacea*	Endangered
Short-tailed albatross		*Phoebastria albatrus*	Endangered
Stellers eider		*Polysticta stelleri*	Threatened
Spectacled eider		*Polysticta stelleri*	Threatened

Notes: [1]Green, Pacific Ridley, and loggerhead turtles are recorded to occur in Alaska, but are considered extralimital.

Source: NOAA Protected Resources Division website: http://fakr.noaa.gov/protectedresources/esakspecies.pdf, accessed on 16 Jun 03 (Table 1).

Table 3.4-2. Salmon species, stocks, or evolutionarily significant units listed or pending under the Endangered Species Act.

Species	Evolutionarily significant unit[a]	Present status	Federal register notice
Chinook salmon (*Oncarhynchus tshawytscha*)	Sacramento River Winter run	Endangered	54 FR 32085 8/1/89
	Snake River fall	Threatened	57 FR 14653 4/22/92
	Snake River spring/summer	Threatened	57 FR 14653 4/22/92
	Puget Sound	Threatened	64 FR 14308 3/24/99
	Lower Columbia River	Threatened	64 FR 14308 3/24/99
	Upper Willamette River	Threatened	64 FR 14308 3/24/99
	Upper Columbia River spring	Endangered	64 FR 14308 3/24/99
	Central Valley spring run	Threatened	64 FR 50393 9/16/99
	California coast	Threatened	64 FR 50393 9/16/99
Chum salmon (*O. keta*)	Hood Canal summer run	Threatened	64 FR 14570 3/25/99
	Columbia River	Threatened	64 FR 14570 3/25/99
Coho salmon (*O. kisutch*)	Central California coast	Threatened	61 FR 56138 10/31/96
	Southern Oregon/Northern California coast	Threatened	62 FR 24588 5/6/97
	Oregon coast	Threatened	63 FR 42587 8/10/98
Sockeye salmon (*O. nerka*)	**Snake River**	Endangered	56 FR 58619 11/20/91
	Lake Ozette	Threatened	64 FR 14528 3/25/99
Steelhead (*O. mykiss*)	Southern California	Endangered	62 FR 43937 8/18/97
	South-Central California	Threatened	62 FR 43937 8/18/97
	Central California coast	Threatened	62 FR 43937 8/18/97
	Upper Columbia River	Endangered	62 FR 43937 8/18/97
	Snake River basin	Threatened	62 FR 43937 8/18/97
	Lower Columbia River	Threatened	63 FR 13347 3/19/98
	Central Valley California	Threatened	63 FR 13347 3/19/98
	Upper Willamette River	Threatened	64 FR 14517 3/25/99
	Middle Columbia River	Threatened	64 FR 14517 3/25/99
Cutthroat trout Sea-run (*O. clarki clarki*)	Umpqua River	Endangered	61 FR 41514 8/9/96
	Southwest Washington/Columbia River	Proposed Threatened	64 FR 16397 4/5/99

Notes: [a] – Names in bold represent those likely ranging into Alaskan waters.
Source: NOAA Protected Resources Division website: http://www.nwr.noaa.gov/1salmon/salmesa/ESAprimer.html accessed on 11 Mar 03.

Table 3.5-1. Biological and reproductive attributes, and habitat associations of walleye pollock in the Bering Sea and Aleutian Islands and Gulf of Alaska.

Life stage/activity			Adult	Juvenile	Larvae	Egg
Biological/reproductive attributes	**Feeding type**	Carnivore	X	X		
		Planktivore			X	
	Movements	Drift with ocean	X	X	X	X
	Social behavior	Schooling	X	X		
		Not known			X	
	Longevity of life stages	1-30 days				X
		1-12 months			X	
		1-5 years		X		
		5-20 years	X			
	Age at maturity	50% female (years)	4			
		50% male (years)	4			
	Fertilization and spawning behavior	External	X			
		Broadcast spawner	X			
	Spawning season		Early spring			
Habitat associations	**Location**	Inner shelf (1-50 meters [m])		X		
		Middle shelf (50-100 m)		X		
		Outer shelf (100-200 m)	X	X	X	X
		Upper slope (200-1,000 m)				X
		Basin (> 3,000 m)	X			X
		Bay/estuaries				
		Island pass		X		
		Depths of high availability	100-200 m			
		Depths of high availability	50-150 m			
		Bottom depth(s) of common	30-200 m			
	Pelagic domain	Pelagic	X	X	X	X
		Semi-demersal/semi-pelagic	X	X		
	Oceanography	Upwelling zone	X			
		Gyres	X	X	X	X
		Thermo/pycnocline		X		
		Fronts	X	X	X	
		Edges (ice, bathymetric)	X			

Source: NPFMC 1999b.
[1]Source: NPFMC 2002a and 2002b; Table 20 and Table 57, respectively.

Table 3.5-2. Status and catch specifications (metric tons) of target species in the Bering Sea and Aleutian Islands in recent years.

Target Species	Area	Year	Biomass[1]	Overfishing level (OFL)[2]	Acceptable biological catch (ABC)[2]	Total allowable catch (TAC)	Catch[3]
Pollock	Eastern Bering Sea (EBS)	2002	9,800,000	3,530,000	2,110,000	1,485,000	1,484,927
		2003	11,100,000	3,530,000	2,330,000	1,491,760	1,489,419
		2004	11,000,000	2,740,000	2,560,000	NA	NA
	Aleutian Islands	2002	106,000	31,700	23,800	1,000	1,079
		2003	175,000	52,600	39,400	1,000	1,641
		2004	175,000	52,600	39,400	NA	NA
	Bogoslof	2002	232,000	46,400	4,310	100	38
		2003	227,000	45,300	4,070	50	24
		2004	198,000	39,600	29,700	NA	NA
Pacific cod	Bering Sea and Aleutian Islands (BSAI)	2002	1,540,000	294,000	223,000	200,000	184,937
		2003	1,680,000	324,000	223,000	207,500	176,314
		2004	1,660,000	350,000	223,000	NA	NA
Sablefish	EBS	2002	28,000	2,900	1,930	1,930	893
		2003	31,000	4,290	2,900	2,900	948
		2004	32,000	4,020	3,010	NA	NA
	Aleutian Islands	2002	39,000	3,850	2,550	2,550	994
		2003	39,000	4,590	3,100	3,100	1,076
		2004	39,000	4,620	3,450	NA	NA
Atka mackerel	EBS areas 541, 542, and 543	2002	440,000	82,300	49,000	49,000	45,293
		2003	358,000	99,700	63,000	60,000	58,475
		2004	286,000	78,500	66,700	NA	NA
Yellowfin sole	BSAI	2002	1,600,000	136,000	115,000	86,000	74,711
		2003	1,550,000	136,000	114,000	83,750	78,738
		2004	1,560,000	135,000	114,000	NA	NA
Rock sole	BSAI	2002	1,850,000	268,000	225,000	54,000	41,621
		2003	877,000	132,000	110,000	44,000	35,832
		2004	1,160,000	166,000	139,000	NA	NA
Flathead sole	BSAI	2002	695,000	101,000	83,000	25,000	15,419
		2003	550,00	81,000	66,000	20,000	14,053
		2004	505,000	75,200	61,900	NA	NA

Table 3.5-2 (cont.). Status and catch specifications (metric tons) of target species in the Bering Sea and Aleutian Islands in recent years.

Target Species	Area	Year	Biomass[1]	Overfishing level (OFL)[2]	Acceptable biological catch (ABC)[2]	Total allowable catch (TAC)	Catch[3]
Arrowtooth flounder	BSAI	2002	671,000	137,000	113,000	16,000	11,540
		2003	597,000	139,000	112,000	12,000	12,556
		2004	696,000	142,000	115,000	NA	NA
Greenland turbot	EBS and Aleutian Islands	2002	208,000	36,500	8,100	8,000	6,164
		2003	112,000	17,800	5,880	4,000	3,017
		2004	132,000	19,300	4,740	NA	NA
Alaska plaice	BSAI	2002	1,110,000	172,000	143,000	30,000	12,291
		2003	1,080,000	165,000	137,000	10,000	9,896
		2004	1,050,000	258,000	203,000	NA	NA
Other flatfish	BSAI	2003	107,000	21,400	16,000	3,000	2,818
		2004	90,300	18,100	13,500	NA	NA
Pacific ocean perch	BSAI	2002	377,000	17,500	14,800	14,800	11,214
		2003	375,000	17,900	15,100	14,100	14,645
		2004	349,000	15,800	13,300	NA	NA
Northern rockfish	BSAI	2002	150,000	9,020	6,760	6,760	4,060
		2003	156,000	9,468	7,101	6,000	4,902
		2004	142,000	8,140	6,880	NA	NA
Shortraker/ rougheye rockfish	BSAI	2002	48,000	1,000	1,000	1,028	573
		2003	45,200	1,290	967	967	410
Shortraker		2004	23,400	701	526	NA	NA
Rougheye		2004	10,400	259	195		
Other rockfish	EBS	2002	6,880	482	361	361	398
		2003	18,300	1,280	960	960	314
		2004	18,300	1,280	960	NA	NA
	Aleutian Islands	2002	12,900	901	676	676	547
		2003	12,100	846	634	634	393
		2004	12,100	846	634	NA	NA

Notes: NA - data not available
[1]Biomass for each year corresponds to the projection given in the Bering Sea and Aleutian Islands SAFE report issued in the preceding year.
[2]The overfishing level and acceptable biological catch for 2004 are those recommended by the Plan Team.
[3]Current through November 2003.

Source: NPFMC 2003a.

Table 3.5-3. Bering Sea and Aleutian Islands pollock past/present effects.

Direct/Indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality	• Foreign pollock fishery pre-Magnuson-Stevens Act (MSA) (1958-1976). • Russian pollock fishery (1967-present). • Marine pollutants and oil spills.	• Foreign pollock fisheries (1976-1991). • Joint Venture (JV) pollock fishery (1980-1991). • Domestic pollock (1988-present). • Marine pollutants and oils spills.	• Bilateral agreement with Japan and Soviet Union (USSR) (1973): Self-monitoring of foreign fishery in eastern Bering Sea (EBS) and pollock catch limits. • Convention on the conservation and management of the pollock Resources in the central Bering Sea. • Russian fishery management actions. • Industry self-imposed actions: catch restrictions. • International, federal, and state laws regarding marine pollutants. • Oil Pollution Act (OPA) 90. • Clean Water Act.	• 1977 Bering Sea and Aleutian Islands (BSAI) Preliminary Fishery Management Plan (FMP) - established observers in foreign fisheries. • Annual total allowable catch (TAC)/acceptable biological catch (ABC) limits. • BSAI FMP Amendment 14 – prohibited roe stripping. • BSAI FMP Amendment 17 – established the Bogoslof District and enacted moratorium on Donut Hole pollock. • Steller sea lion conservation areas reduced pollock fishing mortality.
Changes in reproductive success	• Foreign pollock fisheries (1958-1976) bycatch of juvenile pollock. • Russia pollock fishery (1967-present) bycatch of juvenile pollock. • Commercial whaling and seal harvests. • Cannibalism. • Climate changes and regime shifts.	• Foreign, JV, and domestic pollock fisheries (1976-present) fishery selectivity. • Foreign, JV, and domestic pollock fisheries (1976-present) spatial/temporal concentration of catch. • Foreign, JV, and domestic pollock roe stripping (1976-1991).	• Convention on the conservation and management of the pollock resources in the central Bering Sea. • International Whaling Commission (IWC) ban on commercial whaling. • Marine Mammal Protection Act (MMPA) of 1972. • Industry self-imposed actions: gear modifications to avoid bycatch of juveniles.	• BSAI FMP Amendment 13 – established Observer Program. • BSAI FMP Amendment 14 – prohibited roe stripping. • BSAI FMP Amendment 17 – established the Bogoslof District (spawning populations). • BSAI FMP Amendment 49 – Improved Retention/Improved Utilization (IR/IU), reduced pollock bycatch. • Steller sea lion conservation measures.

Table 3.5-3 (cont.). Bering Sea and Aleutian Islands pollock past/present effects.

Direct/Indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Change in prey availability	• Foreign pollock fishery (1958-1976) reduction of adult pollock biomass. • Foreign groundfish fishery pre-MSA catch/bycatch of forage fish. • State of Alaska groundfish fisheries bycatch of forage fish. • State of Alaska herring fisheries catch. • Subsistence and personal use fisheries that target forage fish. • Introduction of exotic species. • Climate change or regime shifts (1988/89-present). • Marine pollution and oil spills.	• Foreign, JV, and domestic pollock fisheries (1976-present) reduction of adult pollock biomass. • Foreign groundfish fishery post-MSA bycatch of forage fish. • JV groundfish fishery bycatch of forage fish. • Domestic groundfish fishery bycatch of forage fish. • Introduction of exotic species. • Marine pollution and oil spills.	• Industry self-imposed actions: gear modifications to avoid bycatch of juveniles. • International, federal, and state laws regarding marine pollutants. • OPA 90. • Clean Water Act.	• BSAI FMP Amendment 13 – established Observer Program. • BSAI FMP Amendment 36 - protection of forage fish.
Change in important habitat	• Foreign groundfish fishery pre-MSA bottom trawl impacts. • Marine pollutants/oil spills. • Introduction of exotic species. • Climate changes and regime shifts.	• Foreign groundfish fishery bottom trawls (1976-1985). • JV groundfish fishery bottom trawls (1980-1988). • Domestic groundfish fishery bottom trawls (1988-1996). • Introduction of exotic species. • Marine pollution and oil spills.	• 1977 BSAI Preliminary FMP - banned bottom trawling in pollock spawning grounds. • International, federal, and state laws regarding marine pollutants. • OPA 90. • Clean Water Act. • Industry self-imposed actions: gear modifications to avoid habitat degradation.	• BSAI 13, 15, and 46 – decrease in bottom trawls provided for habitat protection. • BSAI FMP Amendment 17 – protect pollock spawning population. • BSAI FMP 55 – EFH designed to protect habitat. • BSAI FMP Amendment 57 – banned non-pelagic gear. • Conversion to pelagic fishery (1996). • Steller sea lion conservation areas indirectly protected habitat.
Comparative Baseline: • The eastern Bering Sea pollock stock is healthy. • The Central Bering Sea-Bogoslof Island stock is increasing and rebuilding. • The Aleutian Islands stock is increasing in biomass. • FMP management takes into account all catch and bycatch in Economic Exclusion Zone and State waters when setting annual harvest levels.				

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.5-4. Biological and reproductive attributes and habitat associations of Pacific cod in the Bering Sea and Aleutian Islands and Gulf of Alaska.[1]

Life stage/activity			Adult	Late juvenile	Early juvenile	Larvae	Egg
Biological/reproductive attributes	**Feeding type**	Carnivore	X	X	X		
		Planktivore				X	
	Movements	Drift with ocean		X	X	X	
		Reside in Nursery					X
		Not known	X				
	Social behavior	Schooling	X				
		Not known		X	X	X	
	Longevity of life stages	1-30 days					X
		1-12 months			X		
		1-5 years		X			
		>50 years	X				
		Not known				X	
	Age at maturity	50% female (years)	5				
		50% male (years)	5				
	Fertilization and spawning behavior	External	X				
		Broadcast spawner	X				
	Spawning season		Early winter - early spring				
Habitat associations	**Location**	Inner shelf (1-50 meters [m])	X	X	X		X
		Middle shelf (50-100 m)	X	X	X		X
		Outer shelf (100-200 m)	X	X			X
		Not known				X	
		Depths of high availability	50-150 m				
		Depths of high availability	<100 m				
		Bottom depth(s) of common	10-150 m				
	Substrate	Mud/clay/silt	X	X	X		X
		Sand/gravel	X	X	X		X
		Not applicable				X	
	Pelagic domain	Near surface				X	
		Demersal	X	X	X		X

Source: NPFMC 1999b.
[1]Source: NPFMC 2002a and 2002b; Table 20 and Table 57, respectively.

Table 3.5-5. Bering Sea and Aleutian Islands Pacific cod past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality	• Subsistence and personal use. • Foreign groundfish fisheries (1964-1976). • Marine pollutants and oil spills.	• Foreign Fisheries post Magnuson-Stevens Act (MSA) (1976-1985). • Joint venture (JV) fisheries (1988-1991). • Domestic fisheries (1864-1950; 1981-present). • Marine pollutants and oil spills.	• Bilateral agreement with Japan and Soviet Union (USSR) (1973). • Industry self-imposed actions. • International laws regarding marine pollutants. • Clean Water Act. • Oil Pollution Act (OPA) 90.	• Annual acceptable biological catch (ABC)/total allowable catch (TAC) limits. • Bering Sea and Aleutian Islands (BSAI) Fishery Management Plan (FMP) Amendments 9, 11a, 12, 13, 27, and 37 addressed domestic and foreign observer programs. • BSAI FMP Amendments16 and 24 – TAC allocations, reduce bycatch, address ghost fishing. • BSAI FMP Amendment 46, 64, 67, and 68 – Pacific cod gear allocations
Change in reproductive success	• Foreign groundfish fisheries (1964-1976) fishery selectivity. • Climate changes and regime shifts.	• Foreign, JV, and domestic groundfish fisheries (post-MSA) fishery selectivity. • Foreign, JV, and domestic groundfish fisheries (post-MSA) spatial/temporal concentration of catch/bycatch.	• Industry self imposed actions – gear modifications. • Bilateral agreement with Japan and USSR (1973). • 1977 BSAI Preliminary FMP – banned bottom trawling in some areas, observers in foreign fisheries.	• BSAI FMP Amendment 4 addressed localized depletion.
Change in prey availability	• Introduction of exotic species. • Marine pollution and oil spills. • Climate change or regime shifts (1988/89-present).	• Foreign, JV, and domestic groundfish fisheries prey species bycatch. • Foreign, JV, and domestic pollock fisheries – pollock is an important prey item for adult Pacific cod. • Marine pollution and oil spills. • Introduction of exotic species.	• Bilateral agreement with Japan and USSR (1973): Self-monitoring of foreign fishery in eastern Bering Sea (EBS) and catch limits. • Industry self-imposed actions; catch restrictions. • International laws regarding marine pollutants. • Clean Water Act. • OPA 90.	• BSAI Amendment 36 - protection of forage fish. • Annual ABC/TAC limits for pollock.
Change in important habitat	• Foreign groundfish fishery (1976-1985) fishery gear impacts. • Introduction of exotic species. • Marine pollutants and oil spills. • Climate changes and regime shifts.	• Foreign, JV, and domestic (post-MSA) fishery gear impacts. • Introduction of exotic species. • Marine pollutants and oil spills. • Climate changes and regime shifts.	• Bilateral agreement with Japan and USSR (1973). • 1977 BSAI Preliminary FMP – banned bottom trawling in some areas. • Industry self-imposed modifications – gear restrictions. • International laws regarding marine pollutants. • Clean Water Act. • OPA 90.	• BSAI FMP Amendment 46, 64, 67, and 68 – Pacific cod gear allocations. • BSAI FMP Amendment 9 – defined habitat requirements. • BSAI FMP Amendments 13, 15, and 46 – decrease in bottom trawls. • BSAI FMP Amendments 55 and 56 – protection for essential fish habitat and habitat area of particular concern.
Comparative baseline: • The Bering Sea Pacific cod stock is not overfished. • Stock is below target biomass. • Stock is decreasing in abundance. • Management takes into account all catch and bycatch when setting annual harvest levels.				

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
IInternal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.5-6. Biological and reproductive attributes and habitat associations of sablefish in the Bering Sea and Aleutian Islands and Gulf of Alaska.[1]

	Life stage/activity		Adult	Late juvenile	Early juvenile	Larvae	Egg
Biological/reproductive attributes	**Feeding type**	Carnivore	X	X	X		
		Planktivore				X	
	Movements	Drift with ocean				X	X
		Inshore/Offshore Migrations			X		
		Highly migratory	X	X			
	Social	Not known	X	X	X	X	X
	Longevity of life stage	1-30 days					X
		1-12 months				X	
		1-5 years		X	X		
		20-50 years	X				
	Age at maturity	50% female (years)	6.5				
		50% male (years)	5				
	Fertilization and spawning behavior	External	X				
		Broadcast spawner	X				
	Spawning season		Late winter - early spring				
Habitat associations	**Location**	Inner shelf (1-50 meters			X		
		Middle shelf (50-100 m)			X	X	
		Outer shelf (100-200 m)			X	X	
		Upper slope (200-1,000 m)	X	X		X	X
		Lower slope	X	X		X	X
		Basin				X	X
		Bay/estuaries			X		
		Island			X		
		Depths of high availability	300-800 m				
		Depths of high availability	300-800 m				
		Bottom depth(s) of common	200-1,000 m				
	Pelagic domain	Near surface				X	
		Pelagic			X		X
		Semi-demersal/semi-			X		
		Demersal	X	X	X		
	Oceanograph	Upwelling zone	X	X	X	X	X

Source: NPFMC 1999b.
[1]Source: NPFMC 2002a and 2002b; Table 20 and Table 57, respectively.

Table 3.5-7. Bering Sea and Aleutian Islands and Gulf of Alaska sablefish past/present effects (Bering Sea and Aleutian Islands and Gulf of Alaska analysis is combined since they are assessed as a single stock).

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality	• Foreign groundfish fishery (Bering Sea and Aleutian Islands [BSAI]: 1958-1976; Gulf of Alaska [GOA]: 1963-1976). • International Pacific Halibut Commission (IPHC) longline fishery. • State of Alaska groundfish fisheries. • Exxon Valdez oil spill.	• Foreign groundfish fisheries post-Magnuson-Stevens Act (MSA) (1976-1985). • Joint venture (JV) groundfish fishery (BSAI: 1980-1991; GOA: 1979-1991). • GOA Domestic (United States [US] National fishery) Pacific cod fishery (1800s-1976). • BSAI domestic groundfish fisheries (BSAI: 1980-present, GOA: 1979-present).	• Bilateral agreement with Japan and Soviet Union (USSR) (1973). • Industry self-imposed actions; catch restrictions. • International laws regarding marine pollutants. • Clean Water Act. • Oil Pollution Act (OPA) 90.	• Foreign and domestic observers. • Annual total allowable catch (TAC)/acceptable biological catch (ABC) limits. • BSAI/GOA Amendments 16/8 and 21 – addressed ghost fishing. • GOA Fishery Management Plan (FMP) Amendment 11 – lowered sablefish quotas. • BSAI/GOA FMP Amendments 20/15 – created individual fishing quota (IFQ) program. • GOA FMP Amendment 65 – revised IFQ program.
Change in reproductive success	• BSAI and GOA Foreign fisheries (1958-1976) fishery selectivity. • IPHC halibut longline. • State of Alaska groundfish fishery spatial/temporal concentration. • Exxon Valdez oil spill. • Climate change or regime shifts.	• Foreign, JV, and domestic (post-MSA) fisheries fishery selectivity. • Foreign, JV. and domestic (post-MSA) fisheries spatial/temporal concentration.	• Bilateral agreement with Japan and USSR (1973). • Preliminary FMPs banned bottom trawling; observers in foreign fisheries. • Industry self-imposed actions; catch restrictions.	• Foreign and domestic observers. • Annual TAC/ABC limits. • BSAI FMP Amendment 4 addressed localized. • BSAI/GOA FMP Amendments 20/15 – created IFQ program. • GOA FMP Amendment 65 – revised IFQ program depletion. • GOA FMP Amendment 8 – defined management areas.
Change in prey availability	• BSAI and GOA foreign groundfish fishery (pre-MSA) catch/bycatch of prey species. • State of Alaska groundfish fisheries catch/bycatch of prey species. • Exxon Valdez oil spill. • Introduction of exotic species. • Climate change or regime shifts (1988/89-present).	• Foreign, JV and domestic (post-MSA) fisheries prey species catch/bycatch. • Introduction of exotic species. • Marine pollution and oil spills.	• Bilateral agreement with Japan and USSR (1973): Self-monitoring of foreign fishery in eastern Bering Sea (EBS) and catch limits. • Foreign fisheries management actions. • Industry self-imposed actions; catch restrictions. • International laws regarding marine pollutants. • OPA 90.	• BSAI/GOA FMP Amendments 36/39 - protection of forage fish. • Annual ABC/TAC limits for pollock. • BSAI and GOA FMP Amendments regulating pollock catch.

Table 3.5-7 (cont.). Bering Sea and Aleutian Islands and Gulf of Alaska sablefish past/present effects (Bering Sea and Aleutian Islands and Gulf of Alaska analysis is combined since they are assessed as a single stock).

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Change in important habitat	• BSAI and GOA foreign groundfish fisheries (pre-MSA) gear impacts. • State of Alaska groundfish fisheries gear impacts. • Exxon Valdez oil spill. • Introduction of exotic species. • Climate changes and regime shifts.	• Foreign, JV, and domestic groundfish fisheries (post-MSA) gear impacts. • Marine pollutants and oil spills. • Introduction of exotic species.	• International Laws regarding marine pollutants. • OPA 90. • Clean Water Act. • Industry self-imposed actions; gear modifications.	• 1977 BSAI Preliminary FMP - banned bottom trawling in pollock spawning grounds. • BSAI FMP Amendments 13, 15, and 46 – decrease in bottom trawls and created Walrus Island Closures, provided for habitat protection. • GOA FMP Amendments 3 and 20 – decreased bottom trawling. • GOA FMP Amendments 14 and 55 – established habitat protection measures. • BSAI/ GOA FMP Amendment 55 – essential fish habitat designed to protect habitat.
Comparative baseline: • The BSAI/GOA sablefish stock is not overfished. • This stock is below target biomass; however, it is a stable stock. • Management takes into account all catch and bycatch when setting annual harvest levels.				

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.5-8. Biological and reproductive attributes and habitat associations of Atka mackerel in the Bering Sea and Aleutian Islands and Gulf of Alaska[1].

Life stage/activity			Adult	Juvenile	Larvae	Egg
Biological/reproductive attributes	**Feeding type**	Carnivore	X	X	X	
		Planktivore				X
	Movements	Inshore/offshore migration	X			
		Not known		X	X	X
	Social behavior	Schooling	X			
		Not known		X	X	X
	Longevity of life stages	1-30 days				X
		1-12 months			X	
		1-5 years	X	X		
	Age at maturity	50% female (years)	3.6			
		50% male (years)	3.6			
	Fertilization and spawning behavior	External	X			
		Nest	X			
		Egg/young tender	X			
	Spawning	Early summer - late summer				
Habitat association	**Locations**	Inner shelf (1-50 meters [m])	X			X
		Middle shelf (50-100 m)	X			
		Outer shelf (100-200 m)	X			
		Island pass	X			X
		Not known		X	X	
		Depths of high availability	Offshore			
		Depths of high availability	Inshore			
		Bottom depth(s) of common	Coastal and open sea			
	Substrate	Gravel	X			X
		Pebble	X			X
		Cobble	X			X
		Kelp forest	X			X
	Pelagic domain	Near surface			X	
		Semi-demersal/semi-pelagic	X			
		Demersal				X
		Not known		X		
	Oceanography	Fronts	X			
		Edges (ice, bathymetric)	X			

Source: NPFMC 1999b.
[1]NPFMC 2002a and 2002b; Table 20 and Table 57, respectively.

Table 3.5-9. Bering Sea and Aleutian Islands Atka mackerel past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality	• Foreign groundfish fisheries (1970-1976). • Marine pollution and oil spills.	• Foreign Fisheries post-Magnuson-Stevens Act (MSA) (1976-1985). • Joint venture (JV) fisheries (1980-1991). • Domestic fisheries (1981-present). • Marine pollution and oil spills.	• Bilateral agreement with Japan and Soviet Union (USSR) (1973). • Industry self-imposed actions. • International laws regarding marine pollutants. • Clean Water Act. • Oil Pollution Act (OPA) 90.	• Annual acceptable biological catch (ABC)/total allowable catch (TAC) limits. • Bering Sea and Aleutian Islands (BSAI) Fishery Management Plan (FMP) Amendments 9, 11a, 12, 13, 27, and 37 – addressed domestic and foreign observer programs. • BSAI FMP Amendments16 and 24 – TAC allocations, reduce bycatch, address ghost fishing. • BSAI FMP Amendment 34 – jig gear allocation. • Steller sea lion conservation measures. • BSAI FMP Amendment 70 – Steller sea lion 2002 measures.
Change in reproductive success	• Foreign groundfish fisheries spatial/temporal concentration of fishery (1970-1976). • Climate changes and regime shifts.	• Foreign, JV, and domestic groundfish fisheries (1981-present) spatial/temporal concentration of fishery.	• Industry self imposed actions – gear modifications. • Bilateral agreement with Japan and USSR (1973). • 1977 BSAI Preliminary FMP – banned bottom trawling in some areas, observers in foreign fisheries.	• Annual ABC/TAC limits. • Foreign and domestic observer programs. • BSAI FMP Amendment 28 – Stelle sea lionr closures. • BSAI FMP Amendment 70 – Steller sea lion 2002 measures.
Change in prey availability	• Commercial whaling. • Introduction of exotic species. • Marine pollutants and oil spills. • Climate change or regime shifts. (1988/89-present).	• Introduction of exotic species. • Marine pollutants and oil spills.	• International Whaling Commission (IWC) ban on commercial whaling. • Marine Mammal Protection Act (MMPA) of 1972. • International laws regarding marine pollutants. • Clean Water Act. • OPA 90.	
Change in important habitat	• Foreign groundfish fishery (pre-MSA) gear impacts. • Introduction of exotic species. • Marine pollution and oil spills. • Climate changes and regime shifts.	• Foreign, JV, and domestic groundfish fisheries (post-MSA) gear impacts. • Introduction of exotic species. • Marine pollution and oil spills.	• Bilateral agreement with Japan and USSR (1973). • 1977 BSAI Preliminary FMP – banned bottom trawling in some areas. • Industry self-imposed modifications – gear restrictions. • Clean Water Act. • OPA 90.	• BSAI FMP Amendment 20 – Steller sea lion buffer. • Steller sea lion conservation measures. • BSAI FMP Amendment 9 – defined habitat requirements. • BSAI FMP Amendments 13, 15, and 46 – decrease in bottom trawls. • BSAI FMP Amendment 55– protection for essential fish habitat and habitat area of particular concern. • BSAI FMP Amendment 70 – Steller sea lion 2002 measures.
Comparative baseline: • The BSAI Atka mackerel stock is not overfished. • The BSAI Atka mackerel stock is above target biomass. • The BSAI Atka mackerel stock is declining in stock size. • Management takes into account all catch and bycatch when setting annual harvest levels.				

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.5-10. Biological and reproductive attributes, and habitat associations of yellowfin sole in the Bering Sea and Aleutian Islands and Gulf of Alaska.

Life stage/activity			Adult	Late juvenile	Early juvenile	Larvae	Egg
Biological/reproductive attributes	**Feeding type**	Carnivore	X	X	X		
		Planktivore				X	
	Movements	Inshore/offshore migrations	X				
		Not known		X	X	X	X
	Longevity of life stage	1-12 months				X	
		1-5 years		X	X		
		5->20 years	X				
		Not known					X
	Age at	50% female (years)	10.5				
	Fertilization and spawning behavior	External	X				
		Broadcast spawner	X				
	Spawning	Late spring - late summer					
Habitat associations	**Location**	Beach (intertidal)	X			X	X
		Inner shelf (1-50 meters [m])	X	X	X	X	X
		Middle shelf (50-100 m)	X	X	X		
		Outer shelf (100-200 m)	X	X	X		
		Bay/estuaries	X	X	X	X	X
		Depths of high availability (winter) (of fishable stock)[1]	50-150 m				
		Depths of high availability (summer) (of fishable stock)[1]	20-50 m				
		Bottom depth(s) of common occurrence (of fishable stock)[1]	10-300 m				
	Substrate	Sand/granule	X	X	X	X	
		Not applicable				X	X
	Pelagic domain	Pelagic				X	X
		Demersal	X	X	X		
	Oceanography	Edges (ice, bathymetric)	X				

Source: NPFMC 1999b.

[1]NPFMC 2002a and 2002b; Table 20 and Table 57, respectively.

Table 3.5-11. Bering Sea and Aleutian Islands yellowfin sole past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality	• Foreign groundfish fisheries (1954-1976). • Marine pollution and oil spills.	• Foreign groundfish fisheries (1976-1985). • Joint venture (JV) groundfish fisheries (1980-1991). • Domestic groundfish fisheries (1987-present). • Marine pollution and oil spills.	• Bilateral agreement with Japan and Soviet Union (USSR) (1973). • Industry self-imposed actions. • International laws regarding marine pollutants. • Clean Water Act. • Oil Pollution Act (OPA) 90.	• Annual acceptable biological catch (ABC)/total allowable catch (TAC) limits. • Prohibited species catch (PSC) limits (crab and halibut). • Bering Sea and Aleutian Islands (BSAI) Fishery Management Plan (FMP) Amendments 9, 11a, 12, 13, 27, and 37 – addressed domestic and foreign observer programs. • BSAI FMP Amendments16 and 24 – TAC allocations, reduce bycatch, address ghost fishing.
Change in reproductive success	• Foreign groundfish fisheries (1954-1976). • Climate changes and regime shifts.	• Foreign groundfish fisheries (1976-1985). • JV groundfish fisheries (1980-1991). • Domestic groundfish fisheries (1987-present).		• Observer programs. • Annual ABC/TAC limits.
Change in prey availability	• Foreign groundfish fisheries (1954-1976) prey species bycatch. • State of Alaska crab fisheries bycatch of juvenile crabs. • Introduction of exotic species. • Marine pollution and oil spills. • Climate change or regime shifts (1988/89-present).	• Foreign, JV, and domestic groundfish (post-Magnuson-Stevens Act [MSA]) prey species bycatch. • Introduction of exotic species. • Marine pollution and oil spills.	• Industry self imposed actions – gear modifications. • International laws regarding marine pollutants. • Clean Water Act. • OPA 90.	• PSC limits for crab.
Change in important habitat	• Foreign groundfish fishery (pre-MSA) gear impacts. • Marine pollution and oil spills. • Introduction of exotic species. • Climate changes and regime shifts.	• Foreign, JV, and domestic groundfish (post-MSA) gear impacts. • Marine pollution and oil spills. • Introduction of exotic species.	• Bilateral agreement with Japan and USSR (1973). • 1977 BSAI Preliminary FMP – banned bottom trawling in some areas. • Industry self-imposed modifications – gear restrictions. • International laws regarding marine pollutants. • Clean Water Act. • OPA 90	• BSAI FMP Amendment 9 – defined habitat requirements. • BSAI FMP Amendments 13, 15, and 46 – decrease in bottom trawls. • BSAI FMP Amendmens 55 – protection for essential fish habitat and habitat area of particular concern.
Comparative baseline: • The BSAI yellowfin sole stock is not overfished. • The BSAI yellowfin sole biomass is above target biomass. • The yellowfin sole stock is decreasing in size. • Management takes into account all bycatch when setting annual harvest levels.				

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.5-12. Biological and reproductive attributes of rock sole in the Bering Sea and Aleutian Islands and Gulf of Alaska.

Life stage/activity			Adult	Late juvenile	Early juvenile	Larvae	Egg
Biological/reproductive attributes	**Feeding type**	Carnivore	X	X	X		
		Planktivore				X	
	Movements	Inshore/offshore migrations	X				
		Not known		X	X	X	X
	Longevity of life stage	1-12 months				X	
		1-5 years			X		
		5-30 years	X	X			
		Not known					X
	Age at maturity	50% female (years)	9				
	Fertilization/ spawning behavior	External	X				
		Batch spawner	X				
	Spawning season	Late winter - early spring					

Source: NPFMC 1999b.

Table 3.5-13. Bering Sea and Aleutian Islands rock sole past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality	• Foreign groundfish fisheries (1954-1976). • Marine pollution and oil spills.	• Foreign Fisheries post-Magnuson-Stevens Act (MSA) (1976-1985). • Joint venture (JV) fisheries (1980-1990). • Domestic fisheries (1987-present). • Marine pollution and oil spills.	• Bilateral agreement with Japan and Soviet Union (USSR) (1973). • Industry self-imposed actions. • International laws regarding marine pollutants. • End of Russian Flounder Fishery (political 1973). • Clean Water Act. • Oil Pollution Act (OPA) 90.	• Annual acceptable biological catch (ABC)/total allowable catch (TAC) limits. • Prohibited species catch (PSC) limits (crab and halibut). • Bering Sea and Aleutian Islands (BSAI) Fishery Management Plan (FMP) Amendments 9, 11a, 12, 13, 27, and 37 – addressed domestic and foreign observer programs. • BSAI FMP Amendments16 and 24 – TAC allocations, reduce bycatch, address ghost fishing.
Change in reproductive success	• Foreign groundfish fisheries (1954-1976) spatial/temporal concentration. • Climate changes and regime shifts.	• Foreign, JV, and domestic groundfish fisheries (post-MSA) fishery selectivity. • Foreign, JV, and domestic groundfish fisheries (post-MSA) spatial/temporal concentration. • Foreign, JV, and domestic groundfish fisheries (post-MSA) roe fishery.	• Industry self imposed actions – gear modifications. • Bilateral agreement with Japan and USSR (1973). • 1977 BSAI Preliminary FMP – banned bottom trawling in some areas, observers in foreign fisheries.	• Annual ABC/TAC limits. • Foreign and domestic observer programs. • BSAI FMP Amendment 36 – forage fish protection.
Change in prey availability	• Climate change or regime shifts (1988/89-present). • Marine pollution and oil spills. • Introduction of exotic species.	• Marine pollution and oil spills. • Introduction of exotic species.	• International laws regarding marine pollutants. • Clean Water Act. • OPA 90.	
Change in important habitat	• Foreign groundfish fishery (pre-MSA) gear impacts. • Marine pollution and oil spills. • Introduction of exotic species. • Climate changes and regime shifts.	• Foreign, JV, and domestic groundfish fisheries (post-MSA) gear impacts. • Marine pollution and oil spills. • Introduction of exotic species. • Climate changes and regime shifts.	• Bilateral agreement with Japan and USSR (1973). • 1977 BSAI Preliminary FMP – banned bottom trawling in some areas. • Industry self-imposed modifications – gear restrictions. • International laws regarding marine pollutants. • Clean Water Act. • OPA 90.	• BSAI FMP Amendment 9 – defined habitat requirements. • BSAI FMP Amendments 13, 15, and 46 – decrease in bottom trawls. • BSAI FMP Amendment 55– protection for essential fish habitat and habitat area of particular concern.
Comparative baseline: • The BSAI rock sole stock is not overfished. • The BSAI rock sole stock is above target biomass. • The BSAI rock sole is declining in size. • Management takes into account all bycatch when setting annual harvest levels.				

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.5-14. Biological and reproductive attributes and habitat associations of flathead sole in the Bering Sea and Aleutian Islands and Gulf of Alaska[1].

Life stage/activity			Adult	Late juvenile	Early juvenile	Larvae	Egg
Biological/reproductive attrib.	**Feeding types**	Carnivore	X	X	X		
		Planktivore				X	
	Movements	Drift with ocean				X	
		Inshore/offshore migrations	X				
		Not known		X	X		X
	Fertilization/egg	External	X				
	Spawning season	Late winter - early spring					
Habitat associations	**Location**	Inner shelf (1-50 meters [m])		X	X	X	X
		Middle shelf (50-100 m)	X	X	X	X	X
		Outer shelf (100-200 m)	X	X		X	X
		Depths of high availability (winter) (of fishable stock)[1]	100-200 m				
		Depths of high availability (summer) (of fishable stock)[1]	50-150 m				
		Bottom depths of common occurrence (of fishable stock)[1]	50-200 m				
	Substrate	Mud/clay/silt	X	X	X		
		Sand/granule	X	X	X		
		Not applicable				X	X
	Pelagic domain	Pelagic				X	X
		Demersal	X	X	X		
	Oceanography	Edges (ice, bathymetric)	X				

Source: NPFMC 1999b.
[1]NPFMC 2002a and 2002b; Table 20 and Table 57, respectively.

Table 3.5-15. Bering Sea and Aleutian Islands flathead sole past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality	Foreign groundfish fisheries (1954-1976). Marine pollution and oil spills.	Foreign groundfish fisheries (1976-1985). Joint venture (JV) groundfish fisheries (1980-1990). Domestic groundfish fisheries (1987-present). Marine pollution and oil spills.	Bilateral agreement with Japan and Soviet Union (USSR) (1973). Industry self-imposed actions. End of Russian Flounder Fishery (political 1973). International laws regarding marine pollutants. Clean Water Act. Oil Pollution Act (OPA) 90.	Annual acceptable biological catch (ABC)/total allowable catch (TAC) limits. Prohibited species catch (PSC) limits (crab and halibut). Bering Sea and Aleutian Islands (BSAI) Fishery Management Plan (FMP) Amendments 9, 11a, 12, 13, 27, and 37 – addressed domestic and foreign observer programs. BSAI FMP Amendments16 and 24 – TAC allocations, reduce bycatch, address ghost fishing.
Change in reproductive success	Foreign groundfish fisheries (1954-1976) spatial/temporal distribution of fishery. Climate changes and regime shifts.	Foreign, JV, and domestic groundfish fisheries (post-Magnuson-Stevens Act [MSA]) spatial/temporal distribution of fishery. Foreign, JV, and domestic groundfish fisheries (post-MSA) fishery selectivity.	Industry self imposed actions – gear modifications. Bilateral agreement with Japan and USSR (1973). 1977 BSAI Preliminary FMP – banned bottom trawling in some areas, observers in foreign fisheries (halibut closures).	Annual ABC/TAC limits. Foreign and domestic observer programs.
Change in prey availability	Foreign groundfish fisheries (1954-1976) prey species bycatch. State of Alaska crab fisheries. Introduction of exotic species. Climate changes and regime shifts. Marine pollution and oil spills.	Foreign, JV, and domestic fisheries prey species bycatch. Introduction of exotic species. Marine pollution and oil spills.	International laws regarding marine pollutants. Clean Water Act. OPA 90.	
Change in important habitat	Foreign groundfish fisheries (pre-MSA) fishery gear impacts. Introduction of exotic species. Marine pollution and oil spills. Climate changes and regime shifts.	Foreign, JV, and domestic groundfish fisheries (post-MSA) fishery gear impacts. Introduction of exotic species. Marine pollution and oil spills.	Bilateral agreement with Japan and USSR (1973). 1977 BSAI Preliminary FMP – banned bottom trawling in some areas. Industry self-imposed modifications – gear restrictions. Clean Water Act. International laws regarding marine pollutants. OPA 90.	BSAI FMP Amendment 9 – defined habitat requirements. BSAI FMP Amendments 13, 15, and 46 – decrease in bottom trawls. BSAI FMP Amendment 55 – protection for essential fish habitat and habitat area of particular concern.
Comparative baseline: The BSAI flathed sole stock is not overfished. The BSAI flathead sole stock is above target biomass. The BSAI flathead sole is declining in size. Management takes into account all bycatch when setting annual harvest levels.				

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.5-16. Biological and reproductive attributes and habitat association of arrowtooth flounder in the Bering Sea and Aleutian Islands and Gulf of Alaska.

Life stage/activity			Adult	Late juvenile	Early juvenile	Larvae	Egg
Biological/reproductive attributes	**Feeding type**	Carnivore	X	X	X		
		Planktivore				X	
	Movements	Inshore/offshore migrations	X				
		Advection from physical forcing				X	
		Not known		X	X		X
	Longevity of life stages	1-12 months				X	
		1-5 years		X	X		
		5-20 years	X				
		Not known					X
	Age at maturity	50% female (years)	5				
		50% male (years)	4				
	Fertilization/egg development	External	X				
Habitat associations	**Location**	Inner shelf (1-50 meters [m])	X	X	X	X	
		Middle shelf (50-100 m)	X	X	X	X	
		Outer shelf (100-200 m)	X	X	X	X	
		Upper slope (200-1,000 m)	X	X			
		Bay/estuaries	X			X	
		Depths of high availability (winter) (of fishable stock)[1]	150-300 m				
		Depths of high availability (summer) (of fishable stock)[1]	80-200 m				
		Bottom depths of common occurrence (of fishable stock)[1]	30-300 m				
	Substrate	Mud/clay/silt	X	X	X		
		Sand/granule	X	X	X		
		Gravel	X	X	X		
	Pelagic domain	Pelagic				X	
		Demersal	X	X	X		
	Oceanography	Edges (ice, bathymetric)	X				

Source: NPFMC 1999b.
[1]NPFMC 2002a and 2002b; Table 20 and Table 57, respectively.

Table 3.5-17. Bering Sea and Aleutian Islands arrowtooth flounder past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality	Foreign groundfish fisheries (1954-1976). Marine pollution and oil spills.	Foreign groundfish fisheries (1976-1985). Joint venture (JV) froundfish fisheries (1980-1990). Domestic groundfish fisheries (1986-present). Marine pollution and oil spills	Bilateral agreement with Japan and Soviet Union (USSR) (1973). **Industry self-imposed actions** International laws regarding marine pollutants. End of Russian Flounder Fishery (political 1973). Clean Water Act. Oil Pollution Act (OPA) 90.	Annual acceptable biological catch (ABC)/total allowable catch (TAC) limits. Prohibited species catch (PSC) limits (crab and halibut). Bering Sea and Aleutian Islands (BSAI) Fishery Management Plan (FMP) Amendments 9, 11a, 12, 13, 27, and 37 – addressed domestic and foreign observer programs. BSAI FMP Amendments16 and 24 – TAC allocations, reduce bycatch, address ghost fishing. Separation from Greenland Turbot species complex (1986).
Change in reproductive success	Foreign groundfish fisheries (1964-1976) spatial/temporal concentration. Climate changes and regime shifts.	Foreign, JV, and domestic groundfish fisheries (post-MSA) spatial/temporal concentration.	Industry self imposed actions – gear modifications. Bilateral agreement with Japan and USSR (1973). 1977 BSAI Preliminary FMP – banned bottom trawling in some areas, observers in foreign fisheries. Southeast Bering Sea wintertime halibut closures (pre-MSA).	Annual ABC/TAC limits. Foreign and domestic observer programs.
Change in prey availability	Foreign groundfish fishery (pre-MSA) prey species bycatch. State of Alaska groundfish fisheries prey species bycatch. State of Alaska herring fisheries catch. Climate change or regime shifts (1988/89-present). Marine pollution and oil spills. Introduction of exotic species.	Foreign, JV, and domestic post-MSA prey species bycatch. Marine pollution and oil spills. Introduction of exotic species.	Industry self imposed actions – gear modifications. Clean Water Act. OPA 90. International laws regarding marine pollutants.	BSAI Amendment 36 - protection of forage fish. Annual ABC/TAC limits for pollock. BSAI FMP Amendments regulating pollock catch.

Table 3.5-17 (cont.). Bering Sea and Aleutians Islands arrowtooth flounder past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Change in important habitat	Foreign groundfish fishery (pre-MSA) gear impacts. Marine pollution and oil spills. Introduction of exotic species. Climate changes and regime shifts.	Foreign, JV, and foreign (post-MSA) groundfish fisheries gear impacts. Marine pollution and oil spills. Introduction of exotic species. Climate changes and regime shifts.	Bilateral agreement with Japan and USSR (1973). 1977 BSAI Preliminary FMP – banned bottom trawling in some areas. Industry self-imposed modifications – gear restrictions. Clean Water Act. OPA 90. International laws regarding marine pollutants.	BSAI FMP Amendment 9 – defined habitat requirements. BSAI FMP Amendments 13, 15, and 46 – decrease in bottom trawls. BSAI FMP Amendment 55 – protection for essential fish habitat and habitat area of particular concern.
Comparative baseline: The BSAI arrowtooth flounder stock is not overfished. The BSAI arrowtooth flounder stock is above target biomass. The BSAI arrowtooth flounder stock is decreasing in stock size. The BSAI arrowtooth flounder stock is currently of low economic value and is lightly harvested. Commercial interest in the BSAI arrowtooth flounder is growing and is expected to improve retention rates in the future. Management takes into account all bycatch when setting annual harvest levels.				

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.5-18. Biological and reproductive attributes and habitat associations of Greenland turbot in the Bering Sea and Aleutian Islands and Gulf of Alaska[1].

Life stage/activity			Adult	Late juvenile	Early juvenile	Larvae	Egg
Biological/reproductive	Feeding type	Carnivore	X	X			
		Planktivore				X	
		Not known			X		
	Movements	Inshore/offshore migrations	X				
		Not known		X	X	X	X
	Longevity of life stages	1-12 months				X	
		1-5 years			X		
		5-20 years	X	X			
		Not known					X
	Age at maturity	50% female (years)	5-10				
	Fertilization/egg development	External	X				
		Broadcast spawner	X				
	Spawning season	Early fall - late winter					
Habitat	Location	Inner shelf (1-50 meters [m])		X	X	X	
		Middle shelf (50-100 m)		X	X	X	X
		Outer shelf (100-200 m)	X	X	X	X	X
		Upper slope (200-1,000 m)	X	X			
		Lower slope (>1,000 m)	X				
		Depths of high availability (winter) (of fishable stock)[1]	300-500 m (Bering Sea and Aleutian Islands [BSAI]) 200+ m (Gulf of Alaska [GOA])				
		Depths of high availability (summer) (of fishable stock)[1]	80-400 m (BSAI) 50-200 m (GOA)				
		Bottom depths of common occurrence (of fishable stock)[1]	50-350 m (BSAI) 30-300 m (GOA)				
	Substrate	Mud/clay/silt	X	X			
		Sand/granule	X	X			
		Not applicable			X	X	
	Pelagic domain	Pelagic				X	
		Semi-demersal/semi-pelagic	X	X			X
		Demersal	X	X			X
		Not known			X		

Source: NPFMC 1999b.
[1]NPFMC 2002a and 2002b; Table 20 and Table 57, respectively.

Table 3.5-19. Being Sea and Aleutian Islands Greenland turbot past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality	• Foreign groundfish fisheries (1954-1976). • Marine pollution and oil spills.	• Foreign fisheries (1976-1985). • Joint venture (JV) fisheries (1968-1990). • Domestic fisheries (1968-present). • Marine pollution and oil spills.	• Bilateral agreement with Japan and Soviet Union (USSR) (1973). • Industry self-imposed actions. • International laws regarding marine pollutants. • End of Russian Flounder Fishery (political 1973). • Greenland turbot restrictions • Clean Water Act. • Oil Pollution Act (OPA) 90.	• Annual acceptable biological catch (ABC)/total allowable catch (TAC) limits. • Prohibited species catch (PSC) limits (crab and halibut). • Bering Sea and Aleutian Islands (BSAI) Fishery Management Plan (FMP) Amendments 1, 4, 12, 14, 15, and 28 – established harvest quotas and allocations. • BSAI FMP Amendments 9, 11a, 12, 13, 27, and 37 – addressed domestic and foreign observer programs. • BSAI FMP Amendments 15, 16, 23, 39, 44, and 59 – set limits, slowed rate of catch, defined overfishing level (OFL). • BSAI FMP Amendments16 and 24 – TAC allocations, reduce bycatch, address ghost fishing. • Separation of Greenland turbot/Arrowtooth flounder species complex (1986). • 1984 restrictions on the fishery. • 1992 TAC set at 7,000 metric tons per year. • PSC limits (halibut).
Change in reproductive success	• Foreign groundfish fisheries (1954-1976) spatial/temporal concentration. • Climate changes and regime shifts.	• Foreign, JV, and domestic (post-Magnuson-Stevens Act [MSA]) groundfish fisheries spatial/temporal concentration.	• Industry self imposed actions – gear modifications. • Bilateral agreement with Japan and USSR (1973). • 1977 BSAI Preliminary FMP – banned bottom trawling in some areas, observers in foreign fisheries. • Southeast Bering Sea wintertime halibut closures (pre-MSA).	• Annual ABC/TAC limits. • Foreign and domestic observer programs. • No PSC allocations for trawl fishery (1998).
Change in prey availability	• Foreign groundfish fishery (1954-1976) prey species bycatch. • Climate changes and regime shifts. • Marine pollution and oil spills. • Introduction of exotic species.	• Foreign, JV, and domestic groundfish fisheries (post-MSA) prey species bycatch. • Marine pollution and oil spills. • Introduction of exotic species.	• Industry self imposed actions – gear modifications. • International laws regarding marine pollutants. • Clean Water Act. • OPA 90.	• BSAI Amendment 36 - protection of forage fish. • Annual ABC/TAC limits for pollock. • BSAI FMP Amendments regulating pollock catch.

Table 3.5-19 (cont.). Being Sea and Aleutian Islands Greenland turbot past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Change in important habitat	• Foreign groundfish fishery (pre-MSA) gear impacts. • Climate changes and regime shifts. • Marine pollution and oil spills. • Introduction of exotic species.	• Foreign, JV and domestic fisheries (post-MSA) gear impacts. • Marine pollution and oil spills. • Introduction of exotic species.	• Bilateral agreement with Japan and USSR (1973). • 1977 BSAI Preliminary FMP – banned bottom trawling in some areas. • Industry self-imposed modifications – gear restrictions. • Clean Water Act. • OPA 90.	• BSAI FMP Amendment 9 – defined habitat requirements. • BSAI FMP Amendments 13, 15, and 46 – decrease in bottom trawls. • BSAI FMP Amendment 55 – protection for essential fish habitat and habitat area of particular concern.
Comparative baseline: • The BSAI Greenland turbot stock is not overfished. • The BSAI Greenland turbot stock is above target biomass. • The BSAI Greenland turbot stock is decreasing in stock size. • The BSAI Greenland turbot fishery is restricted by PSC limits for halibut. • Management takes into account all bycatch when setting annual harvest levels.				

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.5-20 Biological and reproductive attributes of selected flatfish in the Bering Sea and Aleutian Islands and Gulf of Alaska.

Life stage/activity			Rex sole				Alaska plaice				Dover sole				
			Egg	Larvae	Juvenile	Adult	Egg	Larvae	Juvenile	Adult	Egg	Larvae	Early juvenile	Late juvenile	Adult
Biological/reproductive attributes	**Feeding type**	Carnivore			X	X			X	X			X	X	X
		Planktivore		X				X				X			
	Movements	Drift with ocean						X				X			
		Not known	X	X	X	X	X		X	X	X				
	Longevity of life stages	1-12 months						X				X			
		1-5 years			X	X							X	X	
		5-20 years							X	X					X
		Not known	X	X			X				X				
	Age at maturity	50% female (years)	33[a]				6-7				24[a]				
		50% male (years)	16[a]												
	Fertilization/egg development	External	X				X				X				
	Spawning season		Late winter - early summer				Early spring				Early winter - late spring				

Source: NPFMC 1999b.
[a]Source: NPFMC 2002a and 2002b; Table 20 and Table 57, respectively.

Table 3.5-21. Bering Sea and Aleutian Islands Alaska plaice and the other flatfish assemblage past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality	• Foreign groundfish fisheries (1954-1976). • Marine pollution and oil spills.	• Foreign Fisheries post-Magnuson-Stevens Act (MSA) (1976-1985). • Joint venture (JV) fisheries (1988-1991). • Domestic fisheries (1988-present). • Marine pollution and oil spills.	• Bilateral agreement with Japan and Soviet Union (USSR) (1973). • Industry self-imposed actions. • International laws regarding marine pollutants. • End of Russian Flounder Fishery (political 1973). • Clean Water Act. • Oil Pollution Act (OPA) 90.	• Annual acceptable biological catch (ABC)/total allowable catch (TAC) limits. • Prohibited species catch (PSC) limits (crab and halibut). • Bering Sea and Aleutian Islands (BSAI) Fishery Management Plan (FMP) Amendments 9, 11a, 12, 13, 27, and 37 – addressed domestic and foreign observer programs. • BSAI FMP Amendments16 and 24 – TAC allocations, reduce bycatch, address ghost fishing. • PSC limits crab and halibut. • 1989 – rock sole separated out of assemblage. • 1995 – flathead sole separated from assemblage. • PSC limits (halibut).
Change in reproductive success	• Foreign groundfish fisheries (1954-1976) spatial/temporal concentration. • Climate changes and regime shifts.	• Foreign, JV, and domestic groundfish fisheries (post-MSA) spatial/temporal concentration.	• Industry self imposed actions – gear modifications. • Bilateral agreement with Japan and USSR (1973). • 1977 BSAI Preliminary FMP – banned bottom trawling in some areas, observers in foreign fisheries.	• Annual ABC/TAC limits. • Foreign and domestic observer programs.
Change in prey availability	• Foreign groundfish fisheries (1954-1976) prey species bycatch. • Climate change or regime shifts (1988/89-present). • Marine pollution and oil spills. • Introduction of exotic species.	• Foreign, JV, and domestic groundfish fisheries (post-MSA) prey species bycatch. • Marine pollution and oil spills. • Introduction of exotic species.	• Clean Water Act. • OPA 90. • International laws regarding marine pollutants.	

Table 3.5-21 (cont.). Bering Sea and Aleutian Islands Alaska plaice and the other flatfish assemblage past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Change in important habitat	• Foreign groundfish fisheries (post-MSA) gear impacts. • Climate change or regime shifts (1988/89-present). • Marine pollution and oil spills. • Introduction of exotic species.	• Foreign, JV, and domestic groundfish fisheries gear impacts. • Marine pollution and oil spills. • Introduction of exotic species.	• Bilateral agreement with Japan and USSR (1973). • 1977 BSAI Preliminary FMP – banned bottom trawling in some areas. • Industry self-imposed modifications – gear restrictions. • Clean Water Act. • International laws regarding marine pollutants. • OPA 90.	• BSAI FMP Amendment 9 – defined habitat requirements. • BSAI FMP Amendments 13, 15, and 46 – decrease in bottom trawls. • BSAI FMP Amendments 55 – protection for essential fish habitat and habitat area of particular concern.
Comparative baseline: • The BSAI other flatfish assemblage stock is not overfished. • The BSAI other flatfish assemblage stock is above target biomass. • The BSAI other flatfish assemblage stock is declining in size. • The other flatfish assemblage stock is restricted by PSC limits for halibut.				

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.5-22. Biological and reproductive attributes and habitat associations of Pacific ocean perch in the Bering Sea and Aleutian Islands and Gulf of Alaska[1].

Life stage/activity			Adult	Juvenile	Larvae
Biological/reproductive attributes	**Feeding type**	Carnivore	X	X	
		Planktivore			X
	Movements	Inshore/offshore migrations	X	X	
		Not known		X	X
	Social behavior	Schooling	X		
		Not known		X	X
	Longevity of life stages	1-12 months			X
		5-20 years		X	
		>50 years	X		
	Age at maturity	Female age at maturity (years)	10.5		
	Fertilization/egg development	External	X		
		Viviparous	X		
	Spawning season	Late fall - early winter			
Habitat associations	**Location**	Inner shelf (1-50 meters [m])		X	X
		Middle shelf (50-100 m)		X	X
		Outer shelf (100-200 m)	X	X	X
		Upper slope (200-1,000 m)	X	X	X
		Lower slope (>1,000 m)			X
		Basin (>3,000 m)			X
		Depths of high availability (winter) (of fishable stock)[1]	150-250 m		
		Depths of high availability (summer) (of fishable stock)[1]	80-200 m		
		Bottom depths of common occurrence (of fishable stock)[1]	50-250 m		
	Substrate	Gravel	X	X	
		Pebble	X	X	
		Cobble	X	X	
		Boulder		X	
		Bedrock		X	
		Not applicable			X
	Pelagic domain	Pelagic		X	X
		Semi-demersal/semi-pelagic		X	X
		Demersal	X	X	
	Oceanography	Upwelling zone	X	X	X

Source: NPFMC 1999b.
[1]NPFMC 2002a and 2002b; Table 20 and Table 57, respectively.

Table 3.5-23. Bering Sea and Aleutian Islands Pacific ocean perch past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality	Foreign groundfish fisheries (1960-1976). Marine pollution and oil spills.	Foreign Fisheries post-Magnuson-Stevens Act (MSA) (1976-1990). Joint venture (JV) fisheries (1980-1990). Domestic fisheries (1982-present). Marine pollution and oil spills.	Bilateral agreement with Japan and Soviet Union (USSR) (1973). Industry self-imposed actions. International laws regarding marine pollutants. Clean Water Act. Oil Pollution Act (OPA) 90.	Annual acceptable biological catch (ABC)/total allowable catch (TAC) limits. Prohibited species catch (PSC) limits (crab and halibut). Bering Sea and Aleutian Islands (BSAI) Fishery Management Plan (FMP) Amendments 9, 11a, 12, 13, 27, and 37 – addressed domestic and foreign observer programs. BSAI FMP Amendments16 and 24 – TAC allocations, reduce bycatch, address ghost fishing. Division of rockfish complex. Division of Aleutian Islands TAC. Assessment of BSAI as single stock 2001.
Change in reproductive success	Foreign groundfish fisheries (1960-1976) spatial/temporal concentration. Climate changes and regime shifts.	Foreign, JV, and domestic (post-MSA) groundfish fisheries spatial/temporal concentration.	Industry self imposed actions – gear modifications. Bilateral agreement with Japan and USSR (1973). 1977 BSAI Preliminary FMP – banned bottom trawling in some areas, observers in foreign fisheries.	Annual ABC/TAC limits. Foreign and domestic observer programs.
Change in prey availability	Commercial whaling. Climate change or regime shifts (1988/89-present). Marine pollution and oil spills. Introduction of exotic species.	Marine pollution and oil spills. Introduction of exotic species.	Clean Water Act. OPA 90. International laws regarding marine pollutants. Marine Mammal Protection Act (MMPA) of 1972. International Whaling Commission (IWC) ban on commercial whaling.	

Table 3.5-23 (cont.). Bering Sea and Aleutian Islands Pacific ocean perch past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Change in important habitat	Foreign groundfish fishery (post-MSA) gear impacts. Marine pollution and oil spills. Introduction of exotic species. Climate change or regime shifts (1988/89-present).	Foreign, JV, and domestic (post-MSA) groundfish fisheries gear impacts. Marine pollution and oil spills. Introduction of exotic species.	Bilateral agreement with Japan and USSR (1973). 1977 BSAI Preliminary FMP – banned bottom trawling in some areas. Industry self-imposed modifications – gear restrictions. Clean Water Act. OPA 90. International laws regarding marine pollutants.	BSAI FMP Amendment 9 – defined habitat requirements. BSAI FMP Amendments 13, 15, and 46 – decrease in bottom trawls. BSAI FMP Amendment 55 – protection for essential fish habitat and habitat area of particular concern.
Comparative baseline: • The BSAI Pacific ocean perch stock is not overfished. • The BSAI Pacific ocean perch stock is below target biomass. • The BSAI Pacific ocean perch stock is at a stable size. • Management takes into account all bycatch when setting annual harvest levels.				

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.5-24. Common and scientific names of rockfish in the Bering Sea and Aleutian Islands and Gulf of Alaska, separated by management group.

Common name	Scientific name	Management group	
		Bering Sea and Aleutian Islands[1]	Gulf of Alaska[2]
aurora rockfish	*Sebastes aurora*	Other rockfish	Slope rockfish
black rockfish	*Sebastes melanops*	Other rockfish	--
blackgill rockfish	*Sebastes melanostomus*	Other rockfish	Slope rockfish
blue rockfish	*Sebastes mystinus*	Other rockfish	--
Boccaccio	*Sebastes paucispinis*	Other rockfish	Slope rockfish
canary rockfish	*Sebastes pinniger*	Other rockfish	Demersal shelf rockfish
chillipepper rockfish	*Sebastes goodei*	Other rockfish	Slope rockfish
China rockfish	*Sebastes nebulosus*	--	Demersal shelf rockfish
copper rockfish	*Sebastes caurinus*	Other rockfish	Demersal shelf rockfish
dark blotched rockfish	*Sebastes crameri*	Other rockfish	Slope rockfish
dusky rockfish	*Sebastes ciliatus*	Other rockfish	Pelagic shelf rockfish
greenstripped rockfish	*Sebastes elongatus*	Other rockfish	Slope rockfish
harlequin rockfish	*Sebastes variegatus*	Other rockfish	Slope rockfish
longspine thornyhead	*Sebastolobus altivelis*	Other rockfish	--
northern rockfish	*Sebastes polyspinis*	Northern rockfish	Slope rockfish
Pacific ocean perch	*Sebastes alutus*	Pacific ocean perch	Slope rockfish
pygmy rockfish	*Sebastes wilsoni*	Other rockfish	Slope rockfish
quillback rockfish	*Sebastes maliger*	--	Demersal shelf rockfish
redbanded rockfish	*Sebastes babcocki*	Other rockfish	Slope rockfish
redstripe rockfish	*Sebastes proriger*	Other rockfish	Slope rockfish
rosethorn rockfish	*Sebastes helvomaculatus*	Other rockfish	Demersal shelf rockfish
rougheye rockfish	*Sebastes aleutianus*	Shortraker/rougheye rockfish	Slope rockfish
sharpchin rockfish	*Sebastes zacentrus*	Other rockfish	Slope rockfish
shortbelly rockfish	*Sebastes jordani*	--	Slope rockfish
shortraker rockfish	*Sebastes borealis*	Shortraker/rougheye rockfish	Slope rockfish
shortspine thornyhead	*Sebastolobus alascanus*	Other rockfish	Thornyhead rockfish
silvergrey rockfish	*Sebastes brevispinis*	Other rockfish	Slope rockfish
splitnose rockfish	*Sebastes diploproa*	Other rockfish	Slope rockfish
stripetail rockfish	*Sebastes saxicola*	Other rockfish	Slope rockfish
tiger rockfish	*Sebastes nigrocinctus*	Other rockfish	Demersal shelf rockfish
vermillion rockfish	*Sebastes miniatus*	Other rockfish	Slope rockfish
widow rockfish	*Sebastes entomelas*	Other rockfish	Pelagic shelf rockfish
yelloweye rockfish	*Sebastes ruberrimus*	Other rockfish	Demersal shelf rockfish
yellowmouth rockfish	*Sebastes reedi*	Other rockfish	Slope rockfish
yellowtail rockfish	*Sebastes flavidus*	Other rockfish	Pelagic shelf rockfish

Notes: [1]BSAI management groups: Pacific ocean perch (see Section 3.4.1.11); northern rockfish, shortraker/rougheye rockfish; other rockfish.
[2]GOA management groups: Slope rockfish (see Section 3.4.1.11); Pelagic shelf rockfish; Demersal shelf rockfish; Thornyhead rockfish (see Section 3.4.1.12).
Source: NPFMC 2001a and NPFMC 2001b.

Table 3.5-25. Bering Sea and Aleutian Islands northern, shortraker, and rougheye rockfish and the other rockfish assemblage past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality	• Foreign groundfish fisheries (1960-1976). • Marine pollution and oil spills.	• Foreign Fisheries post-Magnuson-Stevens Act (MSA) (1976-1985). • Joint venture (JV) fisheries (1980-1990). • Domestic fisheries (1986-present). • Marine pollution and oil spills.	• Bilateral agreement with Japan and Soviet Union (USSR) (1973). • Industry self-imposed actions. • International laws regarding marine pollutants. • Clean Water Act. • Oil Pollution Act (OPA) 90.	• Annual acceptable biological catch (ABC)/total allowable catch (TAC) limits. • Bering Sea and Aleutian Islands (BSAI) Fishery Management Plan (FMP) Amendments 9, 11a, 12, 13, 27, and . domestic and foreign observer programs. • BSAI FMP Amendments16 and 24 – TAC allocations, reduce bycatch, address ghost fishing. • 1991 division of Pacific ocean perch (POP) complex. • 2000 division of Bering Sea (BS) other red rockfish. • 2002 TAC recommendation. • 2003 separation of shortraker and rougheye rockfish from other red rockfish complex. • 2003 separation of northern rockfish from other red rockfish complex.
Change in reproductive success	• Foreign groundfish fisheries (1960-1976) spatial/temporal concentration. • Climate changes and regime shifts.		• Industry self imposed actions – gear modifications. • Bilateral agreement with Japan and USSR (1973). • 1977 BSAI Preliminary FMP – banned bottom trawling in some areas, observers in foreign fisheries.	• Annual ABC/TAC limits. • Foreign and domestic observer programs.
Change in prey availability	• State of Alaska shrimp fisheries. • Climate changes and regime shifts. • Introduction of exotic species. • Marine pollution and oil spills.	• Introduction of exotic species. • Marine pollution and oil spills.	• Industry self imposed actions – gear modifications. • Clean Water Act. • OPA 90. • International laws regarding marine pollutants.	

Table 3.5-25 (cont.). Bering Sea and Aleutian Islands northern, shortraker, and rougheye rockfish and the other rockfish assemblage past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Change in important habitat	• Climate changes and regime shifts. • Introduction of exotic species. • Marine pollution and oil spills.	• Introduction of exotic species. • Marine pollution and oil spills.	• Bilateral agreement with Japan and USSR (1973). • 1977 BSAI Preliminary FMP – banned bottom trawling in some areas. • Industry self-imposed modifications – gear restrictions. • Clean Water Act. • International laws regarding marine pollutants. • OPA 90.	• BSAI FMP Amendment 9 – defined habitat requirements. • BSAI FMP Amendments 13, 15, and 46 – decrease in bottom trawls. • BSAI FMP Amendment 55 – protection for essential fish habitat and habitat area of particular concern.
Comparative baseline: • BSAI northern rockfish are not overfished or approaching an overfished condition. • It is not possible to determine whether the BSAI shortraker and rougheye rockfish are overfished. • It is not possible to determine whether the BSAI other rockfish complex is overfished, however it is a bycatch-only fishery • Management takes into account all bycatch when setting annual harvest levels				

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.5-26. Biological and reproductive attributes and habitat associations of thornyhead rockfish in the Bering Sea and Aleutian Islands and Gulf of Alaska.

Life stage/activity			Adult	Juvenile	Larvae	Egg
Biological/reproductive attrib.	**Feeding type**	Carnivore	X	X		
		Not known			X	X
	Longevity of life stages	1-12 months			X	
		Not known	X	X		X
	Age at maturity	50% female (years)	12			
	Fertilization/egg development	Batch spawner	X			
	Spawning season	Late winter - early spring				
Habitat associations	**Location**	Middle shelf (50-100 m)	X	X		
		Outer shelf (100-200 m)	X	X		
		Upper slope (200-1,000 m)	X	X		
		Lower slope (>1,000 m)	X			
		Not known			X	X
	Substrate	Mud/clay/silt	X	X		
		Sand/granule	X	X		
		Gravel	X	X		
		Pebble	X	X		
		Cobble	X	X		
		Boulder	X	X		
		Bedrock	X	X		
	Pelagic domain	Pelagic			X	X
		Demersal	X	X		

Source: NPFMC 1999b.

Table 3.5-27. Biological and reproductive attributes and habitat associations of selected rockfish species in the Bering Sea and Aleutian Islands and Gulf of Alaska.

Life stage/activity			Yelloweye rockfish			Dusky rockfish			Northern rockfish			Shortraker/ rougheye rockfish		
			Larvae	Juvenile	Adult	Larvae	Juvenile	Adult	Larvae	Juvenile	Adult	Larvae	Juvenile	Adult
Biological/reproductive attributes	**Feeding type**	Carnivore			X			X					X	X
		Planktivore	X								X			
		Not known		X		X	X		X	X		X		
	Social Behavior	Solitary		X	X									
		Schooling									X			
		Not known	X			X	X	X	X	X		X	X	X
	Longevity of life stages	1-12 months	X											
		5-20 years		X						X				
		20-50 years						X						
		>50 years			X						X			X
		Not known				X	X		X			X	X	
	Age at maturity	50% female (years)	22						12.8			20		
		50% male (years)	22									20		
	Fertilization/egg development	Internal	X			X			X			X		
		Viviparous	X			X			X			X		
	Spawning season		Late spring - early summer			Late spring - early			Late spring - early			Late spring - early summer		
Habitat associations	**Location**	Inner shelf (1-50 meters [m])					X			X				
		Middle shelf (50-100 m)		X	X		X			X			X	
		Outer shelf (100-200 m)		X	X		X	X		X	X		X	X
		Upper slope (200-1000 m)		X	X			X			X			X
		Bay/estuaries		X	X									
		Island pass		X	X									
		Not known	X						X			X		
	Substrate	Mud/clay/silt												X
		Sand/granule												X
		Gravel	X	X	X		X	X						X
		Pebble												X
		Cobble	X	X	X		X	X		X	X			X
		Boulder			X		X	X		X	X			X
		Not applicable				X			X			X		
	Pelagic domain	Pelagic				X			X					
		Semi-demersal/semi-pelagic						X		X	X			
		Demersal	X	X	X									X
		Not known					X					X	X	

Source: NPFMC 1999b.

Table 3.5-28. Status and catch specifications (metric tons) of target species in the Gulf of Alaska in recent years.

Target Species	Area	Year	Biomass[1]	Overfishing level (OFL)[2]	Acceptable biological catch (ABC)[2]	Total allowable catch (TAC)	Catch[3]
Pollock	Gulf of Alaska (GOA)	2002	755,310	9,2780	58,250	58,250	50,390
		2003	727,830	86,710	54,350	54,350	49,300
		2004	769,420	99,750	71,260	NA	NA
	West GOA/Central GOA/West Yakutat District	2002	726,600	84,090	47,890	47,890	50,710
		2003	699,120	78,020	47,950	47,950	49,300
		2004	740,440	91,060	64,740	NA	NA
	East Yakutat District/South east GOA	2002	28,710	8,610	6,460	6,460	17
		2003	28,710	8,610	6,460	6,460	0
		2004	28,980	8,690	6,520	NA	NA
Pacific cod	GOA	2002	468,000	72,100	57,600	44,230	44,730
		2003	428,000	70,100	52,800	40,540	52,270
		2004	484,000	102,000	62,810	NA	NA
Sablefish	GOA	2002	188,000	19,350	12,820	12,820	12,246
		2003	182,000	20,020	14,890	14,890	13,995
		2004	179,000	22,160	16,550	NA	NA
Atka mackerel	GOA	2002	NA	6,200	600	600	84
		2003	NA	6,200	600	600	565
		2004	NA	6,200	600	NA	NA
Shallow water flatfish	GOA	2002	349,990	61,810	49,550	NA	6,200
		2003	349,990	61,810	49,340	21,620	4,470
		2004	375,950	63,840	52,070	NA	NA
Flathead sole	GOA	2002	290,590	29,530	22,690	9,280	2,150
		2003	291,420	51,560	41,390	11,150	2,220
		2004	292,670	64,750	51,720	NA	NA
Arrowtooth flounder	GOA	2002	1,760,000	171,060	146,260	38,000	21,230
		2003	1,813,980	181,390	155,140	38,000	28,620
		2004	2,453,390	228,130	194,930	NA	NA

Table 3.5-28 (cont.). Status and catch specifications (metric tons [mt]) of target species in the Gulf of Alaska in recent years.

Target Species	Area	Year	Biomass[1]	Overfishing level (OFL)[2]	Acceptable biological catch (ABC)[2]	Total allowable catch (TAC)	Catch[3]
Deepwater flatfish	GOA	2002	68,260	6,430	4,880	NA	550
		2003	68,260	6,430	4,880	4,880	930
		2004	99,620	8,010	6,070	NA	NA
Rex sole	GOA	2002	71,330	12,320	9,470	NA	2,940
		2003	71,330	12,320	9,470	9,470	3,330
		2004	99,950	16,480	12,650	NA	NA
Pacific ocean perch	GOA	2002	293,240	15,670	13,190	13,190	11,729
		2003	298,820	16,240	13,660	13,660	10,745
		2004	266,960	15,840	13,340	NA	NA
Thornyhead rockfish	GOA	2002	77,840	2,330	1,990	1,990	1,125
		2003	75,896	3,050	2,000	2,000	1,185
		2004	86,200	2,590	1,940	NA	NA
Northern rockfish	GOA	2002	94,350	5,910	4,980	4,980	3,334
		2003	108,830	6,560	5,530	5,530	5,301
		2004	95,150	5,790	4,870	4,870	NA
Shortraker and rougheye rockfish	GOA	2002	66,830	2,340	1,620	1,620	1,291
		2003	66,830	2,340	1,620	1,620	1,560
		2004	73,000	2,510	1,760	1,760	NA
Other slope rockfish	GOA	2002	107,960	6,610	5,040	990	774
		2003	107,960	6,610	5,040	990	1,072
		2004	89,460	5,150	3,900	NA	NA
Pelagic shelf rockfish	GOA	2002	62,489	8,220	5,490	5,490	3,318
		2003	62,489	8,220	5,490	5,490	2,975
		2004	57,412	5,570	4,470	NA	NA
Demersal shelf rockfish	GOA	2002	15,615	480	350	350	292
		2003	17,510	540	390	390	229
		2004	20,168	690	450	NA	NA

Notes: NA - data not available
[1]Biomass for each year corresponds to the projection given in the GOA SAFE report issued in the preceding year.
[2]The overfishing level and acceptable biological catch for 2004 are those recommended by the Plan Team.
[3]Current through November 2003.
Source: NPFMC 2003b.

Table 3.5-29. Gulf of Alaska pollock past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality	• Foreign pollock fishery (1964-1976). • State shrimp fishery pollock bycatch/bait fishery. • State of Alaska Prince William Sound (PWS) directed pollock fishery. • State of Alaska crab bait fishery. • International Pacific Halibut Commission (IPHC) halibut bait fishery. • Exxon Valdez oil spill.	• Foreign pollock fisheries post-Magnuson-Stevens Act (MSA) (1976-1985). • Joint venture (JV) pollock fishery (1979-1991). • Domestic pollock fishery (1976-present). • Marine pollution and oil spills.	• Bilateral agreement with Japan and Soviet Union (USSR) (1973): Self-monitoring of foreign fishery in eastern Bering Sea (EBS) and pollock catch limits. • Preliminary Fishery Management Plans (FMPs) - banned bottom trawling in pollock spawning grounds, established observers in foreign fisheries. • Industry self-imposed actions; catch restrictions. • International, federal and state laws regarding marine pollutants. • Oil Pollution Act (OPA) 90. • Clean Water Act.	• Annual total allowable catch (TAC)/acceptable biological catch (ABC) limits. • Gulf of Alaska (GOA) FMP Amendments 8 and 21 – address ghost fishing. • GOA FMP Amendments 18 and 30 – established domestic observers. • GOA FMP Amendment 11 – increase pollock optimum yield (OY) and eliminate bait fishery. • GOA FMP Amendment 19 – prohibited pollock roe stripping. • GOA FMP Amendment 23 – final phase-out of foreign and JV pollock fisheries. • GOA FMP Amendment 25 – Steller sea lion buffer zones, reduce pollock fishing mortality. • 1993 Steller sea lion buffer zone extension reduce pollock fishing mortality. • GOA FMP Amendment 45 – subdivided pollock areas, reduce fishing mortality. • 1999 Steller sea lion buffer zone extension reduce pollock fishing mortality.
Change in reproductive success	• Foreign pollock fisheries pre-MSA (1964-1976). • Commercial whaling and seal harvests. • Climate changes and regime shifts.	• Foreign, JV, and domestic pollock fishery (post-MSA) spatial temporal concentration of pollock catch. • Foreign, JV, and domestic pollock fishery (post-MSA) fisheries selectivity of juveniles. • Foreign, JV, and domestic pollock fishery (post-MSA) roe stripping.	• Bilateral agreement with Japan and USSR (1973); catch restrictions on Pacific ocean perch indirectly benefit pollock recruitment. • International Whaling Commission (IWC) ban on commercial whaling. • Marine Mammal Protection Act (MMPA) of 1972. • Preliminary FMPs - established observers in foreign fisheries; banned bottom trawling in pollock spawning habitat. • Industry self-imposed actions; gear modifications, catch restrictions.	• GOA FMP Amendment 18 – established the Shelikof Strait area as a management district containing spawning populations and Observer Program. • GOA FMP Amendment 19 – prohibited roe stripping. • GOA FMP Amendments 10, 32, and 38 – Pacific ocean perch (POP) closures and rebuilding plans; indirectly positively affect pollock recruitment. • GOA FMP Amendment 45 – subdivided pollock areas, reduce spatial concentration of fishery.
Change in prey availability	• Foreign groundfish fishery pre-MSA catch/bycatch of forage fish. • Foreign Pacific ocean Perch (POP) fisheries. • Exxon Valdez oil spill. • Climate change or regime shifts (1988/89-present). • Introduction of exotic species.	• Foreign groundfish fishery post-MSA bycatch of prey species. • JV groundfish fishery bycatch of prey species. • Domestic groundfish fishery bycatch of prey species. • Foreign, JV, and domestic POP fisheries (post-MSA). • Marine pollution and oil spills.	• Industry self-imposed actions; catch restrictions. • International, federal, and state laws regarding marine pollutants. • OPA 90. • Clean Water Act.	• GOA FMP Amendment 18 – established the Shelikof Strait area as a management district containing spawning populations and Observer Program. • GOA FMP Amendment 39 – afforded protection for forage fish

Table 3.5-29 (cont.). Gulf of Alaska pollock past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Change in important habitat	• Foreign fishery bottom trawling (pre-MSA). • Exxon Valdez oil spill. • Climate change or regime shifts (1988/89-present). • Introduction of exotic species.	• Foreign, JV, and domestic fisheries bottom trawling (post-MSA). • Introduction of exotic species. • Marine pollution and oil spills.	• International Laws regarding marine pollutants. • OPA 90. • Clean Water Act. • Industry self-imposed actions; gear modifications.	• GOA FMP Amendments 3 and 20 – decrease bottom trawls and provided for habitat protection. • GOA FMP Amendments 14, 55, and 65 – established habitat protection. • GOA FMP Amendment 15 – Kodiak trawl closures, provide habitat protection. • GOA FMP Amendment 18 – established the Shelikof Strait area as a management district containing spawning populations and Observer Program. • GOA FMP Amendment 23 – banned bottom trawling, protect habitat. • GOA FMP Amendment 25 – Steller sea lion buffer zones. • Steller sea lion conservation areas indirectly protected habitat.
Comparative baseline: • The GOA stock is at an all-time low and is projected to decline. • Recent year classes appear to be weak. • Spawner biomass is expected to decline. • Management takes into account all catch and bycatch when setting annual harvest levels.				

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.5-30. Gulf of Alaska Pacific cod past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality	• Subsistence and personal use. • Foreign fisheries (1962-1976). • State of Alaska groundfish fisheries. • State of Alaska crab fisheries. • Marine pollutants and oil spills.	• Foreign groundfish fisheries (1976-1985). • Domestic groundfish fisheries (1867-present). • Joint venture (JV) groundfish fisheries (1978-1988). • Marine pollutants and oil spills.	• Bilateral agreement with Japan and Soviet Union (USSR) (1973). • Industry self-imposed actions. • International laws regarding marine pollutants. • Oil Pollution Act (OPA) 90. • Clean Water Act.	• Annual acceptable biological catch (ABC)/total allowable catch (TAC) limits. • Foreign and domestic observer programs. • Gulf of Alaska (GOA) Fishery Management Plan (FMP) Amendment 11 – eliminate bait fishery. • GOA FMP Amendment 21 – TAC setting. • GOA FMP Amendment 4, 8, and 22 – regulatory districts. • GOA FMP Amendments 8 and 21 address ghost fishing. • GOA FMP Amendment 25 – Steller sea lion buffer zones, reduce Pacific cod (P. Cod) fishing mortality. • 1993 Steller sea lion buffer zone extension reduce P. cod fishing mortality. • 1999 Steller sea lion buffer zone extension reduce P. cod fishing mortality.
Change in reproductive success	• Foreign groundfish fisheries (pre-Magnuson-Stevens Act [MSA]) fishery selectivity. • State of Alaska groundfish fisheries fishery selectivity. • Climate changes and regime shifts.	• Foreign, JV, and domestic groundfish fisheries (post-MSA) fishery selectivity. • Foreign, JV, and domestic groundfish fisheries (post-MSA) spatial/temporal concentration of catch.	• Industry self imposed actions – gear modifications. • Bilateral agreement with Japan and USSR (1973). • Preliminary FMPs – banned bottom trawling in some areas, observers in foreign fisheries.	• GOA FMP Amendment 49 – Improved retention/improved utilization (IR/IU) program.

Table 3.5-30 (cont.). Gulf of Alaska Pacific cod past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Change in prey availability	• Foreign groundfish fishery pre-MSA catch/bycatch of prey species. • Marine pollution and oil spills. • Introduction of exotic species. • Climate change or regime shifts (1988/89-present).	• Foreign, JV, and domestic fisheries (post-MSA) prey species bycatch. • Domestic pollock fishery - Pollock is an important prey item for adult P. cod. • Introduction of exotic species. • Marine pollution and oil spills.	• Industry self-imposed actions; catch restrictions. • International Laws regarding marine pollutants. • OPA 90. • Clean Water Act.	• GOA FMP Amendment 39 – afforded protection for forage fish.
Change in important habitat	• Foreign groundfish fishery (pre-MSA) gear impacts. • Marine pollutants and oil spills. • Introduction of exotic species. • Climate change or regime shifts (1988/89-present).	• Foreign, JV, and domestic fisheries (post-MSA) gear impacts. • Marine pollutants and oil spills. • Introduction of exotic species.	• International laws regarding marine pollutants. • OPA 90. • Clean Water Act. • Industry self-imposed actions; gear modifications.	• GOA FMP Amendments 3 and 20 – decrease bottom trawls and provided for habitat protection. • GOA FMP Amendments 14, 55, and 65 – established habitat protection. • GOA FMP Amendment 15 – Kodiak trawl closures, provide habitat protection. • GOA FMP Amendment 23 – banned bottom trawling, protect habitat. • Steller sea lion conservation areas indirectly protected habitat. • GOA FMP Amendment 55/56 – essential fish habitat and habitat area of particular concern protection.
Comparative baseline: • The Gulf of Alaska Pacific cod stock is not overfished. • Stock is below target biomass. • Stock is decreasing in abundance. • Management takes into account all catch and bycatch when setting annual harvest levels.				

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.5-31. Gulf of Alaska Atka mackerel past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality	• Foreign fisheries (1973-1976). • Marine pollution and oil spills.	• Foreign fisheries post-Magnuson-Stevens Act (MSA) (1976-1986). • Joint venture (JV) fisheries (1979-1985). • Domestic fisheries (1979-present). • Marine pollution and oil spills.	• Bilateral agreement with Japan and Soviet Union (USSR) (1973). • Industry self-imposed actions. • International laws regarding marine pollutants. • Oil Pollution Act (OPA) 90. • Clean Water Act.	• Annual acceptable biological catch (ABC)/total allowable catch (TAC) limits. • Foreign and domestic observer programs. • Gulf of Alaska (GOA) Fishery Management Plan (FMP) Amendment 16 – combined A.M. with other species. • GOA FMP Amendment 31 – established Atka mackerel as a target species. • GOA FMP Amendment 44 – overfishing level (OFL) definition established as bycatch only. • GOA FMP Amendments 8 and 21 – address ghost fishing. • GOA FMP Amendment 25 – Steller sea lion buffer zones, reduce Atka Mackerel fishing mortality. • 1993 Steller sea lion buffer zone extension. • 1999 Steller sea lion buffer zone extension. • GOA FMP Amendment 70 – Steller sea lion 2002 measures.
Change in reproductive success	• Foreign groundfish fisheries (1973-1976) spatial/temporal concentration. • Climate changes and regime shifts.	• Foreign, JV, and domestic (post-MSA) fisheries fishery selectivity. • Foreign, JV, and domestic (post-MSA) fisheries spatial/temporal concentration.	• Industry self imposed actions – gear modifications. • Bilateral agreement with Japan and USSR (1973).	• GOA FMP Amendment 49 – Improved Retention/Improved Utilization (IR/IU) program. • Steller sea lion protection measures - regulations to spatially/temporally disperse fishery. • GOA FMP Amendment 70 – Steller sea lion 2002 measures.
Change in prey availability mostly prey on invertebrates.	• Commercial whaling. • Introduction of exotic species. • Marine pollutants and oil spills. • Climate change or regime shifts (1988/89-present).	• Introduction of exotic species. • Marine pollutants and oil spills.	• International Whaling Commission (IWC) commercial ban of whaling. • Marine Mammal Protection Act (MMPA) of 1972. • International laws regarding marine pollutants. • OPA 90. • Clean Water Act.	

Table 3.5-31 (cont.). Gulf of Alaska Atka mackerel past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Change in important habitat	• Foreign groundfish fishery (pre-MSA) gear impacts. • Marine pollution and oil spills. • Introduction of exotic species. • Climate change or regime shifts (1988/89-present).	• Foreign, JV, and domestic groundfish fisheries (post-MSA) gear impacts. • Marine pollution and oil spills. • Introduction of exotic species.	• Preliminary FMPs – banned bottom trawling in some areas, observers in foreign fisheries. • International laws regarding marine pollutants. • OPA 90. • Clean Water Act. • Industry self-imposed actions; gear modifications.	• GOA FMP Amendments 3 and 20 – decrease bottom trawls and provided for habitat protection. • GOA FMP Amendments 14, 55, and 65 – established habitat protection. • GOA FMP Amendment 15 – trawl closures, provide habitat protection. • GOA FMP Amendment 23 – banned bottom trawling, protect habitat. • Steller sea lion conservation areas indirectly protected habitat. • GOA FMP Amendment 56 – essential fish habitat and habitat area of particular concern protection. • GOA FMP Amendment 70 – Steller sea lion 2002 measures.
Comparative baseline: • The GOA Atka mackerel stock is at a low abundance and low exploitation. • There may be some evidence of localized depletion of the GOA Atka mackerel stock. • The GOA Atka mackerel fishery is a bycatch only fishery. • Management takes into account all bycatch when setting annual harvest levels.				

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.5-32. Gulf of Alaska shallow water flatfish past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality	Foreign groundfish fisheries (1960's-1976). State of Alaska crab fisheries. Marine pollution and oil spills.	Foreign groundfish fisheries (1976-1985). Joint venture (JV) groundfish fisheries (1968-1988). Domestic groundfish fisheries (1968-present). Marine pollution and oil spills.	Bilateral agreement with Japan and Soviet Union (USSR) (1973). Industry self-imposed actions. International laws regarding marine pollutants. Oil Pollution Act (OPA) 90. Clean Water Act.	Annual acceptable biological catch (ABC)/total allowable catch (TAC) limits. Foreign and domestic observer programs. Gulf of Alaska (GOA) Fishery Management Plan (FMP) Amendments 8 and 21 – address ghost fishing. Flatfish assemblage division (1990). Rex sole division (1993). Rock sole species split into northern and southern (1996). Prohibited species catch (PSC) limits (crab and halibut).
Change in reproductive success	Foreign groundfish fisheries (1960s-1976) spatial/temporal distribution of catch/bycatch. Climate changes and regime shifts.	Foreign, JV, and domestic groundfish fisheries (1968-present) spatial/temporal distribution of catch/bycatch.	Industry self imposed actions – gear modifications. Bilateral agreement with Japan and USSR (1973). Preliminary FMPs – banned bottom trawling in some areas, observers in foreign fisheries.	Annual ABC/TAC limits. Foreign and domestic observer programs.
Change in prey availability	Foreign groundfish fisheries (pre-Magnuson-Stevens Act [MSA]) prey bycatch. Marine pollution and oil spills. Introduction of exotic species. Climate changes and regime shifts.	Foreign, JV, and domestic groundfish fisheries (post-MSA) prey bycatch. Introduction of exotic species. Marine pollution and oil spills.	Industry self imposed actions – gear modifications. International laws regarding marine pollutants. OPA 90. Clean Water Act.	PSC Limits for crab.
Change in important habitat	Foreign groundfish fisheries (post-MSA) gear impacts. State of Alaska scallop fishery gear impacts. Marine pollutants and oil spills. Introduction of exotic species. Climate change or regime shifts (1988/89-present).	Foreign, JV, and domestic groundfish fisheries (post-MSA) gear impacts. Marine pollution and oil spills. Introduction of exotic species. Climate changes and regime shifts.	International laws regarding marine pollutants. OPA 90. Clean Water Act. Industry self-imposed actions – gear modifications.	Trawl prohibition (1998) Area east of 140°West. GOA FMP Amendments 3 and 20 – decrease bottom trawls and provided for habitat protection. GOA FMP Amendments 14, 55, and 65 – established habitat protection. GOA FMP Amendment 15 – trawl closures, provide habitat protection. GOA FMP Amendment 23 – banned bottom trawling, protect habitat. GOA FMP Amendment 56 – essential fish habitat and habitat area of particular concern protection.
Comparative baseline: • The shallow water flatfish stock is not overfished. • The shallow water flatfish stock has been lightly to moderately harvested. • The yellowfin sole survey biomass has increased in recent years. • The Northern rock sole survey biomass has decreased in recent years. • The Southern rock sole survey biomass has increased in recent years. • Management takes into account all bycatch when setting annual harvest levels.				

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.5-33. Gulf of Alaska arrowtooth flounder past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality	• Foreign groundfish fisheries (1960's-1976). • International Pacific Halibut Commission (IPHC) halibut longline fishery. • State of Alaska crab fisheries. • Marine pollution and oil spills.	• Foreign Fisheries post-Magnuson-Stevens Act (MSA) (1976-1985). • Joint venture (JV) fisheries (1968-1990). • Domestic fisheries (1968-present). • Marine pollution and oil spills.	• Bilateral agreement with Japan and Soviet Union (USSR) (1973). • Industry self-imposed actions. • International laws regarding marine pollutants. • Oil Pollution Act (OPA) 90. • Clean Water Act.	• Annual acceptable biological catch (ABC)/total allowable catch (TAC) limits. • Foreign and domestic observer programs. • Gulf of Alaska (GOA) Fishery Management Plan (FMP) Amendments 8 and 21 – address ghost fishing. • Flatfish assembly. • Prohibited species catch (PSC) limits (crab and halibut).
Change in reproductive success	• Foreign groundfish fisheries (1960's-1976) spatial/temporal concentration. • Climate changes and regime shifts.	• Foreign, JV, and domestic (post-MSA) groundfish fisheries spatial/temporal concentration.	• Industry self-imposed actions – gear modifications. • Bilateral agreement with Japan and USSR (1973). • Preliminary FMPs – banned bottom trawling in some areas, observers in foreign fisheries. • OPA 90. • Clean Water Act.	• Annual ABC/TAC limits. • Foreign and domestic observer programs.
Change in prey availability	• Foreign groundfish fisheries (1960's-1976) prey species bycatch. • State of Alaska groundfish fisheries prey species bycatch. • State of Alaska herring fisheries catch. • Climate change or regime shifts (1988/89-present). • Marine pollution and oil spills. • Introduction of exotic species.	• Foreign, JV, and domestic (post-MSA) groundfish fisheries prey species bycatch. • Marine pollution and oil spills. • Introduction of exotic species.	• Industry self-imposed actions – gear modifications. • Clean Water Act. • OPA 90.	• GOA FMP Amendment 39 – afforded protection for forage fish. • GOA Amendments regulating pollock catch.

Table 3.5-33 (cont.). Gulf of Alaska arrowtooth flounder past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Change in important habitat	• Foreign groundfish fishery (post-MSA) gear impacts. • Marine pollution and oil spills. • Introduction of exotic species. • Climate change or regime shifts (1988/89-present).	• Foreign, JV, and domestic (post-MSA) groundfish fisheries gear impacts. • Marine pollution and oil spills. • Introduction of exotic species.	• International laws regarding marine pollutants. • OPA 90. • Clean Water Act. • Industry self-imposed actions; gear modifications.	• GOA FMP Amendments 3 and 20 – decrease bottom trawls and provided for habitat protection. • GOA FMP Amendments 14, 55, and 65 – established habitat protection. • GOA FMP Amendment 15 – trawl closures, provide habitat protection. • GOA FMP Amendment 23 – banned bottom trawling, protect habitat. • GOA FMP Amendment 56 essential fish habitat and habitat area of particular concern protection.
Comparative baseline: • The GOA arrowtooth flounder stock is the most abundant groundfish species in the GOA. • The GOA arrowtooth flounder is currently of low economic value and is lightly harvested. • Commercial interest in the GOA arrowtooth flounder stock is growing and is expected to improve retention rates. • Management takes into account all bycatch when setting annual harvest levels.				

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.5-34. Gulf of Alaska deep water flatfish (including Greenland turbot) past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality	• Foreign groundfish fisheries (1960's-1976). • State of Alaska crab bait fisheries. • International Pacific Halibut Commission longline bait fisheries. • Marine pollution and oil spills.	• Foreign Fisheries post-Magnuson-Stevens Act (MSA) (1976-1985). • Joint venture (JV) fisheries (1968-1988). • Domestic fisheries (1968-present). • Marine pollution and oil spills.	• Bilateral agreement with Japan and Soviet Union (USSR) (1973). • Industry self-imposed actions. • International laws regarding marine pollutants. • Oil Pollution Act (OPA) 90. • Clean Water Act.	• Annual acceptable biological catch (ABC)/total allowable catch (TAC) limits. • Foreign and domestic observer program. • Gulf of Alaska (GOA) Fishery Management Plan (FMP) Amendments 8 and 21 – address ghost fishing. • Flatfish assemblage division (1990). • Rex sole division (1993). • Rock sole species split (1996). • Prohibited species catch (PSC) limits (crab and halibut).
Change in reproductive success	• Foreign groundfish fisheries (1960's-1976) spatial/temporal concentration. • Climate changes and regime shifts.	• Foreign, JV, and domestic (post-MSA) groundfish fisheries spatial/temporal concentration.	• Industry self-imposed actions – gear modifications. • Bilateral agreement with Japan and USSR (1973). • Preliminary FMPs – banned bottom trawling in some areas, observers in foreign fisheries.	• Annual ABC/TAC limits. • Foreign and domestic observer programs.
Change in prey availability	• Foreign groundfish fisheries (1960s-1976) prey species bycatch. • Climate changes and regime shifts. • Marine pollution and oil spills. • Introduction of exotic species.	• Foreign, JV, and domestic (post-MSA) groundfish fisheries prey species bycatch. • Marine pollution and oil spills. • Introduction of exotic species.	• Industry self-imposed actions – gear modifications. • International laws regarding marine pollutants. • Clean Water Act. • OPA 90.	• GOA Amendment 39 - protection of forage fish. • Annual ABC/TAC limits for pollock. • GOA FMP Amendments regulating pollock catch.
Change in important habitat	• Foreign groundfish fisheries (post-MSA) gear impacts. • State of Alaska scallop fishery. • Climate changes and regime shifts. • Marine pollution and oil spills. • Introduction of exotic species.	• Foreign, JV, and domestic (post-MSA) groundfish fisheries gear impacts. • Marine pollution and oil spills. • Introduction of exotic species.	• International laws regarding marine pollutants. • OPA 90. • Clean Water Act. • Industry self-imposed actions – gear modifications.	• GOA FMP Amendments 3 and 20 – decrease bottom trawls and provided for habitat protection. • GOA FMP Amendments 14, 55, and 65 – established habitat protection. • GOA FMP Amendment 15 – trawl closures, provide habitat protection. • GOA FMP Amendment 23 – banned bottom trawling, protect habitat. • GOA FMP Amendment 56 – essential fish habitat and habitat area of particular concern protection.
Comparative baseline: • No accurate biomass estimates exist for the GOA deep water flatfish species. • The deep water flatfish target fishery is severely restricted by PSC limits for halibut. • Management takes into account all bycatch when setting annual harvest levels.				

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.5-35. Gulf of Alaska rex sole past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality	• Foreign groundfish fisheries (1960s-1976) • International Pacific Halibut Commission (IPHC) halibut longline fisheries. • State of Alaska crab fisheries. • Marine pollution and oil spills.	• Foreign Fisheries post-Magnuson-Stevens Act (MSA) (1976-1985). • Joint venture (JV) fisheries (1968-1990). • Domestic fisheries (1968-present). • Marine pollution and oil spills.	• Bilateral agreement with Japan and Soviet Union (USSR) (1973). • Industry self-imposed actions. • International laws regarding marine pollutants. • Oil Pollution Act (OPA) 90. • Clean Water Act.	• Annual acceptable biological catch (ABC)/total allowable catch (TAC) limits. • Foreign and domestic observer programs. • Gulf of Alaska (GOA) Fishery Management Plan (FMP) Amendments 8 and 21 – address ghost fishing. • Flatfish assemblage division (1990). • Rex sole separated from other flatfish division (1993). • Rock sole species split into northern and southern (1996). • Prohibited species catch (PSC) Limits.
Change in reproductive success	• Foreign groundfish fisheries (1960s-1976) spatial/temporal concentration. • Climate changes and regime shifts.	• Foreign, JV, and domestic groundfish fisheries (post-MSA) spatial/temporal concentration.	• Industry self-imposed actions – gear modifications. • Bilateral agreement with Japan and USSR (1973). • Preliminary FMPs – banned bottom trawling in some areas, observers in foreign fisheries.	• Annual ABC/TAC limits. • Foreign and domestic observer programs.
Change in prey availability	• Foreign groundfish fisheries (1960s-1976) prey species bycatch. • Climate change or regime shifts (1988/89-present). • Introduction of exotic species. • Marine pollution and oil spills.	• Foreign, JV, and domestic groundfish fisheries (post-MSA) prey species bycatch. • Introduction of exotic species. • Marine pollution and oil spills.	• Industry self-imposed actions – gear modifications. • International laws regarding marine pollutants. • OPA 90. • Clean Water Act.	• PSC limits for crab.
Change in important habitat	• Foreign groundfish fisheries (pre-MSA) gear impacts. • IPHC halibut longline fisheries. • State of Alaska scallop fisheries. • Climate change or regime shifts (1988/89-present). • Introduction of exotic species. • Marine pollution and oil spills.	• Foreign, JV, and domestic groundfish fisheries (post-MSA) gear impacts. • Introduction of exotic species. • Marine pollution and oil spills.	• International laws regarding marine pollutants. • OPA 90. • Clean Water Act. • Industry self-imposed actions – gear modifications.	• GOA FMP Amendments 3 and 20 – decrease bottom trawls and provided for habitat protection. • GOA FMP Amendments 14, 55, and 65 – established habitat protection. • GOA FMP Amendment 15 – trawl closures, provide habitat protection. • GOA FMP Amendment 23 – banned bottom trawling, protect habitat. • GOA FMP Amendment 56 – essential fish habitat and habitat area of particular concern protection.
Comparative baseline: • The relative abundance of the GOA rex sole stock is currently unknown. • The GOA rex sole stock is lightly to moderately harvested. • The GOA rex sole stock is constrained by PSC limits for halibut. • Management takes into account all bycatch when setting annual harvest levels.				

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.5-36. Gulf of Alaska Pacific ocean perch past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality	• Foreign groundfish fisheries (1961-1976). • Marine pollution and oil spills.	• Foreign Fisheries post-Magnuson-Stevens Act (MSA) (1976-1985). • Joint venture (JV) fisheries (1979-1989). • Domestic fisheries (1970-present). • Marine pollution and oil spills.	• Bilateral agreement with Japan and Soviet Union (USSR) (1973). • Industry self-imposed actions. • International laws regarding marine pollutants. • Oil Pollution Act (OPA) 90. • Clean Water Act.	• Annual acceptable biological catch (ABC)/total allowable catch (TAC) limits. • Foreign and domestic observer programs. • Gulf of Alaska (GOA) Fishery Management Plan (FMP) Amendments 8 and 21 – address ghost fishing. • GOA FMP Amendment 32 – Pacific ocean perch (POP) rebuilding plan. • GOA FMP Amendment 38 – TAC setting. • 1991 sub-management group. • 1993 Northern Rockfish Division.
Change in reproductive success	• Foreign groundfish fisheries (1961-1976) spatial/temporal concentration. • Climate changes and regime shifts.	• Foreign, JV, and domestic groundfish fisheries (post-MSA) spatial/temporal concentration.	• Industry self-imposed actions – gear modifications. • Bilateral agreement with Japan and USSR (1973). • Preliminary FMPs – banned bottom trawling in some areas, observers in foreign fisheries.	• Annual ABC/TAC limits. • TAC apportionment. • Foreign and domestic observer programs.
Change in prey availability	• Commercial whaling. • Climate change or regime shifts (1988/89-present). • Marine pollution and oil spills. • Introduction of exotic species.	• Marine pollution and oil spills. • Introduction of exotic species.	• Industry self-imposed actions – gear modifications. • Clean Water Act. • OPA 90. • International Whaling Commission (IWC) ban on commercial whaling. • Marine Mammal Protection Act (MMPA) of 1972.	
Change in important habitat	• Foreign groundfish fisheries (pre-MSA) gear impacts. • Climate change or regime shifts (1988/89-present). • Marine pollution and oil spills. • Introduction of exotic species.	• Foreign, JV, and domestic groundfish fisheries (post-MSA) gear impacts. • Marine pollution and oil spills. • Introduction of exotic species.	• International laws regarding marine pollutants. • OPA 90. • Clean Water Act. • Industry self-imposed actions – gear modifications.	• GOA FMP Amendments 3 and 20 – decrease bottom trawls and provided for habitat protection. • GOA FMP Amendments 14, 55, and 65 – established habitat protection. • GOA FMP Amendment 15 – trawl closures, provide habitat protection. • GOA FMP Amendment 23 – banned bottom trawling, protect habitat. • GOA FMP Amendment 56 – essential fish habitat and habitat area of particular concern protection.
Comparative baseline: • The GOA POP stock is at a low relative abundance. • The GOA POP stock was considered rebuilt in 1997. • The GOA POP stock is constrained by PSC limits and bycatch of other species. • Management takes into account all bycatch when setting annual harvest levels.				

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.5-37. Gulf of Alaska thornyheads past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality	• Foreign groundfish fisheries (late 1800's-1976). • Marine pollution and oil spills.	• Foreign fisheries (1976-1985). • Joint venture (JV) fisheries (1983-1990). • Domestic fisheries (1983-present). • Marine pollution and oil spills.	• Bilateral agreement with Japan and Soviet Union (USSR) (1973). • Industry self-imposed actions. • International laws regarding marine pollutants. • Oil Pollution Act (OPA) 90. • Clean Water Act.	• Annual acceptable biological catch (ABC)/total allowable catch (TAC) limits. • Foreign and domestic observer programs. • Gulf of Alaska (GOA) Fishery Management Plan (FMP) Amendments 8 and 21 – address ghost fishing.
Change in reproductive success	• Foreign groundfish fisheries (late 1800's-1976) spatial/temporal concentration. • Climate changes and regime shifts.	• Foreign, JV, and domestic groundfish fisheries (post-Magnuson-Stevens Act [MSA]) spatial/temporal concentration.	• Industry self-imposed actions – gear modifications. • Bilateral agreement with Japan and USSR (1973). • Preliminary FMPs – banned bottom trawling in some areas, observers in foreign fisheries.	• Annual ABC/TAC limits. • Foreign and domestic observer programs.
Change in prey availability	• Foreign groundfish fisheries (late 1800's-1976) prey species bycatch. • State of Alaska shrimp fisheries. • Climate change or regime shifts (1988/89-present). • Marine pollution and oil spills. • Introduction of exotic species.	• Foreign, JV, and domestic groundfish fisheries (post-MSA) prey species bycatch. • Marine pollution and oil spills. • Introduction of exotic species.	• Industry self-imposed actions – gear modifications. • International laws regarding marine pollutants. • Clean Water Act. • OPA 90.	
Change in important habitat	• Foreign groundfish fisheries (pre-MSA) gear impacts. • Climate change or regime shifts (1988/89-present). • Marine pollution and oil spills. • Introduction of exotic species.	• Foreign, JV, and domestic groundfish fisheries (post-MSA) gear impacts. • Marine pollution and oil spills. • Introduction of exotic species.	• International laws regarding marine pollutants. • OPA 90. • Clean Water Act. • Industry self-imposed actions – gear modifications.	• GOA FMP Amendments 3 and 20 – decrease bottom trawls and provided for habitat protection. • GOA FMP Amendments 14, 55, and 65 – established habitat protection. • GOA FMP Amendment 15 – trawl closures, provide habitat protection. • GOA FMP Amendment 23 – banned bottom trawling, protect habitat. • GOA FMP Amendment 56 – essential fish habitat and habitat area of particular concern protection.
Comparative baseline: • The GOA thornyhead rockfish group is at a relatively high abundance. • The GOA thornyhead rockfish group is not overfished. • Management takes into account all bycatch when setting annual harvest levels.				

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries an managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.5-38. Gulf of Alaska rockfish (including northern, shortraker, rougheye, slope, pelagic shelf, demersal shelf rockfish) past/present effects.

Direct/ indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality	• Foreign groundfish fisheries (1962-1976). • Slope rockfish: State of Alaska groundfish fisheries. • Marine pollution and oil spills.	• Foreign Fisheries post-Magnuson-Stevens Act (MSA) (1976-1985). • Joint venture (JV) fisheries (1980-1991). • Domestic fisheries (1981-present). • Marine pollution and oil spills.	• Bilateral agreement with Japan and Soviet Union (USSR) (1973). • Industry self-imposed actions. • International laws regarding marine pollutants. • Oil Pollution Act (OPA) 90. • Clean Water Act.	• Annual acceptable biological catch (ABC)/total allowable catch (TAC) limits. • Foreign and domestic observer programs. • Gulf of Alaska (GOA) Fishery Management Plan (FMP) Amendments 8 and 21 – address ghost fishing. • GOA FMP 1988-pelagic shelf rockfish fish group formed. • 1990s – restrictive TACs. • GOA FMP Amendment 46 – removed blue and black rockfish. • GOA FMP Amendment 14 – separated demersal shelf rockfish (DSR). • GOA FMP Amendment 21 – DSR under State in southeast (SE). • 1998 – full retention of DSR. • 1988 – separation of slope rockfish.
Change in reproductive success	• Slope rockfish: Foreign groundfish fisheries (1962-1976) spatial/temporal concentration. • Climate changes and regime shifts.		• Industry self-imposed actions – gear modifications. • Bilateral agreement with Japan and USSR (1973). • Preliminary FMPs – banned bottom trawling in some areas, observers in foreign fisheries.	• Annual ABC/TAC limits. • Foreign and domestic observer programs.
Change in prey availability	• State of Alaska shrimp fisheries. • Climate changes and regime shifts. • Marine pollution and oil spills. • Introduction of oil spills.	• Marine pollution and oil spills. • Introduction of oil spills.	• Industry self-imposed actions – gear modifications. • Clean Water Act. • OPA 90. • International laws regarding marine pollutants.	

Table 3.5-38 (cont.). Gulf of Alaska rockfish (including northern, shortraker, rougheye, slope, pelagic shelf, demersal shelf rockfish) past/present effects.

Direct/ indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Change in important habitat	• Climate changes and regime shifts. • Marine pollution and oil spills. • Introduction of oil spills.	• Marine pollution and oil spills. • Introduction of oil spills. • PSR: Foreign, JV, and domestic groundfish fisheries (post-MSA) gear impacts.	• International Laws regarding marine pollutants. • OPA 90. • Clean Water Act. • Industry self-imposed actions – gear modifications.	• GOA FMP Amendments 3 and 20 – decrease bottom trawls and provided for habitat protection. • GOA FMP Amendments 14, 55, and 65 – established habitat protection. • GOA FMP Amendment 15 – trawl closures, provide habitat protection. • GOA FMP Amendment 23 – banned bottom trawling, protect habitat. • GOA FMP Amendment 56 – essential fish habitat and habitat area of particular concern protection.
Comparative baseline: • The GOA pelagic shelf rockfish group is exploited at 50-90% of the ABC, and relative abundance is unknown. • The relative abundance of the GOA DSR group is unknown. • The GOA slope rockfish group is not overfished, although the some species within the group are highly exploited. • Management takes into account all bycatch when setting annual harvest levels.				

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.5-39. Comparison of biomass[1] estimates (metric tons) for slope rockfish in the Gulf of Alaska.

Species	1984	1987	1990	1993	1996	1999	2001[2]
Shortraker rockfish	17,721	41,457	10,809	19,710	20,258	28,231	27,929
Rougheye rockfish	46,999	43,929	46,142	61,833	45,913	39,620	43,784
Total, shortraker/ rougheye	64,720	85,386	56,951	81,543	66,171	67,850	71,713
Northern rockfish	40,564	140,049	112,948	104,480	98,965	242,187	355,275
Sharpchin rockfish	7,219	70,160	37,050	23,676	64,570	20,841	34,276
Redstripe rockfish	4,803	23,706	24,681	29,619	14,964	8,226	17,571
Harlequin rockfish	2,442	63,833	17,194	9,281	19,974	9,877	14,940
Silvergrey rockfish	4,145	4,710	13,774	18,979	24,127	37,641	27,029
Redbanded rockfish	1,400	1,564	3,173	3,675	4,594	10,941	6,414
Darkblotched rockfish	6	33	184	291	121	272	227
Splitnose rockfish	0	2	3	0	0	7	2
Greenstriped rockfish	16	62	156	268	352	467	362
Vermillion rockfish	0	0	0	20	0	0	0
Bocaccio	502	38	176	106	137	0	81
Pygmy rockfish	0	366	76	3	283	187	141
Yellowmouth rockfish	516	241	1,900	3,563	923	5,570	3,352
Total, other slope rockfish	21,049	164,712	98,367	89,480	130,044	94,027	101,394
Total, all species	359,027	604,974	406,269	758,985	1,066,985	1,131,327	1,387,364

Notes: [1]Biomass estimates are from 1984, 1987, 1990, 1993, 1996, 1999, and 2001 trawl surveys. Biomass estimates for 1993, 1996, and 1999 have been slightly revised from those listed in SAFE reports previous to 2001 for slope rockfish. These are estimates of total biomass.

[2]The 2001 survey did not sample the eastern Gulf of Alaska; substitute estimates of biomass for this region in 2001 were obtained by averaging the eastern Gulf of Alaska biomass estimates in the 1993, 1996, and 1999 surveys. These eastern Gulf of Alaska estimates have been included in the 2001 biomass estimates listed here.

Source: Heifetz et al. 2001.

Table 3.5-40. Halibut past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality catch/ bycatch	• International Pacific Halibut Commission (IPHC) commercial catch (1923 to present). • Foreign fisheries bycatch of adults and < 81 centimeters (cm) juveniles (pre-Magnuson-Stevens Act [MSA] 1910 to 1980).	• Foreign fisheries bycatch (post-MSA 1980 to 1987). • Joint venture (JV) fisheries bycatch (1982 to 1991). • Domestic fisheries bycatch (1982 to present).	• International commission for halibut management established (1923). • United States (U.S.) multilateral and bilateral agreements. • Japanese self-imposed management. • Industry self-imposed actions. • IPHC management takes into account bycatch of < 81 cm.	• Annual prohibited species catch (PSC) limits. • Individual fishing quota (IFQ) Program. • Longline Careful Release Program. • Steller sea lion protection measures may have provided an indirect reduction in bycatch.
Change in reproductive success	• Decadal oscillations (1910 to present).	• Not applicable (N/A).	• N/A.	• N/A.
Change in important habitat	• IPHC commercial catch in winter spawning areas (1923 to 1930).	• Unknown.	• IPHC closure of halibut fishery during winter spawning time indirectly halted fishing on spawning grounds (1930 to present).	• None.
Comparative baseline • Pacific halibut stock is considered healthy. • IPHC management takes into account all catch and bycatch when setting annual harvest levels.				

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.5-41. Chronology of management measures to control bycatch of prohibited species in the groundfish fisheries of the Bering Sea and Aleutian Islands and Gulf of Alaska, 1935–2000.

Effective year	Management action
1935	Trawls prohibited except for shrimp and flounder fishing in Bering Sea and Aleutian Islands (BSAI).
1937	Use of dynamite prohibited in BSAI.
1938	Use of gillnets prohibited for catching halibut in BSAI.
1942	Trawls permitted except for salmon and herring fishing in BSAI.
1944	Use of trawls prohibited for catching halibut in BSAI.
1948	Five-inch minimum mesh size required for trawls in BSAI.
1959	Trawls prohibited for taking any crab species in BSAI. Trawling prohibited in Bristol Bay king crab pot sanctuary in BSAI.
1967	Halibut nursery area closed to halibut fishing in BSAI. Foreign fisheries prohibited around Fox Islands in BSAI.
1969	Pribilof Islands area closed to foreign fishing.
1972	Pot gear prohibited for catching halibut in BSAI.
1973	Use of tangle nets prohibited for catching crab in BSAI.
1974	Catch quotas established for Japanese groundfish fisheries limit effort for BSAI pollock and flatfish and Gulf of Alaska (GOA) Pacific ocean perch and sablefish.
1975	Catch quotas established for Soviet Union (USSR) groundfish fisheries in BSAI. Trawling prohibited in winter halibut savings area and along most of the Aleutian Islands.
1976	Magnuson-Stevens Act passed, providing national standards and regulations for managing federal fisheries to 200 miles.
1977	Preliminary groundfish Fishery Management Plans (FMPs) implemented with groundfish optimum yields (OYs); closures of foreign fisheries when any one species limit is attained; several closure areas in BSAI and GOA extended from bilateral agreements; prohibited status for halibut, salmon, crabs, and shrimp.
1979	GOA FMP implemented with no retention of prohibited species (salmonids, halibut, shrimp, herring, crab, and scallops); expansion of time-area closures to reduce halibut bycatch; restrictions on use of non-pelagic trawls by foreign fleets; limit of 25 % of foreign quota taken December 1 to May 31 to minimize halibut bycatch; domestic trawlers restricted by halibut catch limits for five areas for December 1 to May 31; halibut and Tanner crab catch limits for domestic fishermen included; depth restrictions on use of foreign longlines seaward of 500 meters (m) May 1 to September 30 to minimize bycatch of halibut. Created new species OY for grenadiers (rattails) to protect them from bycatch (since rescinded, GOA-5). Pacific cod foreign quota allocated to foreign longlines around Chirikov to reduce bycatch of other species, permitted directed longlining for Pacific cod to reduce halibut bycatch, required foreign vessel operators to report bycatch and discard of salmon and halibut.
1980	Set OY and four species categories, required biodegradable panels on sablefish pots to minimize bycatch of small sablefish, and established four species categories (target, prohibited species, unallocated, and other) (GOA-8).
1982	BSAI FMP implemented with specific management objective to rebuild halibut; established prohibited species category for halibut, salmon, and crabs; expanded time-area closures for foreign fisheries to reduce bycatch of juvenile halibut; set bycatch policy for domestic fishermen; set target observer coverage in foreign fisheries at 35–40 %. Set chinook catch limit of 65,000 fish for foreign trawl fishery (BSAI -1a). Closed waters east of 140°West (W) to foreign fishery and restricted domestic fishery to pelagic trawling between 140 and 147°W (GOA-10). Prohibited pot longline gear for sablefish, partially to eliminate ghost fishing (GOA-12).
1983	Prohibited species bycatch reduction schedule established for BSAI foreign trawl fishery, allowed domestic trawling in pot sanctuary and halibut savings area in BSAI, set 1986 goal of 17,473 salmon (BSAI-3). Closed GOA southeast to foreign trawl fisheries to protect halibut, allowed foreign longlines to fish shallower than 500 m in winter halibut savings area, until halibut bycatch reached 105 metric tons (mt).
1984	Set BSAI groundfish OY cap at 2 million mt, allowed domestic trawling in winter halibut savings area with observers and Bristol Bay pot sanctuary until halibut catch limit is reached (BSAI -7). Raised halibut catch limit to 270 mt in western GOA and 768 mt in central GOA and exempted domestic pelagic trawl fishery from halibut catch limit.
1985	Set BSAI salmon catch limit at 27,957 salmon (26,000 chinook) (BSAI-8). Established reporting requirements and directed fishing definitions (BSAI-9, GOA-14). Revised OYs and implemented framework for setting and revising halibut catch limits (GOA-14).

Table 3.5-41 (cont.). Chronology of management measures to control bycatch of prohibited species in the groundfish fisheries of the Bering Sea and Aleutian Islands and Gulf of Alaska, 1935–2000.

Effective year	Management action
1987	Prohibited species bycatch limits and zones established in BSAI domestic and joint venture (JV) flatfish trawl fisheries, set Bristol Bay trawl closure area (Area 512) to all trawling year-round, allowed regional direction (RD) discretion to set target species as prohibited once quota is reached (BSAI-10). Established four red king crab bottom trawl closed areas during February 15 to June 15 around Kodiak Island to protect crab, revised OYs, implemented framework for setting and revising prohibited species catch (PSC) limits, revised reporting requirements (GOA-15).
1988	Began Pilot Observer Program in Dutch Harbor and Kodiak, revised acceptable biological catch (ABC) definition (BSAI-11). Added steelhead and salmon to prohibited species list and established target, other, and non-specified categories, required 30-day comment period for annual specifications and prohibitad species limits (BSAI-11a/GOA-16).
1989	Required weekly reporting, established PSC limits for foreign and JV fisheries, set limits on retention of bycatch after target fishery closes (BSAI-12/GOA-17). Area 516 closed to trawling seasonally during crab molting period. Endorsed voluntary herring bycatch plan. Adopted policy on full utilization of BSAI and GOA groundfish.
1990	Established crab and halibut catch limits (BSAI-12a). New observer program, data reporting system, and directed fishing standards implemented (BSAI-13/GOA-18). Pot, jig, hand, and troll gear exempted from GOA halibut catch limits.
1991	Prohibited pollock roe-stripping as wasteful (BSAI-14/GOA-19). Allowed seasonal apportionment of PSC limits, established vessel incentive program to reduce bycatch rates of red king crab and halibut bycatch, refined overfishing, specification process and fishing gear definitions (BSAI-16/GOA-21). Established herring savings areas and hotspot authority (BSAI-16a). Season for BSAI yellowfin sole fishery changed to May 1. BSAI flatfish fisheries delayed to May 1 to reduce halibut and crab bycatch.
1992	Regional Administrator authorized to approve experimental fishing permits to reduce bycatch (BSAI-17/GOA-22). Established time and area closures for bycatch reduction, delayed rockfish trawl opening to Monday closest to July 1 to reduce salmon bycatch and groundfish trawl fisheries to January 20 to reduce salmon and halibut bycatch, expanded Vessel Incentive Program (VIP) for all trawl fisheries and GOA, halibut catch limits established for BSAI non-trawl fisheries, and redefined VIP and PSC limits in GOA (BSAI-19/GOA-24).
1993	Gillnets and seines prohibited for groundfish fishing in BSAI. Careful release requirements established for halibut bycatch in groundfish longline fisheries in BSAI and GOA, halibut catch limit set at 3,775 mt for halibut trawl fishery with regulatory framework for revisions (BSAI-21). Crab bycatch performance standards set for pelagic trawl fishery in BSAI. Kodiak Island crab protection zones made permanent (GOA-26). Set performance-based pelagic trawl definition in BSAI and GOA. Established a separate species category for Atka mackerel (GOA-31).
1994	Council adopts minimum mesh-size requirements for trawl codends used in pollock, cod, and rock sole fisheries in BSAI. NOAA Fisheries (NMFS) published vessel specific bycatch rates on the Internet, required observers to monitor salmon discards, eliminated primary halibut catch limits, but kept 3,775 mt trawl limit (BSAI-25). Gillnets and seines prohibited.
1995	Halibut and sablefish individual fishing quota (IFQ) program implemented (BSAI-15/GOA-20). BSAI chum salmon savings area, chinook salmon savings area, red king crab savings area, and Pribilof Islands Habitat Conservation Area established to protect crabs (BSAI-21a; 21b; and 35). Established minimum trawl mesh size in BSAI. BSAI jig gear exempted from halibut catch limits.
1996	Bsai Red King Crab Savings Area permanently established as year-round trawl closure area. Voluntary salmon donation program implemented to reduce bycatch and waste (BSAI-26/GOA-29).
1997	Nearshore Bristol Bay closed to all trawling year-round. PSC limits for red king crab and bairdi Tanner crab reduced and for opilio Tanner crab implemented (BSAI-37; 41). Overfishing definitions implemented (BSAI-44/GOA-44).
1998	Established PSC limits for opilio Tanner crab in trawl fisheries and opilio Tanner crab bycatch limitation zone (BSAI-40). Improved Retention/improved Utilization Program (IR/IU) implemented for pollock and cod (BSAI-49/GOA-49). Prohibited species donation program redefined to include halibut (BSAI-50/ GOA-50). Forage fish category and ban on fishing implemented (BSAI-36/GOA-39).
1999	Revised overfishing definitions implemented (BSAI-56/GOA-56).
2000	Bottom trawl ban in BSAI pollock fisheries (BSAI-57). Chinook salmon catch limits reduced to 29,000 fish in four years (pending) (BSAI-58). GOA demersal shelf rockfish full retention to account for bycatch (pending).

Table 3.5-42. Pacific salmon past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality catch/ bycatch	• Catch/bycatch State directed fisheries. • Catch/bycatch in foreign groundfish fisheries pre-Magnuson-Stevens Act (MSA). • Catch/bycatch foreign fisheries outside United States (U.S.) economic exclusive zone (EEZ). • Subsistence fisheries catch. • Climatic variability effects on prey and salmon survival.	• Bycatch in foreign groundfish fisheries post-MSA. • Bycatch joint venture (JV) fisheries. • Bycatch domestic groundfish fisheries.	• Alaska Department of Fish and Game (ADF&G) Management. • International Pacific Salmon Treaty. • Foreign Fisheries Management. • Industry self-imposed measures.	• Bering Sea and Aleutian Islands (BSAI) Fishery Management Plan (FMP) prohibited species catch (PSC) bycatch limits. • Salmon closure areas.
Harvest of distinct genetic stock	• Catch/bycatch in external groundfish fisheries pre-MSA in U.S. EEZ. • Catch/bycatch foreign fisheries outside U.S. EEZ.	• Bycatch in MSA groundfish fisheries post-MSA.	• ADF&G Management. • Foreign Fisheries Management.	• BSAI FMP PSC bycatch limits. • Salmon closure areas.
Change in reproductive success	• Exxon Valdez Oil Spill (EVOS). • Salmon mariculture competition. • Climatic variability effects on salmon marine survival.	• Not applicable (N/A).	• EVOS Trustees Council monitoring. • Alaska ban on fin fish mariculture.	• N/A.
Change in prey availability	• Climatic variability effects on salmon prey.	• N/A.	• N/A.	• N/A.
Comparative baseline: • Southeast Alaska stocks are stable.				

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.5-43. Salmon bycatch (number of fish) in groundfish fisheries.

Year	Bering Sea and Aleutian Islands			Gulf of Alaska		
	Chinook	Others	Total	Chinook	Others	Total
1990	14,085	16,416	30,501	16,913	4,172	21,085
1991	48,873	79,133	79,133	38,894	53,844	53,844
1992	41,955	41,450	83,405	20,462	17,846	38,308
1993	45,964	243,246	289,210	24,465	56,388	80,853
1994	44,380	96,431	140,811	13,973	40,513	54,486
1995	23,079	21,780	44,859	14,647	64,792	79,439
1996	63,205	77,995	141,200	15,761	4,176	19,937
1997	50,218	67,535	117,753	15,119	3,420	18,539
1998	58,966	69,237	128,203	16,941	13,539	30,480
1999	16,861	62,372	79,233	13,539	18,691	32,230
10-year average	40,759	72,672	113,431	19,071	23,849	42,920
Percent	36%	64%		44%	56%	

Source: Berger 1999

Table 3.5-44. Productivity (in metric tons) and status of Alaska salmon fishery resources.

Alaska salmon	Recent average yield (1995–1997)	Current potential yield	Long-term potential yield	Stock level relative to long-term potential yield
Pink	153,600	125,700	125,700	Above
Sockeye	128,900	116,800	116,800	Above
Chum	70,800	44,900	44,900	Above
Coho	17,700	17,700	17,700	Near
Chinook	5,100	5,500	5,500	Below
Total	376,100	310,600	310,600	

Source: NOAA 1999

Table 3.5-45. Pacific herring past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality catch/ bycatch	• Alaska State directed fisheries. • Foreign fishery catch (1900 to 1980).	• Pollock trawl fisheries bycatch (1980 to present).	• Alaska Department of Fish and Game (ADF&G) management. • Industry self-imposed measures.	• Magnuson-Stevens Act (MSA) disallowed foreign fisheries direct catch. • Annual prohibited species catch (PSC) limits.
Change in reproductive success	• Egg, larvae, adult exposure to Exxon Valdez Oil Spill (EVOS) (Prince William Sound population only).	• Not applicable (N/A).	• EVOS Trustee Council monitoring.	• N/A.
Change in prey availability	• Climate influence on plankton populations.	• N/A.	• N/A.	• N/A.
Change to important habitat	• EVOS spawning habitat contamination (Prince William Sound population only).	• N/A.	• EVOS Trustee Council monitoring.	• N/A.
Comparative baseline: • Herring stocks are considered stable. • Prince William Sound stock is potentially recovering. • ADF&G quota setting process is responsive to fluctuations in herring biomass.				

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.5-46. Crab past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality catch/bycatch	• Catch in Japanese and Russian crab fisheries (1953 to 1975). • Bycatch in foreign groundfish fisheries pre-Magnuson-Stevens Act (MSA). • Bycatch and unobserved mortality from foreign fleet gear conflicts with State fisheries (pre-MSA). • Catch/bycatch in State crab fisheries. • Subsistence Fisheries catch. • Predation of larval and juvenile life stages.	• Bycatch in foreign groundfish fisheries pre-MSA. • Bycatch in foreign groundfish fisheries post-MSA. • Bycatch in joint venture (JV) fisheries. • Bycatch in domestic groundfish fisheries.	• Bilateral agreements to reduce gear conflict (mid-1960's). • Crab Fishery Management Plan (FMP) management. • Industry self-imposed measures to control and reduce bycatch of crab. • Bering Sea and Aleutian Islands (BSAI) king and Tanner crab FMP (North Pacific Fishery Management Council [NPFMC] 1989).	• BSAI FMP amendment 57 banned non-pelagic gear in the pollock fishery. • BSAI Groundfish FMP prohibited species catch (PSC) bycatch limits. • BSAI Groundfish FMP crab closure areas.
Change in reproductive success	• Spatial concentration of State fisheries catch/bycatch . • Catch/bycatch in commercial crab fisheries. • Direct catch in subsistence crab fisheries. • Bycatch and unobserved mortality from foreign fleet gear conflicts with State fisheries (pre-MSA). • Worm predation of egg masses in Southcentral Alaskan waters. • Climatic variability effects on food and crab larval transport.	• Spatial concentration of the MSA groundfish fisheries bycatch.	• Crab FMP management (restricted harvest, legal males only).	• None.
Change in prey availability	• Unknown.	• Unknown.	• None.	• None.
Changes in important habitat	• Spatial concentration of external bottom trawl fisheries. • Spatial concentration of commercial crab pot fisheries.	• Spatial concentration of the MSA bottom trawl fisheries.	• Closures in State directed crab fisheries.	• BSAI FMP Amendment 10. • BSAI FMP Amendment 37. • BSAI FMP Amendment 21a. • BSAI FMP Amendment 40. • GOA FMP Amendments 15 and 26.

Comparative baseline:

- Red king crab stocks in the Pribilof Islands show estimated biomass levels above minimum stock size threshold (MSST) but these estimates are considered poor with a high degree of uncertainty. Currently, there is no harvest due to bycatch concerns; Bristol Bay stock has shown an increase in biomass in the last year, and Kodiak Island stocks are in decline.
- Blue king crab stocks in the Pribilof Islands are considered to be overfished and a rebuilding plan is in progress. The Saint Matthew Island stock is considered overfished and a rebuilding plan is in effect.
- Golden king crab population levels are unknown due to lack of survey information.
- Bairdi Tanner crab stock in the Bering Sea is considered overfished and a rebuilding plan is in effect.
- Opilio Tanner crab stock in the Bering Sea was declared overfished in 1999, and a rebuilding plan has been in effect since 2000.
- GOA crab stock status is unknown due to lack of survey information. However, Alaska Department of Fish and Game survey data generally shows depressed stocks overall.

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.5-47. Squid past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality catch/bycatch	• Foreign directed squid fisheries (1975-1987) conducted by Japan and Republic of Korea. • Foreign groundfish fisheries pre-Magnuson-Stevens Act (MSA) bycatch (mid 1960's-1976). • State of Alaska groundfish fisheries bycatch. • State of Alaska shrimp fisheries bycatch.	• Foreign groundfish fisheries post-MSA bycatch. • Joint venture (JV) groundfish fisheries bycatch. • Domestic groundfish fisheries bycatch.	• Bilateral agreement with Japan and Soviet Union (USSR) (1973).	• 1977 Bering Sea and Aleutian Islands (BSAI) Preliminary Fishery Management Plan (FMP) - established observers in foreign fisheries and restricted squid catch. • Domestic observer program to monitor bycatch. • BSAI FMP Amendment 57 – banned non-pelagic gear in pollock fishery. • Conversion to pelagic pollock fishery (1996). • 1999 and 2000 restrictions on pollock fisheries reduced squid bycatch. • Steller sea lion conservation measures – closures to pollock fisheries have indirectly benefitted squid by reducing bycatch.
Change in reproductive success	• Spatial concentration of external fisheries bycatch of large squid aggregations could alter stock structure. • Climatic variability effects on drifting egg masses.	• Spatial concentration of MSA fisheries bycatch of large squid aggregations could alter stock structure.	• Not applicable.	• 1999 and 2000 restrictions on pollock fisheries in areas of historically concentrated squid bycatch. • Steller sea lion conservation measures – closures to pollock fisheries have indirectly benefitted squid by reducing bycatch in spatially concentrated areas.
Comparative baseline: • Minimal life history and distribution information for squid species in the BSAI and Gulf of Alaska (GOA). • No survey biomass estimate exists for squid species in the BSAI or GOA. • The squid complex represents a relatively low proportion of the non-target species bycatch in the BSAI and GOA groundfish fisheries.				

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.5-48. Sculpin past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality bycatch	• Foreign groundfish fisheries pre-Magnuson-Stevens Act (MSA) bycatch. • State of Alaska groundfish fisheries (1995-present) bycatch.	• Foreign groundfish fisheries bycatch (post-MSA). • Joint venture (JV) groundfish fisheries bycatch. • Domestic groundfish fisheries bycatch.	• Bilateral agreement with Japan and Soviet Union (USSR) (1973). • Industry self-imposed actions–gear modifications.	• Domestic observer program to monitor bycatch. • Bering Sea and Aleutian Islands (BSAI) Fishery Management Plan (FMP) Amendment 57 – banned non-pelagic gear in pollock fisheries– may decrease sculpin bycatch. • Conversion to pelagic pollock fishery (1996) – may have indirectly reduced sculpin bycatch.
Change to important habitat	• External groundfish fisheries bottom trawling.	• MSA bottom trawl fisheries.	• Unknown.	• BSAI FMP Amendment 57 – banned non-pelagic gear in pollock fisheries. • Conversion to pelagic pollock fishery (1996). • BSAI FMP 55/65 – essential fish habitat/habitat area of particular concern designed to protect habitat.
Change in reproductive success	• Spatial/temporal concentration of external fisheries may over exploit a given sex at certain times of the year. • Habitat alterations may impact reproductive success.	• Spatial/temporal concentration of MSA fisheries may over exploit a given sex at certain times of the year. • Habitat alterations may impact reproductive success.	• Unknown.	• Unknown.
Comparative baseline: • Minimal life history and distribution information for sculpin species in the BSAI and GOA. • BSAI and GOA survey biomass estimates are uncertain.				

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.5-49. Shark past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality bycatch	• Foreign groundfish fisheries (pre-Magnuson-Stevens Act [MSA]) bycatch. • International Pacific Halibut Commission (IPHC) halibut longline fisheries bycatch. • State of Alaska shark sport fisheries. • State of Alaska groundfish fisheries bycatch.	• Foreign fisheries bycatch (post-MSA). • Joint venture (JV) fisheries bycatch. • Domestic groundfish fisheries bycatch.	• Bilateral agreement with Japan and Soviet Union (USSR) (1973).	• 1977 Bering Sea and Aleutian Islands (BSAI) Preliminary Fishery Management Plan (FMP) - established observers in foreign fisheries. • Annual acceptable biological catch (ABC)/total allowable catch (TAC) limits. • Domestic observer program to monitor bycatch. • BSAI FMP Amendment 57 – banned non-pelagic gear in pollock fisheries. • Conversion to pelagic pollock fishery (1996).
Change in reproductive success	• Spatial/temporal concentration of external fisheries may over exploit a given sex at certain times of the year. • Habitat alterations may impact reproductive success.	• Spatial/temporal concentration of MSA fisheries may over exploit a given sex at certain times of the year. • Habitat alterations may impact reproductive success.	• Unknown.	• Unknown.
Comparative baseline: • Minimal life history and distribution information for shark species in the BSAI and Gulf of Alaska (GOA). • The survey biomass estimates for shark in the BSAI and GOA are uncertain.				

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.5-50. Estimated total catch (metric tons) of sharks in the Bering Sea and Aleutian Islands and Gulf of Alaska, 1997-2001.

Species	Bering Sea and Aleutian Islands					Gulf of Alaska				
	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001
Dogfish	4	6	5	9	17	658	865	314	398	494
Salmon	7	18	30	23	24	124	71	132	38	33
Sleeper shark	304	336	319	490	687	136	74	558	608	249
Unidentified shark	53	136	176	68	35	124	1,380	33	74	77

Source: Gaichas 2002; NORPAC observer database and year-end estimates of target species catch from the NMFS Regional Office BLEND database.

Table 3.5-51. Skate species identified in Alaska Fisheries Science Center bottom trawl surveys.

Species	Common name	Bering Sea 1999	Aleutian Islands 1997	Gulf of Alaska 1999	Other records
Raja binoculata	Big skate	X	X	X	
Raja rhina	Longnose skate		X	X	
Raja stellulata	Starry skate				Pre-1990
Bathyraja interrupta	Bering skate	X	X	X	
Bathyraja tanaretzi	Mud skate	X	X	X	
Bathyraja trachura	Black skate		X	X	
Bathyraja parmifera	Alaska skate	X	X	X	
Bathyraja aleutica	Aleutian skate	X	X	X	
Bathyraja lindberghi	Commander skate		X	X	
Bathyraja maculata	Whiteblotched skate	X	X	X	
Bathyraja minispinosa	Whitebrow skate	X	X		
Bathyraja violacea	Okhotsk skate	X			
Bathyraja smirnovi	Golden skate				1983 Bering Sea and Aleutian Islands (BSAI)
Bathyraja spinosissima	White skate				1983 Aleutian Islands
Bathyraja abyssicola	Deepsea skate				Pre-1995

Table 3.5-52. Skate life history information available for Bering Sea and Aleutian Islands and Gulf of Alaska species.

Species	Common name	Maximum length (centimeters)[1]	Maximum age (years)	Age and length at maturity[2]	Feeding mode[3]	No./ egg case[1]	Depth range (meters)[4]	Estimated natural mortality rate
Raja binoculata	Big skate	180–240	Unknown	8–12 yrs 109–130 cm	Predatory[1]	1-7	3–800[5]	0.10
Raja rhina	Longnose skate	137	Unknown	7–10 yrs 74–100 cm	Unknown	1	25–675[5]	0.10
Bathyraja interrupta	Bering skate	86	Unknown	Unknown	Benthophagic	1	50–1380	0.10
Bathyraja tanaretzi	Mud skate	70[6]	Unknown	Unknown	Unknown	1		0.10
Bathyraja trachura	Black skate	89	Unknown	Unknown	Unknown	1	800–2,050	0.10
Bathyraja parmifera	Alaska skate	61–91, 113[6]	Unknown	Unknown	Predatory	1	25–300	0.10
Bathyraja aleutica	Aleutian skate	120–150	Unknown	Unknown	Predatory	1	300–950	0.10
Bathyraja lindberghi	Commander skate	93[6]		Unknown	Unknown	1	175–950	0.10
Bathyraja maculata	Whiteblotched skate	120[6]		Unknown	Predatory	1	175–550	0.10
Bathyraja minispinosa	Whitebrow skate	82[6]	Unknown	Unknown	Benthophagic	1	100–1400	0.10
Bathyraja violacea	Okhotsk skate	150[6]	Unknown	Unknown	Benthophagic	1	25–500	0.10

Notes: [1]Eschemeyer 1983 (assuming that B. kincaidii = B. interrupta).

[2]Zeiner and Wolf 1993.

[3]Orlov 1998,1999 (benthophagic eats mainly amphipods and worms. Predatory diet primarily fish and cephalopods).

[4]McEachran and Miyake 1990b.

[5]Allen and Smith 1988.

[6]Species identification notes by Jay Orr (American Fisheries Science Center).

Table 3.5-53. Skate past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality bycatch	• Foreign groundfish fisheries (pre-Magnuson-Stevens Act [MSA]) bycatch. • International Pacific Halibut Commission (IPHC) halibut longline fisheries bycatch. • State of Alaska groundfish fisheries bycatch. • State of Alaska sport halibut fisheries bycatch.	• Foreign, fisheries bycatch (post-MSA). • Joint venture (JV) fisheries bycatch. • Domestic groundfish fisheries bycatch.	• Bilateral agreement with Japan and Soviet Union (USSR) (1973): Reduced catch of groundfish and thus bycatch. • Industry self-imposed actions.	• 1977 Bering Sea and Aleutian Islands (BSAI) Preliminary Fishery Management Plan (FMP) - established observers in foreign fisheries. • Domestic observer program to monitor bycatch. • Skates separated of other species group in the Gulf of Alaska (GOA).
Change in reproductive success	• Bycatch in external fisheries could over exploit rarer species. • Bycatch in external fisheries could over exploit immature skates, affecting population.	• Bycatch in MSA fisheries could overexploit rarer species. • Bycatch in MSA fisheries could over exploit immature skates, affecting population.	• Unknown.	• Unknown.
Comparative baseline: • Little life history or distribution information is currently known of the different skate species existing within the BSAI and GOA. • The survey biomass estimates for skate in the BSAI and GOA are uncertain. • Skates make up the majority of the other species bycatch.				

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the NOAA Fisheries Alaska groundfish fisheries.
Internal - Events and actions directly associated with the NOAA Fisheries Alaska groundfish fisheries.

Table 3.5-54. Estimated biomass (metric tons) of common skate species from recent bottom trawl surveys.

Year	Area	Species	Biomass estimate
1999	Eastern Bering Sea	*Bathyraja parmifera*	337,998
		Bathyraja interrupta	23,694
		All (6) other skate species	8,580
1999	Gulf of Alaska	*Raja binoculata*	54,612
		Raja rhina	39,336
		Bathyraja aleutica	11,290
		Bathyraja interrupta	3,817
		All (5) other skate species	3,788
1997	Aleutian Islands	*Bathyraja maculata*	13,729
		Bathyraja parmifera	8,435
		Bathyraja aleutica	4,878
		Bathyraja tanaretzi	1,002
		All (6) other skate species	2,629

Table 3.5-55. Estimated catch (metric tons) of all skate species combined by gear and target fishery.

Bering Sea and Aleutian Islands				
Gear	**1997**	**1998**	**1999**	**Average**
Bottom trawl	3,619	5,169	3,601	4,130
Pelagic trawl	311	204	359	291
Pot	1	0	1	1
Longline	13,816	13,945	10,118	12,627
Total	**17,747**	**19,318**	**14,080**	**17,048**
Target species	**1997**	**1998**	**1999**	**Average**
Arrowtooth	2	118	27	49
Atka	111	131	127	123
Cod	14,016	14,305	10,636	12,985
Flathead	777	1,868	1,215	1,287
Other flats	39	103	69	71
Other rockfish	110	1	1	37
Other species		10	26	18
Other targets	0	3	1	1
Pacific ocean	30	40	54	41
Pollock B[a]	52	205	28	95
Pollock P[b]	298	200	347	282
Rock sole	679	559	322	520
Sablefish	266	110	110	162
Shortraker/ rougheye		6	0	3
Turbot	157	300	338	265
Yellowfin sole	1,211	1,359	778	1,116
Total	**17,747**	**19,318**	**14,080**	**17,048**

Gulf of Alaska				
Gear	**1997**	**1998**	**1999**	**Average**
Bottom trawl	2,247	1,166	926	1,446
Pelagic trawl	5	15	20	14
Pot	1	0	0	0
Longline	867	3,295	1,054	1,738
Total	**3,120**	**4,476**	**2,000**	**3,199**
Target species	**1997**	**1998**	**1999**	**Average**
Arrowtooth	133	21	49	67
Cod	954	873	1,174	1,000
Deep water	42	31	17	30
Demersal shelf	200		22	111
Flathead sole	139	130		134
Northern	4	9	15	9
Other species	446	138	0	195
Pelagic shelf	8	15	11	11
Pacific ocean	52	15	44	37
Pollock B[a]	29	41	19	30
Pollock P[b]	2	11	5	6
Rex sole	489	172	331	331
Sablefish	166	2,834	243	1,081
Shallow water flats	427	186	70	228
Shortraker/ rougheye	28		1	14
Thornyheads	1			1
Total	**3,120**	**4,476**	**2,000**	**3,199**

Notes: [a]When pollock is majority of retained catch, but less than 95 percent of total catch.
[b]When catch of pollock is more than 95 percent of total catch.

Table 3.5-56. Octopi past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality catch/bycatch	• Foreign groundfish fisheries (pre-Magnuson-Stevens Act [MSA]) bycatch. • State of Alaska directed fisheries. • State of Alaska groundfish fisheries bycatch. • State of Alaska crab fisheries bycatch.	• Foreign fisheries bycatch (post-MSA). • Joint venture (JV) fisheries bycatch. • Domestic groundfish fisheries bycatch.	• Bilateral agreement with Japan and Soviet Union (USSR) (1973). • Industry self-imposed actions.	• 1977 Bering Sea and Aleutian Islands (BSAI) Preliminary Fishery Management Plan (FMP) – established observers in foreign fisheries. • Domestic observer program to monitor bycatch.
Change in reproductive success	• Spatial/temporal concentration of external fisheries may over exploit a given sex at certain times of the year.	• Spatial/temporal concentration of MSA fisheries may over exploit a given sex at certain times of the year.	• Unknown.	• Unknown.
Comparative baseline: • Minimal life history and distribution information for octopus species in the BSAI and Gulf of Alaska (GOA). • No accurate survey biomass estimates exist for octopi species in the BSAI or GOA. • The octopi complex represents a relatively low proportion of the non-target species bycatch in the BSAI and GOA groundfish fisheries.				

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.5-57. Habitat associations of selected osmeridae species in the Bering Sea and Aleutian Islands and Gulf of Alaska.

	Life stage/activity		Eulachon				Capelin			
			Egg	Larvae	Juvenile	Adult	Egg	Larvae	Juvenile	Adult
Habitat associations	**Location**	Beach (intertidal)					X			X
		Inner shelf (1-50 meters [m])		X				X	X	X
		Middle shelf (50-100 m)			X	X		X	X	X
		Outer shelf (100-200 m)			X	X				X
		Upper slope (200-1,000 m)			X	X				
		Lower slope (>1,000 m)								
		Basin (>3,000 m)								
		Bay/estuaries	X			X				
		Island pass								
		Not known								
	Substrate	Mud/clay/silt								
		Sand/granule	X			X	X			X
		Gravel								X
		Cobble	X			X	X			
		Boulder								
		Bedrock								
		Not applicable		X	X			X	X	
	Vegetation	Kelp forest								
		Sea grasses								
	Pelagic domain	Near surface						X		
		Pelagic		X	X	X		X	X	X
		Semi-demersal/semi-pelagic								X
		Demersal	X			X	X			X
		Not known								
	Oceanography	Upwelling zone								
		Gyres								
		Thermo/pycnocline								
		Fronts			X	X			X	X
		Edges (ice, bathymetric)							X	X

Source: NPFMC 1999, 1999b.

Table 3.5-58. The diet[1,2] of selected eastern Bering Sea shelf groundfish species.

Rank	Pollock	Cod	Arrowtooth flounder	Pacific halibut	Greenland halibut
1	Euphausiids (44.9)	Pollock (49.1)	Pollock (67.4)	Pollock (53.9)	Pollock (74.8)
2	Pollock (17.0)	Offal (12.1)	Miscellaneous fish (15.3)	Flatfish (9.0)	Squid (11.1)
3	Copepods (11.4)	Brachyuran crab (10.3)	Herring (5.4)	Brachyuran crabs (7.8)	Miscellaneous fish (6.2)
4	Shrimp (8.0)	Miscellaneous fish (7.6)	Offal (3.6)	Misc. fish (7.6)	Offal (4.1)
5	Amphipods (4.1)	Flatfish (7.1)	Amphipods (1.8)	Anomuran crabs (4.6)	Flatfish (1.2)
6	Mysids (3.2)	Anomuran crabs (3.4)	Squid (1.8)	Cod (4.3)	Cod (0.9)
7	Miscellaneous fish (2.8)	Shrimp (2.5)	Euphausiids (1.5)	Offal (4.1)	Herring (0.7)
8	Offal (1.1)	Polychaete worms (1.0)	Flatfish (1.0)	*Sand lance* (2.2)	*Myctophids* (0.2)
9	*Capelin* (0.7)	*Sand lance* (0.8)	Scorpaenids (0.3)	*Capelin* (1.8)	Shrimp (0.2)
10	*Sand lance* (0.5)	Gastropods (0.5)	*Capelin* (0.2)	Herring (1.1)	Cyclopterids (0.2)
Other forage fish	*Osmerids* (<0.1) *Bathylagids* (<0.1) *Myctophids* (<0.1) *Eulachon* (<0.1)	*Capelin* (0.1) *Osmerids* (<0.1) *Bathylagids* (<0.1) *Myctophids* (<0.1) *Eulachon* (<0.1)	*Eulachon* (0.2) *Osmerids* (0.1) *Myctophids* (<0.1) *Sand lance* (<0.1)	*Osmerids* (0.1) *Eulachon* (<0.1)	*Bathylagids* (0.1) *Osmerids* (<0.1) *Sand lance* (<0.1)
Rank	**Yellowfin sole**	**Rock sole**	**Alaska plaice**	**Flathead sole**	**Skates**
1	Echiuroid worms (22.4)	Polychaete worms (44.9)	Polychaete worms (55.5)	Echinoderms (28.3)	Pollock (56.7)
2	Bivalves (18.5)	*Sand lance* (14.3)	Bivalves (11.1)	Pollock (25.6)	Miscellaneous fish (9.9)
3	Polychaete worms (18.1)	Echiuroid worms (11.0)	Echiuroid worms (10.7)	Shrimp (12.8)	Brachyuran crabs (8.8)
4	Amphipods (7.0)	Amphipods (7.2)	Sipunculid worms (10.7)	Miscellaneous fish (5.8)	Flatfish (6.7)
5	Echinoderms (3.7)	Bivalves (5.1)	Amphipods (4.6)	Euphausiids (4.5)	Shrimp (5.5)
6	Anomuran crabs (3.7)	Sipunculid worms (5.0)	Priapulid worms (2.8)	Offal (3.9)	Offal (5.2)
7	Euphausiids (3.2)	Echinoderms (2.8)	Exhinoderms (2.0)	Mysids (3.5)	Anomuran crabs (3.1)
8	Shrimp (3.1)	Shrimp (2.0)	Unidentified crustaceans (0.6)	Bivalves (3.1)	Ampipods (1.3)
9	Gastropods (2.6)	Miscellaneous fish (1.6)	*Sand lanc*e (0.5)	Anomuran crab (2.5)	*Sand lance* (0.7)
10	Brachyuran crabs (2.4)	Priapulid worms (1.5)	Brachyuran crabs (0.2)	Brachyuran crab (2.3)	Cod (0.4)
Other forage fish	*Sand lance* (0.6) *Bathylagids* (<0.1) *Capelin* (<0.1)	*Osmerids* (<0.1)	None	*Capelin* (1.3) *Sand lance* (0.5) *Osmerids* (0.1) *Myctophids* (<0.1)	*Capelin* (0.1) *Sandfish* (0.1) *Myctophids* (<0.1)

Notes: [1]Forage fish in the diet appear in italics.

[2]Numbers in parentheses represent percent by weight contribution to the diet.

Source: NMFS, unpublished data.

Table 3.5-59. Diet[1,2] of selected eastern Bering Sea slope groundfish species.

Rank	Greenland halibut	Flathead sole	Arrowtooth flounder	Pollock	Cod
1	Pollock (58.3)	Echinoderm (49.6)	Pollock (55.4)	Euphausiids (26.4)	Pollock (51.4)
2	Squid (18.5)	Offal (23.7)	Miscellaneous fish (15.9)	Shrimp (16.4)	Offal (9.7)
3	Offal (11.9)	Scorpaenidae (10.1)	Squid (11.3)	Pollock (15.8)	Miscellaneous fish (9.1)
4	Miscellaneous fish (5.0)	Shrimp (4.2)	Herring (11.1)	Squid (8.3)	Shrimp (8.6)
5	Cyclopterids (2.7)	Miscellaneous fish (4.0)	Shrimp (4.6)	Miscellaneous fish (7.0)	Brachyuran crab (6.2)
6	Flatfish (0.8)	Pollock (2.9)	Offal (0.7)	*Bathylagids* (7.0)	Flatfish (4.0)
7	Herring (0.6)	Polychaete worms (1.6)	Echinoderm (0.3)	*Myctophids* (5.5)	Herring (3.5)
8	*Bathylagids* (0.4)	Brachyuran crab (1.4)	Miscellaneous Unidentified (0.3)	Offal (3.7)	Squid (1.9)
9	*Myctophids* (0.4)	Squid (0.4)	Euphausiids (0.2)	Copepods (2.2)	Cod (1.0)
10	Anomuran crab (0.1)	Mysid (0.4)	*Myctophids* (0.2)	Herring (2.5)	Polychaete worms (0.9)
Other forage fish	N/A	*Myctophids* (0.3) *Bathylagids* (0.1)	None	*Osmerids* (0.1) *Sand lance* (<0.1)	*Bathylagids* (<0.1)

Notes: [1]Forage fish in the diet appear in italics.
[2]Numbers in parentheses represent percent by weight contribution to the diet.
Source: Lang and Livingston 1996.

Table 3.5-60. Percent by weight of important prey consumed by groundfish in the Aleutian Islands.

Prey	Predator										
	Arrowtooth flounder	Pacific halibut	Pacific cod	Greenland turbot	Pollock	Shortspine thornyhead	Rougheye rockfish	Shortraker rockfish	Atka mackerel	Pacific Ocean perch	Northern rockfish
Atka mackerel	44	12	27	0	0	0	0	0	0	0	0
Pollock	13	19	17	1	0	0	0	0	2	0	0
Herring	-	2	1	0	0	0	0	0	0	0	0
Capelin	0	5	0	0	-	0	0	0	0	0	0
Myctophid	7	0	3	28	37	0	4	15	1	34	1
Bathylagid	0	0	-	13	1	0	0	0	0	0	0
Pacific sand lance	-	-	-	0	-	0	0	0	0	0	0
Eulachon	0	0	0	0	-	0	0	0	0	0	0
Tanner crab	0	7	2	0	-	0	0	0	-	0	0
Cottid	3	1	7	0	-	51	0	19	-	0	0
Cyclopterid	-	-	-	0	-	1	45	0	0	0	0
Shrimp	2	-	10	0	4	23	45	32	-	0	3
Cephalopods	3	27	12	50	2	-	0	3	8	2	1
Euphausiids	5	-	-	0	43	1	2	1	55	51	50
Calanoid copepods	-	0	-	0	3	0	0	0	17	7	17

Notes: - indicates less than 1 percent.
Source: Yang 1996.

Table 3.5-61. Percent by weight of important prey consumed by groundfish in the Gulf of Alaska.

Prey	Predator										
	Arrowtooth flounder	Pacific halibut	Sablefish	Pacific cod	Pollock	Shortspine thornyhead	Rougheye rockfish	Shortraker rockfish	Dusky rockfish	Pacific Ocean perch	Northern rockfish
Pollock	66	57	24	7	2	1	0	0	0	0	0
Herring	9	0	2	-	-	0	0	0	0	0	0
Capelin	8	1	-	2	13	1	0	0	0	0	0
Pacific sand lance	-	1	-	-	-	0	0	0	0	0	0
Eulachon	1	-	6	-	0	0	0	0	0	0	0
Atka mackerel	1	0	0	0	0	0	0	0	0	0	0
Bathylagid	0	0	0	0	-	0	0	0	0	0	0
Myctophid	0	0	-	0	0	0	0	18	0	1	0
Tanner crab	0	6	-	12	0	1	2	0	0	-	-
Pandalids	4	-	4	9	19	54	51	0	4	2	0
Cephalopods	2	5	8	10	3	1	21	82	6	1	-
Offal	1	7	29	13	0	0	0	0	0	0	0
Euphausiids	3	0	7	1	39	0	2	0	69	87	96
Calanoid copepods	0	0	0	0	1	0	0	0	2	2	3

Notes: - indicates less than 1 percent.
Source: Yang and Nelson 2000.

Table 3.5-62. Bering Sea and Aleutian Islands and Gulf of Alaska forage fish past/present effects.

Direct/indirect effect	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality	• Foreign groundfish fisheries (pre-Magnuson-Stevens Act [MSA]). • State of Alaska capelin fishery. • Subsistence and personal use fisheries. • Marine pollution and oil spills.	• Foreign, joint venture (JV), and domestic groundfish fisheries (post-MSA). • Marine pollution and oil spills.	• State of Alaska capelin fishery regulations. • International laws regarding marine pollutants. • Clean Water Act. • Oil Pollution Act (OPA) 90.	• Annual acceptable biological catch (ABC)/total allowable catch (TAC) limits. • Bering Sea and Aleutian Islands (BSAI)/Gulf of Alaska (GOA) Fishery Management Plan (FMP) Amendment 36/39 – protect forage fish from developing into a commercial fishery, forage fish established as bycatch only.
Change in reproductive success	• Foreign groundfish fisheries (pre-MSA) predator removal. • Climate changes and regime shifts.	• Foreign, JV, and domestic groundfish fisheries (post-MSA) predator removal.		
Change in prey availability	• Climate changes and regime shifts. • Introduction of exotic species. • Marine pollution and oil spills.	• Introduction of exotic species. • Marine pollution and oil spills.	• International laws regarding marine pollutants. • Clean Water Act. • OPA 90.	
Change in important habitat	• Foreign groundfish fisheries (pre-MSA) fishery gear impacts. • Climate changes and regime shifts. • Introduction of exotic species. • Marine pollution and oil spills.	• Foreign, JV, and domestic (post-MSA) fishery gear impacts. • Introduction of exotic. species. • Marine pollution and oil spills.	• International laws regarding marine pollutants. • Clean Water Act. • OPA 90. • Industry self-regulations: modification to gear.	• Steller sea lion conservation measures. • Reduction in use of bottom trawl gear.
Comparative baseline: • Abundance data is limited or does not exist for most species groups within the forage fish category. • Forage fish category has been limited to bycatch only.				

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.5-63. Estimated populations and principal diets of seabirds that breed in the Bering Sea and Aleutian Islands and Gulf of Alaska regions.

Species	Population[a,b]		Diet[c,d]
	Bering Sea and Aleutian Islands	Gulf of Alaska	
Northern fulmar (*Fulmarus glacialis*)	1.500,000	600,000	Q,M,P,S,F,Z,I,C
Fork-tailed storm-petrel (*Oceanodroma furcata*)	4,500,000	1,200,000	Q,I,Z,C,P,F
Leach's storm-petrel (*Oceanodroma leucorrhoa*)	4,500,000	1,500,000	Z,Q,F,I
Double-crested cormorant (*Phalacrocorax auritis*)[e]	9,000	8,000	F,I
Pelagic cormorant (*Phalacrocorax pelagicus*)	80,000	70,000	S,C,P,H,F,I
Red-faced cormorant (*Phalacrocorax urile*)	90,000	40,000	C,S,H,F,I
Brandt's cormorant (*Phalacrocorax penicillatus*)	0	Rare	H,F,G,I
Pomarine jaeger (*Stercorarius pomarinus*)	Uncommon-Rare	Uncommon	C,S,F
Parasitic jaeger (*Stercorarius parasiticus*)	Uncommon	Uncommon	C,S,F
Long-tailed jaeger (*Stercorarius longicaudus*)	Uncommon	Rare	C,S,F
Bonaparte's gull (*Larus philadelphia*)	Rare	Uncommon	Z,I,F
Mew gull (*Larus canus*)[e]	700	40,000	C,S,I,D,Z
Herring gull (*Larus argentatus*)[e]	50	300	C,S,H,F,I,D
Glaucous-winged gull (*Larus glaucescens*)	150,000	300,000	C,S,H,F,I,D
Glaucous gull (*Larus hyperboreus*)[e]	30,000	2,000	C,S,H,I,D
Black-legged kittiwake (*Rissa tridactyla*)	800,000	1,000,000	C,S,H,P,F,M,Z
Red-legged kittiwake (*Rissa brevirostris*)	150,000	0	M,C,S,Z,P,F
Sabine's gull (*Xema sabini*)	Uncommon	Uncommon	F,Q,Z
Arctic tern (*Sterna paradisaea*)[e]	7,000	20,000	C,S,Z,F,H
Aleutian tern (*Sterna aleutica*)	9,000	25,000	C,S,Z,F
Common murre (*Uria aalge*)	3,000,000	2,000,000	C,S,H,G,F,Z
Thick-billed murre (*Uria lomvia*)	5,000,000	200,000	C,S,P,Q,Z,M,F,I
Pigeon guillemot (*Cepphus columba*)	100,000	100,000	S,C,F,H,P,I,G,Q
Black guillemot (*Cepphus grylle)*	Rare	0	S,F,I
Marbled murrelet (*Brachyramphus marmoratus*)	Uncommon	Common	C,S,H,P,F,G,Z,I
Kittlitz's murrelet (*Brachyramphus brevirostris*)	Uncommon	Uncommon	S,C,H,Z,I,P,F
Ancient murrelet (*Synthliboramphus antiquus*)	200,000	600,000	Z,F,C,S,P,I
Cassin's auklet (*Ptychoramphus aleuticus*)	250,000	750,000	Z,Q,I,S,F
Least auklet (*Aethia pusilla*)	9,000,000	50	Z
Parakeet auklet (*Cyclorrhynchus psittacula*)	800,000	150,000	F,I,S,P,Z,C,H
Whiskered auklet (*Aethia pygmaea*)	30,000	0	Z
Crested auklet (*Aethia cristatella*)	3,000,000	50,000	Z,I

Table 3.5-63 (cont.). Estimated populations and principal diets of seabirds that breed in the Bering Sea and Aleutian Islands and Gulf of Alaska regions.

Species	Population[a,b]		Diet[c,d]
	Bering Sea and Aleutian Islands	Gulf of Alaska	
Rhinoceros auklet (*Cerorhinca monocerata*)	50	200,000	C,S,H,A,F
Tufted puffin (*Fratercula cirrhata*)	2,500,000	1,500,000	C,S,P,H,F,Q,Z,I
Horned puffin (*Fratercula corniculata*)	500,000	1,500,000	C,S,P,H,F,Q,Z,I
Total	36,000,000	12,000,000	

Notes: [a] Population data for colonial seabirds that breed in coastal colonies were modified from USFWS 1998a. Estimates are minimal, especially for storm-petrels, auklets, and puffins.

[b] Numerical estimates are not available for species that do not breed in coastal colonies. Approximate numbers: abundant $\geq 10^6$; common = 10^5 to 10^6; uncommon = 10^4 to 10^5; rare $\leq 10^4$.

[c] Abbreviations of diet components: M, Myctophid; P, walleye pollock; G, other gadids; C, capelin; S, sandlance; H, herring; A, Pacific saury; F, other fish; Q, squid; Z, zooplankton; I, other invertebrates; D, detritus; no information for Alaska. Diet components are listed in approximate order of importance. However, diets depend on availability and usually are dominated by one or a few items (NPFMC 2000).

[d] For sources of diet data, see species accounts in seabird section of NPFMC 2000.

[e] Species breeds both coastally and inland; population estimate is only for coastal colonies.

Table 3.5-64. Comparative population estimates and diets of nonbreeding seabirds that frequent the Bering Sea and Aleutian Islands and Gulf of Alaska regions.

Species	Population [a,b]			Diet[c,d]
	Bering Sea and Aleutian Islands	Gulf of Alaska	World[e]	
Short-tailed albatross (Phoebastria albatrus)	Rare	Rare	1,600	Q,F,I
Black-footed albatross (Phoebastria nigripes)	Uncommon	Common	250,000	Q,M,F,I,D
Laysan albatross (Phoebastria immutabilis)	Common	Common	2.5 million	Q,M,F,I
Sooty shearwater (Puffinus griseus)	Common	Abundant	>30 million	M,C,S,A,Q,S,F,Z,I
Short-tailed shearwater (Puffinus tenuirostris)	Abundant	Common	23 million	Z,I, C,Q, F,S
Ivory gull (Pagophila eburnea)	Uncommon	0	~35,000	M,P,R,I,F,Q

Notes: [a] Population data for colonial seabirds that breed in coastal colonies were modified from USFWS 1998a. Estimates are minimal, especially for storm-petrels, auklets, and puffins.

[b] Numerical estimates are not available for species that do not breed in coastal colonies. Approximate numbers: abundant > 106; common = 105 to 106; uncommon = 103 to 105; rare <103.

cAbbreviations of diet components: M, Myctophid; P, walleye pollock; G, other gadids; C, capelin; S, sandlance; H, herring; A, Pacific saury; F, other fish; Q, squid; Z, zooplankton; I, other invertebrates; D, detritus; no information for Alaska. Diet components are listed in approximate order of importance. However, diets depend on availability and are usually dominated by one or a few items (see text seabird section of NPFMC 2000).

dFor sources of diet data, see species accounts in text.

[e] orld population estimates are provided solely to provide a relative scale. In populations where multiple breeding colonies exist, any analysis of effects on populations must be considered at the colony level, not at the global level. These estimates provided by: Hasegawa, pers. comm.; Whittow, 1993; Whittow, 1993; C. Baduini, pers. comm.; Oka et al 1987; USFWS. Species breeds both coastally and inland; population estimate is only for coastal colonies

Table 3.5-65. Rank of prey species in the diets of northern fur seals, Steller sea lions, and harbor seals in the Gulf of Alaska and Bering Sea.

Ranking	Northern fur seal[a]	Steller sea lion[b]	Harbor seal[c]
1	Squids (33.3)	Pollock (58.3)	Pollock (21.4)
2	Capelin (30.6)	Herring (20.6)	Octopus (18.3)
3	Pollock (25.1)	Capelin (7.4)	Eulachon (11.6)
4	Atka mackerel (3.5)	Salmon (5.1)	Capelin (10.4)
5	Herring (2.9)	Squid (4.2)	Herring (6.4)
6	Bathylagidae (2.9)	Sculpins (1.3)	Salmon (4.4)
7	Salmon (1.1)	Pacific cod (0.9)	Shrimps (3.3)
8	Flatfishes (0.6)	Rockfishes (0.8)	Pacific cod (3.2)
9	Sablefish (0.2)	Flatfishes (0.3)	Flatfishes (2.6)
10	Sand lance (0.2)	Octopus (<0.1)	Squids (1.6)

Notes: [a]Rankings based on modified volume, numbers in parentheses are modified volumes; from Perez and Bigg (1981).
[b]Rankings based on combination rank index, numbers in parentheses are percent of total sample volume; from Pitcher and Calkins (1981).
[c]Rankings based on modified index of relative importance, numbers in parentheses are percent of total sample volume; from Pitcher (1980a, 1980b).

Table 3.5-66. Life history information available for common Gulf of Alaska grenadier species.

Species	Common name	Maximum length (centimeters)	Maximum age (years)	Age and length at maturity	Feeding mode and fecundity	Depth range (meters)	Estimate of natural mortality rate
Albatrossia pectoralis[a]	Giant grenadier	150 total length (TL)	56	10–16 yrs 50–56 cm TL	–	140–1,200	0.074
Coryphaenoides acrolepis[b]	Pacific grenadier	84 TL	73	20–40 yrs 46–65 cm TL	–	600–2,500	0.057
Coryphaenoides cinereus[c]	Popeye grenadier	56 TL	–	–	–	225–2,832	0.074

Notes: [a]Burton 1999
[b]Andrews et al. 1999
[c]Macrourid life history project notes provided by Jerry Hoff (American Fisheries Science Center)

Table 3.5-67. Estimated catches (metric tons) of non-target species groups[1], 1997 to 1999, with average.

Fishery management plan category	Species group	Bering Sea and Aleutian Islands				Gulf of Alaska			
		1997	1998	1999	Average	1997	1998	1999	Average
Forage	Gunnels	0	0	0	0	0	0	0	0
Forage	Lantern fishes	0	0	0	0	0	0	0	0
Forage	Sandfish	1	0	3	2	4	2	1	2
Forage	Sand lances	0	0	0	0	0	0	0	0
Forage	Smelts	30	37	45	37	23	123	26	57
Forage	Sticheidae	0	0	0	0	0	0	4	1
Nonspecified	Anemones	183	114	172	156	18	16	17	17
Nonspecified	Benthic invertebrates	673	531	226	477	25	31	25	27
Nonspecified	Birds	29	43	24	32	2	6	6	5
Nonspecified	Corals	39	28	52	40	4	8	1	4
Nonspecified	Crabs	304	186	109	200	15	25	11	17
Nonspecified	Echinoderms	45	24	30	33	23	32	8	21
Nonspecified	Grenadiers	5,852	6,589	7,388	6,610	12,029	14,683	11,388	12,700
Nonspecified	Invertebrates unidentified	1,609	638	140	796	8	43	1	17
Nonspecified	Jellyfish	8,849	7,148	7,153	7,717	36	167	107	103
Nonspecified	Other fish species	1,569	1,363	1,327	1,420	576	8,400	819	3,265
Nonspecified	Sea pens and sea whips	3	2	5	3	1	3	3	2
Nonspecified	Shrimps	3	2	1	2	4	2	1	2
Nonspecified	Sponges	530	501	322	451	4	4	13	7
Nonspecified	Starfish	6,191	3,287	3,051	4,177	987	1,245	1,510	1,247
Nonspecified	Tunicates	1,794	728	372	965	2	1	0	1
Other	Dogfish	4	6	5	5	657	865	314	612
Other	Octopus	248	190	326	255	232	112	166	170
Other	Salmon sharks	7	18	30	18	124	71	132	109
Other	Sculpins	7,478	6,285	5,470	6,411	907	541	544	664
Other	Sharks unidentified	53	136	176	122	123	1,380	33	512
Other	Skates	17,747	19,318	14,080	17,048	3,120	4,476	2,000	3,199
Other	Sleeper sharks	304	336	319	320	136	74	558	256
Other	Squids	1,573	1,256	502	1,110	97	59	41	66

Notes: [1]Prohibited species catch is excluded from totals; it is reported in Section 4.6.

Table 3.5-68. Estimated catch (metric tons) of all grenadier species combined by gear and target fishery.

Bering Sea and Aleutian Islands					Gulf of Alaska				
Gear	**1997**	**1998**	**1999**	**Average**	**Gear**	**1997**	**1998**	**1999**	**Average**
Bottom-trawl	214	241	132	195	**Bottom-trawl**	965	655	529	716
Pelagic trawl	36	41	79	52	**Pelagic trawl**	28	5	81	38
Pot	0	0	0	0	**Pot**	0	0	0	0
Longline	5,602	6,307	7,177	6,362	**Longline**	11,037	14,023	10,777	11,946
Total	5,852	6,589	7,388	6,610	**Total**	12,029	14,683	11,388	12,700
Target species	**1997**	**1998**	**1999**	**Average**	**Target species**	**1997**	**1998**	**1999**	**Average**
Arrowtooth	0	1	43	15	**Arrowtooth**	102	28	140	90
Atka mackerel	10	92	1	34	**Cod**	191	1	439	211
Cod	835	693	571	700	**Deep water flats**	318	232	285	278
Flathead	3	11	3	6	**Demersal shelf rockfish**	0		0	0
Other flats	0	0	6	2	**Flathead sole**	46	6		26
Other rockfish	232	1	4	79	**Northern rockfish**	44	149	2	65
Other species		0	59	29	**Other species**	0	0	0	0
Other targets	0	0	0	0	**Pelagic shelf rockfish**	83	7	26	39
Pollock B[a]	0	0	0	0	**Pollock B**[a]	0	2	29	10
Pollock P[b]	36	41	79	52	**Pollock P**[b]	28	0	52	27
Pacific ocean perch	149	104	115	123	**Pacific ocean perch**	185	136	29	117
Rock sole	0	0	0	0	**Rex sole**	166	77	26	90
Sablefish	2,309	881	2,008	1,732	**Sablefish**	10,806	14,023	10,351	11,727
Shortraker/ rougheye		49	0	24	**Shallow water flats**	20	21	0	14
Turbot	2,276	4,713	4,499	3,830	**Shortraker/ rougheye**	2		8	5
Yellowfin sole	1	3	0	1	**Thornyheads**	38			38
Total	**5,852**	**6,589**	**7,388**	**6,610**	**Total**	**12,029**	**14,683**	**11,388**	**12,700**

Notes: [a]Pollock is majority of retained catch, but less than 95 percent of total catch.
[b]Pollock is more than 95 percent of total catch.

Table 3.5-69. Bering Sea and Aleutian Islands and Gulf of Alaska grenadier past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality bycatch	• Foreign groundfish fisheries (pre-Magnuson-Stevens Act [MSA]) bycatch. • State of Alaska groundfish fisheries bycatch.	• Foreign fisheries bycatch (post-MSA). • Joint venture (JV) fisheries bycatch. • Domestic groundfish fisheries bycatch.	• Bilateral Agreement between Japan, Soviet Union (USSR) and United States (U.S.).	• Gulf of Alaska (GOA) Fishery Management Plan (FMP) Amendment 5 – grenadier bycatch in sablefish fishery; separate management of grenadier. • GOA FMP Amendment 8 – established non-specified category. • Observer program monitors bycatch.
Change in reproductive success	• Spatial concentration of external fisheries bycatch; may over exploit one sex over the other in sex-specific aggregations. • Possible to over exploit rarer species in bycatch.	• Spatial concentration of MSA fisheries bycatch; may over exploit one sex over the other in sex-specific aggregations. • Possible to over exploit rarer species in bycatch.	• Unknown.	• Unknown.
Comparative baseline: • Biomass estimates were collected in 1999 for giant grenadier, but accurate biomass data does not exist for other species of grenadier. • Grenadiers make up the largest portion of the non-target species bycatch in the GOA.				

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.5-70. Estimated aggregate biomass (metric tons) of grenadier species complex from trawl surveys.

Year	Eastern Bering Sea	Aleutian Islands	Gulf of Alaska
1979	91,500		
1980		322,400	
1981	90,500		
1982	104,700		
1983		364,100	
1984			169,800
1985	107,600		
1986		618,100	
1987			136,000
1988	61,400		
1989			
1990			
1991	38,100		
1992			
1993			
1994			
1995			
1996			
1997			
1998			
1999			410,820

Table 3.6-1. Time series of groundfish management measures and closure areas protecting habitat under Bering Sea and Aleutian Islands and Gulf of Alaska fishery management plans.

Bering Sea and Aleutian Islands				
Year	**Location**	**Season**	**Area size**	**Notes**
1982 - Bering Sea and Aleutian Islands (BSAI) groundfish Fishery Management Plan (FMP); descriptions of fish habitat, gear restrictions and several no-trawl zones.				
1983 - National Oceanic and Atmospheric Administration (NOAA) Fisheries adopts a National Habitat Conservation Policy.				
1985 - Intentional discarding of fishing gear and debris prohibited.				
1986 - Magnuson-Stevens Act (MSA) amended to give Council's authority to protect habitat and recommend habitat protection measures.				
1986 - Habitat policy added to BSAI FMP.				
1987	Area 512	Year-round	8,000 square nautical miles (nm^2)	Trawling prohibited to protect king crab habitat.
	Area 516	3/15-6/15	4,000 nm^2	Trawling prohibited during crab molting period.
1995	Chum Salmon Savings Area	8/1-8/31	5,000 nm^2	Re-closed if 42,000 chum salmon bycaught.
	Chinook Salmon Savings Area	Trigger	9,000 nm^2	Closed if 48,000 chinook salmon bycaught.
	Herring Savings Area	Trigger	30,000 nm^2	Closed to specified trawl fisheries when trigger reached.
	Zone 1	Trigger	30,000 nm^2	Closed to specified trawl fisheries when trigger reached.
	Zone 2	Trigger	50,000 nm^2	Closed to specified trawl fisheries when trigger reached.
	Pribilof Islands	Year-round	7,000 nm^2	Established to protect red king crab habitat.
	Red King Crab Savings Area	Year-round	4,000 nm^2	Bottom trawling prohibited by emergency rule, pelagic trawling allowed.
	Walrus Islands	5/1-9/30	900 nm^2	12–mile no-fishing zones around 3 haulouts.
	Steller sea lion rookeries	Year-round	5,800 nm^2	10–mile no-trawl zones around 27 rookeries.
	Steller sea lion rookeries	Seasonal extension	5,100 nm^2	20–mile extensions around 8 rookeries.
1996 - Same closures in effect as in 1995.				
1997 - Red King Crab Savings Area permanently established as year-round closure area.				
1997 - Same closures in effect as in 1995 and 1996, with two additions:				
1997	Nearshore Bristol Bay	Year-round	19,000 nm^2	Expanded Area 512 closure.
	Opilio Tanner Crab Bycatch Limitation Zone	Trigger	90,000 nm^2	Closed to specified trawl fisheries when trigger reached.
1998 - Same closures in effect as in 1995, 1996, and 1997.				
1999 - Same closures in effect as in 1995, 1996, 1997, and 1998.				
2000 - Non-pelagic trawls prohibited in BSAI pollock fisheries.				
2000 - Same closures in effect as in 1995, 1996, 1997, and 1998 with three additions:				
2000	Eastern Bering Sea (EBS) and Aleutian Islands (AI) Pollock Trawl exclusion zones	Year-round	11,900 nm^2 (includes Gulf of Alaska [GOA])	Trawling for pollock prohibited for Steller sea lion protection.
	EBS and AI Pollock Trawl exclusion zones	Jan-June	14,800 nm^2 (includes GOA)	Trawling for pollock prohibited for Steller sea lion protection.
	EBS and AI Trawl exclusion zones	Year-round	29,000 nm^2 (includes GOA)	Trawling for Atka mackerel restricted for Steller sea lion protection.
2001 - Same closures in effect as in 1995, 1996, 1997, 1998, 1999, and 2000.				
2002 - Same closures in effect as in 1995, 1996, 1997, 1998, 1999, 2000, and 2001.				

Table 3.6-1 (cont). Time series of groundfish management measures and closure areas protecting habitat under Bering Sea and Aleutian Islands and Gulf of Alaska fishery management plans.

Gulf of Alaska				
Year	**Location**	**Season**	**Area size**	**Notes**
1978 - GOA groundfish FMP; descriptions of fish habitat, gear restrictions, and area closures to foreign fishing.				
1985 - NOAA Fisheries habitat policy added to GOA FMP.				
1987	Kodiak	Year-round	1,000 nm^2	Trawling prohibited; intended to protect juvenile red king crab habitat.
	Kodiak	2/15-6/15	500 nm^2	Trawling prohibited; intended to protect juvenile red king crab habitat.
1990 - Kodiak trawl closures extended.				
1993 - Kodiak no-trawl zones made permanent.				
1995	Steller sea lion rookeries	Year-round	3,000 nm^2	10–mile no-trawl zones around 14 rookeries.
	Steller sea lion rookeries	Seasonal extension	1,900 nm^2	20–mile no-trawl extensions around 3 rookeries.
1996 and 1997 - Same closures in effect as in 1995.				
1998 - Same closures in effect as in 1995, 1996, and 1997, with one addition:				
1998	Southeast Trawl areas	Year-round	52,600 nm^2 (1,929 nm^2 on the shelf)	Adopted as part of license limitation program, all trawling prohibited east of 140°.
1999 - Additional closures to protect Steller sea lion critical habitat and:				
1999	Sitka Pinnacles Marine Reserve	Year-round	3.1 nm^2	Closure to all commercial gear.
2000 - Same closures in effect as in 1995, 1996, 1997, 1998, and 1999 plus:				
2000	GOA Pollock Trawl exclusion zones	Year-round	11,900 nm^2 (includes EBS & AI)	Steller sea lion protection.
	GOA Pollock Trawl exclusion zones	Jan-June	14,800 nm^2 (includes EBS & AI)	Steller sea lion protection.
	Cook Inlet Trawl Closure	Year-round	7,000 nm^2 (includes State waters)	Control crab bycatch and protect crab habitat in an area with depressed King and Tanner crab stocks.
2001 - Same closures in effect as in 1995, 1996, 1997, 1998, 1999, and 2000.				
2002 - Same closures in effect as in 1995, 1996, 1997, 1998, 1999, 2000, and 2001.				

Sources: NPFMC, C. Coon.

Table 3.6-2. Habitat past and present effects.

Direct/indirect effect	Past/present events		Past/present management actions	
	External	Internal	External	Internal
(1) Changes to non-living habitat • Cross reference effects (see Section 3.6.4.3): a) Alteration of physical structure. b) Sediment resuspension. c) Chemical and physical modification of the water column.	• Dredging (for scallops, clams, and/or for navigation). • Foreign fisheries pre-Magnuson-Stevens Act (MSA) (1958-1976). • Foreign fisheries post-MSA (1976-1985). • State of Alaska trawl fisheries. • Longline/pots ○ International Pacific Halibut Commission (IPHC). ○ Shrimp pot fisheries. ○ State crab fisheries. ○ Subsistence. • Offal discharge from non-Fishery Management Plan (FMP) regulated fisheries; onshore processing plants. • Vessel groundings/ sinkings. • Port Constr./Devel[1]. • Petrol. Exp./Facilities.[1] • Oil/HazMat release. • Storm Surges. • Wind–induced waves. • Volcanic eruptions. • Earthquakes/underwater landslides.	• Joint venture (JV) fisheries (1980-1991). • Domestic bottom trawl fisheries (1988-present): ○ Pollock. ○ Rockfish. ○ Atka mackerel. ○ Flatfish. ○ Pacific Cod. • Domestic Longline/pots: ○ Pacific cod. ○ Sablefish. ○ Rockfish. • Offal discharge from domestic fishing vessels; catcher processors. • Vessel groundings/ sinkings.	• Bilateral agreement with Japan and Soviet Union (USSR) (1973): Self-monitoring of foreign fishery in eastern Bering Sea (EBS). • Industry self-imposed actions– gear modifications. • Clean Water Act. • Oil Pollution Act (OPA) 90. • International laws regarding marine pollutants.	• Fishing equipment restrictions: ○ Seasonal and areal restrictions on the use of specified equipment. ○ Equipment modifications. ○ Prohibitions on anchoring or setting equipment in sensitive areas. ○ Prohibitions on fishing activities that cause physical damage. • Time/Area Closures ○ Seasonal closures. ○ Year round closures. • Reduction in fishing effort ○ Annual total allowable catch (TAC)/acceptable biological catch (ABC) limits. ○ Prohibited species catch (PSC) limits. • Bering Sea and Aleutian Islands (BSAI)/Gulf of Alaska (GOA) FMP 55/65 – essential fish habitat (EFH)/habitat area of particular concern (HAPC) designed to protect habitat.

Comparative baseline:
Adversely impacted
Non-living habitat baseline physical characteristics:

Bering Sea
- Large, relatively shallow (<100 meters [m]) plain consisting of mud, sand, sand and mud, and gravels. Boulders and smaller rock are scattered.
- Bedrock and gravel shelf break relatively far offshore, as compared to the Aleutian Islands.
- Non-living shell hash is common.

Aleutian Islands
- Volcanic island system consisting of higher relief and vertical rock wall bedrock ledges with numerous rock and gravel passes, canyons, and trenches.
- Shelf break relatively nearshore.

Gulf of Alaska
- Diverse rock, cobble, gravel, sand, and mud slope extending to bedrock shelf break consisting of canyons, banks, and flats.

Non-living habitats have been historically exposed to fishing activity. Generally, theses habitats can be categorized into hard substrates (bedrock, boulders), coarse substrates (cobble, gravel) and soft substrates (sand, mud). Harder substrates are considered static with some local relocation of smaller boulders. Softer and coarse substrates are thought to be altered in some degree, but the extent of these alterations is not well known.

Physical benthic information is limited to site-specific investigations. Existing information includes recent Bering Sea sampling grid efforts, older Outer Continental Shelf Environmental Assessment Program (OCSEAP) investigations for a portion for the central Gulf of Alaska, and no specific physical mapping effort for the Aleutian Islands. A complete representation of the physical benthic environment for Alaska does not exist.

Table 3.6-2 (cont.). Habitat past and present effects.

Direct/indirect effect	Past/present events		Past/present management actions	
	External	Internal	Internal	External
(2) Changes to Living Habitat a) Direct Mortality of Benthic Organisms. b) Changes to Benthic Community Structure.	• Dredging (for clams, scallops, and/or for navigation). • Foreign fisheries pre-MSA (1958-1976). • Foreign fisheries post-MSA (1976-1985). • State of Alaska trawl fisheries. • Longline/pots ○ IPHC. ○ Shrimp pot fisheries. ○ State crab fisheries. ○ Subsistence. • Offal discharge from non-FMP regulated fisheries; onshore processing plants. • Vessel groundings/sinkings. • Port constr./devel[1]. • Petrol. exp./facilities[1]. • Oil/HazMat release. • Toxic algal blooms. • Intro. of exotic species. • Climatic changes. • Storm surges. • Wind–induced waves. • Volcanic eruptions. • Earthquakes/underwater landslides.	• JV fisheries (1980-1991). • Domestic bottom trawl fisheries (1988-present): ○ Pollock. ○ Rockfish. ○ Atka mackerel. ○ Flatfish. ○ Pacific Cod. • Domestic Longline/pots ○ Pacific cod. ○ Sablefish. ○ Rockfish. • Offal discharge. • Vessel groundings/sinkings.	• Bilateral agreement with Japan and USSR (1973): Self-monitoring of foreign fishery in EBS. • Industry self-imposed actions– gear modifications. • Clean Water Act. • OPA 90. • International laws regarding marine pollutants.	• Fishing equipment restrictions: ○ Seasonal and areal restrictions on the use of specified equipment. ○ Equipment modifications. ○ Prohibitions on anchoring or setting equipment in sensitive areas. ○ Prohibitions on fishing activities that cause physical damage. • Time/Area Closures ○ Seasonal closures. ○ Year round closures. • Reduction in fishing effort ○ Annual TAC/ABC limits. ○ PSC limits. • BSAI/GOA FMP 55/65 – EFH/HAPC designed to protect habitat.

Living-habitat baseline:

Bering Sea
- Diverse benthic community consisting of infauna and epifauna such as sponges, soft and hard corals, anemones, and bryozoans.

Aleutian Islands
- Rich, diverse, concentrated benthic bio-structures such as sponges, soft corals, tree corals, and anemones.

Gulf of Alaska
- Diverse benthic community consisting of infauna and epifauna such as sponges, tree corals, soft corals, anemones, and bryozoans.

Benthic habitats have been exposed to fishing in larger areas of the Bering Sea, smaller areas in the Gulf of Alaska, and in more discrete locations in the Aleutian Islands. Benthic community diversity has been altered in these areas. However, the direct association of the fishing intensity and the degree of diversity alteration remains relatively unknown. Information suggests that areas subject to high disturbance notice some change in species diversity, as compared to similar habitats or historical species distribution.

Habitat Impacts modeling indicates that biostrucure has been reduced in these locations. In the Bering Sea, impacts to biostructure range from 1.8 to 9% of the fishable economic exclusion zone (EEZ) and 8.2 to 41.9% of the fished area. In the Aleutian Islands, baseline impacts ranged from 1.1 to 6.8% of the fishable EEZ and 5.4 to 32.6% of the fished area. In the GOA, baseline effects averaged over the entire fishable EEZ range from 0.9 to 6.9% and 3.8 to 29% of the fished area.

Long-lived corals and sponges are more prevalent in the Aleutian Islands. These organisms have life history traits that make them very susceptible to fishery-induced mortality. Past fishing practices likely have had lingering effects on these species.

Table 3.6-2 (cont.). Habitat past and present effects.

Direct/indirect effect	Past/present events		Past/present management actions	
	External	Internal	External	Internal
(3) Changes in Distribution of Fishing Effort a) Geographic diversity of management measures.	• Dredging (for clams, scallops, and/or for navigation). • Foreign fisheries pre-MSA (1958-1976). • Foreign fisheries post-MSA (1976-1985). • Russian pollock fishery (1976-present). • State of Alaska trawl fisheries. • Longline/pots ○ IPHC. ○ Shrimp pot fisheries. ○ State crab fisheries. ○ Subsistence.	• JV fisheries (1980-1991). • Domestic bottom trawl fisheries (1988-present): ○ Pollock. ○ Rockfish. ○ Atka mackerel. ○ Flatfish. ○ Pacific Cod. • Domestic Longline/pots ○ Pacific cod. ○ Sablefish. ○ Rockfish.	• Bilateral agreement with Japan and USSR (1973): Self-monitoring of foreign fishery in EBS.	• Fishing equipment restrictions: ○ Seasonal and areal restrictions on the use of specified equipment. ○ Equipment modifications. ○ Prohibitions on anchoring or setting equipment in sensitive areas. ○ Prohibitions on fishing activities that cause physical damage. • Time/Area Closures ○ Seasonal closures. ○ Year round closures. • Reduction in fishing effort ○ Annual TAC/ABC limits. ○ PSC limits. • BSAI/GOA FMP 55/65 – EFH/HAPC designed to protect habitat.

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
[1]Anticipated external impact for GOA only.

Distribution of fishing effort baseline:

Bering Sea
- Bottom trawl fisheries mainly target shallow and deepwater flatfish, Pacific cod, and rockfish.
- Pelagic fisheries mainly target Walleye pollock and Atka mackerel.
- Pot gear fisheries mainly target Pacific cod, sablefish, and crab.
- Longline fisheries mainly target sablefish and rockfish.

Aleutian Islands
- Bottom trawl fisheries mainly target Pacific cod, Atka mackerel, and Pacific ocean perch.
- Pelagic fisheries mainly target Walleye pollock.
- Pot gear fisheries mainly target Pacific cod, sablefish, and crab.
- Longline fisheries mainly target sablefish and rockfish.

Gulf of Alaska
- Bottom trawl fisheries mainly target Pacific cod, flatfish, and rockfish.
- Pelagic fisheries mainly target Walleye pollock and Atka mackerel.
- Pot gear fisheries mainly target Pacific cod, sablefish and crab.
- Longline fisheries mainly target sablefish and rockfish.

FMPs for the BSAI and GOA distribute effort to specific fishery management units with the plan. Areas are seasonally and permanently closed to a particular gear type and afford protection of habitats. In the GOA, there exists a large permanently closed area to a trawl gear and a mixture of seasonal closures. In the Bering Sea, there is a mixture of open fishing areas adjacent to areas closed to fishing. In the Aleutian Islands, closure areas exist for a limited number of fishing types and there are no permanent closure areas for all fishing activities.

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Table 3.7-1. Annual estimates, by area, of total fishery effort, total numbers and bycatch rates of seabirds taken in longline fisheries.

Year	Effort (number of hooks in thousands)	Number of birds[1]	Bycatch rate (number of birds per 1,000 hooks)	Percent of hooks observed
Bering Sea and Aleutian Islands				
1993	123,232	7,975 (6,981-8,968)	0.06	24.5
1994	134,954	10,633 (9,604-11,662)	0.08	24.5
1995	141,779	19,214 (17,853-20,576)	0.14	24.2
1996	141,810	8,480 (7,594-9,366)	0.06	23.8
1997	176,534	18,063 (16,491-19,634)	0.10	22.6
1998	175,530	24,592 (22,769-26,415)	0.14	23.5
1999	157,319	12,409 (10,940-13,877)	0.08	25.0
2000	192,994	18,154 (16,562-19,746)	0.09	22.8
2001	226,186	9,992 (9,027-10,958)	0.04	21.0
Average annual estimates				
1993-1996	135,444	11,576 (11,034-12,117)	0.09	24.5
1997-2001	185,725	16,642 (15,966-17,318)	0.09	22.8
1993-2001	163,377	14,390 (13,344-14,836)	0.09	23.3
Gulf of Alaska				
1993	56,300	1,309 (1,056-1,563)	0.02	10.2
1994	49,452	532 (397-668)	0.01	4.9
1995	42,357	1,519 (1,302-1,736)	0.04	12.7
1996	33,195	1,631 (1,203-2,059)	0.05	10.8
1997	28,047	514 (338-689)	0.02	10.0
1998	29,399	1,495 (792-2,198)	0.05	8.1
1999	31,895	1,093 (812-1,375)	0.03	8.6
2000	35,345	742 (392-1,032)	0.02	6.5
2001	34,216	512 (311-713)	0.01	7.8
1993-1996	45,326	1,248 (1,108-1,388)	0.03	9.5
1997-2001	31,780	871 (696-1,047)	0.03	8.1
1993-2001	37,801	1,039 (923-1,154)	0.03	8.8

Notes: [1]Values in parentheses are 95 percent confidence bounds.

Table 3.7-2. Estimated total incidental catch[a] of seabirds by species or species groups[b] in Bering Sea and Aleutian Islands longline fisheries, 1993-2001.

Year	Observed number taken[c]	Short-tailed albatross	Black-footed albatross	Laysan's albatross	Northern fulmar	Gull[d]	Unidentified shearwaters[e]	Unidentified tubenoses[f]	Unidentified alcids[g]	Other[h]	Unidentified albatrosses[i]	Unidentified seabirds	Total Bering Sea and Aleutian Islands
1993	1,942	0	11 (4-21)	617 (458-777)	4,251 (3,416-5,103)	853 (576-1,130)	64 (22-107)	0	15 (4-30)	4 (1-10)	352 (188-517)	1,799 (1,399-2,200)	7,975 (6,981-8,968)
1994	2,700	0	37 (7-66)	311 (218-404)	4,826 (4,185-5,467)	1,734 (1,297-2,172)	675 (487-864)	350 (226-475)	4 (1-13)	4 (1-11)	76 (43-109)	2,615 (1,956-3,274)	10,633 (9,604-11,662)
1995	4,832	0	66 (26-107)	463 (267-660)	9,628 (8,613-10,643)	3,954 (3,274-4,634)	330 (225-434)	475 (253-697)	4 (1-11)	45 (16-74)	38 (19-57)	4,211 (3,489-4,933)	19,214 (17,853-20,576)
1996	2,002	4 (1-13)	20 (5-48)	234 (156-313)	5,636 (4,817-6,455)	1,487 (1,232-1,741)	487 (246-728)	14 (4-26)	46 (9-103)	49 (13-86)	60 (31-90)	442 (326-558)	8,480 (7,594-9,366)
1997	4,123	0	9 (2-22)	343 (252-433)	13,611 (12,109-15,122)	2,755 (2,276-3,234)	300 (154-445)	173 (103-243)	0	7 (2-16)	14 (3-28)	852 (519-1185)	18,063 (16,491-19,634)
1998	5,851	8 (2-15)	9 (2-21)	1,431 (1,068-1,734)	15,533 (13,873-17,192)	4,413 (3,732-5,093)	1,131 (936-1326)	21 (5-38)	53 (24-82)	48 (15-81)	4 (1-11)	1,941 (1,584-2,297)	24,592 (22,769-26,415)
1999	3,293	0	18 (4-34)	573 (475-675)	7,843 (6,477-9,209)	2,208 (1,816-2,600)	449 (358-540)	409 (144-673)	4 (1-10)	47 (12-85)	0	859 (551-1,167)	12,409 (10,940-13,877)
2000	3,868	0	16 (5-33)	441 (320-562)	10,941 (9,503-12,378)	4,504 3,857-5,150	556 (414-697)	85 (44-125)	5 (1-14)	16 (4-30)	15 (3-30)	1,576 (1,166-1,985)	18,154 (16,462-19,746)
2001	1,987	0	4 (1-12)	425 (304-547)	5,517 (4,701-6,332)	2,459 (2,044-2,873)	457 (337-578)	94 (49-139)	2 (1-6)	33 (6-61)	5 (1-14)	997 (698-1,295)	9,992 (9,027-10,958)
Average annual estimate													
1993 - 1996	NA	1 (0-4)	33 (18-48)	406 (336-477)	6,087 (5,667-6,508)	2,007 (1,784-2,230)	389 (307-471)	210 (146-274)	17 (3-33)	26 (13-38)	132 (89-175)	2,267 (2,001-2533)	11,576 (11,034-12,117)
1997 - 2001	NA	2 (0-4)	11 (5-18)	643 (558-728)	10,689 (10,069-11,309)	3,268 (3,028-3,507)	578 (514-643)	156 (100-213)	13 (6-19)	30 (18-43)	7 (2-13)	1,245 (1,091-1,399)	16,642 (15,966-17,318)
1993 - 2001	NA	1 (0-3)	21 (14-29)	538 (481-595)	8,644 (8,252-9,036)	2,707 (2,541-2,874)	494 (443-545)	180 (137-223)	15 (7-23)	28 (19-37)	63 (43-82)	1,699 (1,553-1,845)	14,390 (13,944-14,836)

Notes: [a]Values in parentheses are 95 percent confidence bounds.
[b]Species or species group codes.
[c]Observed number taken is the total number of seabirds recorded dead in the observed hauls.
[d]Unidentified gulls (herring gulls, glaucous gulls, glaucous-winged gulls).
[e]Unidentified shearwaters (unidentified dark shearwaters, sooty shearwaters, short-tailed shearwaters).
Notes: [f]Unidentified Tubenose – Unidentified procellariiformes (albatrosses, shearwaters, petrels).

Table 3.7-2. (cont). Estimated total incidental catch[a] of seabirds by species or species groups[b] in Bering Sea and Aleutian Islands longline fisheries, 1993- 2001.

[g]Unidentified alcids (guillemots, murres, puffins, murrelets, auklets).
[h]Miscellaneous birds (could include loons, grebes, storm-petrels, cormorants, waterfowl, eiders, shorebirds, phalaropes, jaeger/skuas, red-legged kittiwakes, black-legged kittiwakes, terns).
[i]Unidentified albatrosses (could include short-tailed albatrosses, Layson's albatrosses, black-footed albatrosses).

Source: (NMFS observer data; analyzed by Alaska Fisheries Science Center/National Marine Mammal Laboratory, 2002). Spectacled eider, Steller's eider, marbled murrelet, red-legged kittiwake, and Kittlitz's murrelet were not reported by observers in any observed sample from 1993 to 2001. Although of these birds only the two eider species are listed under Endangered Species Act in the action area, USFWS identifies the other three species as "species of concern" because of low and/or declining population levels. "Species of concern" is an informal classification by the USFWS, Office of Migratory Bird Management. Inclusion on the "species of concern" list has no regulatory implications.

Table 3.7-3. Estimated total incidental catch[a] of seabirds by species or species groups[b] in Gulf of Alaska longline fisheries, 1993-2001.

Year	Observed number taken[c]	Short-tailed albatross	Black-footed albatross	Laysan's albatross	Northern fulmar	Gull[d]	Unidentified shearwaters[e]	Unidentified tubenoses[f]	Unidentified alcids[g]	Other[h]	Unidentified albatrosses[i]	Unidentified seabirds	Total Gulf of Alaska
1993	318	0	29 (9-50)	125 (62-187)	833 (615-1,052)	45 (12-77)	59 (18-99)	0	0	3 (1-7)	3 (1-9)	213 (107-318)	1,309 (1,056-1,563)
1994	126	0	7 (2-16)	169 (89-250)	258 (165-351)	30 (2-81)	26 (5-54)	0	0	0	8 (2-18)	33 (8-66)	532 (397-668)
1995	374	0	236 (169-304)	67 (35-99)	520 (348-692)	99 (53-145)	39 (9-69)	6 (1-16)	0	3 (2-6)	376 (275-476)	173 (105-240)	1,519 (1,302-1,736)
1996	250	0	658 (455-860)	154 (90-128)	665 (349-982)	121 (6-317)	14 (2-35)	0	0	0	0	19 (3-42)	1,631 (1,203-2,059)
1997	74	0	99 (32-167)	40 (5-109)	307 (164-451)	46 (14-79)	9 (2-21)	0	0	0	0	12 (2-30)	514 (338-689)
1998	184	0	289 (25-596)	217 (56-378)	919 (308-1530)	53 (14-92)	13 (3-30)	0	0	0	4 (1-12)	0	1,495 (792-2,198)
1999	159	0	183 (70-297)	202 (123-280)	277 (156-399)	358 (136-581)	50 (8-93)	0	0	7 (1-21)	0	16 (4-37)	1,093 (812-1,375)
2000	72	0	139 (53-225)	93 (25-160)	297 (70-524)	179 (15-415)	0	0	0	0	0	34 (2-102)	742 (392-1,032)
2001	45	0	72 (20-124)	67 (6-128)	230 (115-344)	98 (4-244)	20 (1-58)	0	6 (1-18)	0	15 (1-44)	3 (1-9)	512 (311-713)
Average annual estimate													
1993-1996	NA	0	233 (179-287)	129 (97-160)	569 461-677)	74 (21-127)	35 (19-50)	1 (0-4)	0	1 (0-3)	97 (71-122)	109 (76-142)	1,248 (1,108-1,388)
1997-2001	NA	0	156 (86-227)	124 (81-167)	406 (268-544)	147 (75-219)	18 (6-31)	0	1 (0-4)	1 (0-5)	4 (0-10)	13 (1-28)	871 (696-1,047)
1993-2001	NA	0	190 144-236	126 (98-154)	479 (388-569)	114 (68-161)	26 (16-36)	1 (0-2)	1 (0-2)	1 (0-4)	45 (33-57)	56 (39-73)	1,039 (923-1,154)

Notes: [a]Values in parentheses are 95 percent confidence bounds.
[b]Species or species group codes.
[c]Observed number taken is the total number of seabirds recorded dead in the observed hauls.
[d]Unidentified gulls (herring gulls, glaucous gulls, glaucous-winged gulls).
[e]Unidentified shearwaters (unidentified dark shearwaters, sooty shearwaters, short-tailed shearwaters)

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Table 3.7-3. (cont.). Estimated total incidental catch[a] of seabirds by species or species groups[b] in Gulf of Alaska longline fisheries, 1993-2001.

Notes: [f]Unidentified Tubenose – Unidentified procellariiformes (albatrosses, shearwaters, petrels).
[g]Unidentified alcids (guillemots, murres, puffins, murrelets, auklets).
[h]Miscellaneous birds (could include loons, grebes, storm-petrels, cormorants, waterfowl, eiders, shorebirds, phalaropes, jaeger/skuas, red-legged kittiwakes, black-legged kittiwakes, terns).
[i]Unidentified albatrosses (could include short-tailed albatrosses, Layson's albatrosses, black-footed albatrosses).

Source: (NMFS Observer data; analyzed by Alaska Fisheries Science Center/National Marine Mammal Laboratory, 2002).

Spectacled eider, Steller's eider, marbled murrelet, red-legged kittiwake, and Kittlitz's murrelet were not reported by observers in any observed sample from 1993 to 2001. Although of these birds only the two eider species are listed under Expanded Species Act (ESA) in the action area, USFWS identifies the other three species as "species of concern" because of low and/or declining population levels. "Species of concern" is an informal classification by the USFWS, Office of Migratory Bird Management. Inclusion on the "species of concern" list has no regulatory implications.

Table 3.7-4. Range of estimates of total incidental catch of seabirds by species or species groups in the combined Bering Sea and Aleutian Islands and Gulf of Alaska trawl fisheries, 1997-2001.

Year	Observed number taken[a]	Range Estimate	Short-tailed albatross	Black-footed albatross	Laysan's albatross	Northern fulmar	Gull[b]	Unidentified shearwaters[c]	Unidentified tubenoses[d]	Unidentified alcids[e]	Other[f]	Unidentified albatrosses[g]	Unidentified seabirds	Total
1997	55	low	0	0	80	75	0	77	0	115	0	0	181	528
		high	0	0	149	343	0	662	0	115	0	0	1,074	2,343
1998	45	low	0	0	134	93	708	856	1	110	3	0	8	1,912
		high	0	0	341	2,617	1,590	1,238	163	543	2,494	0	1,035	10,020
1999	154	low	0	0	8	446	0	82	0	664	0	0	17	1,218
		high	0	0	27	7,810	0	812	0	730	85	0	663	10,187
2000	101	low	0	0	0	298	37	10	2	1	0	0	60	407
		high	0	0	0	9,432	114	3,034	155	182	0	0	480	13,397
2001	141	low	0	0	8	323	4	329	9	1	3	0	65	741
		high	0	0	150	9,255	288	887	863	68	297	0	681	12,488
Average annual estimate														
1997-2001	na	low	0	0	46	274	150	271	2	178	1	0	66	961
		high	0	0	133	5,891	398	1,327	236	340	575	0	787	9,687

Notes: Observed number taken is the total number of seabirds recorded dead in the observed hauls.

[b]Unidentified gulls (herring gulls, glaucous gulls, glaucous-winged gulls).

[c]Unidentified shearwaters (unidentified dark shearwaters, sooty shearwaters, short-tailed shearwaters).

[d]Unidentified Tubenose – Unidentified procellariiformes (albatrosses, shearwaters, petrels).

[e]Unidentified alcids (guillemots, murres, puffins, murrelets, auklets).

[f]Miscellaneous birds (could include loons, grebes, storm-petrels, cormorants, waterfowl, eiders, shorebirds, phalaropes, jaeger/skuas, red-legged kittiwakes, black-legged kittiwakes, terns).

[g]nidentified albatrosses (could include short-tailed albatrosses, Layson's albatrosses, black-footed albatrosses).

Table 3.7-5. Estimated total incidental catch[a] of seabirds by species or species groups in the combined Bering Sea and Aleutian Islands and Gulf of Alaska pot fisheries, 1993-2001.

Year	Observed number taken[b]	Short-tailed albatross	Black-footed albatross	Laysan's albatross	Northern fulmar	Gull[c]	Unidentified shearwaters[d]	Unidentified Tubenoses[e]	Unidentified alcids[f]	Other[g]	Unidentified Albatrosses[h]	Unidentified seabirds	Total
1993	0	0	0	0	0	0	0	0	0	0	0	0	0
1994	0	0	0	0	0	0	0	0	0	0	0	0	0
1995	6	0	0	0	9 (2-23)	3 (1-10)	7 (1-20)	0	19 (2-55)	0	0	0	39 (6-79)
1996	9	0	0	0	80 (7-174)	0	0	2 (1-6)	0	0	0	7 (1-19)	89 (9-183)
1997	4	0	0	0	14 (3-29)	0	0	0	9 (1-26)	0	0	0	23 (4-46)
1998	2	0	0	0	19 (1-54)	15 (1-44)	0	0	0	0	0	0	33 (2-79)
1999	47	0	0	0	166 (71-261)	0	9 (1-26)	14 (5-28)	0	0	0	0	189 (91-286)
2000	1	0	0	0	0	0	0	0	0	0	0	42 (1-22)	42 (1-22)
2001	3	0	0	0	13 (2-33)	3 (1-8)	0	0	0	0	0	0	16 (3-36)
Average annual estimate													
1993-1996	NA	0	0	0	22 (2-46)	1 (0-3)	2 (0-5)	1 (0-2)	5 (0-14)	0	0	2 (0-5)	32 (6-58)
1997-2001	NA	0	0	0	42 (21-64)	4 (0-10)	2 (0-6)	3 (1-6)	2 (0-6)	0	0	8 (0-25)	61 (33-88)
1993-2001	NA	0	0	0	33 (17-49)	2 (0-6)	2 (0-5)	2 (0-4)	3 (0-8)	0	0	5 (0-15)	48 (28-67)

Notes: [a]Values in parentheses are 95 percent confidence bounds.

[b] Observed number taken is the total number of seabirds recorded dead in the observed hauls.

[c]Unidentified gulls (herring gulls, glaucous gulls, glaucous-winged gulls).

[d]Unidentified shearwaters (unidentified dark shearwaters, sooty shearwaters, short-tailed shearwaters).

[e]Unidentified Tubenose – Unidentified procellariiformes (albatrosses, shearwaters, petrels).

[f]Unidentified alcids (guillemots, murres, puffins, murrelets, auklets).

[g]Miscellaneous birds (could include loons, grebes, storm-petrels, cormorants, waterfowl, eiders, shorebirds, phalaropes, jaeger/skuas, red-legged kittiwakes, black-legged kittiwakes, terns).

[h]Unidentified albatrosses (could include short-tailed albatrosses, Layson's albatrosses, black-footed albatrosses).

Table 3.7-6. Black-footed albatross past/present effects.

Direct/ indirect effect	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Feather hunters (1900). • Military activities at breeding colonies (1940's to 1970's). • Foreign fisheries incidental take (1960's to present). • Other United States (U.S.) longline fisheries.	• Incidental take in Magnuson-Stevens Act (MSA) groundfish longline fisheries (1978 to present). • Observer Program data 1993-2001: estimated average take in Bering Sea and Aleutian Islands (BSAI) = 21 birds per year and in Gulf of Alaska (GOA) = 190 birds per year.	• Migratory Bird Treaty Act (1918). • United Nations (U.N.) Resolution (46/215) banning high-seas drift fishing (1992). • International Plan of Action for reducing incidental take of seabirds in longlines (1999). • National Plan of Action for reducing incidental take of seabirds in longlines (2001).	• Seabird/fishery interaction monitoring and research through Observer Program (1990 to present). • Seabird protection measures instituted for longline fleet (1997 to present) have reduced numbers of albatross taken in both BSAI and GOA.
Reduced fitness through changes in prey availability	• Climate and oceanic fluctuations impact abundance and distribution of prey. •High-seas squid drift fisheries (1970's-1991).	• Impact unknown but presumed to be minimal.	• U.N. Resolution (46/215) banning high-seas drift fishing (1992).	• Ban on targeting forage fish (BSAI/GOA Fishery Management Plan [FMP] amendments 36/39, 1997).
Reduced fitness through consumption of fishery wastes	• Foreign fisheries and processing vessels throughout North Pacific. • Other U.S. fisheries.	• MSA groundfish vessels and at-sea processors (1979 to present). • Benefits of supplemental food offset by increased risk of take in gear.	• National Plan of Action for reducing incidental take of seabirds in longlines (2001).	• Seabird protection measures prohibit discharge of fishery wastes over baited hooks (1997 to present).
Reduced fitness through consumption of plastics	• Numerous sources of raw plastic pellets and plastic consumer products on land and at sea.	• Fishing vessels and processors contribute unknown amounts of plastic products.	• Marine Plastic Pollution Research and Control Act (MPPRCA) (1987).	• Educational effort on importance of compliance with MPPRCA (1995 to present).

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:
- Worldwide population about 300,000 but declining.
- Concern for impacts of international longline fishing on declining population (incidental take).
- Seabird deterrence measures for BSAI/GOA longline fisheries have reduced incidental take since 1997.

Carry forward for cumulative effects analysis?

Yes. Incidental take in longline fisheries expected to remain under all alternatives. Discussed in conjunction with Laysan albatross and shearwaters in Chapter 4.

Table 3.7-7. Laysan albatross past/present effects.

Direct/ indirect effect	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Feather hunters (1900). • Military activities at breeding colonies (1940's to 1970's). • High-seas squid drift fisheries may have taken over 100,000 Laysan's per year (1970's to 1991). • Foreign fisheries incidental take could exceed 15,000 birds per year at present (1960's to present). • Incidental take in other United States (U.S.) longline fisheries.	• Incidental take in Magnuson-Stevens Act (MSA) groundfish longline fisheries (1978 to present). • Observer Program data 1993-2001: estimated average take in Bering Sea and Aleutian Islands (BSAI) longlines = 629 birds per year and in Gulf of Alaska (GOA) = 144 birds per year. • Incidental take in trawls averages 46-133 birds per year in the BSAI and GOA. • Vessel and third wire strikes.	• Migratory Bird Treaty Act (1918). • United Nations (U.N.) Resolution (46/215) banning high-seas drift fishing (1992). • International Plan of Action for reducing incidental take of seabirds in longlines (1999). • National Plan of Action for reducing incidental take of seabirds in longlines (2001).	• Seabird/fishery interaction monitoring and research through Observer Program (1990 to present). • Seabird protection measures instituted for longline fleet (1997 to present) did not reduce numbers of Laysan albatross taken in either BSAI or GOA.
Reduced fitness through changes in prey availability	• Climate and oceanic fluctuations impact abundance and distribution of prey. • High-seas squid drift fisheries (1970's-1991).	• Impact unknown but presumed to be minimal.	• U.N. Resolution (46/215) banning high-seas drift fishing (1992).	• Ban on targeting forage fish (BSAI and GOA FMP Amendments 36/39, 1997).
Reduced fitness through consumption of fishery wastes	• Foreign fisheries and processing vessels throughout North Pacific. • Other U.S. fisheries.	• MSA groundfish vessels and at-sea processors (1979 to present). • Benefits of supplemental food offset by increased risk of take in gear.	• National Plan of Action for reducing incidental take of seabirds in longlines (2001).	• Seabird protection measures prohibit discharge of fishery wastes over baited hooks (1997 to present).
Reduced fitness through consumption of plastics	• Numerous sources of raw plastic pellets and plastic consumer products on land and at sea.	• Fishing vessels and processors contribute unknown amounts of plastic products.	• Marine Plastic Pollution Research and Control Act (MPPRCA) (1987).	• Educational effort on importance of compliance with MPPRCA (1995 to present).

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:

- Worldwide population about 2.4 million but declining at largest nesting colony.
- Concern for impacts of international longline fishing on declining population (incidental take).
- Seabird deterrence measures for BSAI/GOA longline fisheries have not reduced incidental take since 1997.
- Ongoing efforts to reduce incidental take guided by scientific evaluation of deterrence measures through Observer Program and directed research.

Carry forward for cumulative effects analysis?

Yes. Incidental take in longline fisheries expected to remain under all alternatives. Discussed in conjunction with black-footed albatross and shearwaters in Chapter 4.

Table 3.7-8. Timeline of National Oceanic and Atmospheric Administration Alaska region seabird activities and related seabird issues, as of May 31, 2002.

1980	• United States Fish and Wildlife Service (USFWS) proposes domestic Endangered Species Act (ESA) listing of short-tailed albatross (short-tailed albatross is listed as endangered) "outside of the United States (U.S.)," which would include in the Exclusive Economic Zone (EEZ), 45 FR 49844, July 25, 1980. Proposed rule is not finalized.
1989	• USFWS issues biological opinion under Section 7 of the ESA that groundfish fisheries off Alaska (particularly hook-and-line and gillnet) have the potential for taking the endangered short-tailed albatross. Incidental take set at two birds per year; this is based on historical take (1983 and 1987). • First pilot National Marine Fisheries Service (NMFS) observer program for high seas squid fishery in North Pacific; information collected on marine mammal and bird takes. Japanese squid fishery expanding in North Pacific in mid-1970's.
1990	• Squid observer training program relocated to NMFS Groundfish Observer Program (GFOP). Pat Gould brought in as principal investigator of seabird component of High Seas Driftnet Program. Gould recognizes need for GFOP to collect more extensive seabird bycatch data.
1992	• Pilot program targeting hook-and-line fisheries initiated. Special project NMFS observers use special data forms, bird identification (ID), take numbers, number of hooks, whether caught during set or retrieval. • May 8, USFWS publishes proposed rule in *Federal Register* (FR) to list the spectacled eider as a threatened species throughout its range (57 FR 19852). • NMFS Section 7 ESA consultations with USFWS on potential effects of Bering Sea and Aleutian Islands (BSAI) and Gulf of Alaska (GOA) groundfish fisheries on listed species references the spectacled and Steller's eiders. USFWS determines that the groundfish fisheries are not likely to adversely affect either of the species. From 1995 on, the consultations focus on the short-tailed albatross.
1993	• GFOP expands above seabird duties to all groundfish NMFS observers, to include sightings of sensitive species, sightings of miscellaneous species, bird/vessel interactions, gear-related mortality, intended and direct mortality, use of deterrent device by the vessel, detailed information found on leg bands of banded seabirds, and Seabird Daily Notes (record notes associated with seabirds). • May 10, the USFWS publishes final rule in *Federal Register* to list the spectacled eider as a threatened species throughout its range (58 FR 27474).
1994	• Numerous NMFS news releases, support of privately (to present) produced brochure to notify/educate public and industry about methods to reduce seabird bycatch. • July 14, the USFWS publishes proposed rule in *Federal Register* to list the Alaska breeding population of the Steller's eider as a threatened species (58 FR 35896).
1995	• USFWS amends biological opinion on short-tailed albatross to require that NMFS collect fishery observer data. Coordination with USFWS to begin process of estimating total seabird take in groundfish fisheries.
1996	• North Pacific hook-and-line industry petitions the North Pacific Fishery Management Council (NPFMC) for regulations to reduce seabird bycatch in hook-and-line fisheries (November).
1997	
Feb:	• USFWS amends biological opinion on short-tailed albatross, incidental take revised to four birds per two years; reasonable and prudent measures revised to require regulations for seabird avoidance measures and to require development of a plan to test the effectiveness of such measures; conservation recommendations added.

Table 3.7-8 (cont.). Timeline of National Oceanic and Atmospheric Administration Alaska Region seabird activities and related seabird issues, as of May 31, 2002.

Mar:	• Proposed rule published in *Federal Register* that would require groundfish hook-and-line vessels to use seabird avoidance measures (62 FR 10016). • Begin involvement in United Nation's Food and Agriculture Organization (FAO) initiative to reduce incidental catch of seabirds in global longline fisheries; NMFS and USFWS are co-leads for the Interagency Seabird Team.
Apr:	• Final rule published in *Federal Register* requiring groundfish hook-and-line vessels to use seabird avoidance measures (62 FR 23176); regulations effective May 29, 1997. • GFOP begins collecting information from groundfish observers (at debriefing) on what types of seabird avoidance measures are being used by hook-and-line vessels in the GOA and BSAI groundfish fisheries.
Jun:	• Council recommends similar measures for Pacific halibut fishery. • June 11, USFWS publishes final rule in *Federal Register* to list the Alaska breeding population of the Steller's eider as a threatened species (62 FR 31748).
Aug:	• NMFS, USFWS, and International Pacific Halibut Commission (IPHC) staff and industry representatives observe deployment of seabird avoidance gear on F/V *Frontier Spirit*, a freezer-longliner, in Puget Sound. • GFOP transmits seabird bycatch data and seabird notes from observer logbooks to USFWS.
Sep:	• NMFS staff (U.S. co-lead) meet with USFWS (U.S. co-lead), Japan representatives, and FAO representative in Anchorage, Alaska, on FAO seabird consultation initiative. • NMFS staff attend USFWS-sponsored public seminar by Dr. Hiroshi Hasegawa, Toho University, Japan, world expert on the short-tailed albatross; NMFS staff meet with Dr. Hasegawa, USFWS, and university staff to discuss impacts to short-tailed albatross population. • USFWS publishes in the *Federal Register* a "notice of review" that lists the short-tailed albatross as an ESA candidate species (62 FR 49398).
Nov:	• NMFS, USFWS, and industry participation in Fish EXPO conference, "Fisherman to Fisherman: Seabird Avoidance in North Pacific Longline Fisheries"; joint sponsors for information booth. • Letters to 2,500 federal fisheries permit holders asking that short-tailed albatross sightings be reported to USFWS. Letters enclosed laminated identification chart of North Pacific albatrosses.
1998	
Jan:	• NMFS distributes laminated identification chart of North Pacific albatrosses to 6,000 Individual Fishing Quota (IFQ) permit holders (halibut and sablefish).
Feb:	• NMFS publishes proposed rule in *Federal Register* that would require seabird avoidance measures in the Pacific halibut fishery and exempt vessels less than 26 foot (ft.) length overall (LOA) in this fishery and the GOA and BSAI groundfish fisheries from some of the measures (62 FR 65635).
Mar:	• Final rule published in *Federal Register* requiring vessels in Pacific halibut fisheries to use seabird avoidance measures (63 FR 11161) and exempting vessels less than 26 ft. LOA in this fishery and the GOA and BSAI groundfish fisheries from some of the measures; regulations effective April 6, 1998. • IPHC issues news release regarding the above regulations and notice that IPHC port samplers will interview fishermen for information on seabirds. • NMFS and USFWS staff are invited to participate in the FAO's Seabird Technical Working Group (STWG) meeting in Tokyo. The STWG's objective is to draft a plan of action for implementing guidelines to reduce incidental catches of seabirds in longline fisheries. • NMFS staff provide script advice to New England Aquarium staff that are producing a video on fishery bycatch. Script specifically mentions incidental catch of seabirds in hook-and-line fisheries.

Table 3.7-8 (cont.). Timeline of National Oceanic and Atmospheric Administration Alaska Region seabird activities and related seabird issues, as of May 31, 2002.

Apr:	• NMFS submits to USFWS the "Test Plan to Evaluate Effectiveness of Seabird Avoidance Measures Required in Alaska's Hook-and-Line Groundfish and Halibut Fisheries," as required by the 1997 USFWS biological opinion. NMFS begins process to secure funding for test plan's implementation.
Jun:	• NMFS Seabird Coordinator hired to address seabird bycatch management issues and the requirements within Section 7 consultations on effects of the groundfish and halibut fisheries off Alaska on the short-tailed albatross.
Sep:	• NMFS transmits 1993–1997 commercial fisheries catch data to the USFWS for use in extrapolation of seabird bycatch estimates for the GOA and BSAI groundfish fisheries.
Oct:	• NMFS staff (Hawaii and Alaska) attend Black-footed Albatross Population Biology Workshop co-sponsored by the Western Pacific Regional Fishery Management Council, the USFWS, and NMFS. • NMFS and USFWS staff on the U.S. delegation to the FAO's Reduction of Incidental Catch of Seabirds in Longline Fisheries technical consultation held in Rome, Italy.
Nov:	• NMFS distributes seabird bycatch information with annual mailing of NMFS groundfish fisheries permits. Information includes: information bulletin of recent short-tailed albatross takes, measures to avoid seabirds, USFWS's short-tailed albatross encounter form. • NMFS provides above seabird bycatch information at Fish Expo in Seattle and seeks industry comment on effective use of seabird avoidance measures. • The USFWS proposes domestic ESA listing of short-tailed albatross (short-tailed albatross is listed as endangered "outside of the United States," which would include in the EEZ), 63 FR 58692, November 2, 1998.
Dec:	• NMFS presents Seabird Bycatch Report at Council meeting.
1999	
Feb:	• NMFS and USFWS staff participate in and present a paper at the symposium entitled, *Seabird Bycatch: Trends, Roadblocks, and Solutions* at the annual meeting of the Pacific Seabird Group. • At its February meeting, the Council recommends that NMFS release for public review the environmental assessment regulatory impact review (EARIR)/initial regulatory flexibility analysis (IRFA) for a regulatory amendment to revise regulations for seabird avoidance measures in the hook-and-line fisheries off Alaska to reduce bycatch of the short-tailed albatross and other seabird species.
Mar:	• NMFS awards $180K to the Washington Sea Grant Program (WSGP) a Saltonstall-Kennedy Grant to conduct research on the effectiveness of seabird avoidance measures in the North Pacific longline fisheries. NMFS participates in the implementation of this research. • NMFS publishes notice of receipt of an exempted fishing permit (EFP) application from the WSGP to be used in conjunction with its Saltonstall-Kennedy grant award to test the effectiveness of seabird avoidance measures (64 FR 14885). • NMFS receives a second EFP application from WSGP to augment the first EFP. • USFWS issues a biological opinion on March 19, on the effects of the BSAI and GOA groundfish hook-and-line fisheries on the endangered short-tailed albatross. Incidental take limit is four birds in 1999 and 2000.
Apr:	• At its April meeting, the Council recommends that NMFS promulgate revisions to the current regulations that require the use of seabird avoidance gear and methods in the hook-and-line fisheries off Alaska.
May:	• NMFS announces issuance of EFP 99-01 to the WSGP to conduct an experiment in the GOA and BSAI to test the effectiveness of seabird avoidance measures (64 FR 25478).

Table 3.7-8 (cont.). Timeline of National Oceanic and Atmospheric Administration Alaska Region seabird activities and related seabird issues, as of May 31, 2002.

Jun:	• NMFS announces issuance of EFP 99-02 to the WSGP to conduct experiments on freezer-longliners in the Pacific cod BSAI fishery to test the effectiveness of seabird avoidance measures (64 FR 29994, June 4, 1999). • NMFS and the IPHC are notified of approval of a National Fish and Wildlife Foundation (NFWF) grant "Evaluation of Effectiveness of Seabird Avoidance Measures Required in Alaska's Hook-and-Line Groundfish and Halibut Fisheries" ($41K NFWF Funds, $100K Challenge Funds). • NMFS issues Information Bulletin 99-62 to announce the incidental take limit established for the endangered short-tailed albatross in the Alaska hook-and-line groundfish fishery for 1999 and 2000.
Sep:	• Participation on Seabird Inter-Agency Working Group (SIAWG) to develop a U.S. National Plan of Action for the Reduction of the Incidental Catch of Seabirds in Longline Fisheries (NPOA-Seabirds). Notice of schedule for development of NPOA-Seabirds published in the *Federal Register* (64 FR 48987 September 9, 1999).
Dec:	• Continued participation since September on the SIAWG. Draft NPOA-Seabirds made available for review and public comment (64 FR 73017 December 29, 1999).
2000	
Jan:	• Changes made to observer data collection and vessel logbook information to collect data on types of seabird avoidance measures used on a haul-by-haul basis. This will allow for some quantitative measure of the effectiveness of measures at reducing seabird bycatch.
Feb:	• Notice of extension of public comment period for draft NPOA-Seabirds, published in the *Federal Register* (65 FR 4945 February 2, 2000). • NMFS staff attendance at a USFWS informational briefing in Anchorage on the proposals for designating critical habitat for spectacled eiders and Steller's eiders, February 1, Tudor Road USFWS office. • USFWS proposed rule for proposed designation of critical habitat for the spectacled eider. Published in the *Federal Register* (65 FR 6114 February 8, 2000). • NMFS staff attendance at 27th Annual Meeting of the Pacific Seabird Group in Napa, California, February 23–26. Presentation of "A NPOA for Reducing the Incidental Catch of Seabirds in Longline Fisheries."
Mar:	• USFWS proposed rule for proposed designation of critical habitat for the Steller's eider. Published in the *Federal Register* (65 FR 13262 March 13, 2000). • NMFS contract awarded to IPHC for feasibility study that investigates all options for monitoring bycatch of the endangered short-tailed albatross in the Pacific halibut fishery in waters off Alaska. $20K award, work to commence by May 1, progress report due by September 1, final report due no later than December 1.

Table 3.7-8 (cont.). Timeline of National Oceanic and Atmospheric Administration Alaska Region seabird activities and related seabird issues, as of May 31, 2002.

Apr:	• NMFS staff report on status of seabird Issues to the Council at its April meeting in Anchorage. • NMFS Domestic Fisheries Division and National Observer Program Office staff and Alaska Region staff attendance at Conservation of Arctic Flora and Fauna (CAFF) Workshop on Seabird Bycatch in Waters of Arctic Countries. Bedford Institute of Oceanography, Dartmouth, Nova Scotia, April 26–28. General session presentation on "Addressing the problem: seabird mortality from longline fisheries in the waters of Arctic countries" by John Cooper, Euan Dunn, Kim Rivera. Session 1: Poster presentation "A NPOA for Reducing the Incidental Catch of Seabirds in Longline Fisheries." "United States (U.S.) NPOA" by Al Manville, USFWS, and Steve Leathery, NMFS. Session 3: "The Collection of Seabirds and Seabird Bycatch Data by U.S. Fishery Observer Programs: An Overview." by Victoria Cornish, NMFS. "Incidental Observations of Seabirds Taken Incidentally by Alaskan Nearshore Commercial Net Fisheries: Is it Good Enough?"by Brian Fadely. • NMFS staff attendance at 11th Western Groundfish Conference, Sitka, Alaska, April 24–28. Poster presentation of "A NPOA for Reducing the Incidental Catch of Seabirds in Longline Fisheries" and oral presentation "Incidental Catch of Seabirds by Hook-and-Line Fisheries in Alaska." • USFWS notice of extension of comment period for proposed designation of critical habitat for the Steller's eider and the spectacled eider. Published in the *Federal Register* (65 FR 20938 April 19, 2000).
May:	• Presentation for the public (evening of May 3) and NMFS staff (noon, May 3) by Dr. John Cooper, Birdlife International Seabird Conservation Program, "Keeping the World's Seabirds off the Hook: Efforts to Save the Albatross." Alaska region (AKR) efforts reported on in presentation. • NMFS staff attendance at 2nd International Conference on the Biology and Conservation of Albatrosses and other Petrels, May 8–12, Honolulu, Hawaii. Poster presentation of "A NPOA for Reducing the Incidental Catch of Seabirds in Longline Fisheries" and oral presentation "Incidental Catch of Seabirds by Longline Fisheries in Alaska." Participation in associated "Workshop on Albatross and Petrel Mortality from Longline Fishing," presentation on "The FAO International Plan of Action: what are nations doing?" • Mailing of USFWS's Short-tailed Albatross Fact Sheet and Short-tailed Albatross Reporting Form to IFQ permit holders with the IFQ Report to the Fleet, mid-May.
Jul:	• USFWS final rule to extend endangered status for the short-tailed albatross (*Phoebastria albatrus*) to include the species range within the U.S. 65 FR 46643, July 31.
Aug:	• USFWS publishes an extension of comment periods and notice of availability of draft economic analyses on proposed critical habitat determinations for the spectacled eider and Steller's eider. Published in the *Federal Register* (65 FR 51577, August 24, 2000). • "Avoiding Seabirds in the Hook-and-Line Fisheries" information included in the NMFS IFQ Report to the Fleet 2000; mailed to approximately 5,000 IFQ halibut and sablefish permit holders.
Nov:	• First meeting of the North Pacific Albatross Working Group. Goal of group is to "Improve albatross conservation and protection in the North Pacific through enhanced communication and coordination of conservation, management, monitoring, outreach, and research activities." • Participation by representatives of NMFS Alaska Region, WSGP, and the Alaska freezer-longliner industry at the "International Fishers Forum on Solving the Incidental Capture of Seabirds in Longline Fisheries". The Forum is sponsored and hosted by the New Zealand Fishing Industry and the New Zealand Government.
Dec:	• A Feasibility Study that Investigates Options for Monitoring Bycatch of the Short-tailed Albatross in the Pacific Halibut Fishery off Alaska, Prepared for NMFS by IPHC Staff, December 1.

Table 3.7-8 (cont.). Timeline of National Oceanic and Atmospheric Administration Alaska Region seabird activities and related seabird issues, as of May 31, 2002.

2001	
Jan:	• Presidential Executive Order 13186 of January 10, 2001: Responsibilities of Federal Agencies to Protect Migratory Birds. Published in the *Federal Register* (66 FR 3853, January 17, 2001). • NMFS issues news release (NMFS 01-02-AKR) on steps to develop a monitoring plan the incidental catch of short-tailed albatross in the Pacific halibut fishery off Alaska. • NMFS issues Information Bulletin 01-07 to announce the extension of the incidental take limit established for the endangered short-tailed albatross in the Alaska hook-and-line groundfish fishery for 1999 and 2000, until superseded by a subsequent USFWS Biological Opinion.
Feb:	• Revised A Feasibility Study that Investigates Options for Monitoring Bycatch of the Short-tailed Albatross in the Pacific Halibut Fishery off Alaska, Prepared for NMFS by IPHC Staff, February 1. • Information on WSGP's research on effectiveness of seabird avoidance measures included in materials mailed to approximately 2,500 Federal Fisheries and IFQ permit holders using longline gear. Also included was the USFWS's Short-tailed Albatross Encounter Form and the National Oceanic and Atmospheric Administration (NOAA)-AKR news release on development of a monitoring plan in the Pacific halibut fishery off Alaska. • USFWS makes final determination of critical habitat for the Alaska-breeding population of the Steller's eider. Published in the *Federal Register* (66 FR 8850, February 2, 2001). • USFWS makes final determination of critical habitat for the spectacled eider. Published in the *Federal Register* (66 FR 9146, February 6, 2001). • Meeting of the North Pacific Albatross Working Group, concurrent with annual meeting of Pacific Seabird Group. • Poster entitled Seabird Bycatch in Longline Fisheries Off Alaska: 1993-1999 Preliminary Estimates and Bycatch Reduction Efforts presented by NMFS AKR staff at annual meeting of the Pacific Seabird Group. • NMFS announces the availability of the U.S. NPOA for Reducing the Incidental Catch of Seabirds in Longline Fisheries. Notice published in the *Federal Register* (66 FR 12764, February 28, 2001).
April:	• NMFS staff participate at a workshop in South Africa to develop a grant proposal for submission to the United Nations' Global Environmental Facility (GEF) on seabird bycatch reduction initiatives and NPOA development in developing countries.
May:	• NMFS issues Information Bulletin 01-54 to clarify code descriptions in logbook instructions for seabird avoidance devices used with longline gear. Mailed materials to approximately 2,500 Federal Fisheries and IFQ permit holders using longline gear. • USFWS and Japan begin preliminary work on a joint satellite telemetry study of the endangered short-tailed albatross at the breeding colony of Torishima Island, Japan. • North Pacific Albatross Working Group teleconference meeting. • Participation by NMFS staff in Panel Session at Pew Fellows Program for Marine Conservation Annual Meeting, Nova Scotia, "Legislating Change: What Policy Makers Need & Want from Scientists and Advocates" "Case Study: Incidental Catch of Seabirds in Longline Fisheries off Alaska: Collaborative Efforts to Reduce the Bycatch".
Jun:	• NMFS publishes seabird mitigation measures for Hawaii-based pelagic longline fishery in emergency interim rule in the *Federal Register* (66 FR 31565, June 12, 2001).
Sep:	• WSGP makes available Solutions to Seabird Bycatch in Alaska's Demersal Longline Fisheries. Final results and recommendations based on a 2-year experimental study conducted on commercial longline vessels.

Table 3.7-8 (cont.). Timeline of National Oceanic and Atmospheric Administration Alaska Region seabird activities and related seabird issues, as of May 31, 2002.

Oct:	• NMFS staff participate on the U.S. delegation to the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR) ad-hoc group, Incidental Mortality of Albatross in Longline Fisheries (IMALF). • USFWS initiates an international recovery team for the short-tailed albatross under the ESA. • Interagency Seabird Working Group (ISWG) formed (per NPOA). Representatives from NMFS, USFWS, Department of State, and regional fishery management councils. NMFS representatives from each of the five NMFS regions, fishery science centers, and headquarter division offices. • NMFS appoints a National Seabird Coordinator. First tasks will be coordinating the regional implementation of the U.S. NPOA for Reducing Incidental Catch of Seabirds in Longline Fisheries (NPOA). Department of Commerce (DOC) NOAA News Release NOAA 01-R144 • Council takes initial action on proposed changes to seabird avoidance regulations in the groundfish and halibut hook-and-line fisheries off Alaska. Proposed changes based on WSGP study and additional considerations for small vessel operations.
Nov:	• North Pacific Albatross Working Group meets by teleconference. • NMFS/USFWS Alaska staff meeting on seabird issues of joint concern. • Panel discussion/seminar scheduled at Fish Expo, Seattle, Washington, on Alaska seabird bycatch initiatives——research and efforts to reduce bycatch.
Dec:	• NMFS publishes extension to emergency interim rule in the *Federal Register* seabird mitigation measures for Hawaii-based pelagic longline fishery (66 FR 63630, December 10, 2001). • Council takes final action on proposed changes to seabird avoidance regulations in the groundfish and halibut hook-and-line fisheries off Alaska. NMFS AKR News Release 01-22-AKR • Seabird outreach material mailed to all holders of hook-and-line Federal groundfish fisheries permits. Material included: WSGP material on effective use of streamer lines, upcoming changes to seabird avoidance regulations, short-tailed albatross encounter form.
2002:	
Jan:	• ISWG meets in Silver Spring at NMFS Headquarters to address NPOA implementation (e.g. regional assessments of longline fisheries, promotion of NPOA development in international fora). • NMFS includes seabird incidental catch issues in topics to be addressed by an interagency International Bycatch Reduction Task Force.
Feb:	• Seabird outreach material included in the NMFS IFQ 2002 Report to the Fleet. • North Pacific Albatross Working Group teleconference meeting, in conjunction with Pacific Seabird Group's (PSG) annual meeting. • NMFS poster at PSG's annual meeting in Santa Barbara, CA, Changing Regulations in Alaska's Longline Fisheries—An Example of Regional Implementation of the U.S. NPOA for Seabirds.
Mar:	• Alaska Board of Fisheries delegates authority to Alaska Department of Fish & Game's Commissioner to parallel Federal regulations for seabird avoidance requirements in State of Alaska waters.
Apr:	• Asia Pacific Economic Cooperation (APEC) Ministerial meeting in Seoul, Korea. U.S. includes NPOA development and implementation on the meeting agenda. • Seabird Bycatch Avoidance Workshop presented at Kodiak's ComFish Expo; joint presentation by WSGP, NMFS, USFWS.

Table 3.7-8 (cont.). Timeline of National Oceanic and Atmospheric Administration Alaska Region seabird activities and related seabird issues, as of May 31, 2002.

May:	• Seabird issues included on the agenda of the U.S. bilateral fisheries meeting with the People's Republic of China, in Beijing. • WSGP begins conducting work on commercial longline vessels less than 55 ft. to address the performance standards recommended for use on smaller vessels. Work will be conducted in Sitka, Cordova, and Petersburg, Alaska. • WSGP works with the IPHC and Alaska Department of Fish & Game to have standard bird abundance data collected during existing survey platforms. • Seabird Bycatch Avoidance Workshop presented in Sitka, Alaska and Cordova, Alaska. NMFS Information Bulletin 02-31.

Table 3.7-9. National Oceanic and Atmospheric Administration Fisheries seabird avoidance requirements under the Endangered Species Act.

The current nondiscretionary reasonable and prudent measures in the United States Fish and Wildlife Service (USFWS) Biological Opinions for the groundfish and Pacific halibut fisheries off Alaska are as follows:

- Observer data on short-tailed albatross sightings and fishery interactions is collected. Observers are trained in seabird identification and provided with instructions and materials for reporting short-tailed albatross observations (groundfish fisheries).
- Incidental take and observations of any short-tailed albatross are reported to USFWS (in gut-and-head [G&H] fisheries).
- Short-tailed albatross that are found in fishing equipment but still appear healthy, are evaluated and carefully handled and released as soon as identification is confirmed (groundfish).
- Dead short-tailed albatross are tagged with complete catch information and delivered to USFWS (in G&H fisheries).
- An information program is conducted each year to inform fishermen about (1) need and possible methods for avoiding entanglement of short-tailed albatross in fishery gear, (2) request reports of short-tailed albatross sightings, and (3) encourage compliance with International Convention for the Prevention of Pollution from Ships (MARPOL) and related treaties to protect marine animals including the short-tailed albatross, (4) short-tailed albatross identification, and (5) ways to avoid taking short-tailed albatross when they are sighted near bait (in G&H fisheries).
- Vessels operators are required to use seabird bycatch avoidance devices and methods during fishing activities (in G&H fisheries).
- A test plan to evaluate the effectiveness of seabird bycatch avoidance gear and methods was completed and implemented. A final report of the evaluation was released in 2000 (in G&H fisheries).
- National Oceanic and Atmospheric Administration (NOAA) Fisheries shall prepare a plan to investigate all options for monitoring the Pacific halibut fishery and will institute changes to the fishery appropriate to the results of the investigation.
- NOAA Fisheries shall review current seabird deterrent device regulations to determine if changes in the regulations could minimize the likelihood of short-tailed albatross mortalities. NOAA Fisheries shall revise regulations if revisions are likely to reduce the risk of short-tailed albatross bycatch.

Table 3.7-10. Conservation recommendations regarding seabirds and groundfish fisheries.

The United States Fish and Wildlife Service (USFWS) included the following discretionary conservation recommendations to National Oceanic and Atmospheric Administration (NOAA) in the 1997 amendment to the groundfish biological opinion:

- In cooperation with the USFWS, initiate discussions with the Department of State to lead to data exchanges with other nations whose vessels fish with hook-and-line gear in the Pacific ocean. Such data will allow us to determine the incidental take and mortality of seabirds by time and area and are essential to assess the need for additional conservation measures on an international scale.
- Continue cooperative efforts with the USFWS to identify demographic parameters of the Torishima Island breeding population of short-tailed albatrosses with the goal of using these data to quantify the level of take that would appreciably reduce the survival and recovery of the species.
- In cooperation with the USFWS, initiate efforts to conduct a population viability analysis using demographic data and available information on sources and magnitudes of threats to the species.

USFWS included the following discretionary conservation recommendations to NOAA in the 1999 amendment to the groundfish biological opinion:

- Following completion of the research to evaluate the effectiveness of seabird avoidance measures, develop an instructional video which outlines the most effective seabird avoidance devices and methods with hook-and-line gear. Distribute the video to individual permit holders, longline fishing organizations, and at the annual Fish Expo in Seattle.

The following conservation recommendations were made in the 1998 Pacific halibut biological opinion:

- Develop and/or evaluate new seabird avoidance measures.
- Suggest to fishermen actions they may take to prevent the taking of short-tailed albatross that have alighted near their hook-and-line gear.
- Educate fishermen in the proper care of injured seabirds.
- Consider temporary adjustments to the fishery during the times when short-tailed albatross are most abundant in the areas fished by Pacific halibut hook-and-liner gear in waters off Alaska.
- Encourage self-reporting of short-tailed albatross encounters. However, substantial evidence exists that self-reporting by itself is an inadequate method for monitoring protected species encounters in a fishery. The USFWS strongly discourages the use of self-reporting as a sole method for monitoring this fishery, and strongly encourage the use of observers on Pacific halibut hook-and-line vessels over 60 feet in length.

Table 3.7-11. Short-tailed albatross reported[1] takes in Alaska fisheries.

Date	Location	Latitude/longitude	Fishery	Date banded as chick[2]	Age at take	Band(s) no. and color
July 1983	300 miles north of St. Matthew Island	Between 60° North (N), 180° West (W) and 58°5'N, 175°W	In net of vessel fishing for brown crab	March 20, 1983	Juvenile (4 months)	130-01562 orange 039
October 1, 1987	Gulf of Alaska	59°27.7'N, 145°53.3'W	Halibut	April 5, 1987	Juvenile (6 months)	130-01836 red 173
August 28, 1995	South of Krenitizin Islands	53°31'N, 165°38'W	Hook-and-line	April 16, 1994	Sub-adult (16 months)	13A0853 green 131
October 8, 1995	Bering Sea and Aleutian Islands	57°01'N, 170°39'W	Hook-and-line	April 21, 1992	Sub-adult (3 years)	----?? black 063
September 27, 1996	Bering Sea and Aleutian Islands	58°41.3'N, 177°02.6'W	Hook-and-line	April 15, 1991	Sub-adult (5 years)	13A0518 green 057
September 21, 1998	Bering Sea and Aleutian Islands	57°30'N, 173°57'W	Pacific cod hook-and-line	April 18, 1990	Adult (8 years)	130-04189 brown 087
September 28, 1998	Bering Sea and Aleutian Islands	58°27'N, 175°16'W	Pacific cod hook-and-line	Not known	Sub-adult	not known
No birds reported taken since 1998						

Notes: [1]Except for the second take in 1998, leg bands were recovered from all of the above albatrosses, allowing scientists to verify identification and age.
[2]Since 1977, Dr. Hiroshi Hasegawa, Toho University, Japan, has banded all short-tailed albatross chicks at their breeding colony on Torishima Island, Japan.

Table 3.7-12. Short-tailed albatross past/present effects.

Direct/ indirect effect	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through natural disasters	• Volcanic eruptions on Torishima Island killed birds and destroyed nests (periodic).		• Japanese efforts to restore and protect nest sites and to reestablish nesting in alternate areas.	
Mortality through intentional and incidental take	• Commercial hunters (late 1800's to early 1900's). • Foreign fisheries incidental take (1960's to present). • Incidental take in other United States (U.S.) longline fisheries.	• Incidental take in Magnuson-Stevens Act (MSA) groundfish longline fisheries (1983 to present). • Observer Program data 1993-2001: estimated average take in Bering Sea and Aleutian Islands (BSAI) = 1 bird per year and in Gulf of Alaska (GOA) = 0 birds per year.	• Japanese ban on hunting, other protections (1958). • Migratory Bird Treaty Act (1918). • Endangered Species Act (ESA) (1973). • International Plan of Action for reducing incidental take of seabirds in longlines (1999). • National Plan of Action for reducing incidental take of seabirds in longlines (2001).	• Continuous ESA Section 7 consultations with United States Fish and Wildlife Service (USFWS) (1989 to present). • Seabird /fishery interaction monitoring and research through Observer Program (1990 to present). • Seabird protection measures instituted for longline fleet (1997 to present). • Collaborative research on effectiveness of deterrence techniques (2001).
Reduced fitness through consumption of fishery wastes	• Foreign fisheries and processing vessels throughout North Pacific. • Other U.S. fisheries.	• MSA groundfish vessels and at-sea processors (1979 to present). • Benefits of supplemental food offset by increased risk of take in gear.	• National Plan of Action for reducing incidental take of seabirds in longlines (2001).	• Seabird protection measures prohibit discharge of fishery wastes over baited hooks (1997 to present).
Reduced fitness through consumption of plastics	• Numerous sources of raw plastic pellets and plastic consumer products on land and at sea.	• Fishing vessels and processors contribute unknown amounts of plastic products.	• Marine Plastic Pollution Research and Control Act (MPPRCA) (1987).	• Educational effort on importance of compliance with MPPRCA (1995 to present).

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:
- Endangered species.
- Worldwide population 1,600 to 1,700 but increasing at near-maximum rate.
- Concern for impacts of longline fishing incidental take on recovery of population.
- Seabird deterrence measures for BSAI/GOA longline fisheries instituted in 1997. Did not eliminate incidental take.
- Ongoing efforts to reduce incidental take guided by scientific evaluation of deterrence measures through Observer Program and directed research.

Carry forward for cumulative effects analysis?

Yes. Incidental take in groundfish fisheries remains a concern under all alternatives. Discussed as a separate species with special management status under the ESA in Chapter 4.

Table 3.7-13. Northern fulmar past/present effects.

Direct/ indirect effect	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Foreign fisheries incidental take (1960's to present). • Incidental take in other United States (U.S.) longline fisheries.	• Incidental take in Magnuson-Stevens Act (MSA) groundfish fisheries (1978 to present). • Observer Program data 1993-2001: estimated average take in Bering Sea and Aleutian Islands (BSAI) longlines = 8,644 birds per year and in Gulf of Alaska (GOA) = 479 birds per year. • Incidental take in trawls averages 274-5,891 birds per year in BSAI/GOA. • Incidental take in pot gear. • Vessel and third wire strikes.	• Migratory Bird Treaty Act (1918). • International Plan of Action for reducing incidental take of seabirds in longlines (1999). • National Plan of Action for reducing incidental take of seabirds in longlines (2001).	• Seabird/fishery interaction monitoring and research through Observer Program (1990 to present). • Seabird protection measures instituted for longline fleet (1997 to present) increased numbers of fulmars taken in BSAI but decreased take in GOA.
Reduced fitness through changes in prey availability	• Climate and oceanic fluctuations impact abundance and distribution of prey.	• Impact unknown but presumed to be minimal		• Ban on targeting forage fish (BSAI and GOA Fishery Management Plan [FMP] Amendments 36/39, 1997).
Reduced fitness through consumption of fishery wastes	• Foreign fisheries and processing vessels throughout North Pacific. • Other U.S. fisheries.	• MSA groundfish vessels and at-sea processors (1979 to present). • Benefits of supplemental food offset by increased risk of take in gear.	• National Plan of Action for reducing incidental take of seabirds in longlines (2001).	• Seabird protection measures prohibit discharge of fishery wastes over baited hooks (1997 to present).

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:

- Abundant resident and breeder with BSAI and GOA population of about 2 million.
- Concern for colony-level impacts of incidental take in longlines and trawls.
- Seabird deterrence measures for BSAI and GOA longline fisheries (1997 to present) have increased incidental take in BSAI and decreased take in GOA.
- Ongoing efforts to reduce incidental take guided by scientific evaluation of deterrence measures through Observer Program and directed research.

Carry forward for cumulative effects analysis?

Yes. Incidental take in groundfish fisheries expected to remain under all alternatives. Due to its status as the predominant species taken in all three groundfish sectors, northern fulmar will be discussed as a separate species in Chapter 4.

Table 3.7-14. Shearwaters past/present effects.

Direct/ indirect effect	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Commercial and subsistence hunts in South Pacific (historic to present). • High-seas squid drift fisheries may have taken over 1,000,000 shearwaters per year (1970's to 1991). • Foreign fisheries may take thousands of birds per year (1960's to present). • Incidental take in other United States (U.S.) longline fisheries.	• Incidental take in Magnuson-Stevens Act (MSA) groundfish fisheries (1978 to present). • Not identified to species in Observer Program. • Observer Program data 1993-2001: estimated average take of known shearwaters in Bering Sea and Aleutian Islands (BSAI) longlines = 674 birds per year and in Gulf of Alaska (GOA) = 30 birds per year. • Incidental take in trawls averages 271-1,327 birds per year in BSAI and GOA (1997-2001). • Vessel strikes.	• Migratory Bird Treaty Act (1918). • United Nations (U.N.) Resolution (46/215) banning high-seas drift fishing (1992). • International Plan of Action for reducing incidental take of seabirds in longlines (1999). • National Plan of Action for reducing incidental take of seabirds in longlines (2001).	• Seabird/fishery interaction monitoring and research through Observer Program (1990 to present). • Seabird protection measures instituted for longline fleet (1997 to present) did not reduce numbers of shearwaters taken in BSAI but did decrease take in GOA.
Reduced fitness through changes in prey availability	• Climate and oceanic fluctuations impact abundance and distribution of prey.	• Impact unknown but presumed to be minimal.		• Ban on targeting forage fish (BSAI and GOA Fishery Management Plan (FMP) Amendments 36/39, 1997).
Reduced fitness through consumption of fishery wastes	• Foreign fisheries and processing vessels throughout Pacific. • Other U.S. fisheries.	• MSA groundfish vessels and at-sea processors (1979 to present). • Benefits of supplemental food offset by increased risk of take in gear.	• National Plan of Action for reducing incidental take of seabirds in longlines (2001).	• Seabird protection measures prohibit discharge of fishery wastes over baited hooks (1997 to present).

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:

- Worldwide populations estimated to be 23 million short-tailed shearwaters and over 30 million sooty shearwaters. Indications of declining population trends.
- Large numbers of shearwaters taken in commercial and subsistence hunts in the southern hemisphere and in several international fisheries.
- No population modeling to assess impact of fishery takes versus other sources of mortality on declining population.
- Seabird deterrence measures for BSAI/GOA longline fisheries have not reduced incidental take since 1997.

Carry forward for cumulative effects analysis?

Yes. Incidental take in groundfish fisheries expected to remain under all alternatives. Discussed in conjunction with Laysan and black-footed albatross in Chapter 4.

Table 3.7-15. Storm-petrels past/present effects.

Direct/ indirect effect	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Foreign fisheries incidental take (1960's to present).	• Incidental take in Magnuson-Stevens Act (MSA) groundfish longline fisheries (1978 to present). Not identified to species in Observer Program but have group code. • Vessel strikes.	• Migratory Bird Treaty Act (1918). • International Plan of Action for reducing incidental take of seabirds in longlines (1999). • National Plan of Action for reducing incidental take of seabirds in longlines (2001).	• Seabird/fishery interaction monitoring and research through Observer Program (1990 to present).
Reduced fitness through changes in prey availability	• Climate and oceanic fluctuations impact abundance and distribution of prey.	• Impact unknown but presumed to be minimal.		• Ban on targeting forage fish (Bering Sea and Aleutian Islands [BSAI] and Gulf of Alaska [GOA] Fishery Management Plan [FMP] Amendments 36/39, 1997).
Reduced fitness through introduction of nest predators	• Commercial fox farming on Aleutian Islands (1750 to 1930's). • Accidental introduction of rats from marine vessels.	• Fishing vessels and processors contribute to risk of accidentally introducing rats to islands.	• United States Fish and Wildlife Service (USFWS) fox eradication program (1970's to present). • USFWS rat invasion prevention programs.	

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:

- Leach's and fork-tailed storm-petrels are abundant breeders in BSAI and GOA. Population trends poorly known.
- Quantitative impact of fisheries on species largely unknown.

Carry forward for cumulative effects analysis?

Yes. Frequency of interaction with groundfish fisheries warrants inclusion in Cumulative Effects Analysis. Due to the lack of species-specific quantitative information on fishing impacts, these species will be included in the planktivorous seabirds in Chapter 4.

Table 3.7-16. Cormorants past/present effects.

Direct/ indirect effect	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Foreign and domestic fisheries, especially coastal net fisheries, may take cormorants but no data is available.	• Incidental take in Magnuson-Stevens Act (MSA) groundfish fisheries unknown (1978 to present). • Not identified to species in Observer Program but have group code.	• Migratory Bird Treaty Act (1918).	
Reduced fitness through contamination with oil	• It is likely that the *Exxon Valdez* oil spill killed thousands of cormorants.			

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:

- Pelagic, red-faced, and double-crested cormorants are widely distributed in the Bering Sea and Aleutian Islands (BSAI) and Gulf of Alaska (GOA) but are not abundant anywhere. Population trend information is unreliable.
- There is no information on the incidental take of cormorants in any Alaska fisheries, including groundfish.
- Large numbers of cormorants were killed in the *Exxon Valdez* oil spill and they are considered to be "not recovered" in Prince William Sound.

Carry forward for cumulative effects analysis?

No. Lack of quantitative information on population trends and fishery impacts precludes further analysis except as part of piscivorous seabirds in Chapter 4.

Table 3.7-17. Spectacled eider past/present effects.

Direct/ indirect effect	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Subsistence and sport harvest (historic to present).	• Have separate Observer Program species code but no takes have been recorded.	• Migratory Bird Treaty Act (1918).	
Reduced fitness through changes in prey availability	• Climate and oceanic fluctuations impact abundance and distribution of prey.	• Impact unknown but concern for benthic habitat impacts of bottom-trawls.	• United States Fish and Wildlife Service (USFWS) biological opinion (BiOp) recommendation to avoid benthic disturbance in Critical Habitat in any season.	
Reduced fitness through contamination with oil and lead shot	• Pollution from foreign and United States (U.S.) fisheries and marine vessels throughout Pacific. • Waterfowl hunting on breeding grounds with lead shot.	• Pollution from Magnuson-Stevens Act (MSA) groundfish vessels and at-sea processors (1979 to present).	• Oil spill prevention laws and regulations. • Hunting with lead shot illegal (1991).	

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:

- Worldwide population estimates for spectacled eider exceed 300,000 birds but their Alaska-nesting populations have declined 95% in the last 30 years.
- Spectacled eider was listed as threatened under the Endangered Species Act (ESA) in 1993.
- Spectacled eiders have not been recorded as being taken incidentally in the groundfish fisheries.
- Concern for chronic contamination from lead shot on breeding grounds and exposure to oil from all sources while in massive wintering flocks.
- Concern for impacts of bottom trawling and disturbance on benthic foraging habitats.

Carry forward for cumulative effects analysis?

Yes. The status of spectacled eiders as threatened under the ESA warrants further consideration in the cumulative effects analysis. Because of the similarities in their conservation concerns and status under the ESA, spectacled eiders will be considered in conjunction with Steller's eiders in Chapter 4.

Table 3.7-18. Steller's eiders past/present effects.

Direct/ indirect effect	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Subsistence and sport harvest (historic to present).	• Have separate Observer Program species code and one recorded take in the groundfish fishery.	• Migratory Bird Treaty Act (1918).	
Reduced fitness through changes in prey availability	• Climate and oceanic fluctuations impact abundance and distribution of prey.	• Impact unknown but concern for benthic habitat impacts of bottom-trawls and generalized impact of fishery on ecosystem structure.		
Reduced fitness through contamination with oil and lead shot	• Foreign and United States (U.S.) fisheries and marine vessels throughout Pacific. • Waterfowl hunting on breeding grounds with lead shot .	• Magnuson-Stevens Act (MSA) groundfish vessels and at-sea processors (1979 to present).	• Oil spill prevention laws and regulations. • Hunting with lead shot illegal (1991).	

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:

- Worldwide population estimates for Steller's eider unreliable but their Alaska-nesting populations have declined substantially in the last 100 years.
- Steller's eider was listed as threatened under the Endangered Species Act in 1997.
- One recorded incidental take of Steller's eider in the groundfish fisheries since 1993.
- Concern for chronic contamination from lead shot on breeding grounds and exposure to oil from all sources while in wintering and staging flocks.
- Concern for impacts of bottom trawling and disturbance on benthic foraging habitats.

Carry forward for cumulative effects analysis?

Yes. The status of Steller's eiders as threatened under the Endangered Species Act warrants further consideration in the cumulative effects analysis. Because of the similarities in their conservation concerns and status under the Endangered Species Act, Steller's eiders will be considered in conjunction with spectacled eiders in Chapter 4.

Table 3.7-19. Jaegers past/present effects.

Direct/ indirect effect	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Foreign and domestic fisheries may take jaegers but no data is available.	• Incidental take in Magnuson-Stevens Act (MSA) groundfish fisheries unknown (1978 to present). • Not identified to species in Observer Program.	• Migratory Bird Treaty Act (1918).	

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:

- Pomarine, parasitic, and long-tailed jaegers migrate through the Bering Sea and Aleutian Islands (BSAI) and Gulf of Alaska (GOA) in small numbers.
- Population information is not available.
- There is no information on the incidental take of jaegers in any Alaska fisheries, including groundfish.

Carry forward for cumulative effects analysis?

No. Lack of quantitative information on population trends and fishery impacts precludes further analysis except as part of piscivorous seabirds in Chapter 4.

Table 3.7-20. Gulls past/present effects.

Direct/ indirect effect	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Subsistence hunts and egging (historic to present). • Foreign fisheries incidental take, no data (1960's to present). • Incidental take in other United States (U.S.) longline fisheries, no data.	• Incidental take in Magnuson-Stevens Act (MSA) groundfish fisheries (1978 to present). • Observer Program data 1993-2001: estimated average take of gulls in Bering Sea and Aleutian Islands (BSAI) longlines = 2,707 birds per year and in Gulf of Alaska (GOA) = 114 birds per year. • Incidental take in trawls averages between 150 (low est.) and 398 (high est.) birds per year in BSAI and GOA (1997-2001).	• Migratory Bird Treaty Act (1918). • International Plan of Action for reducing incidental take of seabirds in longlines (1999). • National Plan of Action for reducing incidental take of seabirds in longlines (2001).	• Seabird /fishery interaction monitoring and research through Observer Program (1990 to present). • Seabird protection measures instituted for longline fleet (1997 to present) did not reduce numbers of gulls taken in either BSAI or GOA.
Reduced fitness through changes in prey availability	• Climate and oceanic fluctuations impact abundance and distribution of prey.	• Impact unknown but presumed to be minimal.		• Ban on targeting forage fish (BSAI and GOA Fishery Management Plan [FMP] Amendments 36/39, 1997).
Reduced fitness through consumption of fishery wastes	• Foreign fisheries and processing vessels throughout Pacific. • Other U.S. fisheries.	• MSA groundfish vessels and at-sea processors (1979 to present). • Benefits of supplemental food offset by increased risk of take in gear.	• National Plan of Action for reducing incidental take of seabirds in longlines (2001).	• Seabird protection measures prohibit discharge of fishery wastes over baited hooks (1997 to present).

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:

- Population estimates for all species only roughly known. Population trends measured only for glaucous-winged gull in few places.
- Seabird deterrence measures for BSAI/GOA longline fisheries have not reduced incidental take since 1997.
- Impact of fishery waste consumption may be beneficial to some species but harmful to others through predator/prey relationships.

Carry forward for cumulative effects analysis?

Yes. Incidental take in groundfish fisheries expected to remain under all alternatives. Because of a lack of species-specific quantitative information on population trends and fishery impacts, gulls will be included as part of the piscivorous seabirds in Chapter 4.

Table 3.7-21. Seabird population trends compared within regions (only sites counted in 1999 and 2000 are included)[a].

Region	Site	Northern fulmar	Pelagic cormorant	Red-faced cormorant	Glaucous-winged gull	Black-legged kittiwake	Red-legged kittiwake	Common murre	Thick-billed murre	Unidentified murre	Least auklet	Crested auklet	Rhinocerous auklet	Tufted puffin
Southeast Bering	C. Peirce		=			—		—						
	Bogoslof Island													+
	Aiktak Island				=					=				+
	St. Paul Island					—	—	—	—					
	St. George Island	=				—	—	+	+					
Southwest Bering	Kasatochi Island				=						=	=		
	Koniuji Island						=							
Gulf of Alaska	Paule Bay					=				—				
	Chiniak Bay		—	—		+								
	East Amatuli Island				+	=		+						
	Gull Island		—			+		+						
	Prince William Sound					+								
	Middleton Island		—			—				—				
Southeast	St. Lazaria Island		+		=					—			=	

Notes: — - negative population trend for this site or region.
= - no discernable trend.
+ - positive population trend for this site or region.
[a]Table printed with permission from the Alaska Maritime National Wildlife Refuge, from their report: Breeding Status and Population Trends of Seabirds in Alaska in 2000 (Source for this table is Ecosystem Considerations for 2003 Report Appendix D, Table 3). 1999 data incorporated is from Dragoo et al. 2000. Breeding status and population trends of seabirds in Alaska 1999. USFWS Report, Table 34.

Table 3.7-22. Kittiwakes past/present effects.

Direct/ indirect effect	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Subsistence harvest (historic to present). • Foreign fisheries incidental take, very little data (1960's to present). • Incidental take in other United States (U.S.) longline fisheries, no data.	• Incidental take in Magnuson-Stevens Act (MSA) groundfish fisheries (1978 to present). • Observer Program data does not distinguish kittiwakes by species in any of the fisheries.	• Migratory Bird Treaty Act (1918). • International Plan of Action for reducing incidental take of seabirds in longlines (1999). • National Plan of Action for reducing incidental take of seabirds in longlines (2001).	• Seabird /fishery interaction monitoring and research through Observer Program (1990 to present).
Reduced fitness through changes in prey availability	• Climate and oceanic fluctuations impact abundance and distribution of prey.	• Impact unknown but concern for colony-level effects on forage fish availability.		• Ban on targeting forage fish (Bering Sea and Aleutian Islands [BSAI] and Gulf of Alaska [GOA] Fishery Management Plan [FMP] Amendments 36/39, 1997).
Reduced fitness through consumption of fishery wastes	• Foreign fisheries and processing vessels throughout Pacific. • Other U.S. fisheries.	• MSA groundfish vessels and at-sea processors (1979 to present). • Benefits of supplemental food offset by increased risk of take in gear.	• National Plan of Action for reducing incidental take of seabirds in longlines (2001).	• Seabird protection measures prohibit discharge of fishery wastes over baited hooks (1997 to present).
Reduced fitness through introduction of nest predators	• Fox farming in Aleutians and GOA (1750's to 1930's). • Accidental escape from marine vessels of all types.	• Accidental escape from MSA groundfish vessels.	• Fox extermination program of United States Fish and Wildlife Service (USFWS). • Rat invasion prevention program of USFWS.	

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:

- Black-legged kittiwakes widespread and abundant. Population trends monitored in many places throughout the BSAI and GOA.
- Red-legged kittiwakes less numerous and restricted in range. Population trends have been decreasing substantially, leading to status as USFWS species of management concern.
- Since these species are not distinguished in the Observer Program data, no assessment can be made of incidental take impacts.
- Concern for colony-level impacts on prey availability, especially for red-legged kittiwakes on St. George Island.
- Concern for introduction of rats to Pribilofs.

Carry forward for cumulative effects analysis?

Yes. Frequency of interaction with the groundfish fisheries and concern for colony-level impacts warrants analysis under all FMP Alternatives. Since some Alternative FMPs call for special management goals for seabird Species of Management Concern, red-legged kittiwakes will be considered along with marbled and Kittlitz's murrelets in Chapter 4. Black-legged kittiwakes will be discussed in conjunction with the piscivorous birds in Chapter 4.

Table 3.7-23. Terns past/present effects.

Direct/ indirect effect	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Subsistence harvest (historic to present). • Incidental take in foreign and domestic fisheries likely but undocumented.	• Incidental take in Magnuson-Stevens Act (MSA) groundfish fisheries likely but not recorded to species in Observer Program data.	• Migratory Bird Treaty Act (1918). • International Plan of Action for reducing incidental take of seabirds in longlines (1999). • National Plan of Action for reducing incidental take of seabirds in longlines (2001).	
Reduced fitness through changes in prey availability	• Climate and oceanic fluctuations impact abundance and distribution of prey.	• Impact unknown but assumed to be minimal.		• Ban on targeting forage fish (Bering Sea and Aleutian Islands [BSAI] and Gulf of Alaska [GOA] Fishery Management Plan [FMP] Amendments 36/39, 1997).

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:

- Arctic and Aleutian terns are uncommon breeders in BSAI and GOA. Population trends are not monitored anywhere in the project area.
- Since these species are not distinguished in the Observer Program data, no assessment can be made of incidental take impacts.

Carry forward for cumulative effects analysis?

Yes. Lack of species-specific quantitative information on population trends and fishery impacts precludes further analysis except as part of piscivorous seabirds in Chapter 4.

Table 3.7-24. Murres past/present effects.

Direct/ indirect effect	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Subsistence harvest (historic to present). • Foreign fisheries incidental take, very little data (1960's to present). • Incidental take in other United States (U.S.) net fisheries, very little data.	• Incidental take in Magnuson-Stevens Act (MSA) groundfish fisheries (1978 to present). • Observer Program has species specific codes but are reported in alcid group.	• Migratory Bird Treaty Act (1918). • International Plan of Action for reducing incidental take of seabirds in longlines (1999). • National Plan of Action for reducing incidental take of seabirds in longlines (2001).	• Seabird /fishery interaction monitoring and research through Observer Program (1990 to present).
Reduced fitness through changes in prey availability	• Climate and oceanic fluctuations impact abundance and distribution of prey.	• Impact unknown but assumed to be minimal.		• Ban on targeting forage fish (Bering Sea and Aleutian Islands [BSAI] and Gulf of Alaska [GOA] Fishery Management Plan [FMP] Amendments 36/39, 1997).
Reduced fitness through contamination with oil	• Foreign fishing and marine transport vessels throughout Pacific. • Other U.S. fishing and marine transport vessels. • *Exxon Valdez* and other large oil spills from vessel accidents.	• MSA groundfish vessels and at-sea processors (1979 to present).	• Oil spill prevention laws and regulations.	
Reduced fitness through introduction of nest predators	• Fox farming in the Aleutian Islands and GOA (1750's to 1930's). • Accidental escape from marine vessels of all types.	• Accidental escape from MSA groundfish vessels.	• Fox extermination program of United States Fish and Wildlife Service (USFWS). • Rat invasion prevention program of USFWS.	

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:

- Common and thick-billed murres widespread and abundant in BSAI and GOA. Population trends monitored in many places throughout BSAI and GOA.
- Population trends vary by species and area with some colonies increasing, others stable, and others in decline.
- Since these species are not distinguished in the Observer Program data, no assessment can be made of incidental take impacts.
- Concern for chronic and acute contamination with oil from all sources.
- Concern for introduction of rats to colonies.

Carry forward for cumulative effects analysis?

Yes. Frequency of interaction with the groundfish fisheries and good population trend data warrants analysis of the Alternative FMPs. Because there is no species specific quantitative data on the impacts of the fisheries, these species will be discussed in conjunction with the fish-eating (piscivorous) birds in Chapter 4.

Table 3.7-25. Guillemots past/present effects.

Direct/ indirect effect	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Foreign fisheries incidental take, very little data (1960's to present). • Incidental take in nearshore net fisheries likely but no data.	• Guillemots are not identified to species in the Observer Program data but are included in the alcid group.	• Migratory Bird Treaty Act (1918).	
Reduced fitness through changes in prey availability	• Climate and oceanic fluctuations impact abundance and distribution of prey.	• Impact unknown but assumed to be minimal.		• Ban on targeting forage fish (Bering Sea and Aleutian Islands [BSAI] and Gulf of Alaska [GOA] Fishery Management Plan [FMP] Amendments 36/39, 1997).
Reduced fitness through contamination with oil	• Foreign fishing and marine transport vessels throughout Pacific. • Other United States (U.S.) fishing and marine transport vessels. • *Exxon Valdez* and other large oil spills from vessel accidents.	• Magnuson-Stevens Act (MSA) groundfish vessels and at-sea processors (1979 to present).	• Oil spill prevention laws and regulations.	

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:

- Population estimates for both guillemot species are uncertain. Population trends only monitored for pigeon guillemots in Prince William Sound.
- Guillemots do not appear to interact with the groundfish fisheries on a regular basis.
- Since these species are not distinguished in the Observer Program data, no assessment can be made of incidental take impacts.
- Concern for chronic and acute contamination with oil from all sources.

Carry forward for cumulative effects analysis?

Yes. Lack of species-specific quantitative information on population trends and fishery impacts precludes further analysis except as part of piscivorous seabirds in Chapter 4.

Table 3.7-26. Murrelets past/present effects.

Direct/ indirect effect	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Subsistence harvest (historic to present). • Foreign fisheries incidental take, very little data (1960's to present). • Incidental take in other United States (U.S.) net fisheries, very little data.	• Incidental take in Magnuson-Stevens Act (MSA) groundfish fisheries (1978 to present). • Murrelets have separate identification codes in the Observer Program but are reported in the alcid group.	• Migratory Bird Treaty Act (1918).	
Reduced fitness through changes in prey availability	• Climate and oceanic fluctuations impact abundance and distribution of prey.	• Impact unknown but assumed to be minimal.		• Ban on targeting forage fish (Bering Sea and Aleutian Islands [BSAI] and Gulf of Alaska [GOA] Fishery Management Plan [FMP] Amendments 36/39, 1997).
Reduced fitness through contamination with oil	• Foreign and U.S. fisheries and marine vessels throughout Pacific.	• MSA groundfish vessels and at-sea processors (1979 to present).	• Oil spill prevention laws and regulations.	
Reduced fitness through disturbance from vessels	• Marbled and Kittlitz's murrelets sensitive to boat traffic of all types.	• Fishing vessels and processors contribute to total disturbance.		
Reduced fitness through introduction of nest predators	• Fox farming in Aleutians and GOA (1750's to 1930's). • Accidental escape from marine vessels of all types.	• Accidental escape from MSA groundfish vessels.	• Fox extermination program of United States Fish and Wildlife Service (USFWS). • Rat invasion prevention program of USFWS.	

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:

- Population estimates for all three murrelets species are uncertain and population trends are poorly known.
- Marbled and Kittlitz's murrelets are USFWS species of management concern due to apparent population declines. Kittlitz's has been petitioned for Endangered Species Act (ESA) listing.
- Since murrelets are only reported in the alcid group in the Observer Program data, no species-specific assessment can be made of incidental take impacts.
- Concern for disturbance from vessel traffic.
- Concern for chronic and acute contamination with oil from all sources.
- Concern for introduction of rats to ancient

Carry forward for cumulative effects analysis?

Yes. The status of marbled and Kittlitz's murrelets as Species of Management Concern warrants further consideration in the cumulative effects analysis. Since some Alternative FMPs call for special management goals for these species, they will be considered with red-legged kittiwakes in Chapter 4. Because population trend data for ancient murrelets are not available and there is no species specific quantitative data on the impacts of the fisheries, ancient murrelets will be discussed in conjunction with the fish-eating (piscivorous) birds in Chapter 4.

Table 3.7-27. Auklets past/present effects.

Direct/ indirect effect	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Subsistence harvest (historic to present). • Foreign fisheries incidental take, very little data (1960's to present). • Incidental take in other United States (U.S.) net fisheries, very little data.	• Incidental take in Magnuson-Stevens Act (MSA) groundfish fisheries (1978 to present). • Auklets do not have separate identification codes in the Observer Program but are reported in the alcid group.	• Migratory Bird Treaty Act (1918). • International Plan of Action for reducing incidental take of seabirds in longlines (1999). • National Plan of Action for reducing incidental take of seabirds in longlines (2001).	• Seabird/fishery interaction monitoring and research through Observer Program (1990 to present).
Reduced fitness through changes in prey availability	• Climate and oceanic fluctuations impact abundance and distribution of prey.	• Impact unknown but assumed to be minimal.		• Ban on targeting forage fish (Bering Sea and Aleutian Islands [BSAI] and Gulf of Alaska [GOA] Fishery Management Plan [FMP] Amendments 36/39, 1997).
Reduced fitness through contamination with oil	• Foreign and U.S. fisheries and marine vessels throughout Pacific.	• MSA groundfish vessels and at-sea processors (1979 to present).	• Oil spill prevention laws and regulations.	
Reduced fitness through consumption of plastics	• Numerous sources of raw plastic pellets and plastic consumer products on land and at sea.	• Fishing vessels and processors contribute unknown amounts of plastic products.	• Marine Plastic Pollution Research and Control Act (MPPRCA) (1987).	• Educational effort on importance of compliance with MPPRCA (1995 to present).
Reduced fitness through introduction of nest predators	• Fox farming in Aleutians and GOA (1750's to 1930's). • Accidental escape from marine vessels of all types.	• Accidental escape from MSA groundfish vessels.	• Fox extermination program of USFWS Rat invasion prevention program of USFWS.	

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:

- Five auklet species are generally widespread and abundant in BSAI and GOA although population estimates are uncertain and population trends are poorly known.
- Since these species are not distinguished in the Observer Program data, no species-specific assessment can be made of incidental take impacts.
- Concern for chronic and acute contamination with oil from all sources.
- Concern for plastic ingestion by parakeet auklets.
- Concern for introduction of rats to colonies.

Carry forward for cumulative effects analysis?

Yes. Lack of species-specific quantitative information on population trends and fishery impacts precludes further analysis except as part of planktivorous seabirds in Chapter 4.

Table 3.7-28. Puffins past/present effects.

Direct/ indirect effect	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Subsistence harvest (historic to present). • Foreign fisheries incidental take (1960's to present). • High-seas squid drift fisheries took huge numbers of puffins per year (1970's to 1991). • Incidental take in other United States (U.S.) net fisheries, very little data.	• Incidental take in Magnuson-Stevens Act (MSA) groundfish fisheries (1978 to present). • All three species have separate identification codes in the Observer Program data but are reported in the alcid group.	• Migratory Bird Treaty Act (1918). • United Nations (U.N.) Resolution (46/215) banning high-seas drift fishing (1992).	
Reduced fitness through changes in prey availability	• Climate and oceanic fluctuations impact abundance and distribution of prey.	• Impact unknown but assumed to be minimal.		• Ban on targeting forage fish (Bering Sea and Aleutian Islands [BSAI] and Gulf of Alaska [GOA] Fishery Management Plan [FMP] Amendments 36/39, 1997).
Reduced fitness through contamination with oil	• Foreign and U.S. fisheries and marine vessels throughout Pacific.	• MSA groundfish vessels and at-sea processors (1979 to present).	• Oil spill prevention laws and regulations.	
Reduced fitness through introduction of nest predators	• Fox farming in Aleutians and GOA (1750's to 1930's). • Accidental escape from marine vessels of all types.	• Accidental escape from MSA groundfish vessels.	• Fox extermination program of United States Fish and Wildlife Service (USFWS). • Rat invasion prevention program of USFWS.	

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:

- Population estimates for horned and tufted puffins and rhinoceros auklets are imprecise and population trends are poorly known but all species are abundant or common in the BSAI and GOA.
- Puffins suffered major losses from high-sea drift fisheries.
- Since puffins are not distinguished in the Observer Program data, no assessment can be made of incidental take impacts.
- Concern for chronic and acute contamination with oil from all sources.
- Concern for introduction of rats to ancient murrelets colonies.

Carry forward for cumulative effects analysis?

Yes. Lack of species-specific quantitative information on population trends and fishery impacts precludes further analysis except as part of piscivorous seabirds in Chapter 4.

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Table 3.8-1. Steller sea lion past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Commercial harvest for hides and meat – 45,000 pups from 1963-1972. • Incidental take of over 20,000 in foreign joint venture (JV) fisheries-1966-1988. • Incidental take in state-managed gillnet, longline, and trawl fisheries. • Subsistence harvest of 549 in 1992 to 198 in 2001. • Shooting of sea lion in shore-based fisheries.	• Incidental take of up to 20 per year in the groundfish fisheries in the early 1990's. Incidental take has declined to 7.8 per year from 1996 to 2000.	• Marine Mammal Protection Act (MMPA) (1972). • Endangered Species Act (ESA) listing as threatened in 1990, western population listed as endangered in 1993.	• Marine mammal/fishery interaction monitoring and research through Observer Program (1990 to present). • Co-management agreement – National Marine Fisheries Service (NMFS), United States Fish and Wildlife Service (USFWS) and Alaska Native organizations for conservations of marine mammals (1994).
Mortality from entanglement in marine debris	• Intentional and accidental loss of fishing gear and other material from all fishing vessels plus shoreside sources.	• Groundfish fisheries contribution to lost gear and other materials.	• Marine Plastic Pollution Research and Control Act (MPPRCA).	• Educational efforts on importance of compliance with the MPPRCA (1995 to present).
Reduced fitness through disturbance	• General vessel traffic. • Disturbance from state controlled fisheries, recreational boaters. • Subsistence harvest	• General vessel traffic. • Disturbance to prey fields from fishing gear. • Physical disturbance during foraging. • Disturbance from foreign, JV, domestic groundfish fisheries and state- managed fisheries.	• Steller sea lion (SSL) closures around rookeries and haulouts by state fisheries and recreational boaters. • Ban on killing of sea lions outside of subsistence take.	• SSL protective measure 3 nautical miles (nm) no transect area around instituted in 1991.
Reduced fitness through changes in prey availability	• Climate and oceanographic fluctuations impact abundance and distribution of prey. • Foreign JV fisheries. • State-managed salmon and herring fisheries.	• Impact from removal of key prey species from targeted and bycatch harvest. • Potential localized depletion of key prey species in SSL critical habitat.	• Cessation of foreign JV fisheries. • Parallel state regulations in SSL critical habitat.	• Ban on targeting forage fish (Bering Sea and Aleutian Islands [BSAI] and Gulf of Alaska [GOA]). • 3 nm closures around rookeries and haulouts. • Prohibition of groundfish trawling within 10-20 nm of certain rookeries. • Spatial and temporal allocation of GOA Pollock total allowable catch (TAC). • Spatial and temporal dispersal of BSAI Pollock and cod fisheries. • Reduction of removal of Atka mackerel in SSL critical habitat and dispersion of Atka mackerel harvest. •Closure of the Aleutian Islands (AI) to Pollock trawling.

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the NOAA Fisheries Alaska groundfish fisheries.
Internal – Events and actions directly associated with the NOAA Fisheries Alaska groundfish fisheries.

Table 3.8-1 (cont.). Steller sea lion past/present effects.

Comparative baseline:	**Carry forward for cumulative effects analysis?**
• The western stock of the SSL is currently listed as endangered on the ESA due to a population declined approximately 80% from late 1970's, although decline has lessened in the 1990's to 5.4%. Take from groundfish fisheries and other fisheries (29) and subsistence harvest (198) exceeds the potential biological removal (PBR=208) for this species. There is concern for direct competition between the groundfish fisheries and the SSL prey but recent SSL protective measures have potentially lessened this effect. • The eastern stock is listed as threatened under the ESA but population levels have been increasing approximately 2% over the last ten years and numbers are currently considered approximately 10,000 (non-pups).	YES. SSLs, because of their status under the MMPA and the ESA, will be considered as two separate stocks in analysis of Alternatives in Chapter 4.

Table 3.8-2. Northern fur seals past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Subsistence harvest (historic to present) Average 1,605/year in Pribilof Islands from 1986-1996; Average 1,340/year in 1995-2000. • Commercial hunts (historic to 1985) peak take of 126,000 seals in 1961. • Incidental take in high sea driftnet fisheries, thousands/year (1960's to 1992). • Incidental take in state net fisheries; average 15/year in Bering Sea and Aleutian Islands (BSAI) (1990-1998).	• Small numbers of incidental take in foreign, joint venture (JR), and Magnuson-Stevens Act (MSA) groundfish fisheries (1978 to present). • Observer Program data; average less than 1 seal/year in trawls. Last recorded take in 1996.	• Marine Mammal Protection Act (MMPA) (1972). • United Nations (U.N.) Resolution 46/215 banning high seas driftnet fisheries.	• Marine mammal/fishery interaction monitoring and research through Observer Program (1990 to present). • Co-management agreement – National Marine Fisheries Service (NMFS), United States Fish and Wildlife Service (USFWS) and Alaska Native organizations for conservations of marine mammals (1994). • Co-management agreement - NMFS and Aleut Communities of St. Paul and St. George for conservation of fur seal and SSL on Pribilof Islands (2001).
Mortality from entanglement in marine debris	• Intentional and accidental loss of fishing gear and other material from all fishing and shipping vessels plus shoreside sources.	• Contribution to lost gear and material.	• Marine Plastic Pollution Research and Control Act (MPPRCA) (1987).	• Educational effort on importance of compliance with MPPRCA (1995 to present).
Reduced fitness through changes in prey availability	• Climate and oceanic fluctuations impact abundance and distribution of prey.	• Impact unknown but some direct competition for prey. • Concern for localized depletion of prey around Pribilofs, increasing due to displaced fishing effort from SSL habitats.		• Ban on targeting forage fish (BSAI and Gulf of Alaska [GOA] Fishery Management Plan [FMP] Amendments 36/39, 1997).

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the NOAA Fisheries Alaska groundfish fisheries.
Internal – Events and actions directly associated with the NOAA Fisheries Alaska groundfish fisheries.

Comparative baseline:

- Population estimate in 2000 about 940,000 and declining.
- Population declined substantially in 1970's to early 1980's, leading to "depleted" status under MMPA in 1988.
- Majority of population breeds on Pribilof Islands.
- Anthropogenic take small relative to potential biological removal (PBR).
- Concern for localized depletion of prey by groundfish fisheries, especially around Pribilof Islands. Displacement of fishing effort from SSL critical habitats is increasing effort in areas important to fur seals.

Carry forward for cumulative effects analysis?

YES. Regular interaction and direct competition with the groundfish fisheries and depleted population status warrants analysis as a separate species in the analysis of Alternative FMPs in Chapter 4.

Table 3.8-3. Pacific walrus past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Subsistence hunts in Alaska average almost 6,000 walrus/ year (historic to present). • Commercial hunts (1700's to 1950's).	• Rare incidental take in Bering Sea and Aleutian Islands (BSAI) groundfish trawls.	• Marine Mammal Protection Act (1972). • Cooperative management agreement with Eskimo Walrus Commission (1997).	• Marine mammal/fishery interaction monitoring and research through Observer Program (1990 to present).

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:

- Walrus population is considered large and stable. Direct interactions with commercial fishing vessels are rare. There is no overlap of diet with groundfish harvest.

Carry forward for cumulative effects analysis?

Yes. Walrus will be considered under the "other pinniped" group in Chapter 4.

Table 3.8-4. Harbor seals past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Subsistence harvest (historic to present) Average 161/year in Bering; average 791/year in Gulf of Alaska (GOA); average 1,749/year in southeast. (1992-96). • State predator control programs (1950's to 1972). • Commercial hunts (1963 to 1972). • Incidental take in state net fisheries; average 30/year in Bering Sea and Aleutian Islands (BSAI) and 25/year in GOA in 1990's.	• Incidental take in Magnuson-Stevens Act (MSA) groundfish fisheries (1978 to present). • Observer Program data; Bering Sea estimate = 3 seals/year, GOA estimate <1 seal/year, Southeast estimate = 4 seals/year.	• Marine Mammal Protection Act (1972).	• Marine mammal /fishery interaction monitoring and research through Observer Program (1990 to present). • Co-management agreement between NMFS, USFWS, and Alaska Native organizations for conservations of marine mammals (1994).
Reduced fitness through changes in prey availability	• Climate and oceanic fluctuations impact abundance and distribution of prey. • Concern that decline in Steller sea lion population has caused killer whales to prey heavily on seals instead.	• Impact unknown but some direct competition for prey.		• Ban on targeting forage fish (BSAI and GOA Fishery Management Plan [FMP] Amendments 36/39, 1997).
Reduced fitness through disturbance	• Foreign fisheries and processing vessels throughout Pacific. • Other United States (U.S.) fisheries.	• MSA groundfish vessels (1979 to present).		
Reduced fitness through contamination with oil	• *Exxon Valdez* and other large oil spills from vessel accidents. • Many other chronic sources of pollution.	• Contribution of groundfish vessels to chronic pollution.		

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the NOAA Fisheries Alaska groundfish fisheries.
Internal – Events and actions directly associated with the NOAA Fisheries Alaska groundfish fisheries.

Comparative baseline:

- Three recognized stocks but under reassessment; Bering Sea estimate = 13,300 seals, GOA and Aleutian Islands (AI) estimate = 29,200 seals, southeast estimate = 77,900 seals.
- Population trends mixed. Increasing in Bristol Bay but decreasing around Pribilofs. Major declines in GOA from 1976-1992 followed by steady increases. Generally increase in southeast.
- Concern for chronic and acute contamination with oil from all sources.

Carry forward for cumulative effects analysis?

Yes. Regular interaction and direct competition with the groundfish fisheries and major population declines in GOA warrants analysis as a separate species in the analysis of Alternative FMPs in Chapter 4.

Table 3.8-5. Spotted seal past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	**Internal**	**External**	**Internal**
Mortality through intentional and incidental take	• Subsistence hunts in Alaska average > 5,000 seals/year (historic to present). • Incidental take in salmon gillnet fisheries.	• Rare incidental take in Bering Sea and Aleutian Islands (BSAI) groundfish trawls.	• Marine Mammal Protection Act (1972).	• Marine mammal/fishery interaction monitoring and research through Observer Program (1990 to present).

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:

- Spotted seal population is considered large and stable. Direct interactions with commercial fishing vessels are rare. There is only a partial overlap of diet with groundfish harvest.

Carry forward for cumulative effects analysis?

Yes. Spotted seals will be considered under the "other pinniped" group in Chapter 4.

Table 3.8-6. Bearded seal past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	**Internal**	**External**	**Internal**
Mortality through intentional and incidental take	• Subsistence hunts in Alaska average > 6,000 seals/year (historic to present). • Incidental take in State fisheries.	• Rare incidental take in Bering Sea and Aleutian Islands (BSAI) groundfish trawls.	• Marine Mammal Protection Act (1972).	• Marine mammal/fishery interaction monitoring and research through Observer Program (1990 to present).

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:

- Bearded seal population is considered large and stable. Direct interactions with commercial fishing vessels are rare. There is only a partial overlap of diet with groundfish harvest.

Carry forward for cumulative effects analysis?

Yes. Bearded seals will be considered under the "other pinniped" group in Chapter 4.

Table 3.8-7. Ringed seal past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	**Internal**	**External**	**Internal**
Mortality through intentional and incidental take	• Subsistence hunts in Alaska average >9,000 seals/year (historic to present).	• Rare incidental take in Bering Sea and Aleutian Islands (BSAI) groundfish trawls.	• Marine Mammal Protection Act (1972).	• Marine mammal/fishery interaction monitoring and research through Observer Program (1990 to present).

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:

- Ringed seal population is considered large and stable. Direct interactions with commercial fishing vessels are rare. There is only a partial overlap of diet with groundfish harvest.

Carry forward for cumulative effects analysis?

Yes. Ringed seals will be considered under the "other pinniped" group in Chapter 4.

Table 3.8-8. Ribbon seal past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Subsistence hunting (historic to present).	• Very low level of take in Bering Sea and Aleutian Islands (BSAI) groundfish trawls.	• Marine Mammal Protection Act (1972).	• Marine mammal/fishery interaction monitoring and research through Observer Program (1990 to present).

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:

- Ribbon seal population trends and current estimates are unknown although there is no evidence that they are declining. Incidental take by groundfish trawls has been documented but is a rare occurrence, Appears to be some overlap of prey species with groundfish catch.

Carry forward for cumulative effects analysis?

Yes. Ribbon seals will be considered under the "other pinniped" group in Chapter 4.

Table 3.8-9. Northern elephant seal past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Commercial hunts in California and Mexico in 1800's. • Incidental take in various gillnet fisheries average 86 per year from California – Washington.	• Very low level of take in groundfish trawls and longlines.	• Marine Mammal Protection Act (1972).	• Marine mammal/fishery interaction monitoring and research through Observer Program (1990 to present).

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:

- Elephant seal population is expanding and numbers over 100,000 in United States (U.S.) waters. Direct interactions with commercial fishing vessels are infrequent. Incidental take by the groundfish fleet approaches zero.

Carry forward for cumulative effects analysis?

Yes. Elephant seals will be considered under the "other pinniped" group in Chapter 4.

Table 3.8-10. Sea otter past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Commercial hunts (1700's to 1911). • Subsistence hunts (historic to present). • Rare Incidental take in state fisheries.	• Rare incidental take in Bering Sea and Aleutian Islands (BSAI) groundfish trawls.	• International Fur Seal Treaty (1911). • Marine Mammal Protection Act (1972).	• Marine mammal/fishery interaction monitoring and research through Observer Program (1990 to present).
Mortality through oil pollution	• *Exxon Valdez* oil spill. • Chronic small-scale pollution from all vessels.	• Contribution to chronic pollution.	• Oil transportation regulations.	

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:
Sea otter population in Alaska is divided into three stocks. Southwest stock has declined precipitously in past 15 years and is a Candidate for Endangered Species Act (ESA) listing. Southcentral and southeast stocks have generally increased over same period. Direct interactions with commercial fishing vessels are rare. There is a partial overlap of diet with groundfish harvest although sea otters prefer nearshore habitats.

Carry forward for cumulative effects analysis?

Yes. Because of their ESA candidate status and regular interaction with the groundfish fleet, sea otters will be considered as a separate species in Chapter 4.

Table 3.8-11. Blue whale past/present effect.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Commercial hunts in North Pacific until 1965. • Illegal whaling in Russian waters after 1965. • Rare evidence of ship strikes in California.	• No recorded take in Magnuson-Stevens Act (MSA) fisheries.	• International Whaling Commission (IWC) ban on whaling (1966). • Marine Mammal Protection Act (1972).	• Marine mammal/fishery interaction monitoring and research through Observer Program (1990 to present).

Notes: External **-** Natural, climatic, and human controlled events and actions not directly associated with federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:
Blue whales are listed as endangered under the Endangered Species Act (ESA), but the population in Alaskan waters is unknown. Direct interactions with commercial fishing vessels are very rare with no recorded take in Alaska. Diet does not overlap with groundfish fisheries.

Carry forward for cumulative effects analysis?

Yes. Blue whales will be considered under the "baleen whales" group in Chapter 4.

Table 3.8-12. Fin whale past/present effects table.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Commercial whaling in North Pacific until 1976.	• One recorded take in Bering Sea and Aleutian Islands (BSAI) groundfish trawl (1999).	• Marine Mammal Protection Act (1972).	• Marine mammal/fishery interaction monitoring and research through Observer Program (1990 to present).

Notes: External **-** Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:
Fin whales are listed as endangered under the Endangered Species Act (ESA). Population size and trends in Alaskan waters is not known. Direct interactions with commercial fishing operations are rare with only one recorded incidental take in the BSAI trawl fishery. Diet overlaps partially with groundfish fisheries.

Carry forward for cumulative effects analysis?

Yes. Fin whales will be considered under the "baleen whales" group in Chapter 4.

Table 3.8-13. Sei whale past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Commercial whaling in North Pacific until 1976.	• No recorded take in Magnuson-Stevens Act (MSA) groundfish fisheries.	• Marine Mammal Protection Act (1972). • International Whaling Commission (IWC) ban on sei whale hunts (1976).	• Marine mammal /fishery interaction monitoring and research through Observer Program (1990 to present).

Notes: External **-** Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act..

Comparative baseline:
Sei whales are listed as endangered under the Endangered Species Act (ESA) due to commercial whaling. Population trends and current estimates are unavailable. Direct interactions with commercial fishing operations are rare with no recorded incidental takes in any fisheries. Diet does not overlap with groundfish fisheries.

Carry forward for cumulative effects analysis?

Yes. Sei whales will be considered under the "baleen whales" group in Chapter 4.

Table 3.8-14. Minke whale past/present effects table.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Incidental take in gillnet fisheries.	• One recorded take in Gulf of Alaska (GOA) joint-venture trawl groundfish fishery (1989).	• Marine Mammal Protection Act (1972).	• Marine mammal /fishery interaction monitoring and research through Observer Program (1990 to present).

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:
Minke whales are not listed under the Endangered Species Act (ESA) and were not subject to commercial whaling. Population trends and current estimates are unavailable but they are believed to be common in the project area based on frequency of sightings. Direct interactions with commercial fishing operations are rare with no recorded incidental takes in any fisheries since 1989. Diet overlaps partially with groundfish fisheries.

Carry forward for cumulative effects analysis?

Yes. Minke whales will be considered under the "baleen whales" group in Chapter 4.

Table 3.8-15. Humpback whale past/present effect.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Commercial whaling until 1966. • Incidental take in gillnet, longline, and pot fisheries in Hawaii and Alaska. • Ship strikes from fishing and non-fishing vessels.	• Two recorded takes in Bering Sea and Aleutian Islands (BSAI) trawl groundfish fishery (1998 and 1999). • Contribution to entanglement in fishing gear. • Contribution to ship strikes.	• International Whaling Commission (IWC) ban on whaling (1966). • Marine Mammal Protection Act (1972).	• Marine mammal/ fishery interaction monitoring and research through Observer Program (1990 to present).
Reduced fitness through disturbance	• Sound pollution from vessels and research. • Whale watching.	• Sound pollution from vessels.	•Whale watching regulations.	

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:
Humpback whales are listed as endangered under the Endangered Species Act (ESA) due to commercial whaling. The population of Alaska stocks was estimated at about 4,370 animals in 1993. Numbers are thought to be increasing but at an unknown rate. Direct interactions with commercial fishing operations occur on a regular basis. Two cases of incidental take were observed in the BSAI groundfish trawl fisheries since 1998. Diet does not overlap with groundfish fisheries.

Carry forward for cumulative effects analysis?

Yes. Humpback whales will be considered under the "baleen whales" group in Chapter 4.

Table 3.8-16. Gray whale past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Commercial whaling in North Pacific until 1948. • Subsistence hunts from California to Russia (historic to present). • Incidental take in coastal gillnet fisheries.	• No recorded take in Magnuson-Stevens Act (MSA) groundfish fisheries.	• International Convention for the Regulation of Whaling (1948). • International Whaling Commission (IWC) regulation of subsistence take (1966 to present). • Marine Mammal Protection Act (1972).	• Marine mammal/ fishery interaction monitoring and research through Observer Program (1990 to present).

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed by the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed by the Magnuson-Stevens Act.

Comparative baseline:
Gray whales were previously listed as endangered under the Endangered Species Act (ESA), but were delisted in 1994 because population size had recovered to near pre-whaling levels. Population trends have shown increases for past two decades, but have recently leveled off. Direct interactions with commercial fishing operations are rare with no recorded incidental takes in the MSA groundfish fisheries. Diet does not overlap with groundfish fisheries.

Carry forward for cumulative effects analysis?

Yes. Gray whales will be considered under the "baleen whales" group in Chapter 4.

Table 3.8-17. Northern right whale past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Commercial whaling in North Pacific until 1931. • Illegal whaling after 1931. • Incidental take in Russian driftnet fisheries (1980's).	• No recorded take in Magnuson-Stevens Act (MSA) groundfish fisheries.	• League of Nations ban on right whale hunts (1931). • International Whaling Commission (IWC) ban on right whale hunts (1949). • Marine Mammal Protection Act (1972).	• Marine mammal /fishery interaction monitoring and research through Observer Program (1990 to present).

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:
Northern right whales are listed as endangered under the Endangered Species Act (ESA) due to commercial whaling. Population trends and current estimates are unavailable, but believed to be very small. Direct interactions with commercial fishing operations are rare with no recorded incidental takes in any fisheries since 1989. Diet does not overlap with groundfish fisheries.

Carry forward for cumulative effects analysis?

Yes. Right whales will be considered under the "baleen whales" group in Chapter 4.

Table 3.8-18. Bowhead whale past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Commercial hunts in North Pacific until 1965. • Subsistence hunts in Bering Sea (historic to present). • Rare evidence of entanglement in fishing gear.	• No recorded take in Magnuson-Stevens Act (MSA) fisheries.	• International Whaling Commission (IWC) ban on whaling (1966). • Marine Mammal Protection Act (1972).	• Marine mammal/fishery interaction monitoring and research through Observer Program (1990 to present).

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:
Bowhead whales are listed as endangered under the Endangered Species Act (ESA) but the population in Alaskan waters is increasing. Direct interactions with commercial fishing operations are rare with very few recorded incidences of entanglement in fishing gear, most of which appears to be crab gear. Diet does not overlap with groundfish fisheries.

Carry forward for cumulative effects analysis?

Yes. Bowhead whales will be considered under the "baleen whales" group in Chapter 4.

Table 3.8-19. Sperm whale past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Commercial whaling (until 1988). • No subsistence take.	• No incidental take in Bering Sea and Aleutian Islands (BSAI)/Gulf of Alaska (GOA) groundfish fisheries (1990-1999).	• Endangered Species Act (ESA) (1970). • Marine Mammal Protection Act (1972).	• Marine mammal /fishery interaction monitoring and research through Observer Program (1990 to present).

Notes: External - Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal - Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:
Sperm whales are listed as endangered under the ESA, but no population estimates are available for Alaskan waters. No incidental take of sperm whales has been observed or reported in commercial fisheries, including the MSA groundfish fisheries, although there have been reports of fishermen trying to deter sperm whales from their longline catches in the GOA. National Oceanic and Atmospheric Administration (NOAA) Fisheries has issued a biological opinion (BiOp) that concludes the groundfish fisheries do not place sperm whales in jeopardy of extinction or reduce their chances of recovery.

Carry forward for cumulative effects analysis?

Yes. Based on the infrequent interaction between the groundfish fisheries and sperm whales, they will be discussed only as part of the "toothed whales" species group in the analysis of Fishery Management Plan (FMP) alternatives in Chapter 4.

Table 3.8-20. Beaked whales (Baird's, Cuvier's and Stejneger's) past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Incidental take in Prince William Sound, Bristol Bay and southeast drift gillnet fisheries combined - 2/year. • No subsistence take.	• No incidental take in Bering Sea and Aleutian Islands (BSAI) and Gulf of Alaska (GOA) groundfish trawl and longline is 1/year (1990-1998).	• Marine Mammal Protection Act (MMPA) (1972).	• Marine mammal/fishery interaction monitoring and research through Observer Program (1990 to present).

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:
All three species of beaked whales are very rare and seldom if ever interact with the groundfish fisheries in the BSAI and GOA. No incidental take has been recorded from these fisheries. From what is known of these whales, there is little if any competitive overlap as far as prey species.
Baird's Beaked whales are very rarely, if ever, interacts with the groundfish fisheries. Take is or approaches zero. Little is know of the size of the stock or its distribution but its not considered a strategic stock under the MMPA and not listed under the Endangered Species Act (ESA).

Carry forward for cumulative effects analysis?

No. Based on the lack of interaction between the groundfish fisheries and the beaked whales, the low level of effect in other fisheries, and its lack of status under the MMPA or ESA, this species will not be discussed as a single species in the analysis in Chapter 4. So little is known of this whales and its interaction with the groundfish fisheries, it will not be carried forward as a separate species to Chapter 4.

Table 3.8-21. Pacific white-sided dolphin past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Incidental take in Prince William Sound, Bristol Bay and southeast drift gillnet fisheries combined - 2/year. • No subsistence take.	• No incidental take in Bering Sea and Aleutian Islands (BSAI) and Gulf of Alaska (GOA) groundfish trawl and longline is 1/year (1990-1998).	• Marine Mammal Protection Act (MMPA) (1972).	• Marine mammal/fishery interaction monitoring and research through Observer Program (1990 to present).

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under Magnuson-Stevens Act.

Comparative baseline:
The Pacific white-sided dolphin is a seasonal resident of the BSAI and GOA has little competitive overlap with groundfish fisheries as far as prey. Incidental take in the groundfish fisheries approaches zero. This stock is not classified as a strategic stock under the MMPA and is not an Endangered Species Act (ESA)-listed species.

Carry forward for cumulative effects analysis?

No. Based on the lack of interaction between the groundfish fisheries and the Pacific white-sided dolphin, the low level of effect in other fisheries, and its lack of status under the MMPA or ESA, this species will not be discussed as a single species in the analysis in Chapter 4.

Table 3.8-22. Killer whale past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Illegal shooting of killer whales in various fisheries.	• Incidental take of 1.4 whales per year in groundfish trawls and longlines (1995-1999). • Vessel strikes.	• Marine Mammal Protection Act (1972). .	• Marine mammal/fishery interaction monitoring and research through Observer Program (1990 to present).
Reduced fitness through changes in prey availability	• Climate and oceanographic fluctuations impact abundance and distribution of prey. • State-managed salmon and herring fisheries.	• Fisheries incidental take of marine mammal prey populations is limited.		• Ban on targeting forage fish (Bering Sea and Aleutian Islands [BSAI] and Gulf of Alaska [GOA]). • Steller sea lion protection measures (protection of killer whale prey).
Spatial/temporal concentration of the fishery		• Groundfish fisheries do not directly affect the distribution of marine mammals.		
Disturbance		•Similar levels of disturbance to baseline.		

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:
Killer whales are divided into two stocks that regularly inhabit Alaskan waters, including 745 known residents and 251 known transients. Population estimates do not include provisional identifications, so they should be considered minimums. Resident whales feed on various fish species and are likely the type that interacts directly with the fisheries through depredation of longline catches, incidental take in trawl and longline gear, and other effects. Transient whales concentrate on marine mammal prey and are being investigated for their potential role in the decline of Steller sea lion populations, as well as other marine mammal species.

Carry forward for cumulative effects analysis?

Yes. Because of their frequent interaction with the groundfish fisheries and their possible role in the decline of several marine mammal species, killer whales will be considered as a separate species in the analysis of Alternative Fishery Management Plans (FMPs) in Chapter 4.

Table 3.8-23. Beluga whale past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Subsistence hunts (historic to present). • Infrequent take in salmon gillnet fisheries.	• No observed or reported incidental takes.	• Marine Mammal Protection Act (MMPA) (1972). • Cooperative management agreements with Alaska Native groups. .	• Marine mammal/fishery interaction monitoring and research through Observer Program (1990 to present).

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:
Beluga whales are divided into five stocks including four stocks that winter in the Bering Sea and one that resides in Cook Inlet. The four Bering Sea stocks appear to be stable or increasing. The Cook Inlet stock declined substantially in the last ten years because of excessive subsistence harvests and was recently listed as depleted under the MMPA. The stock is now under a co-management agreement that greatly controls subsistence harvest. Belugas feed on a variety of fish species but prefer to forage near coastal waters or near the pack ice. No belugas have been reported taken in the groundfish fisheries but they are infrequently taken in state-managed salmon fisheries.

Carry forward for cumulative effects analysis?

Yes. Because of their infrequent interaction with the groundfish fisheries, beluga whales will be considered as part of the "toothed whale" group in the analysis of Alternative Fishery Management Plans (FMPs) in Chapter 4.

Table 3.8-24. Harbor porpoise past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• Take in Southeast gillnet fisheries 2.8/year (1990-1998). • No subsistence take.	• No incidental take in Bering Sea and Aleutian Islands (BSAI) groundfish trawl or longline (1990-1998).	• Marine Mammal Protection Act (MMPA) (1972).	• Marine mammal/fishery interaction monitoring and research through Observer Program (1990 to present).

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:
Harbor porpoise is a common species in the BSAI and Gulf of Alaska (GOA) but has little interaction with the groundfish fisheries. There is little competitive overlap between the ground fisheries and harbor porpoise prey. Annual incidental take in the groundfish fisheries rarely, if every, occurs. This species is not classified as a strategic stock under the MMPA and is not an Endangered Species Act (ESA)-listed species.

Carry forward for cumulative effects analysis?

No. The low level of interaction between the harbor porpoise and the groundfish fisheries and lack of incidental take, harbor porpoise will not be considered as a separate species in the analysis of Alternative in Chapter 4, but will be addressed with the toothed whale group.

Table 3.8-25. Dall's porpoise past/present effects.

Direct/indirect effect indicator	Past/present events		Past/present management actions	
	External	Internal	External	Internal
Mortality through intentional and incidental take	• No Incidental take in State fisheries. • No subsistence take. • 54 taken per year off Japan but may be different stock.	• No incidental take in Bering Sea and Aleutian Islands (BSAI) and Gulf of Alaska (GOA) groundfish trawl or longline fisheries (1990-1998).	• Marine Mammal Protection Act (MMPA) (1972).	• Marine mammal/fishery interaction monitoring and research through Observer Program (1990 to present).

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Comparative baseline:
Dall's Porpoise is a common species in the BSAI and GOA and interacts with the groundfish fisheries on a regular basis. Annual incidental take in the groundfish fisheries is relatively low for the large populations size in this region. There is little overlap between the prey of Dall's porpoise and the fish targeted by the groundfish fisheries. This species is not classified as a strategic stock under the MMPA and is not an Endangered Species Act (ESA) listed species.

Carry forward for cumulative effects analysis?

No. Considering the low level of incidental take in the groundfish fisheries and their very limited overlap in prey species, Dall's porpoise will not be carried forward as separate species in analysis of Alternatives in Chapter 4, but will be grouped with the toothed whale group.

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Table 3.9-1. Catcher vessel and processor classes identified for the sector and regional profiles.

Acronym	Catcher vessel classes (all mutually exclusive)
TCV BSP ≥ 125	Bering Sea Pollock Trawl Catcher Vessel Greater than or Equal to 125 Feet in Length.
TCV BSP 60-124	Bering Sea Pollock Trawl Catcher Vessel 60 to 124 Feet in Length.
TCV Div. AFA	Diversified AFA-Eligible Trawl Catcher Vessel Greater than or Equal to 60 Feet in Length.
TCV Non-AFA	Non-AFA Trawl Catcher Vessel Greater than or Equal to 60 Feet in Length.
TCV < 60	Trawl Catcher Vessel Less than 60 Feet in Length.
PCV	Pot Catcher Vessel.
LCV	Longline Catcher Vessel.
FGCV 33-59	Fixed Gear Catcher Vessel 33 Feet to 59 Feet in Length.
FGCV ≤ 32	Fixed Gear Catcher Vessel Less than or Equal to 32 Feet in Length.
Catcher processor classes (all mutually exclusive)	
ST-CP	surimi trawl catcher-processor
FT-CP	fillet trawl catcher-processor
HT-CP	head-and-gut trawl catcher-processor
L-CP	longline catcher-processor
P-CP	pot catcher-processor
Inshore processor and mothership classes (all mutually exclusive)	
BSP-SP	Bering Sea pollock shore plant
APAI-SP	Alaska Peninsula and Aleutian Islands shore plant
K-SP	Kodiak shore plant
SC-SP	Southcentral Alaska shore plant
SE-SP	Southeast Alaska shore plant
FLT	Floating inshore plant
MS	Mothership

Source: Northern Economics, Inc. and EDAW, Inc. 2001.

Table 3.9-2. Species groups identified for the sector and regional profiles.

Acronym	Species groups
A-R-S-O	Atka mackerel, all rockfish species, sablefish, and other groundfish
FLAT	all flatfish species (excludes halibut, which is not a groundfish)
PCOD	Pacific cod
PLCK	Pollock
GFSH	all groundfish species, including PLCK, PCOD, FLAT, and A-R-S-O
non-GFSH	all non-groundfish species harvested in Alaska commercial fisheries, including salmon, crab, halibut, and herring

Source: Northern Economics, Inc. and EDAW, Inc. 2001.

Table 3.9-3. Regions identified for the sector and regional profiles.

Acronym	Regions (boroughs, census areas, municipalities, and counties included)
AKAPAI	Alaska Peninsula and Aleutian Islands Region. Includes the Aleutians East Borough and the Aleutians West Census Area.
AKSC	Southcentral Alaska Region. Includes Valdez-Cordova Census Area, Kenai Peninsula Borough, Matanuska-Susitna Borough, and the Municipality of Anchorage.
AKKO	Kodiak Region. Includes the Kodiak Island Borough and other parts of the Kodiak archipelago.
AKSE	Southeast Alaska Region. Includes Yakutat Borough, Skagway-Hoonah-Angoon Borough, Haines Borough, City and Borough of Juneau, City and Borough of Sitka, Wrangell-Petersburg Census Area, Prince of Wales-Outer Ketchikan Census Area, and Ketchikan Gateway Borough.
WAIW	Washington Inland Waters Region. All counties bordering Puget Sound and the Strait of Juan de Fuca, including Clallum Island, Jefferson, King, Kitsap, Mason, Pierce, San Juan, Skagit, Snohomish, Thurston, and Whatcom.
ORCO	Oregon Coast Region. Counties bordering the Northern Oregon coast including Lincoln, Tillamook, and Clatsop.
OTHER	Includes all other boroughs, census areas, municipalities, and counties in the United States.

Source: Northern Economics, Inc. and EDAW, Inc. 2001.

Table 3.9-4. Summary of domestic harvesting and processing activities in Alaska groundfish fisheries, 1992–2001.

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number of groundfish vessels and processors										
Catcher vessels[a]	1,374	1,142	1,240	1,076	1,002	1,032	961	1,005	1,078	917
Catcher-processors	136	120	116	118	112	106	98	88	90	89
Inshore processors and motherships[b]	77	69	73	77	67	64	62	61	69	59
All vessels and processors	1,587	1,331	1,429	1,271	1,181	1,202	1,121	1,154	1,237	1,065
Ex-vessel value of groundfish and non-groundfish retained										
Groundfish ($ millions)	264.3	169.6	200.3	254.7	229.0	264.8	181.5	248.4	324.7	299.5
Non-groundfish ($ millions)[c]	561.5	499.4	541.2	470.2	405.5	382.9	371.1	542.4	245.1	NA
Groundfish (% of total)	32.0	25.4	27.0	35.1	36.1	40.9	32.8	31.4	57.0	NA
Total groundfish catch										
Groundfish Catch (1,000s of metric tons [mt])[d]	2,275	2,139	2,178	2,140	2,048	2,057	1,864	1,654	1,823	1,998
Groundfish catch by species group										
A-R-S-O (% of Total)	9.7	11.0	9.8	10.2	11.6	10.5	9.1	11.1	10.5	7.4
FLAT (% of Total)	10.4	8.9	10.5	9.8	11.2	13.5	10.2	8.8	9.8	8.4
PCOD (% of Total)	12.5	10.4	11.0	14.6	15.0	15.9	13.8	14.6	13.4	10.9
PLCK (% of Total)	67.3	69.7	68.6	65.4	62.1	60.2	67.0	65.5	66.3	73.0
Groundfish catch by Fishery Management Plan subarea										
BSAI (% of Total)	85.5	84.6	85.9	87.4	87.7	85.1	82.3	83.0	86.0	90.7
GOA (% of Total)	14.5	15.4	14.1	12.6	12.3	14.9	17.7	17.0	14.0	9.3
Quantity and value of processed product										
Product Quantity (1,000s of mt)	565.7	544.9	569.8	594.6	598.1	598.5	550.7	533.2	593.8	656.2
Gross Product Value ($ millions)	1,411.3	990.3	1,124.1	1,381.4	1,224.0	1,194.7	1,048.6	1,210.9	1,371.6	1,426.8
Groundfish fishery employment by region (full time employee positions)[e]										
Alaska[f]	4,483	3,953	4,302	4,814	4,686	4,833	4,527	4,817	5,369	5,579
WAIW[g]	5,520	5,430	5,076	6,109	6,706	5,508	5,569	4,473	4,638	4,805
Total[h]	10,404	9,682	9,680	11,205	11,651	10,640	10,371	9,664	10,379	10,384
Groundfish fishery payments to labor by region ($ millions)										
Alaska[f]	194.8	143.1	174.3	207.8	183.3	191.1	159.3	200.6	225.7	256.9
WAIW[g]	428.9	293.1	326.1	412.1	368.6	387.8	308.0	347.4	410.1	391.3
Total[h]	652.2	494.0	547.4	646.8	585.3	573.0	517.1	578.5	645.3	648.2

Notes: [a]The count of catcher vessels excludes vessels that made only incidental landings or could not be classified. Since 1992, there have been an average of 408 such vessels. The annual deliveries of these vessels have averaged less than 70 mt and generated an average of only $87,000 in ex-vessel value.
[b]The count of processors does not include facilities that acted as buying stations or inshore processors that were not identified with a specific port. There were an average of 53 excluded facilities, which accounted for an average of 0.3 percent of total groundfish processing since 1992.
[c] Includes all deliveries of salmon, crab, halibut, and other non-groundfish species to groundfish processors. Data for 2000 does not include halibut.
[d]Includes all groundfish reported by processors including at-sea discards.
[e]Includes skippers, fishing crew, processing crew, managers, and home office support staff. Total employment estimates combine full-time equivalent (FTE) positions from all processors with position counts from catcher vessels.
[f]Includes coastal boroughs and census areas from the Aleutians southward and eastward through Southeast Alaska.
[g]Includes coastal counties in Washington that border on Puget Sound and the Strait of Juan de Fuca.
[h]Totals include all areas of the United State (U.S.) not included in Alaska and WAIW.

Source: Commercial Fisheries Entry Commision (CFEC) / Alaska Department of Fish and Game (ADF&G) fish tickets, National Oceanic and Atmospheric Administration (NOAA) Fisheries observer data, NOAA Fisheries blend data and NOAA Fisheries Weekly Production Report data.

Table 3.9-5. A comparison of the activities of catcher vessel classes, 2001.

Catcher vessel class	Number of vessels	Groundfish landings retained (1,000's of metric tons)				Ex-vessel value of groundfish ($ millions)	Payments to labor ($ millions)	Employment (No. of full time employee positions)
		PLCK	PCOD	A-R-S-O	FLAT			
TCV BSP ≥ 125	29	357.5	2.2	0.8	0.8	86.2	34.5	157.7
TCV BSP 60-124	51	365.0	8.4	1.3	1.3	91.7	36.7	290.5
TCV Div. AFA	20	41.3	10.2	2.3	2.1	17.2	6.9	102.2
TCV Non-AFA	42	25.8	11.1	4.7	6.6	17.1	6.8	147.8
TCV < 60	44	22.8	8.1	0.3	0.8	12.1	4.9	169.2
PCV	89	0.0	14.3	0.3	0.0	9.1	3.6	176.1
LCV	72	0.0	0.5	4.0	0.0	18.7	7.5	179.2
FGCV 33-59	514	0.1	8.6	6.7	0.2	33.8	13.5	687.7
FGCV ≤ 32	56	0.0	0.9	0.0	0.0	0.8	0.3	86.9
Total	917	812.4	64.2	20.4	11.7	286.7	114.7	1,997.4

Source: Commercial Fisheries Entry Commision (CFEC) / Alaska Department of Fish and Game (ADF&G) fish tickets.

Table 3.9-6. Summary of catcher vessel activities, 1992–2001.

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number of Vessels										
Number of vessels	1,374	1,142	1,240	1,076	1,002	1,032	961	1,005	1,078	917
AKAPAI owners (% of total)	4.4	3.9	4.8	6.6	7.0	7.2	7.9	6.7	6.5	7.6
AKKO owners (% of total)	12.4	11.4	11.5	13.4	14.2	15.5	15.9	15.6	17.8	15.5
AKSC owners (% of total)	24.7	25.2	24.4	22.0	19.0	19.0	17.8	16.8	18.3	16.9
AKSE owners (% of total)	29.8	31.4	30.6	28.2	28.9	26.7	25.5	24.4	22.2	22.9
WAIW owners (% of total)	19.7	19.3	19.8	22.3	23.1	23.6	23.9	25.8	25.0	26.1
ORCO owners (% of total)	3.1	2.9	3.1	3.5	3.6	3.5	3.7	3.9	3.9	3.8
Other owners (% of total)	5.9	5.9	5.7	4.0	4.3	4.5	5.2	6.9	6.3	7.2
Total groundfish catch retained										
Groundfish catch retained (1,000s of metric tons [mt])	823.6	771.9	790.7	834.3	813.7	969.9	809.6	785.1	833.6	908.8
Ex-vessel value of groundfish and non-groundfish retained										
GFSH ($ millions)	266.2	172.9	197.6	261.3	232.4	334.7	181.0	247.4	308.3	224.6
Non-GFSH ($ millions)[a]	182.7	134.0	168.0	193.1	155.2	170.6	139.4	250.7	108.2	NA
Salmon (% of Total)	38.7	33.4	31.9	21.2	15.8	15.9	22.9	19.5	24.6	NA
Crab (% of Total)	37.5	31.5	28.6	47.9	36.2	29.0	35.4	43.7	65.5	NA
Halibut (% of Total)	18.5	27.8	32.8	24.9	37.2	45.8	34.5	32.9	0.0	NA
Other (% of Total)	5.3	7.3	6.7	6.1	10.7	9.3	7.3	4.0	9.8	NA
GFSH (% of Total)	59.3	56.3	54.0	57.5	60.0	66.2	56.5	49.7	74.0	NA
Ex-vessel value of groundfish retained by species group (% of total)										
A-R-S-O	19.5	25.1	29.1	27.9	28.7	20.6	24.0	18.7	20.3	18.2
FLAT	3.6	2.0	2.2	2.2	2.6	4.9	1.5	0.7	0.9	1.3
PCOD	15.2	17.1	14.0	18.1	21.6	21.6	23.2	28.0	24.3	12.4
PLCK	61.6	55.8	54.7	51.8	47.1	52.8	51.3	52.6	54.6	68.2
Ex-vessel value of groundfish retained by Fishery Management Plan subarea (% of total)										
Aleutian Islands	2.5	2.3	2.2	2.5	1.9	2.6	1.8	2.0	2.8	2.3
Bering Sea	59.9	52.4	52.6	55.5	54.7	60.6	49.1	53.3	58.1	58.1
WG	6.8	4.7	3.8	6.1	6.7	6.5	8.2	8.4	7.4	7.1
CG	21.3	27.0	21.3	21.1	21.6	19.5	28.4	26.5	21.5	19.5
EG	8.8	13.5	20.1	14.7	15.1	10.7	12.1	9.2	9.9	13.0
Groundfish fishery employment by region (full time employee positions)[b]										
AKAPAI	103.8	65.0	93.7	123.7	127.6	140.9	147.3	129.8	130.1	113.7
AKKO	310.0	211.0	236.4	270.0	285.3	332.3	294.2	291.9	337.3	237.2
AKSC	487.6	321.2	334.4	363.1	302.2	321.9	270.9	268.3	317.1	199.7
AKSE	545.7	371.2	393.3	445.7	432.1	433.6	369.7	375.9	372.0	348.1
WAIW	590.0	412.2	468.3	560.4	554.6	558.5	526.0	598.9	622.0	808.6
ORCO	120.3	91.1	97.0	112.0	108.0	108.2	105.7	114.1	110.8	136.2
Total[c]	2,297.3	1,572.2	1,723.9	1,968.0	1,907.0	1,994.9	1,820.8	1,913.2	2,021.1	1,997.4
Groundfish fishery payments to labor by region ($ millions)[c]										
AKAPAI	2.3	1.4	1.8	2.0	3.2	3.9	3.0	4.0	2.8	3.2
AKKO	11.4	8.5	8.9	11.0	11.3	15.8	9.1	12.0	12.4	8.2
AKSC	6.9	4.9	4.5	4.9	3.7	4.5	3.0	4.1	5.6	3.8
AKSE	7.9	7.7	10.6	10.6	10.1	9.7	6.5	7.0	9.2	7.8
WAIW	61.0	36.2	42.6	59.2	50.9	84.9	39.9	56.0	74.9	74.0
ORCO	9.1	6.0	5.9	9.0	7.6	8.7	6.4	9.1	9.6	10.4
Total[c]	107.0	69.3	79.2	106.7	94.5	134.7	73.1	99.1	122.4	114.7

Notes: [a]Salmon, crab, halibut, and other.
[b]Includes skipper, crew, and support staff.
[c]Includes estimates for residents of other regions.
NA - data is not available.

Source: CFEC/ADF&G fish tickets.

Table 3.9-7. Summary of activities of Bering Sea pollock trawl catcher vessels greater than or equal to 125 feet in length, 1992–2001.

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number of vessels										
Number of vessels	25	22	22	24	29	36	31	33	30	29
WAIW owners (% of Total)	88.0	90.9	90.9	91.7	89.7	97.2	96.8	97.0	96.7	96.6
ORCO owners (% of Total)	4.0	4.5	4.5	4.2	0.0	0.0	0.0	0.0	0.0	0.0
Other owners (% of Total)	8.0	4.5	4.5	4.2	10.3	2.8	3.2	3.0	3.3	3.4
Total groundfish catch retained										
Groundfish catch retained (1,000s of metric tons [mt])	205.8	226.0	232.9	233.5	268.6	382.6	269.2	300.6	309.1	361.3
Ex-vessel value of groundfish and non-groundfish retained										
GFSH ($ millions)	55.5	35.0	39.2	49.5	49.0	100.4	39.6	64.6	79.5	86.2
Non-GFSH ($ millions)[a]	CR	3.1	CR	1.8	CR	1.6	2.2	5.0	1.2	NA
Salmon (% of total)	0.0	0.0	0.0	0.0	0.0	0.0	CR	CR	0.0	NA
Crab (% of total)	CR	100.0	CR	100.0	CR	100.0	100.0	100.0	100.0	NA
Other (% of total)	0.0	0.0	0.0	0.0	0.0	CR	0.0	CR	0.0	NA
GFSH (% of total)	CR	91.9	CR	96.5	CR	98.4	94.8	92.8	98.5	NA
Ex-vessel value of groundfish retained by species group (% of total)										
A-R-S-O	0.0	0.0	0.1	0.3	0.0	0.0	0.1	0.0	0.0	0.1
FLAT	1.7	0.0	1.2	1.1	0.8	5.4	0.1	0.3	0.5	0.4
PCOD	2.4	5.0	3.8	5.7	9.5	5.2	5.8	6.5	4.5	1.2
PLCK	95.9	95.0	94.9	92.9	89.7	89.4	94.0	93.2	95.1	98.3
Ex-vessel value of groundfish retained by Fishery Management Plan subarea (% of total)										
Aleutian Islands	6.5	5.3	6.5	7.1	3.9	4.2	3.0	1.7	1.3	0.8
Bering Sea	89.3	90.4	88.9	86.4	93.3	93.1	91.4	95.2	98.7	99.2
WG	3.4	2.0	2.5	4.8	2.0	1.9	2.9	1.9	CR	CR
CG	0.9	2.1	1.3	1.6	0.8	0.2	0.8	0.8	0.0	0.0
EG	0.0	0.2	0.7	0.1	0.0	0.5	2.0	0.3	0.0	0.0
Groundfish fishery employment by region (full time employee positions)[b]										
WAIW	66.7	62.8	68.4	76.6	87.1	101.5	95.5	106.7	95.9	151.1
ORCO	3.0	3.1	3.4	3.5	0.0	0.0	0.0	0.0	0.0	6.7
Total[c]	75.8	69.1	75.3	83.6	97.1	104.4	98.7	110.1	99.2	157.7
Groundfish fishery payments to labor by region ($ millions)[c]										
WAIW	21.0	13.1	15.1	19.9	19.2	42.3	16.1	24.9	32.2	33.0
ORCO	0.7	0.6	0.6	0.7	0.0	0.0	0.0	0.0	0.0	1.5
Total[c]	22.2	14.0	15.7	19.8	19.6	40.2	15.8	25.8	31.8	34.5

Notes: [a] Salmon, crab, halibut, and other.
[b] Includes skipper, crew, and support staff.
[c] Includes estimates for residents of other regions.
NA - data is not available.
CR - data can not be presented due to NOAA Fisheries data confidentiality restrictions.
Source: CFEC/ADF&G fish tickets.

Table 3.9-8. Summary of activities of Bering Sea pollock trawl catcher vessels 60 to 124 feet in length, 1992–2001.

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number of vessels										
Number of vessels	56	54	54	63	62	54	48	42	45	51
AKAPAI owners (% of total)	0.0	1.9	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AKKO owners (% of total)	1.8	1.9	1.9	6.3	8.1	3.7	6.3	2.4	2.2	5.9
AKSC owners (% of total)	5.4	1.9	1.9	1.6	0.0	1.9	0.0	0.0	0.0	0.0
WAIW owners (% of total)	71.4	79.6	74.1	69.8	67.7	74.1	81.3	83.3	77.8	68.6
ORCO owners (% of total)	14.3	5.6	11.1	14.3	16.1	13.0	6.3	9.5	15.6	21.6
Other owners (% of total)	7.1	9.3	9.3	7.9	8.1	7.4	6.3	4.8	4.4	3.9
Total groundfish catch retained										
Groundfish catch retained (1,000s of metric tons [mt])	404.6	352.4	384.2	424.3	370.9	350.8	292.2	254.3	320.4	376.0
Ex-vessel value of groundfish and non-groundfish retained										
GFSH ($ millions)	95.1	52.1	63.8	88.8	68.3	79.9	43.4	53.9	82.7	91.7
Non-GFSH ($ millions)[a]	5.8	8.0	4.0	4.2	1.2	3.4	4.1	7.7	3.1	NA
Salmon (% of total)	CR	CR	CR	0.0	0.0	CR	CR	0.0	0.0	NA
Crab (% of total)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	NA
Halibut (% of total)	0.0	CR	CR	CR	CR	CR	0.0	CR	0.0	NA
Other (% of total)	0.0	0.0	0.0	0.0	CR	CR	CR	0.0	0.0	NA
GFSH (% of total)	94.2	86.7	94.2	95.4	98.3	95.9	91.3	87.5	96.4	NA
Ex-vessel value of groundfish retained by species group (% of total)										
A-R-S-O	0.0	0.2	0.1	0.4	1.9	0.6	0.6	0.3	0.4	0.5
FLAT	0.4	0.1	1.5	2.5	1.7	0.8	0.6	0.0	0.2	0.4
PCOD	5.7	7.9	11.1	12.4	16.8	14.0	13.6	12.5	12.7	4.5
PLCK	93.8	91.7	87.3	84.7	79.6	84.6	85.2	87.2	86.7	94.5
Ex-vessel value of groundfish retained by Fishery Management Plan subarea (% of total)										
Aleutian Islands	1.8	2.6	1.3	1.1	1.9	2.1	2.4	1.7	1.3	CR
Bering Sea	92.9	93.2	93.4	91.5	92.3	92.9	90.3	94.4	97.1	97.2
WG	2.9	2.2	2.0	3.8	1.2	2.0	1.9	2.2	CR	CR
CG	2.4	1.9	2.5	3.6	4.1	2.5	5.0	1.7	1.6	2.8
EG	0.0	0.1	0.8	0.0	0.5	0.5	0.5	0.0	0.0	0.0
Groundfish fishery employment by region (full time employee positions)[b]										
AKAPAI	0.0	3.1	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AKKO	3.9	3.1	3.5	14.6	17.8	5.8	9.6	3.0	3.3	13.1
AKSC	11.8	3.1	3.5	3.7	0.0	2.9	0.0	0.0	0.0	0.0
WAIW	157.6	134.0	141.9	161.0	149.8	116.9	125.3	106.4	116.7	216.2
ORCO	31.5	9.3	21.3	32.9	35.7	20.5	9.6	12.2	23.3	51.8
Total[c]	220.7	168.2	191.6	230.5	221.2	157.8	154.2	127.7	150.1	290.4
Groundfish fishery payments to labor by region ($ millions)[c]										
AKAPAI	0.0	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AKKO	0.7	0.5	0.5	2.3	2.4	1.3	1.1	0.7	0.8	1.6
AKSC	1.6	0.3	0.3	0.3	0.0	0.3	0.0	0.0	0.0	0.0
WAIW	29.2	17.1	20.0	27.2	20.2	25.6	14.8	17.8	27.0	27.3
ORCO	4.3	1.1	2.4	4.4	4.3	3.5	1.1	2.1	4.6	6.5
Total[c]	38.5	21.0	25.7	37.7	28.9	32.8	18.1	21.7	33.8	36.7

Notes: [a]Salmon, crab, halibut, and other.
[b]Includes skipper, crew, and support staff.
[c] Includes estimates for residents of other regions.
NA - data is not available.
CR - data can not be presented due to NOAA Fisheries data confidentiality restrictions.
Source: CFEC/ADF&G fish tickets.

Table 3.9-9. Summary of activities of diversified AFA-eligible trawl catcher vessels greater than or equal to 60 feet in length, 1992–2001.

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number of vessels										
Number of vessels	31	31	27	24	19	26	32	34	30	20
AKKO owners (% of total)	38.7	35.5	40.7	33.3	36.8	34.6	25.0	17.6	20.0	20.0
AKSC owners (% of total)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	3.3	5.0
WAIW owners (% of total)	19.4	6.5	11.1	12.5	10.5	15.4	12.5	23.5	26.7	45.0
ORCO owners (% of total)	32.3	45.2	40.7	41.7	42.1	42.3	50.0	44.1	36.7	20.0
Other owners (% of total)	9.7	12.9	7.4	12.5	10.5	7.7	12.5	11.8	13.3	10.0
Total groundfish catch retained										
Groundfish catch retained (1,000s of metric tons [mt])	111.1	99.3	78.2	70.5	47.6	75.7	106.5	94.9	74.2	55.7
Ex-vessel value of groundfish and non-groundfish retained										
GFSH ($ millions)	33.4	20.0	16.4	18.1	11.8	22.1	20.4	28.4	25.3	17.2
Non-GFSH ($ millions)[a]	1.0	1.9	1.8	1.0	1.4	1.0	0.8	2.0	0.8	NA
Salmon (% of total)	CR	0.0	CR	0.0	0.0	CR	CR	CR	CR	NA
Crab (% of total)	86.2	78.2	45.9	CR	CR	CR	58.1	64.2	99.8	NA
Halibut (% of total)	12.7	19.3	33.2	35.5	29.5	44.8	41.5	24.3	0.0	NA
Other (% of total)	0.0	CR	CR	CR	0.0	CR	0.0	CR	0.0	NA
GFSH (% of total)	97.0	91.4	89.9	94.8	89.3	95.5	96.3	93.3	97.0	NA
Ex-vessel value of groundfish retained by species group (% of total)										
A-R-S-O	7.3	2.7	7.5	4.0	6.5	6.1	4.2	4.5	5.9	4.9
FLAT	17.8	5.0	5.8	6.5	3.8	6.4	3.3	1.6	2.9	3.4
PCOD	23.7	34.9	23.0	36.9	43.1	40.1	41.6	45.0	43.1	30.2
PLCK	51.2	57.4	63.8	52.6	46.6	47.4	50.8	48.9	48.0	61.5
Ex-vessel value of groundfish retained by Fishery Management Plan subarea (% of total)										
Aleutian Islands	CR	0.0	0.0	0.0	0.0	CR	CR	CR	8.8	8.8
Bering Sea	49.8	32.7	24.6	58.3	59.0	42.1	44.5	44.8	39.0	42.8
WG	6.0	3.8	4.1	5.1	7.9	8.2	8.0	4.2	7.7	13.7
CG	44.2	63.2	67.9	36.1	33.1	49.1	47.2	50.7	44.3	33.9
EG	0.0	0.2	3.5	0.5	0.0	0.6	0.3	0.4	0.2	0.8
Groundfish fishery employment by region (full time employee positions)[b]										
AKKO	50.7	42.0	41.0	30.8	27.0	35.6	29.1	22.4	19.8	26.1
AKSC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	3.3	9.1
WAIW	25.3	7.6	11.2	11.6	7.7	15.8	14.5	29.9	26.4	37.6
ORCO	42.2	53.5	41.0	38.5	30.8	43.5	58.2	56.1	36.4	18.3
Total[c]	130.8	118.4	100.7	92.4	73.2	102.8	116.3	127.2	99.2	102.2
Groundfish fishery payments to labor by region ($ millions)[c]										
AKKO	5.3	3.3	3.0	2.5	1.9	3.4	2.1	2.5	2.2	1.8
AKSC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.6
WAIW	2.8	0.5	0.8	1.0	0.5	1.5	1.1	2.7	2.8	2.5
ORCO	3.4	3.5	2.2	2.6	1.9	3.2	4.1	5.2	3.3	1.2
Total [c]	13.4	8.0	6.6	7.2	4.7	8.8	8.2	11.4	10.1	6.9

Notes: [a]Salmon, crab, halibut, and other.
[b]Includes skipper, crew, and support staff.
[c]Includes estimates for residents of other regions.
NA - data is not available.
CR - data can not be presented due to NOAA Fisheries data confidentiality restrictions.
Source: CFEC/ADF&G fish tickets.

Table 3.9-10. Summary of activities of non-American Fisheries Act trawl catcher vessels greater than or equal to 60 feet in length, 1992–2001.

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number of vessels										
Number of vessels	48	40	32	35	34	38	40	39	38	42
AKAPAI owners (% of total)	10.4	7.5	6.3	11.4	8.8	7.9	7.5	7.7	7.9	7.1
AKKO owners (% of total)	29.2	32.5	43.8	31.4	29.4	39.5	32.5	30.8	31.6	26.2
AKSC owners (% of total)	6.3	7.5	3.1	5.7	5.9	5.3	7.5	5.1	5.3	2.4
WAIW owners (% of total)	37.5	35.0	34.4	28.6	32.4	21.1	22.5	25.6	23.7	21.4
ORCO owners (% of total)	8.3	10.0	6.3	11.4	14.7	15.8	15.0	15.4	15.8	21.4
Other owners (% of total)	8.3	7.5	6.3	11.4	8.8	10.5	15.0	15.4	15.8	21.4
Total groundfish catch retained										
Groundfish catch retained (1,000's of metric tons [mt])	38.3	37.8	32.6	33.4	39.7	53.0	55.7	50.8	47.0	48.2
Ex-vessel value of groundfish and non-groundfish retained										
GFSH ($ millions)	13.3	9.7	9.0	11.3	12.5	22.2	11.9	16.7	16.4	17.1
Non-GFSH ($ millions)[a]	1.6	2.5	1.6	2.9	3.1	4.3	2.7	3.2	CR	NA
Salmon (% of total)	0.0	CR	0.0	CR	0.0	0.0	CR	0.0	CR	NA
Crab (% of total)	34.8	38.1	CR	43.6	34.3	CR	CR	CR	CR	NA
Halibut (% of total)	59.8	39.5	88.5	54.9	60.4	60.6	65.7	90.5	CR	NA
Other (% of total)	CR	22.4	CR	CR	5.3	CR	CR	CR	CR	NA
GFSH (% of total)	89.2	79.2	85.4	79.5	80.0	83.8	81.6	83.9	CR	NA
Ex-vessel value of groundfish retained by species group (% of total)										
A-R-S-O	6.2	4.9	13.4	6.5	11.4	10.0	7.7	7.4	14.5	10.7
FLAT	15.7	18.0	17.4	13.8	16.5	30.5	10.1	4.6	8.4	11.7
PCOD	50.0	46.0	34.8	51.6	43.2	36.0	35.9	50.3	41.2	36.1
PLCK	28.1	31.0	34.4	28.1	28.8	23.4	46.3	37.8	35.9	41.4
Ex-vessel value of groundfish retained by Fishery Management Plan subarea (% of total)										
Aleutian Islands	0.0	CR	CR	0.0	0.0	0.0	CR	CR	CR	0.0
Bering Sea	22.0	16.7	20.2	18.2	12.0	26.0	5.6	9.3	11.2	8.4
WG	14.2	10.7	6.4	7.1	10.2	7.0	7.3	9.8	10.5	6.1
CG	63.4	72.3	71.4	74.0	76.6	62.0	86.6	78.8	74.8	81.7
EG	0.4	0.3	2.0	0.7	1.1	5.1	0.6	2.1	3.5	3.8
Groundfish fishery employment by region (full time equivalent positions)[b]										
AKAPAI	14.4	8.8	6.3	11.2	10.3	9.9	9.1	10.1	8.4	9.0
AKKO	40.4	38.0	44.1	30.8	34.2	49.4	39.3	40.3	33.4	29.6
AKSC	8.7	8.8	3.1	5.6	6.8	6.6	9.1	6.7	5.6	1.9
AKSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WAIW	52.0	40.9	34.6	28.0	37.6	26.3	27.2	33.6	25.1	27.0
ORCO	11.6	11.7	6.3	11.2	17.1	19.8	18.1	20.1	16.7	45.9
Total[c]	138.6	116.8	100.7	98.1	116.3	125.1	121.0	130.8	105.9	147.8
Groundfish fishery payments to labor by region ($ millions)[c]										
AKAPAI	0.5	0.2	0.1	0.3	0.4	0.6	0.3	0.5	0.4	0.4
AKKO	1.6	1.5	1.8	1.5	1.6	3.9	1.6	2.6	2.2	1.4
AKSC	0.3	0.2	0.1	0.1	0.2	0.3	0.2	0.3	0.3	0.1
WAIW	2.1	1.4	1.3	1.4	1.8	2.0	1.1	1.7	1.6	1.2
ORCO	0.4	0.4	0.2	0.5	0.7	1.2	0.7	1.1	0.9	2.1
Total[c]	5.3	3.9	3.6	4.5	5.0	8.9	4.8	6.7	6.6	6.8

Notes: [a]Salmon, crab, halibut, and other.
[b]Includes skipper, crew, and support staff.
[c]Includes estimates for residents of other regions.
NA - data is not available.
CR - data can not be presented due to NOAA Fisheries data confidentiality restrictions.
Source: CFEC/ADF&G fish tickets.

Table 3.9-11. Summary of activities of trawl catcher vessels less than 60 feet in length, 1992–2001.

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number of vessels										
Number of vessels	58	66	60	55	58	61	54	51	46	44
AKAPAI owners (% of total)	48.3	48.5	50.0	56.4	53.4	49.2	55.6	56.9	63.0	54.5
AKKO owners (% of total)	19.0	16.7	18.3	18.2	17.2	21.3	16.7	11.8	6.5	6.8
AKSC owners (% of total)	5.2	6.1	6.7	1.8	5.2	3.3	1.9	2.0	0.0	2.3
AKSE owners (% of total)	3.4	6.1	3.3	5.5	5.2	3.3	3.7	5.9	6.5	4.5
WAIW owners (% of total)	24.1	22.7	21.7	18.2	19.0	21.3	22.2	23.5	21.7	27.3
Other owners (% of total)	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	2.2	4.5
Total groundfish catch retained										
Groundfish catch retained (1,000's of metric tons [mt])	22.2	22.6	25.1	19.8	32.5	38.6	39.8	31.0	26.1	32.0
Ex-vessel value of groundfish and non-groundfish retained										
GFSH ($ millions)	9.1	7.3	8.1	7.6	11.1	13.8	10.5	13.2	13.4	12.1
Non-GFSH ($ millions)[a]	14.1	11.7	12.3	12.3	6.8	7.1	7.4	10.8	3.9	NA
Salmon (% of total)	83.5	75.2	58.2	76.1	51.3	54.5	73.5	72.4	85.2	NA
Crab (% of total)	CR	4.3	7.1	5.8	4.6	3.0	CR	CR	5.2	NA
Halibut (% of total)	11.9	14.4	29.3	14.9	27.6	35.0	21.1	20.6	0.0	NA
Other (% of total)	2.9	6.0	5.5	3.1	16.5	7.5	5.0	5.4	9.6	NA
GFSH (% of total)	39.1	38.4	39.7	38.4	62.1	65.9	58.6	55.0	77.4	NA
Ex-vessel value of groundfish retained by species group (% of total)										
A-R-S-O	7.9	15.7	24.9	19.5	14.3	12.2	12.0	8.2	8.9	8.9
FLAT	3.0	2.8	1.4	3.3	7.1	3.6	2.0	0.9	0.8	1.6
PCOD	80.5	69.8	53.2	57.5	60.7	56.7	59.9	69.7	68.9	37.1
PLCK	8.6	11.7	20.5	19.7	17.9	27.4	26.2	21.1	21.3	52.4
Ex-vessel value of groundfish retained by Fishery Management Plan subarea (% of total)										
Aleutian Islands	0.0	0.0	0.0	0.0	0.0	0.0	0.0	CR	CR	2.7
Bering Sea	2.7	0.8	CR	1.0	CR	0.6	0.8	1.0	5.1	1.1
WG	54.6	51.8	39.9	38.3	49.5	50.6	53.2	74.1	78.5	68.1
CG	39.9	45.9	50.5	53.6	45.8	44.6	41.6	21.7	12.1	22.1
EG	2.8	1.5	9.6	7.1	4.7	4.2	4.4	3.2	4.3	5.9
Groundfish fishery employment by region (full time equivalent positions)[b]										
AKAPAI	51.9	43.9	55.2	59.8	61.4	65.4	71.5	66.9	63.4	86.3
AKKO	20.4	15.1	20.2	19.3	19.8	28.3	21.5	13.8	6.6	7.3
AKSC	5.6	5.5	7.4	1.9	5.9	4.4	2.4	2.3	0.0	3.9
AKSE	3.7	5.5	3.7	5.8	5.9	4.4	4.8	6.9	6.6	9.6
WAIW	26.0	20.6	23.9	19.3	21.8	28.3	28.6	27.7	21.9	53.4
ORCO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total[c]	107.5	90.5	110.3	106.2	114.9	132.9	128.8	117.7	100.6	169.2
Groundfish fishery payments to labor by region ($ millions)[c]										
AKAPAI	1.5	0.9	1.0	1.0	2.0	2.4	1.9	2.7	1.5	2.5
AKKO	0.7	0.6	0.7	0.6	0.8	1.3	0.7	0.8	0.7	0.2
AKSC	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1
AKSE	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.1	0.3
WAIW	0.9	0.7	0.7	0.6	0.9	1.3	1.0	1.2	0.9	1.5
Total[c]	3.6	2.9	3.2	3.1	4.4	5.5	4.2	5.3	3.6	4.9

Notes: [a]Salmon, crab, halibut, and other.
[b]Includes skipper, crew, and support staff.
[c]Includes estimates for residents of other regions.
NA - data is not available.
CR - data can not be presented due to NOAA Fisheries data confidentiality restrictions.
Source: CFEC/ADF&G fish tickets.

Table 3.9-12. Summary of activities of pot catcher vessels, 1992-2001.

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number of vessels										
Number of vessels	72	37	40	101	100	76	65	103	158	89
AKAPAI owners (% of total)	1.4	0.0	0.0	3.0	5.0	1.3	3.1	2.9	2.5	0.0
AKKO owners (% of total)	25.0	40.5	37.5	23.8	32.0	32.9	33.8	24.3	22.8	23.6
AKSC owners (% of total)	29.2	21.6	10.0	17.8	16.0	10.5	15.4	16.5	14.6	13.5
AKSE owners (% of total)	0.0	0.0	0.0	0.0	0.0	3.9	0.0	1.9	2.5	0.0
WAIW owners (% of total)	31.9	29.7	37.5	44.6	37.0	38.2	32.3	45.6	46.8	49.4
ORCO owners (% of total)	11.1	5.4	12.5	5.9	5.0	6.6	6.2	5.8	6.3	5.6
Other owners (% of total)	1.4	2.7	2.5	5.0	5.0	6.6	9.2	2.9	4.4	7.9
Total groundfish catch retained										
Groundfish catch retained (1,000's of metric tons [mt])	10.6	7.4	10.8	21.2	26.9	25.0	16.3	20.3	26.5	14.7
Ex-vessel value of groundfish and non-groundfish retained										
GFSH ($ millions)	6.5	4.3	4.7	11.0	12.5	12.6	7.8	13.6	21.0	9.1
Non-GFSH ($ millions)[a]	45.0	16.4	26.7	73.8	50.2	38.4	40.0	90.8	62.4	NA
Salmon (% of total)	CR	CR	0.0	0.0	CR	CR	CR	0.0	CR	NA
Crab (% of total)	94.9	87.9	92.5	95.0	90.0	86.2	91.2	93.3	98.8	NA
Halibut (% of total)	4.8	11.5	7.4	5.0	9.9	13.5	8.4	6.6	0.0	NA
Other (% of total)	0.3	0.6	CR	0.0	CR	0.3	0.4	0.0	CR	NA
GFSH (% of total)	12.6	20.9	15.0	13.0	20.0	24.7	16.2	13.0	25.2	NA
Ex-vessel value of groundfish retained by species group (% of total)										
A-R-S-O	18.7	29.0	16.7	16.0	13.0	9.5	11.7	4.8	10.6	13.9
FLAT	0.0	NA	0.0	0.0	0.1	1.8	0.4	0.0	0.0	0.0
PCOD	81.2	70.5	83.3	84.0	86.9	88.6	87.8	95.2	89.1	86.1
PLCK	0.1	NA	0.0	0.0	0.0	0.1	0.1	0.0	0.3	0.0
Ex-vessel value of groundfish retained by Fishery Management Plan subarea (% of total)										
Aleutian Islands	CR	CR	CR	CR	0.4	CR	CR	8.2	10.0	6.9
Bering Sea	35.3	19.4	48.8	52.6	62.8	67.8	46.9	43.2	38.3	71.4
WG	3.5	5.8	3.0	4.1	6.5	6.6	6.1	4.2	10.1	4.0
CG	55.1	63.3	41.6	38.7	28.0	24.2	45.0	43.7	39.5	17.2
EG	6.2	11.5	6.6	4.6	2.3	1.3	2.0	0.5	2.1	0.5
Groundfish fishery employment by region (full time equivalent positions)[b]										
AKAPAI	2.1	0.0	0.0	5.7	10.9	2.4	4.3	6.3	8.3	0.0
AKKO	37.4	29.3	31.4	46.0	70.1	61.0	46.8	52.5	75.0	40.9
AKSC	43.7	15.6	8.4	34.5	35.0	19.5	21.3	35.7	47.9	13.9
AKSE	0.0	0.0	0.0	0.0	0.0	7.3	0.0	4.2	8.3	0.0
WAIW	47.8	21.5	31.4	86.2	81.0	70.7	44.7	98.7	154.3	86.9
ORCO	16.6	3.9	10.5	11.5	10.9	12.2	8.5	12.6	20.8	15.0
Total [c]	149.8	72.3	83.8	193.6	218.9	185.3	138.3	216.4	329.4	176.1
Groundfish fishery payments to labor by region ($ millions)[c]										
AKAPAI	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.2	0.0
AKKO	0.7	0.8	0.8	1.1	1.7	1.9	1.1	1.7	2.1	0.8
AKSC	0.6	0.3	0.1	0.4	0.4	0.3	0.3	0.6	0.9	0.3
AKSE	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.2	0.0
WAIW	0.9	0.5	0.8	2.2	2.0	2.1	1.1	2.5	4.1	1.8
ORCO	0.2	0.1	0.2	0.2	0.2	0.3	0.2	0.3	0.5	0.3
Total [c]	2.6	1.7	1.9	4.4	5.0	5.0	3.1	5.4	8.4	3.6

Notes: [a]Salmon, crab, halibut, and other.
[b]Includes skipper, crew, and support staff.
[c]Includes estimates for residents of other regions.
NA - data is not available.
CR - data can not be presented due to NOAA Fisheries data confidentiality restrictions.
Source: CFEC/ADF&G fish tickets.

Table 3.9-13. Summary of activities of longline catcher vessels greater than or equal to 60 feet in length, 1992-2001.

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number of vessels										
Number of vessels	117	91	121	99	94	96	88	89	72	72
AKAPAI owners (% of total)	0.0	0.0	1.7	1.0	1.1	1.0	2.3	1.1	0.0	0.0
AKKO owners (% of total)	12.0	12.1	9.1	8.1	7.4	8.3	6.8	7.9	4.2	9.7
AKSC owners (% of total)	22.2	27.5	27.3	22.2	20.2	12.5	12.5	9.0	15.3	12.5
AKSE owners (% of total)	18.8	17.6	15.7	22.2	22.3	19.8	22.7	21.3	25.0	23.6
WAIW owners (% of total)	38.5	36.3	36.4	37.4	38.3	45.8	44.3	47.2	43.1	40.3
ORCO owners (% of total)	1.7	2.2	4.1	4.0	3.2	3.1	2.3	2.2	2.8	2.8
Other owners (% of total)	6.8	4.4	5.8	5.1	7.4	9.4	9.1	11.2	9.7	11.1
Total groundfish catch retained										
Groundfish catch retained (1,000's of metric tons [mt])	6.3	4.2	4.7	8.2	6.6	18.4	5.4	5.8	5.5	4.5
Ex-vessel value of groundfish and non-groundfish retained										
GFSH ($ millions)	13.1	8.3	11.2	28.2	25.7	39.5	16.6	17.4	21.0	18.7
Non-GFSH ($ millions)[a]	18.8	18.8	22.7	25.0	22.7	33.8	18.7	33.7	1.8	NA
Salmon (% of total)	CR	0.2	0.2	0.3	0.3	CR	0.4	0.2	3.4	NA
Crab (% of total)	55.1	49.5	41.9	33.4	15.7	17.5	14.1	19.5	32.1	NA
Halibut (% of total)	39.7	43.8	51.0	60.1	76.5	76.0	77.9	77.0	0.0	NA
Other (% of total)	4.9	6.5	7.0	6.2	7.5	6.4	7.6	3.3	64.5	NA
GFSH (% of total)	41.1	30.5	33.1	53.1	53.1	53.9	47.0	34.1	92.0	NA
Ex-vessel value of groundfish retained by species group (% of total)										
A-R-S-O	92.7	94.1	93.5	97.6	98.1	68.8	98.3	95.1	95.1	83.0
FLAT	0.2	2.6	2.0	0.4	0.4	3.2	0.3	0.7	0.2	0.2
PCOD	7.0	3.3	4.5	1.9	1.6	27.9	1.4	4.2	4.7	16.8
PLCK	0.0	CF	0.0	CF	CF	CF	CF	CF	0.0	0.0
Ex-vessel Value of groundfish retained by Fishery Management Plan subarea (% of total)										
Aleutian Islands	7.0	7.2	5.7	5.9	4.0	6.3	3.8	6.2	5.4	4.0
Bering Sea	6.6	7.5	6.8	3.5	2.5	28.0	2.6	3.3	1.3	5.0
WG	17.9	4.4	3.6	11.8	13.8	11.1	11.5	11.7	9.2	11.2
CG	43.1	51.2	33.6	36.8	38.0	27.5	44.7	41.1	42.3	36.6
EG	25.4	29.7	50.2	41.9	41.8	27.1	37.4	37.6	41.8	43.3
Groundfish fishery employment by region (full time equivalent Positions)[b]										
AKAPAI	0.0	0.0	2.6	2.2	2.1	2.1	4.1	2.1	0.0	0.0
AKKO	25.1	13.9	14.1	17.4	14.5	16.6	12.2	14.8	7.1	17.0
AKSC	46.5	31.6	42.4	47.8	39.4	24.9	22.3	16.9	25.9	9.7
AKSE	39.4	20.2	24.4	47.8	43.5	39.4	40.5	40.1	42.4	40.2
WAIW	80.5	41.7	56.5	80.4	74.6	91.3	79.0	88.6	73.0	89.8
ORCO	3.6	2.5	6.4	8.7	6.2	6.2	4.1	4.2	4.7	3.4
Total[c]	209.4	114.9	155.5	215.1	194.8	199.3	178.3	187.8	169.4	179.2
Groundfish fishery payments to labor by region ($ millions)[c]										
AKAPAI	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
AKKO	0.7	0.5	0.5	0.9	0.8	1.5	0.5	0.7	0.4	0.7
AKSC	0.9	0.7	0.8	1.4	1.1	1.1	0.5	0.5	0.9	0.4
AKSE	1.0	0.6	0.9	2.5	2.3	2.8	1.5	1.3	2.1	1.7
WAIW	2.2	1.2	1.7	4.6	4.3	7.8	3.1	3.3	3.8	3.8
ORCO	0.1	0.1	0.2	0.4	0.3	0.4	0.2	0.2	0.2	0.1
Total[c]	5.2	3.3	4.5	11.3	10.3	15.8	6.7	7.0	8.4	7.5

Notes: [a]Salmon, crab, halibut, and other.
[b]Includes skipper, crew, and support staff.
[c]Includes estimates for residents of other regions.
NA - data is not available.
CR - data can not be presented due to NOAA Fisheries data confidentiality restrictions.
CF - data was combined with FLAT due to NOAA Fisheries data confidentiality restrictions.
Source: CFEC/ADF&G fish tickets.

Table 3.9-14. Summary of activities of fixed gear catcher vessels greater than 32 and less than 60 feet in length, 1992–2001.

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number of vessels										
Number of vessels	860	718	785	609	551	580	546	554	590	514
AKAPAI owners (% of total)	2.7	1.1	2.3	4.4	4.2	4.7	5.5	4.2	5.3	7.2
AKKO owners (% of total)	10.5	8.6	9.0	11.8	11.3	12.8	14.7	15.3	18.8	15.6
AKSC wners (% of total)	27.0	28.3	26.1	25.9	22.7	24.7	22.9	21.5	22.4	20.6
AKSE owners (% of total)	41.5	44.3	43.4	43.7	46.5	42.2	39.6	38.6	34.7	36.6
WAIW owners (% of total)	11.9	11.0	12.5	10.7	11.6	12.1	13.0	12.6	12.0	13.4
ORCO owners (% of total)	0.9	1.0	1.0	0.7	0.9	0.7	0.9	1.1	1.0	0.8
Other owners (% of total)	5.6	5.7	5.6	2.8	2.9	2.9	3.5	6.7	5.8	5.8
Total groundfish catch retained										
Groundfish catch retained (1,000's of metric tons [mt])	23.7	21.4	21.2	22.8	20.1	24.6	23.3	26.7	23.7	15.4
Ex-vessel value of groundfish and non-groundfish retained										
GFSH ($ millions)	39.1	34.7	43.8	46.0	40.5	43.4	30.1	38.9	47.9	33.8
Non-GFSH ($ millions)[a]	88.1	67.5	90.8	69.9	67.3	78.6	61.6	94.1	33.3	NA
Salmon (% of total)	61.3	49.3	46.6	43.0	29.7	28.5	41.8	42.1	66.8	NA
Crab (% of total)	6.3	6.3	6.3	7.5	5.2	4.1	4.5	3.8	8.3	NA
Halibut (% of total)	23.3	33.9	37.8	35.6	44.9	51.3	41.0	45.6	0.0	NA
Other (% of total)	9.2	10.6	9.3	13.9	20.1	16.1	12.7	8.5	24.9	NA
GFSH (% of total)	30.8	33.9	32.5	39.7	37.6	35.6	32.8	29.2	59.0	NA
Ex-vessel value of groundfish retained by species group (% of total)										
A-R-S-O	86.0	88.8	92.4	86.1	84.4	79.5	75.4	64.5	72.1	83.0
FLAT	0.0	0.8	0.2	0.0	2.4	0.6	0.5	0.2	0.1	0.2
PCOD	14.0	10.3	7.4	13.8	13.2	19.9	24.1	35.3	27.8	16.8
PLCK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Ex-vessel value of groundfish retained by Fishery Management Plan subarea (% of total)										
Aleutian Islands	1.1	0.5	0.6	1.0	0.5	0.8	1.2	1.7	2.4	4.3
Bering Sea	1.1	2.0	1.2	3.1	3.1	1.5	1.8	1.0	1.6	3.1
WG	5.4	0.3	0.7	4.0	4.1	5.7	7.6	7.8	8.2	10.8
CG	43.8	40.5	26.6	37.3	36.3	41.1	43.8	51.2	45.9	35.5
EG	48.6	56.7	70.9	54.5	55.9	51.0	45.7	38.2	41.8	46.3
Groundfish fishery employment by region (full time equivalent positions)[b]										
AKAPAI	29.9	8.1	18.2	38.2	33.1	40.8	43.4	33.9	45.6	12.6
AKKO	117.1	62.5	71.8	101.9	89.3	111.9	115.8	125.3	163.4	83.8
AKSC	301.8	204.7	207.3	223.6	180.0	216.3	181.0	175.5	194.3	109.8
AKSE	464.4	320.7	344.8	376.4	368.6	370.6	312.8	315.6	301.8	296.4
WAIW	132.7	79.7	99.1	92.0	92.2	105.9	102.8	103.2	104.5	142.6
ORCO	10.4	7.1	8.1	5.7	7.2	6.1	7.2	8.8	8.8	1.9
Total[c]	1,118.8	724.2	793.8	861.7	793.4	877.4	790.6	816.9	868.6	687.7
Groundfish fishery payments to labor by region ($ millions)[c]										
AKAPAI	0.4	0.1	0.3	0.5	0.6	0.7	0.5	0.6	0.8	0.2
AKKO	1.7	1.4	1.8	2.2	2.0	2.5	1.9	3.0	3.9	1.6
AKSC	3.3	3.0	2.9	2.6	1.9	2.4	1.8	2.4	3.1	2.2
AKSE	6.7	6.7	9.4	7.9	7.5	6.6	4.8	5.3	6.7	5.8
WAIW	2.0	1.6	2.3	2.2	2.1	2.3	1.7	2.0	2.4	2.8
ORCO	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.0
Total[c]	15.7	13.9	17.5	18.4	16.2	17.4	12.1	15.6	19.2	13.5

Notes: [a]Salmon, crab, halibut, and other.
[b]Includes skipper, crew, and support staff.
[c]Includes estimates for residents of other regions.
NA - data is not available.
Source: CFEC/ADF&G fish tickets.

Table 3.9-15. Summary of activities of fixed gear catcher vessels less than or equal to 32 feet in length, 1992–2001.

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number of vessels										
Number of vessels	107	83	99	66	55	65	57	60	69	56
AKAPAI owners (% of total)	3.7	1.2	7.1	7.6	12.7	18.5	15.8	13.3	4.3	10.7
AKKO owners (% of total)	10.3	7.2	9.1	10.6	16.4	21.5	21.1	25.0	29.0	23.2
AKSC owners (% of total)	47.7	53.0	55.6	53.0	45.5	43.1	36.8	35.0	40.6	44.6
AKSE owners (% of total)	26.2	25.3	18.2	18.2	18.2	10.8	12.3	11.7	13.0	5.4
WAIW owners (% of total)	0.9	3.6	1.0	6.1	3.6	1.5	8.8	5.0	4.3	7.1
ORCO owners (% of total)	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other owners (% of total)	10.3	9.6	9.1	4.5	3.6	4.6	5.3	10.0	8.7	8.9
Total groundfish catch retained										
Groundfish catch retained (1,000's of metric tons [mt])	1.0	1.0	1.0	0.7	0.7	1.2	1.2	0.9	1.1	0.9
Ex-vessel value of groundfish and non-groundfish retained										
GFSH ($ millions)	1.2	1.5	1.4	0.7	0.9	0.8	0.7	0.8	1.1	0.8
Non-GFSH ($ millions)[a]	5.9	4.0	6.2	2.2	2.1	2.3	1.8	3.3	1.1	NA
Salmon (% of total)	81.7	67.4	66.3	64.0	50.3	33.4	29.4	40.4	93.5	NA
Crab (% of total)	2.6	7.2	6.6	5.6	CR	7.7	CR	CR	CR	NA
Halibut (% of total)	15.3	24.2	26.2	27.7	44.2	57.4	67.4	58.9	0.0	NA
Other (% of total)	0.5	1.1	0.9	2.7	4.7	1.5	2.2	0.4	CR	NA
GFSH (% of total)	17.2	27.1	18.7	23.2	31.3	26.0	26.9	19.2	51.2	100.0
Ex-vessel value of groundfish retained by species group (% of total)										
A-R-S-O	74.7	85.7	83.8	65.4	73.2	34.5	26.6	23.0	28.2	18.6
FLAT	0.1	CP	0.0	CP	0.2	CP	5.1	0.0	CP	0.1
PCOD	25.0	13.7	16.2	34.6	26.5	65.3	68.1	76.9	71.8	81.2
PLCK	0.2	CP	0.0	CP	CP	0.2	0.1	0.0	CP	0.1
Ex-vessel value of groundfish retained by Fishery Management Plan subarea (% of total)										
Aleutian Islands	0.0	0.0	0.0	CR	0.0	0.0	0.0	CR	0.0	CR
Bering Sea	5.9	CR	10.7	18.9	10.0	7.9	14.2	5.7	3.1	5.5
WG	9.6	CR	1.0	CR	CR	9.0	6.3	12.1	7.0	11.8
CG	60.9	62.9	62.0	49.5	50.9	73.8	68.3	75.8	76.4	77.6
EG	23.6	37.1	26.4	31.6	39.1	9.3	11.1	6.5	13.4	5.1
Groundfish fishery employment by region (full time equivalent positions)[b]										
AKAPAI	5.5	1.2	7.9	6.6	9.8	20.3	14.9	10.5	4.3	5.9
AKKO	15.0	7.1	10.2	9.2	12.6	23.7	19.9	19.6	28.6	19.5
AKSC	69.5	51.9	62.3	46.0	35.0	47.3	34.9	27.5	40.1	51.3
AKSE	38.2	24.8	20.4	15.8	14.0	11.8	11.6	9.2	12.9	1.9
WAIW	1.4	3.5	1.1	5.3	2.8	1.7	8.3	3.9	4.3	4.0
ORCO	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total[c]	145.8	97.8	112.2	86.8	77.1	109.8	94.6	78.5	98.8	86.9
Groundfish fishery payments to labor by region ($ millions)[c]										
AKAPAI	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
AKKO	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1
AKSC	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2
AKSE	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0
Total[c]	0.5	0.6	0.6	0.3	0.4	0.3	0.3	0.3	0.5	0.3

Notes: [a]Salmon, crab, halibut, and other.
[b]Includes skipper, crew, and support staff.
[c]Includes estimates for residents of other regions.
NA - data is not available.
CR - data can not be presented due to NOAA Fisheries data confidentiality restrictions.
CP - the data was added to PCOD due to NOAA Fisheries confidentiality restrictions.
Source: CFEC/ADF&G fish tickets.

Table 3.9-16. A comparison of the activities of catcher/processor classes, 2001.

Vessel class	Number of vessels	Groundfish catch (1,000's of metric tons)				Gross product value ($ millions)	Payments to labor ($ millions)	Total employment (full time equivalent positions)
		PLCK	PCOD	A-R-S-O	FLAT			
ST-CP	12	505.9	1.8	1.4	5.1	308.0	107.8	1317.7
FT-CP	4	98.2	4.0	0.3	0.4	75.8	30.2	339.3
HT-CP	23	31.8	28.7	100.2	139.5	196.6	64.2	1211.6
P-CP	7	0.1	5.6	0.1	0.2	7.1	2.4	67.9
L-CP	43	6.0	111.9	19.0	5.5	156.5	61.3	940.2
Total	89	642.0	152.0	120.9	150.7	743.9	265.9	3876.7

Sources: NOAA Fisheries blend data and NOAA Fisheries Weekly Production Report data.

Table 3.9-17. Summary of catcher/processor activities, 1992–2001.

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number of vessels and vessel ownership by region										
Number of vessels	136	120	116	118	112	106	98	88	90	89
AKAPAI owners (% of total)	0.7	0.0	0.9	0.8	0.9	0.9	1.0	1.1	1.1	1.1
AKKO owners (% of total)	1.5	1.7	1.7	2.5	2.7	2.8	4.1	4.5	4.4	4.5
AKSC owners (% of total)	4.4	2.5	2.6	2.5	2.7	3.8	3.1	3.4	3.3	4.5
AKSE owners (% of total)	3.7	4.2	4.3	2.5	2.7	1.9	4.1	4.5	4.4	3.4
WAIW owners (% of otal)	78.7	80.8	83.6	84.7	85.7	85.8	83.7	79.5	81.1	78.7
All other (% of total)	11.0	10.8	6.9	6.8	5.4	4.7	4.1	6.8	5.6	7.9
Total groundfish catch										
Groundfish catch (1,000's of metric tons [mt])	1,432	1,330	1,368	1,338	1,269	1,268	1,110	874	976	1,066
Groundfish catch by species group (% of total)										
A-R-S-O	13.2	15.3	13.5	14.0	16.2	14.5	12.9	17.6	16.1	11.3
FLAT	13.8	12.6	14.4	12.9	15.5	18.5	15.7	14.7	16.1	14.1
PCOD	13.0	10.1	10.9	14.2	13.8	15.5	14.6	16.5	14.6	14.3
PLCK	60.0	62.0	61.2	58.9	54.6	51.5	56.8	51.2	53.2	60.2
Groundfish catch by Fishery Management Plan subarea (% of total)										
BSAI	88.0	88.0	89.0	90.0	90.0	89.0	86.0	86.0	88.0	97.1
GOA	12.0	12.0	11.0	10.0	10.0	11.0	14.0	14.0	12.0	2.9
Quantity and value of processed product										
Product quantity (1,000's of mt)	339.0	322.0	331.0	346.0	355.0	355.0	316.0	280.0	307.0	313.6
Gross product value ($ millions)	812.0	585.0	623.0	748.0	681.0	639.0	569.0	625.0	699.0	743.9
Groundfish fishery employment by region (full time equivalent positions)[a]										
Alaska	145	115	119	101	134	136	153	155	187	294
WAIW	4,528	4,655	4,257	4,880	5,391	4,439	4,593	3,546	3,465	3,582
Total[b]	4,673	4,770	4,376	4,981	5,525	4,575	4,746	3,701	3,652	3,877
Groundfish fishery payments to labor by region ($ millions)[a]										
Alaska	8.0	5.8	6.7	4.9	6.9	6.1	7.5	9.8	11.7	17.8
WAIW	285.9	209.4	225.4	274.8	249.8	234.0	209.8	223.1	246.1	248.1
Total[b]	312.4	230.5	247.5	292.8	269.7	252.8	229.1	249.8	278.5	265.9

Notes: [a]Includes skippers, fishing crew, processing crew, and home-office staff.
[b]Total includes estimates for resident of other regions.
Sources: NOAA Fisheries blend data and NOAA Fisheries Weekly Production Report data.

Table 3.9-18. Summary of activities of surimi trawl catcher/processors, 1992–2001.

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number of vessels and vessel ownership by region										
Number of vessels	20	18	20	20	18	16	16	12	11	12
WAIW owners (% of total)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total groundfish catch										
Groundfish catch (1,000's of metric tons [mt])	670	514	601	586	507	481	453	354	413	514
Groundfish catch by species group (% of total)										
A-R-S-O	2.6	1.1	2.7	2.7	2.9	3.7	2.7	0.7	1.4	0.3
FLAT	3.1	3.6	5.1	5.9	9.6	6.7	5.5	4.0	2.6	1.0
PCOD	1.7	1.3	1.7	2.7	1.5	0.9	1.4	0.9	0.3	0.4
PLCK	92.6	94.1	90.5	88.7	86.1	88.7	90.3	94.4	95.7	98.4
Groundfish catch by Fishery Management Plan subarea (% of total)										
Aleutian Islands	6.8	6.4	8.2	9.1	4.9	5.4	5.2	0.4	0.0	0.0
Bering Sea	92.7	93.6	91.7	90.8	95.0	94.5	94.8	99.5	100.0	100.0
GOA	0.5	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0
Quantity and value of processed product										
Product quantity (1,000's of mt)	119.2	95.5	120.2	125.7	115.7	103.2	98.3	93.0	107.5	126.0
Gross product value ($ millions)	397.4	200.0	257.5	351.3	246.9	259.1	217.4	277.4	321.4	308.9
Groundfish fishery employment by region (full time equivalent)[a]										
WAIW	1,717	1,562	1,736	2,029	2,000	1,478	1,692	1,436	1,439	1,318
Total[b]	1,717	1,562	1,736	2,029	2,000	1,478	1,692	1,436	1,439	1,318
Groundfish fishery payments to labor by region ($ millions)[a]										
WAIW	143.0	72.8	93.7	129.5	90.7	95.4	81.7	104.0	117.7	107.8
Total[b]	143.0	72.8	93.7	129.5	90.7	95.4	81.7	104.0	117.7	107.8

Notes: [a]Includes skippers, fishing crew, processing crew, and home-office staff.
[b]Total includes estimates for resident of other regions.
Sources: NOAA Fisheries blend data and NOAA Fisheries Weekly Production Report data.

Table 3.9-19. Summary of activities of fillet trawl catcher/processors, 1992–2001.

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number of vessels and vessel ownership by region										
Number of vessels	18	22	15	13	14	13	12	4	4	4
WAIW owners (% of total)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total groundfish catch										
Groundfish catch (1,000's of metric tons [mt])	350	422	306	277	264	243	222	91	95	103
Groundfish catch by species group (% of total)										
A-R-S-O	13.8	13.9	5.9	3.7	3.6	3.8	2.9	0.8	2.0	0.2
FLAT	16.7	8.2	8.7	6.5	5.3	9.3	1.4	0.6	0.5	0.4
PCOD	10.8	7.3	6.7	8.7	10.0	11.2	8.0	10.8	4.6	3.9
PLCK	58.7	70.7	78.7	81.2	81.1	75.8	87.7	87.7	92.8	95.5
Groundfish catch by Fishery Management Plan subarea (% of total)										
Aleutian Islands	8.3	9.8	4.0	4.2	5.2	8.8	7.4	10.0	3.6	3.7
Bering Sea	88.1	87.0	94.7	93.4	91.3	89.5	90.5	90.0	96.4	96.3
GOA	3.5	3.2	1.2	2.4	3.5	1.8	2.1	0.0	0.0	0.0
Quantity and value of processed product										
Product quantity (1,000's of mt)	70.9	87.7	57.9	49.5	53.1	47.7	44.2	20.7	25.7	24.4
Gross product value ($ millions)	171.6	171.6	125.7	128.9	137.0	122.1	118.6	69.0	80.6	75.8
Groundfish fishery employment by region (full time equivalent)[a]										
WAIW	1,583	1,956	1,156	1,282	1,508	1,052	1,167	369	378	339
Total[b]	1,583	1,956	1,156	1,282	1,508	1,052	1,167	369	378	339
Groundfish fishery payments to labor by region ($ millions)[a]										
WAIW	70.6	71.3	52.3	54.3	57.5	51.4	50.9	29.5	33.7	30.2
Total[b]	70.6	71.3	52.3	54.3	57.5	51.4	50.9	29.5	33.7	30.2

Notes: [a]Includes skippers, fishing crew, processing crew, and home-office staff.
[b]Total includes estimates for resident of other regions.
Sources: NOAA Fisheries blend data and NOAA Fisheries Weekly Production Report data.

Table 3.9-20. Summary of activities of head-and-gut trawl catcher processors, 1992–2001.

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number of vessels and vessel ownership by region										
Number of vessels	28	25	25	32	28	28	23	24	24	23
AKKO owners (% of total)	3.6	4.0	4.0	3.1	3.6	3.6	4.3	4.2	4.2	4.0
WAIW owners (% of total)	78.6	76.0	84.0	84.4	85.7	82.1	78.3	79.2	79.2	78.0
WAOR owners (% of total)	3.6	4.0	4.0	3.1	0.0	0.0	0.0	0.0	0.0	4.0
All other (% of total)	14.3	16.0	8.0	9.4	10.7	14.3	17.4	16.7	16.7	13.0
Total groundfish catch										
Groundfish catch (1,000s of metric tons [mt])	275	298	350	339	367	382	298	299	330	300
Groundfish catch by species group (% of total)										
A-R-S-O	38.8	41.6	38.5	43.3	46.1	36.7	36.0	44.6	39.1	33.4
FLAT	41.5	35.8	38.8	33.7	34.7	44.9	45.6	36.2	41.8	46.5
PCOD	8.5	9.1	8.5	11.3	8.7	8.3	10.2	9.4	9.4	9.6
PLCK	11.2	13.4	14.3	11.8	10.5	10.2	8.2	9.8	9.7	10.6
Groundfish catch by Fishery Management Plan subarea (% of total)										
Aleutian Islands	14.3	23.9	22.4	27.1	34.4	18.7	22.9	26.5	21.6	29.4
Bering Sea	66.2	64.3	66.7	62.3	54.7	73.9	68.1	63.2	67.4	60.7
GOA	19.5	11.8	10.9	10.6	10.9	7.4	9.0	10.3	11.0	9.9
Quantity and value of processed product										
Product Quantity (1,000s of mt)	93.7	102.7	110.1	117.7	133.6	141.0	121.1	114.2	120.4	110.7
Gross Product Value ($ millions)	139.7	137.5	155.5	174.8	197.6	161.3	121.7	138.5	151.5	196.6
Groundfish fishery employment by region (full time employee)[a]										
Alaska	35	31	38	18	35	29	32	30	32	73
WAIW	728	636	900	929	1,252	1,196	1,031	1,108	947	1,139
Total[b]	764	667	937	947	1,287	1,225	1,062	1,138	979	1,212
Groundfish fishery payments to labor by region ($ millions)[a]										
Alaska	2.2	2.1	2.3	1.2	2.0	1.3	1.3	1.3	1.7	4.2
WAIW	45.2	43.4	54.3	62.1	71.1	55.7	40.9	47.0	50.2	60.0
Total[b]	47.3	45.6	56.6	63.3	73.1	57.1	42.2	48.2	51.9	64.2

Notes: [a]Includes skippers, fishing crew, processing crew, and home-office staff.
[b]Total includes estimates for resident of other regions.
Sources: NOAA Fisheries blend data and NOAA Fisheries Weekly Production Report data.

Table 3.9-21. Summary of activities of pot catcher processors, 1992–2001.

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number of vessels and vessel ownership by region										
Number of vessels	14	2	3	6	9	7	5	9	10	7
AKSC owners (% of total)	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AKKO owners (% of total)	0.0	0.0	0.0	16.7	11.1	14.3	20.0	11.1	10.0	14.0
WAIW owners (% of total)	78.6	50.0	100.0	83.3	88.9	85.7	80.0	77.8	90.0	72.0
All other (% of total)	14.3	50.0	0.0	0.0	0.0	0.0	0.0	11.1	0.0	14.0
Total groundfish catch										
Groundfish catch (1,000's of metric tons [mt])	9.3	CR	1.7	4.9	8.0	4.6	3.5	7.6	3.9	5.9
Groundfish catch by species group (% of total)										
A-R-S-O	4.5	CR	2.9	2.1	1.7	0.9	1.1	1.5	1.8	1.5
FLAT	0.1	CR	CR	0.4	0.9	0.7	2.3	0.5	1.6	3.2
PCOD	95.4	CR	97.1	97.5	97.4	97.6	96.6	98.0	96.6	94.4
PLCK	0.0	CR	0.0	0.0	0.1	0.7	0.0	0.1	0.3	1.0
Groundfish catch by Fishery Management Plan subarea (% of total)										
Aleutian Islands	70.0	0.0	0.6	22.0	47.6	9.3	11.4	15.8	30.6	10.1
Bering Sea	28.9	100.0	99.1	75.6	52.4	90.7	87.7	31.2	44.5	58.6
GOA	1.1	0.0	0.3	2.4	0.0	0.0	0.9	53.0	24.9	31.3
Quantity and value of processed product										
Product quantity (1,000's of mt)	3.8	0.3	0.7	2.2	3.7	2.2	1.5	3.6	1.8	2.1
Gross product value ($ millions)	6.5	0.4	1.2	2.9	6.5	3.2	3.3	9.4	4.9	7.1
Groundfish fishery employment by region (full time employee)[a]										
Alaska	1	0	0	3	6	3	4	4	3	9
WAIW	17	CR	9	33	58	30	30	54	39	59
Total[b]	18	0	9	37	64	34	34	58	42	68
Groundfish fishery payments to labor by region ($ millions)[a]										
Alaska	0.1	0.0	0.0	0.1	0.2	0.1	0.1	0.2	0.1	0.3
WAIW	1.6	CR	0.4	0.8	1.6	0.7	0.9	2.3	1.4	2.1
Total[b]	1.7	0.0	0.4	0.9	1.7	0.8	1.0	2.5	1.5	2.4

Notes: [a]Includes skippers, fishing crew, processing crew, and home-office staff.
[b]Total includes estimates for resident of other regions.
CR - data can not be presented due to NOAA Fisheries data confidentiality restrictions.
Sources: NOAA Fisheries blend data and NOAA Fisheries Weekly Production Report data.

Table 3.9-22. Summary of activities of longline catcher processors, 1992–2001.

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number of vessels and vessel ownership by region										
Number of vessels	56	53	53	47	43	42	42	39	41	43
AKAPAI owners (% of total)	1.8	0.0	1.9	2.1	2.3	2.4	2.4	2.6	2.4	2.3
AKKO owners (% of total)	1.8	1.9	1.9	2.1	2.3	2.4	4.8	5.1	4.9	4.7
AKSC owners (% of total)	8.9	5.7	5.7	6.4	7.0	9.5	7.1	7.7	7.3	9.3
AKSE owners (% of total)	8.9	9.4	9.4	6.4	7.0	4.8	9.5	10.3	9.8	7.0
WAIW owners (% of total)	64.3	69.8	71.7	74.5	74.4	78.6	76.2	71.8	73.2	72.1
WAOR owners (% of total)	1.8	1.9	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All other (% of total)	12.5	11.3	7.5	8.5	7.0	2.4	0.0	2.6	2.4	4.7
Total groundfish catch										
Groundfish catch (1,000's of mt)	128	96	110	131	123	158	134	122	135	142
Groundfish catch by species group (% of total)										
A-R-S-O	12.4	16.4	14.1	11.4	9.7	10.3	13.0	14.0	15.1	13.3
FLAT	2.8	8.8	3.7	4.3	5.7	5.3	7.2	4.8	5.6	3.9
PCOD	82.3	72.6	79.5	81.7	82.3	81.5	77.3	78.0	75.7	78.6
PLCK	2.5	2.3	2.6	2.6	2.4	2.9	2.5	3.2	3.6	4.2
Groundfish catch by Fishery Management Plan subarea (% of total)										
Aleutian Islands	19.2	22.6	9.4	4.7	6.3	5.8	12.7	9.5	15.1	16.1
Bering Sea	71.3	67.1	83.6	88.5	87.6	90.3	83.3	82.8	78.2	78.8
GOA	9.4	10.3	7.0	6.8	6.1	3.9	4.0	7.7	6.7	5.1
Quantity and value of processed product										
Product quantity (1,000's of mt)	51.2	35.3	42.4	50.6	48.9	61.2	51.3	48.1	51.5	50.4
Gross product value ($ millions)	96.8	75.3	83.0	89.8	93.0	93.3	108.1	131.1	140.9	158.5
Groundfish fishery employment by region (full time employee)[a]										
Alaska	108	84	82	79	94	104	117	121	152	262
WAIW	483	502	457	608	573	683	672	580	661	677
Total[b]	591	586	539	687	667	787	789	701	814	940
Groundfish fishery payments to labor by region ($ millions)[a]										
Alaska	5.7	3.7	4.4	3.7	4.7	4.7	6.2	8.4	9.9	17.1
WAIW	25.6	21.9	24.7	28.2	29.0	30.8	35.4	40.3	43.1	44.2
Total[b]	31.3	25.5	29.1	31.8	33.8	35.5	41.5	48.7	53.1	61.3

Notes: [a]Includes skippers, fishing crew, processing crew, and home-office staff.
[b]Total includes estimates for resident of other regions.
Sources: NOAA Fisheries blend data and NOAA Fisheries Weekly Production Report data.

Table 3.9-23. A comparison of the activities of inshore processor classes and motherships, 2001.

Processor class	Number of facilities	Reported harvest—retained and discarded (1,000's of metric tons)				Gross product value ($ millions)	Payments to labor ($ millions)	Total employment (full time employee positions)
		PLCK	PCOD	FLAT	A-R-S-O			
BSP-SP	6	595.2	21.3	2.8	3.5	414.6	165.5	3,076
APA-SP	8	40.7	14.3	1.3	1.4	49.2	19.5	384
K-SP	10	39.8	22.9	16.0	12.1	81.0	31.1	571
SC-SP	14	0.4	1.4	0.3	4.0	23.6	9.3	59
SE-SP	15	0.0	0.1	0.3	5.8	28.4	11.3	36
Floaters	3	0.3	6.0	0.2	0.2	8.2	2.9	69
Motherships	3	140.9	0.4	0.3	0.1	77.4	27.1	294
Total	59	817.3	66.3	21.3	27.2	682.9	266.9	4,491

Sources: NOAA Fisheries blend data and NOAA Fisheries Weekly Production Report data.

Table 3.9-24. Summary of inshore processor[a] and mothership activities, 1992–2001[b].

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number of facilities and facility ownership by region										
Number of facilities	77	69	73	77	67	64	62	61	69	59
AKAPAI owners (% of total)	0.0	0.0	1.4	5.2	6.0	4.7	4.8	4.9	4.3	1.0
AKKO owners (% of total)	7.8	8.7	8.2	6.5	4.5	4.7	3.2	6.6	4.3	6.0
AKSC owners (% of total)	15.6	17.4	19.2	20.8	16.4	23.4	19.4	16.4	18.8	13.0
AKSE owners (% of total)	5.2	5.8	8.2	5.2	9.0	10.9	11.3	9.8	8.7	16.0
WAIW owners (% of total)	64.9	66.7	63.0	62.3	64.2	56.3	58.1	60.7	63.8	58.0
All other (% of total)	6.5	1.4	0.0	0.0	0.0	0.0	3.2	1.6	0.0	8.0
Total groundfish catch										
Groundfish catch (1,000's of metric tons [mt])	844	809	809	802	779	790	755	781	847	932
Ex-vessel value of groundfish and non-groundfish retained										
GFSH ($ millions)	264.3	169.6	200.3	254.7	229.0	264.8	181.5	248.4	324.7	299.5
Non-GFSH ($ millions)[c]	561.5	499.4	541.2	470.2	405.5	382.9	371.1	542.4	245.1	NA
GFSH (% of total)	32.0	25.4	27.0	35.1	36.1	40.9	32.8	31.4	57.0	NA
Salmon (% of non-GFSH)	50.3	41.6	39.3	41.8	38.2	34.8	33.8	33.6	50.7	NA
Crab (% of non-GFSH)	31.4	38.7	37.0	35.5	31.8	32.6	43.1	40.8	40.5	NA
Halibut (% of non-GFSH)	10.6	12.5	16.0	14.1	17.5	24.1	16.8	19.5	NA	NA
Other (% of non-GFSH)	7.6	7.2	7.7	8.7	12.6	8.5	6.3	6.1	8.8	NA
Groundfish catch by species group (% of total)										
A-R-S-O	3.9	4.0	3.6	3.8	4.1	4.1	3.4	3.8	3.9	2.9
FLAT	4.8	2.8	4.0	4.6	4.2	5.4	2.0	2.1	2.5	2.3
PCOD	11.6	10.8	11.2	15.4	17.1	16.4	12.6	12.5	12.1	7.1
PLCK	79.8	82.4	81.2	76.2	74.5	74.0	81.9	81.6	81.4	87.7
Groundfish catch by Fishery Management Plan subarea (% of total)										
BSAI	78.6	76.3	77.5	80.5	81.8	76.0	72.6	76.8	80.8	85.5
GOA	21.4	23.7	22.5	19.5	18.2	24.0	27.4	23.2	19.2	14.5
Ex-vessel value paid to catcher vessels by type (% of total)										
TCV BSP ≥ 125	20.4	19.5	19.1	19.5	20.2	28.8	21.4	25.6	24.4	NA
TCV BSP 60-124	37.8	29.3	30.7	32.7	28.1	23.1	23.7	21.8	29.1	NA
TCV Div. AFA	9.2	10.9	7.7	5.7	4.9	6.2	9.7	10.3	7.4	NA
TCV Non-AFA	4.9	5.5	4.4	4.2	5.1	6.4	6.3	6.6	5.0	NA
TCV < 60	3.3	4.1	4.0	2.9	4.6	4.0	5.6	5.2	4.1	NA
PCV	2.4	2.5	2.3	4.1	5.2	3.7	4.1	5.4	6.4	NA
LCV	5.2	5.3	6.5	11.1	11.4	12.2	9.6	7.3	6.8	NA
FGCV 33-59	16.2	21.9	24.7	19.6	20.0	15.4	19.3	17.6	16.5	NA
FGCV ≤ 32	0.5	0.8	0.7	0.3	0.4	0.2	0.4	0.3	0.3	NA
Quantity and value of processed product										
Product (1,000's of mt)	236.9	225.5	240.5	254.2	247.4	245.1	235.2	256.6	294.6	342.6
Gross Product Value ($ millions)	615.4	410.7	505.7	643.3	550.2	560.4	480.9	589.1	693.2	682.9
Groundfish fishery employment by region (full time employee positions)[d]										
Alaska	2,700	2,706	2,951	3,332	3,235	3,332	3,152	3,447	3,874	3,957
WAIW	539	472	478	790	875	597	541	434	666	534
Total[e]	3,239	3,178	3,429	4,122	4,110	3,929	3,693	3,881	4,540	4,491
Groundfish fishery payments to labor by region ($ millions)[d]										
Alaska	158.2	114.9	141.9	174.3	148.1	150.9	130.2	163.5	183.1	183.7
WAIW	81.9	47.5	58.1	78.1	67.8	68.8	58.3	68.3	88.8	83.2
Total[e]	240.1	162.4	200.0	252.4	215.9	219.7	188.5	231.8	271.9	266.9

Notes: [a]Does not include inshore processors located in other states or GHOST processors.
[b]Includes all groundfish reported by processors including at-sea discards.
[c]Salmon, crab, halibut, and other. Data for 2000 does not include halibut.
[d]Includes skippers, fishing crew, processing crew, and home-office staff.
[e]Total includes estimates for resident of other regions.

Sources: NOAA Fisheries blend data, NOAA Fisheries Weekly Production Report data, and ADFG/CFEC fish ticket data.

Table 3.9-25. Summary of activities of Bering Sea pollock inshore plants[a], 1992–2001.

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number of facilities and facility ownership by region										
Number of facilities	6	6	6	6	6	6	6	6	6	6
WAIW Owners (% of total)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total groundfish catch										
Groundfish catch (1,000's of metric tons [mt])[b]	474	477	493	494	474	462	418	477	544	623
Ex-vessel value Of groundfish and non-groundfish retained										
GFSH ($ millions)	123.8	70.4	84.9	109.7	90.6	105.8	69.1	108.3	151.5	157.6
Non-GFSH ($ millions)[c]	68.8	68.5	56.6	52.1	44.6	44.4	53.4	77.9	40.8	NA
GFSH (% of total)	64.3	50.7	60.0	67.8	67.0	70.4	56.4	58.2	78.8	NA
Salmon (% of non-GFSH)	0.0	4.9	8.0	0.0	0.0	0.6	2.0	1.4	0.0	NA
Crab (% of non-GFSH)	95.4	88.6	84.9	89.7	92.8	77.9	92.8	93.4	98.7	NA
Halibut (% of non-GFSH)	3.8	4.9	6.2	9.7	6.4	19.6	4.1	4.0	NA	NA
Other (% of non-GFSH)	0.8	1.5	0.9	0.6	0.7	2.0	1.2	1.1	NA	NA
Groundfish catch by species group (% of total)										
A-R-S-O	1.1	1.7	1.4	1.9	2.0	2.3	1.4	1.3	0.8	0.6
FLAT	2.1	0.7	2.7	2.7	2.5	4.6	1.0	0.7	0.9	0.5
PCOD	6.2	6.8	8.3	11.2	12.3	12.1	9.4	7.7	7.3	3.4
PLCK	90.6	90.9	87.5	84.3	83.2	81.0	88.2	90.2	91.0	95.6
Groundfish catch by Fishery Management Plan subarea (% of total)										
BSAI	95.0	96.1	98.1	96.1	99.6	96.8	97.5	99.3	98.6	98.7
GOA	5.0	3.9	1.9	3.9	0.4	3.2	2.5	0.7	1.4	1.3
Ex-vessel value paid to catcher vessels by type (% of total)										
TCV BSP ≥ 125	41.7	44.4	43.2	40.9	46.6	51.6	54.3	55.1	51.7	NA
TCV BSP 60-124	46.2	45.7	49.3	44.5	37.0	32.3	28.7	28.1	35.2	NA
TCV Div. AFA	5.5	5.5	2.8	5.1	6.5	7.0	9.7	9.5	5.8	NA
TCV Non-AFA	1.8	1.1	1.1	1.2	1.4	1.0	0.3	0.8	0.7	NA
TCV < 60	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	NA
PCV	1.4	1.0	2.4	4.5	6.1	5.2	5.2	5.3	5.5	NA
LCV	1.8	1.3	0.8	2.5	1.6	2.3	1.4	0.7	0.4	NA
FGCV 33-59	1.4	1.0	0.4	1.1	0.8	0.6	0.4	0.4	0.7	NA
FGCV ≤ 32	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	NA
Quantity and value of processed product										
Product (1,000's of mt)	141.0	137.3	160.3	168.2	160.5	155.2	144.4	164.8	199.7	247.9
Gross Product Value ($ millions)	337.4	185.3	259.8	340.4	286.5	283.9	239.7	315.2	390.5	414.6
Groundfish fishery employment by region (full time employee positions)[d]										
Alaska	1,772	1,642	1,987	2,197	2,226	2,099	1,898	2,146	2,765	2,929
WAIW	91	85	103	116	117	110	102	115	145	147
Total[e]	1,863	1,727	2,091	2,313	2,342	2,209	2,000	2,261	2,910	3,076
Groundfish fishery payments to labor by region ($ millions)[d]										
Alaska	101.2	55.6	77.9	102.1	85.9	85.2	71.9	94.5	117.2	124.1
WAIW	34.7	19.3	27.0	35.8	30.1	29.9	25.7	33.7	40.9	41.4
Total[e]	135.9	74.8	105.0	137.9	116.0	115.0	97.7	128.3	158.0	165.5

Notes: [a]Does not include inshore processors located in other states or GHOST processors.
[b]Includes all groundfish reported by processors including at-sea discards.
[c]Salmon, crab, halibut, and other. Data for 2000 does not include halibut.
[d]Includes skippers, fishing crew, processing crew, and home-office staff.
[e]Total includes estimates for resident of other regions.
NA - data is not available.

Sources: NOAA Fisheries blend data, NOAA Fisheries Weekly Production Report data, and ADFG/CFEC fish ticket data.

Table 3.9-26. Summary of activities of Alaska Peninsula and Aleutian Islands inshore plants[a], 1992–2001.

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number of facilities and facility ownership by region										
Number of Facilities	5	6	6	6	5	6	6	8	8	8
AKAPAI Owners (% of total)	0.0	0.0	16.7	33.3	40.0	33.3	33.3	25.0	25.0	13.0
AKSC Owners (% of total)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.5	12.5	13.0
AKSE Owners (% of total)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.0
WAIW Owners (% of total)	100.0	100.0	83.3	66.7	60.0	66.7	66.7	62.5	62.5	63.0
Total groundfish catch										
Groundfish Catch (1,000s of metric tons [mt])[b]	42	57	58	73	74	70	68	66	46	58
Ex-vessel value of groundfish and non-groundfish retained										
GFSH ($ millions)	16.4	9.9	12.6	20.9	22.8	22.2	16.6	26.3	26.8	25.7
Non-GFSH ($ millions)[c]	107.0	99.2	97.9	95.5	66.4	58.7	75.4	128.4	60.6	NA
GFSH (% of total)	13.3	9.0	11.4	18.0	25.5	27.4	18.1	17.0	30.7	NA
Salmon (% of non-GFSH)	52.4	41.5	27.9	41.9	34.0	27.5	35.2	36.2	46.0	NA
Crab (% of non-GFSH)	42.2	53.1	64.1	54.0	59.0	64.2	61.7	53.9	53.8	NA
Halibut (% of non-GFSH)	4.0	4.8	6.9	3.2	4.9	7.9	2.6	9.7	NA	NA
Other (% of non-GFSH)	1.3	0.6	1.2	0.9	2.1	0.4	0.4	0.2	0.3	NA
Groundfish catch by species group (% of total)										
A-R-S-O	3.8	2.7	2.1	2.1	2.3	2.0	2.0	3.0	3.7	2.4
FLAT	4.6	2.3	4.5	1.4	2.0	1.6	1.0	2.2	2.1	2.2
PCOD	62.5	39.7	37.5	27.5	42.5	38.2	31.8	29.2	36.1	24.8
PLCK	29.1	55.3	55.9	69.0	53.2	58.3	65.1	65.7	58.1	70.6
Groundfish catch by Fishery Management Plan subarea (% of total)										
BSAI	26.9	51.0	38.5	54.5	37.9	27.1	15.1	32.6	35.1	43.3
GOA	73.1	49.0	61.5	45.5	62.1	72.9	84.9	67.4	64.9	56.7
Ex-vessel value paid to catcher vessels by type (% of total)										
TCV BSP ≥ 125	0	3	3	10	9	4	3	13	3	NA
TCV BSP 60-124	9	11	20	27	12	10	7	9	5	NA
TCV Div. AFA	23	32	17	11	10	17	19	8	13	NA
TCV Non-AFA	9	8	8	5	8	7	9	6	7	NA
TCV < 60	36	36	37	17	30	43	44	37	41	NA
PCV	4	0	3	6	13	5	1	6	8	NA
LCV	8	6	6	14	10	5	7	6	6	NA
FGCV 33-59	10	4	4	9	9	8	10	15	17	NA
FGCV ≤ 32	0	0	1	0	0	0	0	0	0	NA
Quantity and value of processed product										
Product (1,000s of mt)	12.1	15.3	12.4	15.0	17.1	21.0	20.8	26.1	17.4	20.0
Gross product value ($ millions)	36.5	32.6	31.5	46.2	45.2	46.6	43.4	61.1	46.7	49.2
Groundfish fishery employment by region (full time employee positions)[d]										
Alaska	267	305	275	302	380	406	384	463	353	372
WAIW	14	16	12	11	12	14	10	15	11	12
Total[e]	281	321	286	312	392	421	395	479	364	384
Groundfish fishery payments to labor by region ($ millions)[d]										
Alaska	11.0	9.8	10.0	14.0	13.7	14.1	13.1	18.4	14.1	16.4
WAIW	3.8	3.4	2.7	3.2	2.8	3.3	2.3	4.1	3.1	3.1
Total[e]	14.7	13.2	12.7	17.2	16.5	17.3	15.4	23.1	17.6	19.5

Notes: [a]Does not include inshore processors located in other states or GHOST processors.
[b]Includes all groundfish reported by processors including at-sea discards..
[c]Salmon, crab, halibut, and other. Data for 2000 does not include halibut.
[d]Includes skippers, fishing crew, processing crew, and home-office staff.
[e]Total includes estimates for resident of other regions.
NA - data is not available.

Sources: NOAA Fisheries blend data, NOAA Fisheries Weekly Production Report data, and ADFG/CFEC fish ticket data.

Table 3.9-27. Summary of activities of Kodiak inshore plants[a], 1992–2001.

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number of facilities and facility ownership by region										
Number of facilities	15	15	14	16	11	12	10	12	11	10
AKKO owners (% of total)	42.9	42.9	50.0	41.7	30.0	30.0	20.0	33.3	27.3	20.0
AKSC owners (% of total)	7.1	7.1	8.3	8.3	10.0	10.0	10.0	8.3	9.1	10.0
WAIW owners (% of total)	42.9	42.9	41.7	50.0	60.0	60.0	60.0	58.3	63.6	70.0
All other (% of total)	7.1	7.1	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0
Total groundfish catch										
Groundfish catch (1,000s of mt)[b]	107	125	114	82	75	101	115	117	106.0	90.9
Ex-vessel value of groundfish and non-groundfish retained										
GFSH ($ millions)	38.4	31.4	30.1	31.8	30.0	38.8	33.7	45.8	47.4	30.9
Non-GFSH ($ millions)[c]	77.7	68.4	62.5	69.3	50.9	44.0	41.6	54.5	26.4	NA
GFSH (% of total)	33.0	31.4	32.5	31.5	37.1	46.9	44.8	45.7	64.2	NA
Salmon (% of non-GFSH)	64.9	63.1	53.2	67.8	48.3	37.6	68.0	52.5	69.9	NA
Crab (% of non-GFSH)	14.5	12.9	13.0	6.0	6.8	6.3	4.1	8.1	26.6	NA
Halibut (% of non-GFSH)	15.6	17.4	26.9	20.6	32.4	53.1	25.8	37.8	NA	NA
Other (% of non-GFSH)	5.0	6.6	7.0	5.6	12.5	3.0	2.1	1.7	3.5	NA
Groundfish catch by species group (% of total)										
A-R-S-O	6.3	5.7	4.4	6.3	12.2	9.7	7.7	10.0	13.3	13.3
FLAT	14.2	13.5	11.7	15.3	21.9	17.9	8.3	8.6	13.4	17.6
PCOD	18.3	19.5	16.0	39.2	36.3	32.0	24.7	30.1	25.3	25.2
PLCK	61.2	61.3	68.0	39.2	29.7	40.4	59.3	51.2	48.0	43.8
Groundfish catch by Fishery Management Plan subarea (% of total)										
BSAI	5.2	1.5	0.5	0.4	0.5	0.0	0.2	0.1	0.1	0.1
GOA	94.8	98.5	99.5	99.6	99.5	100.0	99.8	99.9	99.9	99.9
Ex-vessel value paid to catcher vessels by type (% of total)										
TCV BSP ≥ 125	0.8	1.0	1.4	0.5	0.0	1.9	1.4	0.2	0.0	NA
TCV BSP 60-124	3.9	0.5	3.2	8.4	8.1	3.6	4.5	1.8	2.1	NA
TCV Div. AFA	37.4	39.1	37.9	19.9	12.1	25.8	25.3	29.8	23.8	NA
TCV Non-AFA	20.3	21.9	20.4	23.8	29.0	25.9	27.0	26.8	25.3	NA
TCV < 60	4.8	5.4	7.1	8.3	9.6	5.9	6.0	3.8	1.8	NA
PCV	7.0	7.4	5.4	9.8	9.0	6.4	8.5	10.0	13.6	NA
LCV	7.6	7.8	6.5	8.9	11.3	10.3	7.0	3.9	7.9	NA
FGCV 33-59	17.8	16.7	17.1	20.3	19.3	19.6	19.7	22.9	24.1	NA
FGCV ≤ 32	0.4	0.4	1.0	0.1	1.6	0.6	0.8	0.8	1.4	NA
Quantity and value of processed product										
Product (1,000s of mt)	27.1	31.9	28.3	26.4	22.8	25.3	28.8	31.4	29.8	27.7
Gross product value ($ millions)	80.3	81.7	85.5	92.0	71.3	76.3	77.7	94.7	89.6	81.0
Groundfish fishery employment by region (full time employee positions)[d]										
Alaska	520	602	533	649	487	597	650	698	635	551
WAIW	11	13	11	17	15	19	21	18	18	19
Total[e]	532	616	545	666	502	616	672	716	653	571
Groundfish fishery payments to labor by region ($ millions)[d]										
Alaska	28.3	28.5	30.2	30.4	23.5	24.8	24.8	30.8	29.1	25.7
WAIW	3.5	3.6	3.7	4.8	4.5	4.8	5.0	5.1	5.1	5.4
Total[e]	32.2	32.5	33.9	35.3	28.0	29.6	30.2	35.8	34.3	31.1

Note: [a]Does not include inshore processors located in other states or GHOST processors.
[b]Includes all groundfish reported by processors including at-sea discards.
[c]Salmon, crab, halibut, and other. Data for 2000 does not include halibut.
[d]Includes skippers, fishing crew, processing crew, and home-office staff.
[e]Total includes estimates for resident of other regions.
NA - data is not available.

Sources: NOAA Fisheries blend data, NOAA Fisheries Weekly Production Report data, and ADFG/CFEC fish ticket data.

Table 3.9-28. Summary of activities of southcentral Alaska inshore plants[a], 1992–2001.

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number of facilities and facility ownership by region										
Number of facilities	18	16	19	18	15	21	19	15	17	14
AKSC owners (% of total)	55.6	56.3	52.6	55.6	53.3	66.7	57.9	53.3	64.7	50.0
WAIW owners (% of total)	38.9	43.8	47.4	44.4	46.7	33.3	42.1	46.7	35.3	50.0
Other owners (% of total)	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total groundfish catch										
Groundfish catch (1,000s of metric tons [mt])[b]	13	13	12	13	13	17	18	11	10	6
Ex-vessel value of groundfish and non-groundfish retained										
GFSH ($ millions)	17.4	16.2	17.1	27.8	26.2	28.2	20.2	20.7	21.4	18.1
Non-GFSH ($ millions)[c]	117.7	59.0	78.3	60.2	78.6	80.1	54.1	80.3	40.7	NA
GFSH (% of total)	12.9	21.5	18.0	31.6	25.0	26.1	27.2	20.5	34.5	NA
Salmon (% of non-GFSH)	83.2	76.1	71.2	72.1	67.4	69.7	59.6	57.6	99.3	NA
Crab (% of non-GFSH)	1.0	1.8	1.7	0.6	0.6	0.2	0.1	0.0	0.6	NA
Halibut (% of non-GFSH)	9.7	19.0	25.2	22.7	26.1	28.5	40.1	42.3	NA	NA
Other (% of non-GFSH)	6.1	3.1	1.9	4.5	5.9	1.6	0.2	0.1	0.1	NA
Groundfish catch by species group (% of total)										
A-R-S-O	50.5	56.7	47.9	46.9	42.6	28.2	26.5	42.3	54.3	65.2
FLAT	4.6	6.3	3.2	3.7	4.4	6.2	2.9	8.0	4.0	5.2
PCOD	42.8	36.9	36.5	42.7	41.6	31.0	20.4	30.9	22.5	23.2
PLCK	2.1	0.2	12.4	6.8	11.4	34.7	50.3	18.8	19.2	6.5
Groundfish catch by Fishery Management Plan subarea (% of total)										
BSAI	3.2	0.0	0.0	0.4	3.6	4.3	0.0	0.1	0.0	0.0
GOA	96.8	100.0	100.0	99.6	96.4	95.7	100.0	99.9	100.0	100.0
Ex-vessel value paid to catcher vessels by type (% of total)										
TCV BSP ≥ 125	0.0	0.0	0.8	0.0	0.0	0.0	2.5	0.8	0.0	NA
TCV BSP 60-124	0.0	0.2	0.0	0.5	0.5	0.8	1.6	0.0	0.0	NA
TCV Div. AFA	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.3	0.1	NA
TCV Non-AFA	0.3	0.3	2.1	2.7	2.9	6.1	5.1	5.2	3.8	NA
TCV < 60	0.4	5.1	5.2	2.9	2.9	4.7	3.4	2.5	2.8	NA
PCV	5.4	5.5	3.2	5.6	4.4	3.8	4.5	6.9	7.6	NA
LCV	21.4	15.1	23.8	44.2	45.4	40.3	41.0	39.4	34.1	NA
FGCV 33-59	69.0	68.5	61.2	42.9	42.9	42.6	40.5	43.9	50.8	NA
FGCV ≤ 32	3.4	5.4	3.7	1.2	1.0	1.3	1.1	0.9	0.8	NA
Quantity and value of processed product										
Product (1,000s of mt)	6.6	6.6	5.3	7.1	6.9	9.2	9.7	6.6	5.2	4.3
Gross product value ($ millions)	25.7	31.3	28.8	39.9	34.9	40.3	31.7	29.8	32.2	23.6
Groundfish fishery employment by region (full time employee positions)[d]										
Alaska	81	103	91	112	86	177	177	105	79	58
WAIW	2	2	2	2	2	3	4	3	1	1
Total[e]	83	105	93	114	88	180	181	108	81	59
Groundfish fishery payments to labor by region ($ millions)[d]										
Alaska	8.8	11.1	10.0	14.0	12.0	14.1	10.8	10.2	11.3	8.3
WAIW	1.0	1.2	1.3	1.6	1.7	1.4	1.4	1.5	1.2	1.0
Total[e]	9.9	12.3	11.3	15.6	13.7	15.5	12.3	11.7	12.5	9.3

Note: [a]Does not include inshore processors located in other states or GHOST processors.
[b]Includes all groundfish reported by processors including at-sea discards.
[c]Salmon, crab, halibut, and other. Data for 2000 does not include halibut.
[d]Includes skippers, fishing crew, processing crew, and home-office staff.
[e]Total includes estimates for resident of other regions.
NA - data is not available.

Sources: NOAA Fisheries blend data, NOAA Fisheries Weekly Production Report data, and ADFG/CFEC fish ticket data.

Table 3.9-29. Summary of activities of southeast Alaska inshore plants[a], 1992–2001.

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number of facilities and facility ownership by region										
Number of facilities	12	14	16	16	16	14	15	12	13	15
AKSE owners (% of total)	16.7	28.6	37.5	25.0	37.5	42.9	46.7	50.0	46.2	53.0
WAIW owners (% of total)	83.3	71.4	62.5	75.0	62.5	57.1	53.3	50.0	53.8	47.0
Total groundfish catch										
Groundfish Catch (1,000s of metric tons [mt])[b]	7	8	10	6	6	5	5	5	6	6
Ex-vessel value of groundfish and non-groundfish retained										
GFSH ($ millions)	23.3	24.0	36.8	40.3	38.0	40.9	25.4	25.7	32.0	30.9
Non-GFSH ($ millions)[c]	100.2	98.9	124.2	103.3	93.9	100.7	79.2	105.3	51.1	NA
GFSH (% of total)	18.8	19.5	22.8	28.1	28.8	28.9	24.3	19.6	38.5	NA
Salmon (% of non-GFSH)	28.4	29.9	31.0	30.0	28.2	26.9	29.0	30.9	42.9	NA
Crab (% of non-GFSH)	16.4	14.9	13.8	15.7	17.9	19.2	20.3	19.1	21.4	NA
Halibut (% of non-GFSH)	28.4	29.9	31.0	28.6	28.2	28.2	26.1	25.0	NA	NA
Other (% of non-GFSH)	26.9	25.4	24.1	25.7	25.6	25.6	24.6	25.0	35.7	NA
Groundfish catch by species group (% of total)										
A-R-S-O	92.7	89.0	96.2	94.6	95.9	94.2	93.2	92.2	93.7	93.5
FLAT	5.1	3.9	3.1	4.6	2.8	4.2	4.0	5.3	5.3	4.8
PCOD	2.2	1.8	0.6	0.8	1.2	1.7	2.6	2.5	1.0	1.6
PLCK	0.0	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Groundfish catch by Fishery Management Plan subarea (% of total)										
BSAI	0.0	5.2	0.0	0.0	0.1	2.5	0.0	0.0	0.0	0.0
GOA	100.0	94.8	100.0	100.0	99.9	97.5	100.0	100.0	100.0	100.0
Ex-vessel value paid to catcher vessels by type (% of total)										
TCV BSP ≥ 125	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA
TCV BSP 60-124	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	NA
TCV Div. AFA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA
TCV Non-AFA	0.0	0.5	0.0	0.0	0.1	0.0	0.0	0.0	0.0	NA
TCV < 60	0.9	1.0	1.3	1.6	1.5	1.6	1.9	2.1	2.4	NA
PCV	0.3	0.4	0.0	0.1	0.1	0.2	0.1	0.0	0.1	NA
LCV	10.8	9.1	12.3	20.2	21.2	22.0	21.6	20.7	19.8	NA
FGCV 33-59	86.7	87.1	85.5	77.7	76.9	75.8	76.2	76.9	77.2	NA
FGCV ≤ 32	1.3	1.9	0.9	0.4	0.3	0.1	0.3	0.2	0.5	NA
Quantity and value of processed product										
Product (1,000s of mt)	5.0	5.4	6.4	4.7	4.5	4.2	4.3	3.5	4.2	3.5
Gross product value ($ millions)	27.2	30.5	42.0	40.7	38.6	37.2	28.8	26.9	32.1	28.4
Groundfish fishery employment by region (full time employee positions)[d]										
Alaska	45	49	58	43	42	42	43	34	40	35
WAIW	2	2	2	2	1	1	1	1	1	1
Total[e]	47	51	60	45	43	43	44	35	41	36
Groundfish fishery payments to labor by region ($ millions)[d]										
Alaska	8.4	9.6	13.4	12.7	12.6	12.5	9.5	9.0	10.9	10.0
WAIW	2.3	2.3	2.7	3.2	2.5	2.2	1.7	1.4	1.8	1.3
Total[e]	10.7	11.9	16.1	15.9	15.2	14.7	11.2	10.4	12.7	11.3

Notes: [a]Does not include inshore processors located in other states or GHOST processors.
[b]Includes all groundfish reported by processors including at-sea discards.
[c]Salmon, crab, halibut, and other. Data for 2000 does not include halibut.
[d]Includes skippers, fishing crew, processing crew, and home-office staff.
[e]Total includes estimates for resident of other regions.
NA - data is not available.

Source: NOAA Fisheries blend data, NOAA Fisheries Weekly Production Report data, and ADFG/CFEC fish ticket data.

Table 3.9-30. Summary of activities of motherships[a], 1992–2001.

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number of facilities and facility ownership by region										
Number of Facilities	5	3	4	4	3	3	3	3	3	3
WAIW owners (% of total)	100	100	100	100	100	100	100	100	100	100
Total groundfish catch										
Groundfish Catch (1,000s of metric tons [mt])[b]	178	125	117	121	128	129	128	101	116	142
Ex-vessel value of groundfish and non-groundfish retained										
GFSH ($ millions)	40.6	15.0	16.3	23.3	20.3	26.8	16.0	18.8	39.0	32.5
Non-GFSH ($ millions)[c]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Groundfish catch by species group (% of total)										
A-R-S-O	2	0	0	2	0	1	0	0	1	0
FLAT	5	0	1	3	1	1	0	0	0	0
PCOD	2	1	2	4	3	3	0	0	0	0
PLCK	91	99	97	91	96	95	100	100	99	99
Groundfish catch by Fishery Management Plan subarea (% of total)										
BSAI	99	100	100	99	100	100	100	100	100	100
GOA	1	0	0	1	0	0	0	0	0	0
Ex-vessel value paid to catcher vessels by type (% of total)										
TCV BSP ≥ 125	3	3	1	1	2	3	4	4	2	NA
TCV BSP 60-124	95	97	99	96	98	97	95	93	98	NA
TCV Div. AFA	0	0	0	2	0	0	0	0	0	NA
TCV Non-AFA	2	0	0	0	0	0	0	2	0	NA
TCV < 60	0	0	0	0	0	0	0	0	0	NA
PCV	0	0	0	0	0	0	0	0	0	NA
LCV	0	0	0	0	0	0	0	0	0	NA
FGCV 33-59	0	0	0	0	0	0	0	0	0	NA
FGCV ≤ 32	0	0	0	0	0	0	0	0	0	NA
Quantity and value of processed product										
Product (1,000s of mt)	35.1	26.8	25.8	27.5	31.3	28.4	26.3	21.1	30.6	
Gross product value ($ millions)	92.1	44.1	53.6	74.5	66.5	71.6	58.2	57.9	81.3	77.4
Groundfish fishery employment by region (full time employee positions)[d]										
WAIW	326	330	330	591	663	423	398	232	323	294
Total[e]	326	330	330	591	663	423	398	232	323	294
Groundfish fishery payments to labor by region ($ millions)[d]										
WAIW	33.2	16.0	19.5	27.4	24.4	26.4	21.9	21.7	29.7	27.1
Total[e]	33.2	16.0	19.5	27.4	24.4	26.4	21.9	21.7	29.7	27.1

Notes: [a]IDoes not include inshore processors located in other states or GHOST processors.
[b]Includes all groundfish reported by processors including at-sea discards.
[c]Salmon, crab, halibut, and other. Data for 2000 does not include halibut.
[d]Includes skippers, fishing crew, processing crew, and home-office staff.
[e]Total includes estimates for resident of other regions.
NA - data is not available.

Sources: NOAA Fisheries blend data, NOAA Fisheries Weekly Production Report data, and ADFG/CFEC fish ticket data.

Table 3.9-31. Summary of activities of floating inshore plants[a], 1992–2001.

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number of facilities and facility ownership by region										
Number of facilities	17	10	10	15	12	4	3	5	11	3
AKAPAI owners (% of total)	0.0	0.0	0.0	13.3	16.7	25.0	33.3	20.0	9.1	33.0
AKSC owners (% of total)	5.9	20.0	30.0	33.3	16.7	0.0	0.0	0.0	0.0	0.0
AKSE owners (% of total)	11.8	0.0	0.0	0.0	0.0	25.0	0.0	0.0	0.0	0.0
WAIW owners (% of total)	64.7	80.0	70.0	53.3	66.7	50.0	33.3	60.0	90.9	67.0
Other owners (% of total)	17.6	0.0	0.0	0.0	0.0	0.0	33.3	20.0	0.0	0.0
Total groundfish catch										
Groundfish catch (1,000s of metric tons [mt])[b]	22	4	5	12	10	5	1	3	18	7
Ex-vessel value of groundfish and non-groundfish retained										
GFSH ($ millions)	4.4	2.8	2.6	0.8	1.1	2.1	0.4	2.8	6.6	3.8
Non-GFSH ($ millions)[c]	90.0	105.3	121.7	89.8	71.1	54.9	67.4	96.0	25.6	NA
GFSH (% of total)	4.7	2.6	2.1	0.9	1.6	3.7	0.7	2.8	20.6	NA
Salmon (% of non-GFSH)	54.9	43.4	43.8	39.0	39.4	31.8	21.4	28.5	61.7	NA
Crab (% of non-GFSH)	40.8	52.4	51.5	53.1	38.7	54.8	68.2	57.2	32.3	NA
Halibut (% of non-GFSH)	1.0	1.4	1.2	0.6	2.0	7.7	7.4	9.6	NA	NA
Other (% of non-GFSH)	3.3	2.8	3.5	7.3	19.9	5.7	3.1	4.7	6.0	NA
Groundfish catch by species group (% of total)										
A-R-S-O	10.4	20.9	15.8	5.6	6.4	5.5	4.1	2.6	2.9	2.6
FLAT	13.4	4.7	37.9	43.9	17.9	3.1	3.4	2.3	1.1	3.6
PCOD	61.2	66.1	43.3	41.9	70.0	91.4	92.5	69.2	92.5	89.0
PLCK	15.0	8.5	3.2	8.7	5.6	CP	CP	25.9	3.6	4.8
Groundfish catch by Fishery Management Plan subarea (% of total)										
BSAI	28.6	15.3	68.8	76.8	80.1	99.9	99.9	24.7	82.7	99.4
GOA	71.4	84.7	31.2	23.2	19.9	0.1	0.1	75.3	17.3	0.6
Ex-vessel value paid to catcher vessels by type (% of total)										
TCV BSP $\geq$ 125	0.1	0.7	0.0	23.0	6.2	9.9	0.0	0.0	2.5	NA
TCV BSP 60-124	1.6	2.1	0.0	7.5	9.4	25.5	0.0	2.4	17.8	NA
TCV Div. AFA	3.2	0.0	0.0	0.0	5.0	17.0	0.0	5.1	14.6	NA
TCV Non-AFA	19.2	7.6	0.0	2.2	0.0	1.7	1.8	13.4	11.5	NA
TCV < 60	23.6	18.9	0.5	0.1	6.4	0.0	4.0	20.7	4.7	NA
PCV	5.3	2.0	4.0	10.3	15.7	37.7	25.8	10.8	31.9	NA
LCV	17.5	14.4	20.1	0.1	19.2	2.7	6.6	6.5	3.4	NA
FGCV 33-59	29.0	53.4	74.4	56.8	38.0	4.9	59.8	40.5	13.3	NA
FGCV $\leq$ 32	0.5	0.9	0.9	0.2	0.1	0.5	2.0	0.5	0.4	NA
Quantity and value of processed product										
Product (1,000s of mt)	10.0	2.2	2.0	5.4	4.3	1.8	0.8	3.0	7.7	2.8
Gross Product Value ($ millions)	16.2	5.3	4.5	9.6	7.3	4.6	1.4	3.5	20.9	8.2
Groundfish fishery employment by region (full time employee positions)[d]										
Alaska	15	6	7	29	14	11	0	0	1	22
WAIW	93	24	18	52	65	26	5	50	167	47
Total[e]	124	30	25	81	79	37	8	60	168	69
Groundfish fishery payments to labor by region ($ millions)[d]										
Alaska	0.6	0.4	0.4	1.1	0.4	0.4	0.0	0.0	0.0	0.9
WAIW	3.4	1.7	1.1	1.9	1.8	0.9	0.2	0.8	7.1	2.0
Total[e]	4.6	2.1	1.6	3.0	2.2	1.2	0.4	1.0	7.1	2.9

Note: [a]Does not include inshore processors located in other states or GHOST processors.
[b]Includes all groundfish reported by processors including at-sea discards.
[c]Salmon, crab, halibut, and other. Data for 2000 does not include halibut.
[d]Includes skippers, fishing crew, processing crew, and home-office staff.
[e]Total includes estimates for resident of other regions.
CP - data is combined with Pacific cod.
NA - data is not available.

Sources: NOAA Fisheries blend data, NOAA Fisheries Weekly Production Report data, and ADFG/CFEC fish ticket data

Table 3.9-32. Study regions and their acronyms.

AKAPAI	Alaska Peninsula and Aleutian Islands Region. Includes the Aleutians East Borough and the Aleutians West Census Area.
AKKO	Kodiak Island Region. Includes the Kodiak Island Borough and other parts of the Kodiak archipelago.
AKSC	Southcentral Alaska Region. Includes Valdez-Cordova Census Area, Kenai Peninsula Borough, Matanuska-Susitna Borough, and Municipality of Anchorage.
AKSE	Southeast Alaska Region. Includes Yakutat Borough, Skagway-Hoonah-Angoon Borough, Haines Borough, City and Borough of Juneau, City and Borough of Sitka, Wrangell-Petersburg Census Area, Prince of Wales-Outer Ketchikan Census Area, and Ketchikan Gateway Borough.
WAIW	Washington Inland Waters Region. All counties bordering Puget Sound and the Strait of Juan de Fuca, including Clallum Island, Jefferson, King, Kitsap, Mason, Pierce, San Juan, Skagit, Snohomish, Thurston, and Whatcom.
ORCO	Oregon Coast Region. Counties bordering the northern Oregon coast including Lincoln, Tillamook, and Clatsop.

Source: Northern Economics, Inc. and EDAW, Inc. 2001.

Table 3.9-33. Selected north Pacific groundfish participation measures by region, 2001.

	AKAP	AKKO	AKSC	AKSE	WAIW	ORCO	Total
Processor employment and payments to labor							
Employment (estimated full time employees [FTEs])[1]	3,525	617	150	106	3,787	0	8,185
Payments to labor ($ millions)[2]	149.3	28.9	15.3	14.5	317.0	0.0	525.1
Groundfish processing by regional inshore plants							
Reported MT (thousands)	674.5	79.9	6.9	6.2	NA	NA	767.5
Product MT (thousands)	267.9	27.7	4.3	3.5	NA	NA	303.4
Utilization rate (percent)	39.72	34.69	62.20	55.99	NA	NA	39.53
Product value ($ millions)	490.6	77.6	23.4	27.0	NA	NA	618.6
Value per ton ($)	727	972	3,380	4,333	NA	NA	806
Processors owned by regional residents							
Number of processors owned	4	7	16	10	119	0	156
Reported tons (thousands)	1.96	32.73	18.11	12.82	1,898.77	0.00	1,964.3
Wholesale value ($ millions)	1.56	26.38	24.96	18.64	1,308.67	0.00	1,380.2
Catcher vessels owned by regional residents							
Number of catcher vessels	70	142	155	210	239	35	851
Retained tons (thousands)	24.4	55.7	15.0	7.1	692.4	86.5	881.2
Ex-vessel value ($ millions)	6.4	19.3	10.8	19.1	135.6	18.2	209.4
Employment (persons)	326.5	802	1048.5	1,742	1,238	174.5	5,332
Payments to labor ($ millions)	2.56	7.73	4.34	7.65	54.22	7.28	83.77

Notes: [1]Includes all employment at all shoreplants located in the region and all employment of at-sea processors (including floaters) owned by residents. In addition the estimate includes administrative employment of all processors owned by residents.
[2]All payments to labor from at-sea processors (including floaters) are assigned to the owners region. On-site payments to labor from shore plants are assigned to the region in which the plant is located.
NA - data not available.

Source: For processing information, National Marine Fisheries Service (NMFS) blend data and weekly production report (WPR) data, September 2002 and Northern Economics (1994) internally derived tables. For harvest information, Alaska Department of Fish and Game (ADF&G) Fish Tickets and NMFS observer data, September 2002. Count information does not include "ghost" entities, while weight information includes "ghost" entities in order to minimize instances where data can not be reported due to NMFS confidentiality provisions. In all cases the values for Ghost Vessels are negligible.

Table 3.9-34. Groundfish harvests delivered to inshore plants by species group, 2001.

Region	Total reported harvest by species									
	Thousands of tons					Millions of $				
	A-R-S-O	Flatfish	Pacific cod	Pollock	Total	A-R-S-O	Flatfish	Pacific cod	Pollock	Total
AKAPAI	4.95	4.10	35.54	635.91	680.50	9.06	0.60	46.74	432.82	489.23
AKKO	12.21	16.02	22.91	39.36	90.50	12.89	5.34	26.32	29.88	74.44
AKSC	4.05	0.32	1.41	1.90	7.67	18.95	0.03	2.21	2.04	23.22
AKSE	6.82	0.30	0.10	0.00	7.22	26.63	0.00	0.08	0.00	26.72
WAIW	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ORCO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total	28.03	20.73	59.96	677.17	785.89	67.54	5.97	75.35	464.74	613.61

Notes: NA - data not available.
Source: NMFS blend data and WPR data, September 2002.

Table 3.9-35. Groundfish wholesale value ($ millions) of regionally owned processors by processor class, 2001.

Processor class	Region						
	AKAPAI	AKKO	AKSC	AKSE	WAIW	ORCO	Total
Catcher/processors	a	23.60	5.36	10.65	631.82	0.00	671.43
Motherships	0.00	0.00	0.00	0.00	86.94	0.00	86.94
Shoreplants	1.57	2.78	19.57	7.99	589.66	0.00	621.57

Notes: a - Due to the confidentiality of the data presented, this value has been added to shoreplants.
Source: Derived tables, Northern Economics (based on NMFS Blend data and WPR Data, September 2002).

Table 3.9-36. Groundfish retained harvest by catcher vessels owned by residents of various regions by Fishery Management Plan subarea, 2001.

Region	Aleutian Islands	Bering Sea	Western Gulf	Central Gulf	Eastern Gulf	Total
Total ex-vessel value ($ millions)						
AKAPAI	0.25	0.20	5.77	0.18	0	6.41
AKKO	0.42	5.29	1.57	11.19	0.85	19.31
AKSC	0.44	1.07	1.52	7.12	0.69	10.85
AKSE	0.39	0.12	0.64	3.73	14.24	19.12
WAIW	3.53	109.56	5.20	9.95	7.32	135.55
ORCO	a	11.72	0.20	6.07	0.20	18.19
Total	5.05	127.96	14.90	38.24	23.30	209.43

Notes: a - Due to the confidentiality of the data presented, this value has been added to Bering Sea.
Source: Alaska Department of Fish and Game (ADF&G) fish tickets and National Marines Fisheries Service (NMFS) observer data, September 2002.

Table 3.9-37. Number of boats and retained catch by weight and value, by species group, and by catcher vessel ownership by region, 2001.

Data	AKAPAI	AKKO	AKSC	AKSE	WAIW	ORCO
A-R-S-O						
Number of catcher vessels	20	95	117	208	182	33
Retained tons (thousands)	0.02	3.84	1.71	5.37	5.44	2.70
Ex-vessel value ($ millions)	0.07	5.19	5.38	22.49	19.01	1.26
Flatfish						
Number of catcher vessels	13	37	18	6	101	24
Retained tons (thousands)	0.26	3.93	1.01	0.04	2.56	2.22
Ex-vessel value ($ millions)	0.01	0.85	0.32	0.01	0.35	0.44
Pacific Cod						
Number of catcher vessels	70	136	129	97	181	31
Retained tons (thousands)	8.41	14.13	7.41	1.61	27.19	9.53
Ex-vessel value ($ millions)	4.21	8.74	5.12	0.60	14.12	5.29
Pollock						
Number of catcher vessels	26	45	60	3	111	26
Retained tons (thousands)	15.68	33.62	4.84	a	657.09	71.80
Ex-vessel value ($ millions)	2.12	4.63	0.68	a	102.67	11.21
All groundfish species						
Total number of catcher vessels	70	142	155	210	239	35
Total retained tons (thousands)	24.36	55.53	14.98	7.03	692.28	86.25
Total ex-vessel value ($ millions)	6.41	19.40	11.51	23.10	136.15	18.20

Notes: a - Due to the confidentiality of the data presented, this value has been added to Pacific cod.
Source: Alaska Departmenr of Fish and Game (ADF&G) fish tickets and National Marine Fisheries Service (NMFS) observer data, September 2002. Count information does not include “ghost” entities, while weight information includes "ghost" entities in order to minimize instances where data can not be reported due to NMFS confidentiality provisions. In all cases the values for Ghost Vessels are negligible.

Table 3.9-38. Retained harvests by Fisheries Management Plan area and species of regional catcher vessels, 2001.

Region of catcher vessel owner	Fishery Management Plan area										Total
	Aleutian Islands		Bering Sea		Western Gulf		Central Gulf		Eastern Gulf		
	Pacific cod	Pollock	Pacific cod	Pollock	Pacific cod	Pollock	Pacific cod	Pollock	Pacific cod	Pollock	
Volume (thousands of tons)											
AKAPAI	0.47	0.00	0.11	0.66	7.80	13.89	0.03	1.12	0.00	0.00	24.08
AKKO	0.04	0.00	3.53	23.32	1.00	0.00	9.56	10.31	a	a	47.76
AKSC	0.03	0.00	0.54	2.02	1.18	0.40	5.58	2.16	0.07	0.26	12.25
AKSE	0.11	0.00	b	b	1.16	c	0.19	c	0.16	c	1.61
WAIW	3.29	0.00	18.92	634.88	2.78	13.71	2.20	7.76	0.73	c	684.28
ORCO	0.00	0.00	3.85	61.58	a	a	5.68	9.39	0.83	c	81.33
Value ($ millions)											
AKAPAI	0.25	0.00	0.06	0.09	3.88	1.86	0.01	0.16	0.00	0.00	6.33
AKKO	0.02	0.00	1.84	3.10	0.54	0.00	6.33	1.53	a	a	13.36
AKSC	0.02	0.00	0.30	0.28	0.63	0.05	4.12	0.32	0.05	0.04	5.81
AKSE	0.02	0.00	b	b	0.34	c	0.11	c	0.12	c	0.60
WAIW	1.81	0.00	9.57	99.36	1.42	2.08	1.33	1.11	0.11	c	116.79
ORCO	0.00	0.00	1.97	9.72	a	a	3.32	1.36	0.13	c	16.50

Notes: a - Due to the confidentiality of the data presented, this value has been added to the same species in Central Gulf.
b - Due to the confidentiality of the data presented, this value has been added to Pacific cod in the Aleutian Islands.
c - Due to the confidentiality of the data presented, this value has been added to Pacific cod in the same area.

Source: Spreadsheet from Northern Economics based on Alaska Department of Fish and Game (ADF&G) Fish tickets and National Marine Fisheries Service (NMFS) observer data, September 2002.

Table 3.9-39. North Pacific groundfish fishery participation measures for the Alaska Peninsula/Aleutian Islands region, 1992-2001.

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Processor employment and payments to labor										
Employment (estimated full time employees [FTEs])[1]	2,053	1,947	2,273	2,532	2,645	2,544	2,313	2,648	3,157	3,525
Payment to labor ($ millions)[2]	112.9	65.4	88.5	116.2	99.7	99.3	85.1	113.0	131.3	149.3
Groundfish processing by regional inshore plants										
Reported tons (thousands)	516.5	534.1	551.6	567.0	548.2	532.5	486.4	544.0	590.6	674.5
Product tons (thousands)	153.1	152.7	172.7	183.2	177.7	176.2	165.2	191.0	217.1	267.9
Utilization rate (percent)	29.6	28.6	31.3	32.3	32.4	33.1	34.0	35.1	36.8	39.7
Product value ($ millions)	374.0	217.9	291.3	386.6	331.6	330.5	283.1	376.3	437.2	490.6
Value per ton ($)	724	408	528	682	605	621	582	692	740	727
Processors owned by regional residents										
Number of processors owned	1	0	2	6	5	4	4	4	4	4
Reported tons (thousands)	0	NA	NA	1.89	1.98	1.42	0.90	0.54	0.74	1.96
Wholesale value ($ millions)	0	NA	NA	1.52	1.40	1.18	0.81	0.53	0.83	1.56
Catcher vessels owned by regional residents										
Number of catcher vessels	61	46	60	71	70	74	76	67	70	70
Retained tons (thousands)	14.1	12.0	14.8	13.4	23.7	28.9	27.8	24.5	20.3	24.4
Ex-vessel value ($ millions)	5.74	3.47	4.38	4.98	8.02	9.86	7.39	10.12	9.86	6.41
Employment (persons)	320	201	305	352	351	382	351	306	318	327
Payment to labor ($ millions)	2.3	1.39	1.75	1.99	3.21	3.95	2.96	4.05	3.94	2.56

Notes: [1]Includes all employment at all shoreplants located in the region and all employment of at-sea processors (including floaters) owned by residents. In addition the estimate includes administrative employment of all processors owned by residents.
[2]All payments to labor from at-sea processors (including floaters) are assigned to the owners region. On-site payments to labor from shore plants are assigned to the region in which the plant is located.

Source: For processing information, Nation Marine Fisheries Service (NMFS) blend data and work production report (WPR) data, September 2002 and Northern Economics (1994) internally derived tables. For harvest information, Alaska Department of Fish and Game (ADF&G) Fish tickets and NMFS observer data, September 2002. Count information does not include "ghost" entities, while weight information includes "ghost" entities in order to minimize instances where data can not be reported due to NMFS confidentiality provisions. In all cases the values for Ghost Vessels are negligible.

Table 3.9-40. Groundfish reported by Alaska Peninsula/Aleutian Islands region inshore plants by species group, 1999-2001.

Groundfish reported	Species group				
	A-R-S-O	Flatfish	Pacific cod	Pollock	Total
1999 tons (thousands)	8.4	5.0	56.11	474.4	543.92
1999 product value ($ millions)	5.58	1.2	81.87	287.66	376.31
2000 tons (thousands)	4.08	7.73	56.73	522.08	590.63
2000 product value ($ millions)	6.88	1.60	80.48	348.28	437.24
2001 tons (thousands)	4.95	4.10	35.54	635.91	680.50
2001 products value ($ millions)	9.06	0.60	46.74	432.82	489.23

Source: National Marine Fisheries Service (NMFS) blend data and work production report (WPR) data, September 2002.

Table 3.9-41. Groundfish wholesale value ($ millions) of processor class owned by residents of the Alaska Peninsula/Aleutian Islands region, 1992-2001.

Processor class	Year									
	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Catcher/processors	0.16	0	0.05	0.51	0.41	0.36	0.12	0.08	0.60	a
Motherships	0	0	0	0	0	0	0	0	0	0
Shoreplants	0	0	0.25	1.01	0.99	0.82	0.69	0.45	0.23	1.56

Notes: a - Due to the confidentiality of the data presented, this value has been added to shoreplants.
Source: Derived tables, Northern Economics (1994) adapted from National Marine Fisheries Service (NMFS) blend data and work production order (WPR) data, September 2002.

Table 3.9-42. Groundfish retained harvest ex-vessel value, catcher vessels owned by Alaska Peninsula/Aleutian Islands region residents by Fisheries Management Plan subarea, 1999-2001.

Retained harvest	Fishery Management Plan subarea					
	Aleutian Islands	Bering Sea	Western Gulf	Central Gulf	Eastern Gulf	Total
1999 ex-vessel ($ millions)	0	0.40	8.65	1.07	a	10.12
2000 ex-vessel ($ millions)	0	0.65	9.09	0.12	a	9.86
2001 ex-vessel ($ millions)	0.25	0.20	5.77	0.18	0	6.41

Notes: a - Due to confidentiality of the data presented, this value has been added to the Central Gulf.
Source: Alaska Department of Fish and Game (ADF&G) fish tickets and National Marine Fisheries Service (NMFS) observer data, September 2002.

Table 3.9-43. Number of boats and retained catch by weight and value, by species group, and by catcher vessel ownership for the Alaska Peninsula/Aleutian Islands region, 1992-2001.

Data	Year									
	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
A-R-S-O										
Number of catcher vessels	16	8	11	9	20	24	16	20	19	20
Retained tons (thousands)	0.1	0.1	0.1	0.2	0.4	0.1	0.2	0.1	0	0
Ex-vessel value ($ millions)	0.31	0.18	0.26	0.70	0.79	0.59	0.32	0.42	0.05	0.07
Flatfish										
Number of catcher vessels	2	3	7	6	12	24	15	15	15	13
Retained tons (thousands)	0	NA	0.1	0	1.7	0.1	0	0	0.1	0.3
Ex-vessel value ($ millions)	0		0.04	0.01	0.92	0.02	0	0	0	0.01
Pacific cod										
Number of catcher vessels	60	45	58	70	67	74	73	67	70	70
Retained tons (thousands)	12.3	8.5	10.0	8.3	13.9	17.0	16.3	14.5	11.5	8.4
Ex-vessel value ($ millions)	5.21	2.85	3.35	3.38	4.85	6.52	5.53	7.54	7.60	4.21
Pollock										
Number of catcher vessels	12	8	10	12	13	29	23	19	19	26
Retained tons (thousands)	1.6	3.4	4.6	4.9	7.8	11.6	11.2	9.8	8.7	15.7
Ex-vessel value ($ millions)	0.22	0.45	0.74	0.88	1.45	2.73	1.55	2.15	2.21	2.12
All groundfish species										
Total number of catcher vessels	61	46	60	71	70	74	76	67	70	70
Total retained tons (thousands)	14.1	12.0	14.8	13.4	23.7	28.9	27.8	24.5	20.3	24.4
Total ex-vessel value ($ millions)	5.74	3.47	4.38	4.98	8.02	9.86	7.39	10.12	9.86	6.41

Source: Alaska Department of Fish and Game (ADF&G) fish tickets and National Marine Fisheries Service (NMFS) observer data, September 2002. Count information does not include "ghost" entities, while weight information includes "ghost" entities in order to minimize instances where data can not be reported due to NMFS confidentiality provisions. In all cases the values for Ghost Vessels are negligible.

Table 3.9-44. Retained harvests by Fisheries Management Plan area and species of Alaska Peninsula/ Aleutian Islands region catcher vessels, 1992-2001.

Year	Fisheries Management Plan Area										Total
	Aleutian Islands		Bering Sea		Western Gulf		Central Gulf		Eastern Gulf		
	Pacific cod	Pollock	Pacific cod	Pollock	Pacific cod	Pollock	Pacific cod	Pollock	Pacific cod	Pollock	
Volume (thousands of tons)											
1992	0	0	0.62	0.44	6.18	0.24	4.02	2.43	0.02	0	13.95
1993	0.02	0.06	0.35	3.68	3.12	1.21	1.96	1.52	0.01	0	11.94
1994	0.01	0.06	0.56	4.11	2.74	1.76	2.70	2.64	0.02	0.04	14.63
1995	0	0	0.86	0.23	2.47	2.67	4.66	2.28	0.01	0	13.20
1996	0	0	1.34	0.52	6.79	4.61	6.07	2.32	0.03	0	21.68
1997	0.03	0	1.29	0.24	9.21	3.92	6.25	7.59	0.04	0.07	28.64
1998	0	0	0.47	0.31	8.36	4.18	4.93	9.20	0.03	0.02	27.50
1999	0.12	0	0.46	0.59	9.60	5.86	3.81	3.82	0.02	0.05	24.34
2000	0.22	0	0.44	1.49	8.19	5.38	2.46	1.85	0.02	0.13	20.20
2001	0.47	0	0.11	0.66	7.80	13.89	0.03	1.12	0.00	0.00	24.08
Value ($ millions)											
1992	0	0	0.28	0.09	2.56	0.05	1.80	0.64	0.02	0	5.43
1993	0.01	0.01	0.14	0.62	1.21	0.19	0.82	0.29	0.01	0	3.29
1994	0	0.01	0.24	0.80	1.04	0.36	1.07	0.54	0.01	0.01	4.09
1995	0	0	0.33	0.05	0.92	0.46	2.01	0.48	0.01	0	4.26
1996	0	0	0.50	0.08	2.12	0.81	2.31	0.45	0.03	0	6.30
1997	0.03	0	0.71	0.05	3.24	0.87	2.64	1.66	0.03	0.01	9.25
1998	0	0	0.19	0.04	2.85	0.60	1.96	1.40	0.02	0	7.07
1999	0.07	0	0.26	0.12	4.75	1.25	2.43	0.78	0.01	0.01	9.69
2000	0.15	0	0.28	0.37	5.33	1.34	1.84	0.45	0.02	0.03	9.80
2001	0.25	0	0.06	0.09	3.88	1.86	0.01	0.16	0.00	0.00	6.33

Source: Alaska Department of Fish and Game (ADF&G) fish tickets and National Marine Fisheries Service (NMFS) observer data, September 2002.

Table 3.9-45. North Pacific groundfish fishery participation measures for Kodiak Island region, 1992-2001.

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Processor employment and payments to labor										
Employment (estimated full time employees [FTEs])[1]	562	645	585	708	562	673	749	801	730	617
Payment to labor ($ millions)[2]	30.8	30.6	32.4	31.4	25.7	26.2	26.8	33.0	32.1	28.9
Groundfish processing by regional inshore plants										
Reported tons (thousands)	106.8	124.9	114.4	82.5	74.8	101.1	115.2	116.7	106.0	79.9
Product tons (thousands)	27.1	32.0	28.3	26.4	22.8	25.3	28.8	31.4	29.9	27.7
Utilization rate (percent)	25.4	25.6	24.7	32.0	30.5	25.0	25.0	26.9	28.2	34.7
Product value ($ millions)	80.3	81.7	85.5	92.0	71.3	76.3	77.7	94.7	89.6	77.6
Value per ton ($)	752	654	747	1115	953	755	674	811	845	972
Processors owned by regional residents										
Number of processors owned	9	9	9	9	7	6	6	9	7	7
Reported tons (thousands)	67.3	73.3	71.5	33.6	29.9	33.8	30.0	34.3	33.1	32.7
Wholesale value ($ millions)	45	41.0	46.1	25.4	22.1	18.3	15.8	24.8	25.5	26.4
Catcher vessels owned by regional residents										
Number of catcher vessels	172	130	143	145	144	160	153	158	192	142
Retained tons (thousands)	80.3	77.4	75.5	83.2	82.5	90.8	81.0	69.5	62.7	55.7
Ex-vessel value ($ millions)	28.5	21.1	22.4	27.5	28.3	39.6	22.7	30.0	30.0	19.3
Employment (persons)	856	623	681	709	724	796	749	797	920	802
Payment to labor ($ millions)	11.4	8.5	8.9	11.0	11.3	15.9	9.1	12.0	12.0	7.73

Notes: [1]Includes all employment at all shoreplants located in the region and all employment of at-sea processors (including floaters) owned by residents. In addition the estimate includes administrative employment of all processors owned by residents.
[2]All payments to labor from at-sea processors (including floaters) are assigned to the owners region. On-site payments to labor from shore plants are assigned to the region in which the plant is located.

Source: For processing information, National Marine Fisheries Service (NMFS) blend data and work production order (WPR) data, September 2002 and Northern Economics (1994) internally derived tables. For harvest information, Alaska Department of Fish and Game (ADF&G) fish tickets and NMFS observer data, September 2002. Count information does not include "ghost" entities, while weight information includes "ghost" entities in order to minimize instances where data can not be reported due to NMFS confidentiality provisions. In all cases the values for Ghost Vessels are negligible.

Table 3.9-46. Groundfish reported by Kodiak Island region inshore plants by species group, 1999-2001.

Groundfish reported	Species group				
	A-R-S-O	Flatfish	Pacific cod	Pollock	Total
1999 tons (thousands)	11.69	10.08	35.18	59.75	116.71
1999 product value ($ millions)	11	3.34	50.26	30.06	94.65
2000 tons (thousands)	14.13	14.2	26.82	50.82	105.97
2000 product value ($ millions)	13.33	8.97	40.06	27.21	89.57
2001 tons (thousand)	12.21	16.02	22.91	39.36	90.50
2001 product value ($ millions)	12.89	5.34	26.32	29.88	74.44

Source: National Marine Fisheries Service (NMFS) blend data and work production report (WPR) data, September 2002.

Table 3.9-47. Groundfish wholesale value ($ millions) of processor class owned by residents of the Kodiak Island region, 1992-2001.

Processor class	Year									
	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Catcher/processors	11.12	13.62	14.36	15.81	18.19	15.96	13.40	23.00	22.65	23.60
Motherships	0	0	0	0	0	0	0	0	0	0
Shoreplants	33.91	27.32	31.75	9.59	3.90	2.30	2.35	1.75	2.82	2.78

Source: Derived tables, Northern Economics (1994) adapted from National Marine Fisheries Service (NMFS) blend data and work production report (WPR) data, September 2002.

Table 3.9-48. Groundfish retained harvest ex-vessel value, catcher vessels owned by Kodiak Island region residents by Fisheries Management Plan subarea, 1999-2001.

Retained harvest	Fishery Management Plan subarea					
	Aleutian Islands	Bering Sea	Western Gulf	Central Gulf	Eastern Gulf	Total
1999 ex-vessel ($ millions)	0.79	4.83	0.78	22.98	0.66	30.04
2000 ex-vessel ($ millions)	0.3	4.25	1.12	23.32	1.08	30.07
2001 ex-vessel ($ millions)	0.42	5.29	1.57	11.18	0.85	19.31

Source: Alaska Department of Fish and Game (ADF&G) fish tickets and National Marine Fisheries Service (NMFS) observer data, September 2002

Table 3.9-49. Number of boats and retained catch by weight and value, by species group, and by catcher vessel ownership for the Kodiak Island region, 1992-2001.

Data	Year									
	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
A-R-S-O										
Number of catcher vessels	113	83	106	83	91	111	108	93	99	95
Retained tons (thousands)	2.5	2.2	2.4	1.6	4.2	4.9	4.4	3.5	5.9	3.8
Ex-vessel value ($ millions)	4.93	4.37	6.30	4.22	7.29	7.76	4.69	4.48	6.47	5.19
Flatfish										
Number of catcher vessels	38	34	39	45	52	53	46	35	34	37
Retained tons (thousands)	9.7	6.3	4.5	6.0	7.2	11.5	4.5	2.2	5.6	3.9
Ex-vessel value ($ millions)	3.33	1.96	1.41	1.74	2.58	7.38	1.28	0.59	1.06	0.85
Pacific cod										
Number of catcher vessels	149	103	105	136	127	150	144	150	190	136
Retained tons (thousands)	15.4	17.4	16.5	26.3	24.8	30.6	24.5	27.5	18.9	14.1
Ex-vessel value ($ millions)	7.36	6.84	6.04	11.74	10.32	14.58	10.00	17.67	14.79	8.74
Pollock										
Number of catcher vessels	64	38	44	46	49	79	69	62	64	45
Retained tons (thousands)	52.8	51.5	52.1	49.2	46.2	43.9	47.6	36.3	32.2	33.6
Ex-vessel value ($ millions)	12.85	7.97	8.60	9.84	8.13	9.90	6.76	7.29	7.75	4.63
All groundfish species										
Total number of catcher vessels	172	130	143	145	144	160	153	158	192	142
Total retained tons (thousands)	80.3	77.4	75.5	83.2	82.5	90.8	81.0	69.5	62.7	55.5
Total ex-vessel value ($ millions)	28.47	21.14	22.35	27.54	28.33	39.63	22.74	30.04	30.07	19.40

Source: Alaska Department of Fish and Game (ADF&G) fish tickets and National Marine Fisheries Service (NMFS) observer data, September 2002. Count information does not include "ghost" entities, while weight information includes "ghost" entities in order to minimize instances where data can not be reported due to NMFS confidentiality provisions. In all cases the values for Ghost Vessels are negligible.

Table 3.9-50. Retained harvests by Fisheries Management Plan area and species of Kodiak Island regional catcher vessels, 1992-2001.

Year	Fisheries Management Plan area										Total
	Aleutian Islands		Bering Sea		Western Gulf		Central Gulf		Eastern Gulf		
	Pacific cod	Pollock	Pacific cod	Pollock	Pacific cod	Pollock	Pacific cod	Pollock	Pacific cod	Pollock	
Volume (thousands of tons)											
1992	0.43	0.13	6.15	23.58	6.14	0.75	9.94	20.91	0.10	0	68.14
1993	0.06	0.12	7.46	16.78	3.51	2.59	10.33	27.68	0.32	0.08	68.93
1994	0.02	0.1	7.87	13.45	3.01	2.81	9.55	30.18	0.24	1.46	68.69
1995	0.03	0.28	10.85	37.58	2.53	3.51	11.32	9.34	0.08	0.02	75.54
1996	0.28	0.12	13.80	34.04	3.53	3.73	8.74	6.70	0.08	0.04	71.05
1997	0.47	0.05	14.88	18.65	5.78	3.89	12.99	17.25	0.10	0.35	74.42
1998	0.90	0.04	7.87	22.09	4.27	4.02	10.05	22.63	0.09	0.17	72.11
1999	1.60	0.01	6.70	14.57	4.43	3.30	14.00	18.78	0.10	0.26	63.75
2000	1.87	0	6.30	11.95	3.41	3.02	10.34	13.45	0.10	0.68	51.12
2001	0.04	0	3.53	23.32	1.00	0.00	9.56	10.31	a	a	47.76
Value ($ millions)											
1992	0.17	0.03	2.49	5.04	2.41	0.16	4.63	5.21	0.08	0	20.21
1993	0.02	0.02	2.42	2.28	1.17	0.33	3.95	4.42	0.19	0.01	14.81
1994	0.01	0.02	2.53	2.08	0.93	0.43	3.27	5.03	0.09	0.24	14.64
1995	0.01	0.06	4.25	7.84	1.02	0.66	5.53	2.16	0.04	0	21.58
1996	0.10	0.02	5.09	5.85	1.24	0.71	3.93	1.44	0.07	0.01	18.46
1997	0.26	0.01	6.53	4.17	2.26	0.92	6.17	4.01	0.08	0.07	24.48
1998	0.31	0.01	2.99	3.13	1.58	0.59	4.44	3.64	0.06	0.03	16.77
1999	0.94	0	3.87	3.05	2.43	0.75	9.69	4.11	0.07	0.06	24.97
2000	1.20	0	4.05	2.84	2.21	0.74	8.00	3.24	0.08	0.17	22.55
2001	0.02	0	1.84	3.10	0.54	0.00	6.33	1.53	a	a	13.36

Notes: a - Due to the confidentiality of the data presented, this value has been added to the same species in Central Gulf.
Source: Alaska Department of Fish and Game (ADF&G) fish tickets and National Marine Fisheries Service (NMFS) observer data, September 2002.

Table 3.9-51. North Pacific groundfish fishery participation measures for the southcentral Alaska region, 1992-2001.

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Processor employment and payments to labor										
Employment (estimated full time employees [FTEs])[1]	159	150	135	195	156	260	240	170	148	150
Payment to labor ($ millions)[2]	11.9	13.1	12.2	17.1	14.5	16.8	13.1	13.5	14.5	15.3
Groundfish processing by regional inshore plants										
Reported tons (thousands)	12.86	12.88	11.97	12.82	12.65	16.9	17.69	10.82	10.01	6.9
Product tons (thousands)	6.6	6.62	5.31	7.05	6.86	9.2	9.7	6.64	5.23	4.3
Utilization rate (percent)	51.3	51.4	44.4	55.0	54.2	54.4	54.8	61.4	52.2	62.2
Product value ($ millions)	25.68	31.26	28.78	39.91	34.91	40.28	31.68	29.77	32.21	23.4
Value per ton ($)	1,997	2,427	2,404	3,113	2,760	2,383	1,791	2,751	3,218	3,380
Processors owned by regional residents										
Number of processors owned	19	16	19	19	14	19	15	13	16	16
Reported tons (thousands)	19.46	21.03	19.76	22.55	19.96	26.70	24.15	24.40	23.13	18.11
Wholesale value ($ millions)	23.79	27.77	25.94	35.47	27.80	32.49	24.47	33.59	35.43	24.96
Catcher vessels owned by regional residents										
Number of catcher vessels	340	288	303	237	191	197	171	170	198	155
Retained tons (thousands)	32.5	20.6	19.7	18.4	11.3	11.8	11.4	12.4	15.5	15.0
Ex-vessel value ($ millions)	17.22	12.21	11.17	12.33	9.17	11.21	7.47	10.31	13.75	10.8
Employment (persons)	1,672	1,315	1,432	1,148	984	1,001	813	820	933	1,049
Payment to labor ($ millions)	6.89	4.89	4.47	4.93	3.67	4.48	2.99	4.12	5.5	4.34

Notes: [1]Includes all employment at all shoreplants located in the region and all employment of at-sea processors (including floaters) owned by residents. In addition the estimate includes administrative employment of all processors owned by residents.
[2]All payments to labor from at-sea processors (including floaters) are assigned to the owners region. On-site payments to labor from shore plants are assigned to the region in which the plant is located.

Source: For processing information, National Marine Fisheries Service (NMFS) blend data and work production report (WPR) data, September 2002 and Northern Economics (1994) internally derived tables. For harvest information, Alaska Department of Fish and Game (ADF&G) fish tickets and NMFS observer data, September 2002. Count information does not include "ghost" entities, while weight information includes "ghost" entities in order to minimize instances where data can not be reported due to NMFS confidentiality provisions. In all cases the values for Ghost Vessels are negligible.

Table 3.9-52. Groundfish reported by southcentral Alaska region inshore plants by species group, 1999-2001.

Groundfish reported	Species group				
	A-R-S-O	Flatfish	Pacific cod	Pollock	Total
1999 tons (thousands)	4.58	0.87	3.34	2.03	10.82
1999 product value ($ millions)	20.61	0.21	6.13	2.81	29.77
2000 tons (thousands)	5.44	0.4	2.25	1.92	10.01
2000 product value ($ millions)	26.01	0.21	3.85	2.13	32.21
2001 tons (thousands)	4.05	0.32	1.41	1.90	7.67
2001 product value ($ millions)	18.95	0.03	2.21	2.04	23.22

Source: National Marine Fisheries Service (NMFS) blend data and work production report (WPR) data, September 2002.

Table 3.9-53. Groundfish wholesale value ($ millions) of processor class owned by residents of the southcentral Alaska region, 1992-2001.

Processor class	Year									
	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Catcher/processors	3.29	2.87	2.22	2.19	2.2	2.41	1.75	2.04	2.13	5.36
Motherships	0	0	0	0	0	0	0	0	0	0
Shoreplants	20.50	24.9	23.73	33.28	25.60	30.08	22.72	31.56	33.3	19.57

Source: Derived tables, Northern Economics (1994), adapted from National Marine Fisheries Service (NMFS) blend data and work production report (WPR) data, June 2001.

Table 3.9-54. Groundfish retained harvest ex-vessel value, catcher vessels owned by southcentral Alaska region residents by Fisheries Management Plan subarea, 1999-2001.

Retained harvest	Fishery Management Plan subarea					
	Aleutian Islands	Bering Sea	Western Gulf	Central Gulf	Eastern Gulf	Total
1999 ex-vessel ($ millions)	0.34	0.36	1.01	8.19	0.40	10.31
2000 ex-vessel ($ millions)	0.77	0.61	1.83	9.72	0.83	13.75
2001 ex-vessel ($ millions)	0.44	1.07	1.52	7.10	0.68	10.81

Source: Alaska Department of Fish and Game (ADF&G) fish tickets and National Marine Fisheries Service (NMFS) observer data, September 2002.

Table 3.9-55. Number of boats and retained catch by weight and value, by species group, and by catcher vessel ownership for the southcentral Alaska region, 1992-2001.

Data	Year									
	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
A-R-S-O										
Number of catcher vessels	299	269	290	207	169	175	145	129	141	117
Retained tons (thousands)	3.5	3.5	2.8	2.0	1.5	1.6	1.2	1.3	1.8	1.7
Ex-vessel value ($ millions)	8.14	7.55	7.31	6.91	4.94	6.28	3.47	3.71	5.28	5.38
Flatfish										
Number of catcher vessels	16	12	6	7	16	12	17	7	11	18
Retained tons (thousands)	0.5	0.4	0.8	0.1	0.2	0.1	0.2	0.2	1.0	1.0
Ex-vessel value ($ millions)	0.16	0.13	0.16	0.04	0.11	0.12	0.10	0.09	0.20	0.32
Pacific cod										
Number of catcher vessels	279	162	116	172	139	160	145	151	174	129
Retained tons (thousands)	9.9	6.6	5.0	7.4	7.6	8.8	8.0	8.1	9.1	7.4
Ex-vessel value ($ millions)	4.92	2.98	1.81	3.70	3.73	4.51	3.62	5.91	7.34	5.12
Pollock										
Number of catcher vessels	25	16	6	7	15	30	23	31	41	60
Retained tons (thousands)	18.6	10.2	11.1	8.8	2.1	1.3	2.0	2.8	3.6	4.8
Ex-vessel value ($ millions)	4	1.56	1.89	1.68	0.39	0.29	0.28	0.60	0.92	0.68
All groundfish species										
Total number of catcher vessels	340	288	303	237	191	197	171	170	198	155
Total retained tons (thousands)	32.5	20.6	19.7	18.4	11.3	11.8	11.4	12.4	15.5	15.0
Total ex-vessel value ($ millions)	17.22	12.21	11.17	12.33	9.17	11.21	7.47	10.31	13.75	11.51

Source: Alaska Department of Fish and Game (ADF&G) fish tickets and National Marine Fisheries Service (NMFS) observer data, September 2002. Count information does not include "ghost" entities, while weight information includes "ghost" entities in order to minimize instances where data can not be reported due to NMFS confidentiality provisions. In all cases the values for Ghost Vessels are negligible.

Table 3.9-56. Retained harvests by Fisheries Management Plan area and species of southcentral Alaska regional catcher vessels, 1992-2001.

Year	Fisheries Management Plan area										Total
	Aleutian Islands		Bering Sea		Western Gulf		Central Gulf		Eastern Gulf		
	Pacific cod	Pollock	Pacific cod	Pollock	Pacific cod	Pollock	Pacific cod	Pollock	Pacific cod	Pollock	
Volume (thousands of tons)											
1992	0.04	0.30	2.25	17.29	1.20	0.44	5.58	1.16	0.18	0	28.44
1993	0.05	0.11	1.16	6.80	1.12	0.49	4.95	1.68	0.39	0	16.74
1994	0.02	0.11	2.12	7.22	0.85	0.48	3.94	1.13	0.20	0.06	16.12
1995	0.01	0.06	3.49	5.30	0.59	0.31	5.63	0.83	0.05	0	16.28
1996	0.01	0	2.96	0.13	1.09	0.47	4.14	0.73	0.09	0	9.62
1997	0.11	0.01	2.29	2.70	0.94	0.18	3.07	0.69	0.06	0.03	10.10
1998	0.01	0	1.25	0.05	1.24	0.21	4.94	2.22	0.08	0.02	10.02
1999	0.38	0	1.48	0.71	0.94	0.29	5.28	1.70	0.06	0.03	10.87
2000	0.57	0	2.10	0.57	1.27	0.33	5.87	1.83	0.07	0.09	12.70
2001	0.03	0	0.54	2.02	1.18	0.40	5.58	2.16	0.07	0.26	12.25
Value ($ millions)											
1992	0.02	0.08	1.04	3.87	0.54	0.11	2.83	0.29	0.14	0	8.93
1993	0.02	0.02	0.46	0.92	0.40	0.06	2.13	0.26	0.26	0	4.53
1994	0.01	0.02	0.72	1.01	0.25	0.07	1.37	0.17	0.08	0.01	3.71
1995	0	0.01	1.37	0.97	0.22	0.05	2.56	0.17	0.03	0	5.38
1996	0.01	0	1.24	0.02	0.41	0.09	2.09	0.16	0.09	0	4.12
1997	0.1	0	1.57	0.64	0.46	0.05	1.73	0.18	0.06	0.01	4.80
1998	0	0	0.54	0.01	0.49	0.03	2.40	0.36	0.06	0	3.90
1999	0.25	0	0.96	0.16	0.58	0.07	4.04	0.40	0.05	0.01	6.51
2000	0.36	0	1.39	0.14	0.84	0.08	4.91	0.46	0.06	0.02	8.26
2001	0.02	0	0.30	0.28	0.63	0.05	4.12	0.32	0.05	0.04	5.81

Source: National Marine Fisheries Service (NMFS) blend data and work production report (WPR) data, September 2002, and Northern Economics internally derived tables; Alaska Department of Fish and Game (ADF&G) fish tickets and NMFS observer data, September 2002.

Table 3.9-57 North Pacific groundfish fishery participation measures for the southeast Alaska region, 1992-2001.

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Processor employment and payments to labor										
Employment (estimated FTEs)[1]	128	114	117	93	93	94	121	112	125	106
Payment to labor ($ millions)[2]	10.2	11.1	14.9	13.8	14.6	14.2	12.2	12.6	15.7	14.5
Groundfish processing by regional inshore plants										
Reported tons (thousands)	7.43	8.28	9.53	6.25	5.63	4.8	5.48	4.75	5.84	6.2
Product tons (thousands)	4.96	5.36	6.4	4.68	4.48	4.22	4.31	3.51	4.16	3.5
Utilization rate (percent)	66.8	64.7	67.2	74.9	79.6	87.9	78.6	73.9	71.2	56.0
Product value ($ millions)	27.22	30.51	42.01	40.65	38.56	37.16	38.83	26.91	32.08	27.0
Value per ton ($)	3,664	3,685	4,408	6,504	6,849	7,742	7,086	5,665	5,493	4,333
Processors owned by regional residents										
Number of processors owned	9	9	11	8	13	11	11	10	10	10
Reported tons (thousands)	8.27	8.96	10.18	7.52	9.38	10.66	9.93	11.14	14.37	12.82
Wholesale value ($ millions)	6.82	8.09	11.27	7.56	15.50	17.64	15.45	18.12	24.91	18.64
Catcher vessels owned by regional residents										
Number of catcher vessels	403	356	367	293	283	269	238	235	228	210
Retained tons (thousands)	9.4	9.5	8.9	7.4	7.0	6.6	6.1	6.3	6.5	7.1
Ex-vessel value ($ millions)	19.87	19.24	26.44	26.65	25.29	24.42	16.32	17.67	23.51	19.1
Employment (persons)	1,951	1,796	1,801	1,608	1,589	1,508	1,303	1,328	1,238	1,742
Payment to labor ($ millions)	7.95	7.70	10.58	10.66	10.12	9.77	6.53	7.07	9.4	7.65

Notes: [1]Includes all employment at all shoreplants located in the region and all employment of at-sea processors (including floaters) owned by residents. In addition the estimate includes administrative employment of all processors owned by residents.
[2]All payments to labor from at-sea processors (including floaters) are assigned to the owners region. On-site payments to labor from shore plants are assigned to the region in which the plant is located.

Source: For processing information, National Marine Fisheries Service (NMFS) blend data and work production report (WPR) data, September 2002, and Northern Economics (1994) internally derived tables. For harvest information, Alaska Department of Fish and Game (ADF&G) fish tickets and NMFS observer data, September 2002. Count information does not include "ghost" entities, while weight information includes "ghost" entities in order to minimize instances where data can not be reported due to NMFS confidentiality provisions. In all cases the values for Ghost Vessels are negligible.

Table 3.9-58 Groundfish reported by southeast Alaska region inshore plants by species group, 1999-2001.

Groundfish reported	Species group				
	A-R-S-O	Flatfish	Pacific cod	Pollock	Total
1999 tons (thousands)	4.38	0.25	0.12	0	4.75
1999 product value ($ millions)	26.72	0	0.19	0	26.91
2000 tons (thousands)	5.47	0.31	0.06	0	5.84
2000 product value ($ millions)	31.94	0	0.14	0	32.08
2001 tons (thousands)	6.82	0.30	0.10	0	7.22
2001 product value ($ millions)	26.63	0	0.08	0	26.72

Source: National Marine Fisheries Service (NMFS) blend data and work production report (WPR) data, September 2002.

Table 3.9-59 Groundfish wholesale value ($ millions) of processor class owned by residents of the southeast Alaska region, 1992-2001.

Processor Class	Year									
	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Catcher/processors	5.85	6.43	6.77	4.79	6.68	5.65	7.10	10.96	13.58	10.65
Motherships	0	0	0	0	0	0	0	0	0	0
Shoreplants	0.97	1.67	4.50	2.78	8.82	11.99	8.36	7.16	11.33	7.99

Source: Derived tables, Northern Economics (1994) adapted from National Marine Fisheries Service (NMFS) blend data and work production report (WPR) data, September 2002.

Table 3.9-60. Groundfish retained harvest ex-vessel value, catcher vessels owned by southeast Alaska region residents by Fishery Management Plan subarea, 1999-2001.

Retained harvest	Fishery Management Plan subarea					
	Aleutian Islands	Bering Sea	Western Gulf	Central Gulf	Eastern Gulf	Total
1999 ex-vessel ($ millions)	0.15	0.16	0.70	4.07	12.59	17.67
2000 ex-vessel ($ millions)	0.4	0.56	0.56	5.08	16.91	23.51
2001 ex-vessel ($ millions)	0.39	0.12	0.64	3.73	14.15	19.03

Source: Alaska Department of Fish and Game (ADF&G) fish tickets and National Marine Fisheries Service (NMFS) observer data, September 2002.

Table 3.9-61. Number of boats and retained catch by weight and value, by species group, and by catcher vessel ownership for the southeast Alaska region, 1992-2001.

Data	Year									
	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
A-R-S-O										
Number of catcher vessels	400	350	362	287	278	265	235	229	224	208
Retained tons (thousands)	7.5	8.2	8.1	6.5	5.7	4.9	4.8	4.3	4.7	5.4
Ex-vessel value ($ millions)	18.93	18.57	26.13	26.22	24.53	23.53	15.73	16.48	22.27	22.49
Flatfish										
Number of catcher vessels	12	6	6	12	13	9	8	13	11	6
Retained tons (thousands)	0	0.1	0	0	0	0	0.1	0.1	0	0
Ex-vessel value ($ millions)	0.01	0.06	0	0	0.02	0.01	0.04	0.03	0.02	0.01
Pacific cod										
Number of catcher vessels	137	115	72	88	106	107	93	107	95	97
Retained tons (thousands)	1.9	1.2	0.7	0.9	1.2	1.6	1.2	1.9	1.6	1.61
Ex-vessel value ($ millions)	0.93	0.62	0.31	0.43	0.73	0.88	0.54	1.15	1.18	0.60
Pollock										
Number of catcher vessels	5	7	2	6	9	15	10	13	7	3
Retained tons (thousands)	0	0	NA	0	0	0	0.1	0	0.2	a
Ex-vessel value ($ millions)	0	0	0	0	0.01	0.01	0.01	0.01	0.04	a
All groundfish species										
Total number of catcher vessels	403	356	367	293	283	269	238	235	228	210
Total retained tons (thousands)	9.4	9.5	8.9	7.4	7.0	6.6	6.1	6.3	6.5	7.0
Total ex-vessel value ($ millions)	19.87	19.24	26.44	26.65	25.29	24.42	16.32	17.67	23.51	23.10

Notes: a - Due to the confidentiality of the data presented, this value has been added to Pacific Cod.

Source: Alaska Department of Fish and Game (ADF&G) fish tickets and National Marine Fisheries Service (NMFS) observer data, September 2002. Count information does not include "ghost" entities, while weight information includes "ghost" entities in order to minimize instances where data can not be reported due to NMFS confidentiality provisions. In all cases the values for Ghost Vessels are negligible.

Table 3.9-62. Retained harvests by Fisheries Management Plan area and species of southeast Alaska regional catcher vessels, 1992-2001.

Year	Fishery Management Plan area										Total
	Aleutian Islands		Bering Sea		Western Gulf		Central Gulf		Eastern Gulf		
	Pacific cod	Pollock	Pacific cod	Pollock	Pacific cod	Pollock	Pacific cod	Pollock	Pacific cod	Pollock	
Volume (thousands of tons)											
1992	0.01	0	0.07	0.01	0.32	0.01	1.38	0.04	0.06	0	1.90
1993	0	0	0.02	0	0.21	0.07	0.79	0.05	0.06	0	1.20
1994	0	0	0.07	0	0.09	0.03	0.44	0.04	0.02	0	0.70
1995	0	0	0.09	0	0.08	0.05	0.60	0.02	0.01	0	0.85
1996	0	0	0.04	0.01	0.22	0.10	0.87	0.03	0.03	0	1.29
1997	0.02	0	0.40	0	0.28	0.04	0.81	0.06	0.02	0	1.63
1998	0	0	0.01	0	0.27	0.06	0.75	0.10	0.01	0	1.21
1999	0.06	0	0.07	0.06	0.37	0.13	1.18	0.04	0.02	0	1.94
2000	0.08	0	0.11	0.06	0.41	0.17	0.95	0.02	0.02	0	1.79
2001	0.11	0	b	b	1.16	c	0.19	c	0.16	c	1.61
Value ($ millions)											
1992	0	0	0.05	0	0.14	0	0.68	0.01	0.05	0	0.93
1993	0	0	0.02	0	0.09	0.01	0.43	0.01	0.06	0	0.62
1994	0	0	0.04	0	0.04	0.01	0.21	0.01	0.01	0	0.31
1995	0	0	0.05	0	0.03	0.01	0.33	0.01	0.01	0	0.43
1996	0	0	0.03	0	0.10	0.02	0.54	0.01	0.03	0	0.74
1997	0.02	0	0.29	0	0.12	0.01	0.42	0.01	0.02	0	0.88
1998	0	0	0.01	0	0.11	0.01	0.39	0.02	0.01	0	0.55
1999	0.03	0	0.04	0.01	0.20	0.03	0.83	0.01	0.01	0	1.16
2000	0.04	0	0.07	0.01	0.26	0.04	0.78	0	0.01	0	1.22
2001	0.02	0	b	b	0.34	c	0.11	c	0.12	c	0.60

Notes: b - Due to the confidentiality of the data presented, this value has been added to Pacific Cod in the Aleutian Islands.
c - Due to the confidentiality of the data presented, this value has been added to Pacific Cod in the same area.

Source: Alaska Department of Fish and Game (ADF&G) fish tickets and National Marine Fisheries Service (NMFS) observer data, September 2002.

Table 3.9-63. North Pacific groundfish fishery participation measures for Washington inland waters region, 1992-2001.

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Processor employment and payments to labor										
Employment (estimated full time employees [FTEs])[1]	4,928	4,935	4,556	5,385	5,973	4,788	4,780	3,718	3,949	3,787
Payment to labor ($ millions)[2]	322.6	227.1	246.0	304.2	276.0	261.3	231.9	245.8	282.9	317.0
Groundfish processing by regional inshore plants										
Reported tons (thousands)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Product tons (thousands)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Utilization rate (percent)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Product value ($ millions)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Value per ton ($)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Processors owned by regional residents										
Number of processors owned	156	142	142	147	138	126	119	109	118	119
Reported tons (thousands)	2,135	1,993	2,051	2.046	1,958	1,943	1,766	1,553	1,714	1,899
Wholesale value ($ millions)	1,325	897.7	1,030	1,305	1,149	1,113	979.2	1,120	1,284	1,309
Catcher vessels owned by regional residents										
Number of catcher vessels	273	220	245	253	234	252	236	262	271	239
Retained tons (thousands)	551.8	522.0	545.4	559.9	551.5	706.9	555.0	547.1	609.7	692.4
Ex-vessel value ($ millions)	152.6	90.53	106.6	147.9	127.3	212.3	99.70	140.0	188.0	135.6
Employment (persons)	1,312	1,029	1,129	1,240	1,134	1,253	1,130	1,258	1,311	1,238
Payment to labor ($ millions)	61.02	36.21	42.64	59.17	50.91	84.92	39.88	55.99	75.18	54.22

Notes: [1]Includes all employment at all shoreplants located in the region and all employment of at-sea processors (including floaters) owned by residents. In addition the estimate includes administrative employment of all processors owned by residents.
[2]All payments to labor from at-sea processors (including floaters) are assigned to the owners region. On-site payments to labor from shore plants are assigned to the region in which the plant is located.

Source: For processing information, National Marines Fisheries Service (NMFS) blend data and work production report (WPR) data, September 2002 and Northern Economics (1994) internally derived tables. For harvest information, Alaska Department of Fish and Game (ADF&G) fish tickets and NMFS observer data, September 2002. Count information does not include "ghost" entities, while weight information includes "ghost" entities in order to minimize instances where data can not be reported due to NMFS confidentiality provisions. In all cases the values for Ghost Vessels are negligible.

Table 3.9-64. Groundfish reported by Washington inland waters region inshore plants by species group, 1999-2001.

Groundfish reported	Species group				
	A-R-S-O	Flatfish	Pacific cod	Pollock	Total
1999 tons (thousands)	NA	NA	NA	NA	NA
1999 product value ($ millions)	NA	NA	NA	NA	NA
2000 tons (thousands)	NA	NA	NA	NA	NA
2000 product value ($ millions)	NA	NA	NA	NA	NA
2001 tons (thousands)	NA	NA	NA	NA	NA
2001 product value ($ millions)	NA	NA	NA	NA	NA

Source: National Marine Fisheries Service (NMFS) blend data and work production report (WPR) data, September 2002.

Table 3.9-65. Groundfish wholesale value ($ millions) of processor class owned by residents of the Washington inland waters region, 1992-2001.

Processor class	Year									
	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Catcher/processors	769.55	545.92	584.92	708.70	638.37	598.18	532.11	571.07	637.79	631.82
Motherships	92.12	44.06	53.56	74.46	66.52	71.58	58.17	57.92	81.25	86.94
Shoreplants	463.51	308.01	391.97	522.23	444.44	443.68	388.96	490.81	564.61	589.66

Source: Derived tables, Northern Economics (1994), adapted from National Marines Fisheries Service (NMFS) blend data and work production report (WPR) data, September 2002.

Table 3.9-66. Groundfish retained harvest ex-vessel value, catcher vessels owned by Washington inland waters region residents by Fisheries Management Plan subarea, 1999-2001.

Retained harvest	Fishery Management Plan subarea					
	Aleutian Islands	Bering Sea	Western Gulf	Central Gulf	Eastern Gulf	Total
1999 ex-vessel ($ millions)	4.98	106.18	7.69	13.76	7.36	139.97
2000 ex-vessel ($ millions)	7.19	151.81	7.71	11.66	9.59	187.96
2001 ex-vessel ($ millions)	3.53	109.56	5.20	9.94	7.30	135.53

Source: Alaska Department of Fish and Game (ADF&G) fish tickets and National Marine Fisheries Service (NMFS) observer data, September 2002.

Table 3.9-67. Number of boats and retained catch by weight and value, by species group, and by catcher vessel ownership for the Washington inland waters region, 1992-2001.

Data	Year									
	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
A-R-S-O										
Number of catcher vessels	207	178	210	178	185	199	204	205	204	182
Retained tons (thousands)	7.2	4.5	4.7	7.6	6.1	6.3	5.9	6.1	5.7	5.4
Ex-vessel value ($ millions)	15.87	9.76	14.08	28.57	23.72	25.75	15.71	16.58	21.57	19.01
Flatfish										
Number of catcher vessels	85	80	85	109	103	104	105	104	123	101
Retained tons (thousands)	15.2	1.9	10.2	15.4	8.6	27.6	2.6	3.4	4.8	2.6
Ex-vessel value ($ millions)	5.11	0.71	2.30	3.22	1.42	7.79	0.44	0.50	0.77	0.35
Pacific cod										
Number of catcher vessels	164	123	115	167	146	161	153	191	206	181
Retained tons (thousands)	36.3	30.5	40.2	48.5	60.8	74.9	38.7	40.8	47.4	27.2
Ex-vessel value ($ millions)	13.77	9.72	11.48	17.48	20.87	34.08	12.63	21.82	30.56	14.12
Pollock										
Number of catcher vessels	97	76	78	94	93	103	100	109	129	111
Retained tons (thousands)	493.2	485.2	490.3	488.4	475.9	598.1	507.8	496.9	551.7	657.09
Ex-vessel value ($ millions)	117.79	70.33	78.74	98.67	81.27	144.67	70.93	101.07	135.06	102.67
All groundfish species										
Total number of catcher vessels	273	220	245	253	234	252	236	262	271	239
Total retained tons (thousands)	551.8	522.0	545.4	559.9	551.5	706.9	555.0	547.1	609.7	692.3
Total ex-vessel value ($ millions)	152.55	90.53	106.60	147.91	127.28	212.28	99.70	139.97	188	136.15

Source: Alaska Department of Fish and Game (ADF&G) fish tickets and National Marine Fisheries Service (NMFS) observer data, September 2002. Count information does not include "ghost" entities, while weight information includes "ghost" entities in order to minimize instances where data can not be reported due to NMFS confidentiality provisions. In all cases the values for Ghost Vessels are negligible.

Table 3.9-68. Retained harvests by Fisheries Management Plan area and species of Washington inland waters regional catcher vessels, 1992-2001.

Year	Fisheries Management Plan area										Total
	Aleutian Islands		Bering Sea		Western Gulf		Central Gulf		Eastern Gulf		
	Pacific cod	Pollock	Pacific cod	Pollock	Pacific cod	Pollock	Pacific cod	Pollock	Pacific cod	Pollock	
Volume (thousands of tons)											
1992	0.24	16.71	16.83	446.92	8.13	10.99	9.29	20.33	0.05	0	529.48
1993	1.4	15.42	17.27	441.48	3.72	11.38	6.23	18.11	0.19	0.49	515.69
1994	0.03	17.93	28.98	436.35	2.83	12.49	6.12	21.46	0.16	4.12	530.49
1995	0.26	18.56	34.18	437.37	5.84	17.44	9.83	13.05	0.03	0.31	536.87
1996	2.69	10.13	43.26	449.30	4.02	10.77	9.54	6.62	0.04	0.36	536.72
1997	4.9	12.89	47.70	561.91	7.13	13.47	8.86	12.88	0.04	3.24	673
1998	3.23	7.53	23.21	454.88	4.98	14.62	8.82	23.46	0.04	5.75	546.52
1999	5.49	0.01	21.61	462.51	5.91	10.83	10.13	19.99	0.04	1.15	537.67
2000	5.34	0	24.32	536.78	5.48	4.42	8.26	14.01	0.04	0.47	599.11
2001	3.29	0	18.92	634.88	2.78	13.71	2.20	7.76	0.73	a	684.28
Value ($ millions)											
1992	0.09	4.53	6.14	105.79	3.02	2.90	4.18	4.89	0.03	0	131.57
1993	0.43	2.35	5.19	63.91	1.24	1.61	2.38	2.78	0.10	0.08	80.06
1994	0.01	3.01	8.03	69.92	0.88	2.03	2.07	3.52	0.06	0.69	90.22
1995	0.09	3.85	11.61	87.61	2.09	3.52	4.45	2.82	0.02	0.07	116.12
1996	0.89	1.80	14.49	76.25	1.36	2.00	3.88	1.38	0.02	0.08	102.15
1997	2.2	3.94	20.09	138.49	3.00	3.13	4.11	3.04	0.02	0.72	178.75
1998	1.02	1.10	7.34	62.61	1.66	2.03	3.38	3.44	0.02	0.96	83.56
1999	2.82	0	11.02	92.73	3.01	2.32	6.58	4.16	0.03	0.23	122.89
2000	3.47	0	15.15	132.22	3.63	1.11	6.44	3.45	0.03	0.12	165.62
2001	1.81	0	9.57	99.36	1.42	2.08	1.33	1.11	0.11	a	116.79

Notes: a - Due to the confidentiality of the data presented, this value has been added to Pacific cod in the same area.

Source: Alaska Department of Fish and Game (ADF&G) fish tickets and National Marine Fisheries Service (NMFS) observer data, September 2002.

Table 3.9-69. North Pacific groundfish fishery participation measures for Oregon coast region, 1992-2001.

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Processor employment and payments to labor										
Employment (estimated full time employees [FTEs])[1]	45	45	53	53	0	0	0	0	0	0
Payment to labor ($ millions)[2]	2.69	2.77	3.11	2.19	0	0	0	0	0	0
Groundfish processing by regional inshore plants										
Reported tons (thousands)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Product tons (thousands)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Utilization rate (percent)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Product value ($ millions)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Value per ton ($)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Processors owned by regional residents										
Number of processors owned	2	2	2	2	0	0	0	0	0	0
Reported tons (thousands)	0	*	*	*	0	0	0	0	0	0
Wholesale value ($ millions)	0	*	*	*	0	0	0	0	0	0
Catcher vessels owned by regional residents										
Number of catcher vessels	42	33	38	38	36	36	36	39	42	35
Retained tons (thousands)	73.6	72.4	72.8	84.2	78.6	73.0	76.3	74.7	72.6	86.5
Ex-vessel value ($ millions)	22.82	14.89	14.60	22.41	18.98	21.87	15.94	22.78	24.07	18.2
Employment (persons)	201	152	174	178	174	171	172	181	198	175
Payment to labor ($ millions)	9.13	5.96	5.84	8.96	7.59	8.75	6.38	9.11	9.63	7.28

Notes: [1]Includes all employment at all shoreplants located in the region and all employment of at-sea processors (including floaters) owned by residents. In addition the estimate includes administrative employment of all processors owned by residents.
[2]All payments to labor from at-sea processors (including floaters) are assigned to the owners region. On-site payments to labor from shore plants are assigned to the region in which the plant is located.
*Data suppressed due to confidentiality restrictions.
NA - data not available.

Source: For processing information, National Marine Fisheries Service (NMFS) blend data and work production report (WPR) data, September 2002 and Northern Economics (1994) internally derived tables. For harvest information, Alaska Department of Fish and Game (ADF&G) fish tickets and NMFS observer data, September 2002. Count information does not include "ghost" entities, while weight information includes "ghost" entities in order to minimize instances where data can not be reported due to NMFS confidentiality provisions. In all cases the values for Ghost Vessels are negligible.

Table 3.9-70. Groundfish reported by Oregon coast region inshore plants by species group, 1992-2001.

Groundfish reported	Species group				
	A-R-S-O	Flatfish	Pacific cod	Pollock	Total
1999 tons (thousands)	NA	NA	NA	NA	NA
1999 product value ($ millions)	NA	NA	NA	NA	NA
2000 tons (thousands)	NA	NA	NA	NA	NA
2000 product value ($ millions)	NA	NA	NA	NA	NA
2001 tons (thousands)	NA	NA	NA	NA	NA
2001 product value ($ millions)	NA	NA	NA	NA	NA

Notes: NA - data not available.
Source: National Marine Fisheries Service (NMFS) blend data and work production report (WPR) data, September 2002.

Table 3.9-71. Groundfish wholesale value ($ millions) of processor class owned by residents of the Oregon coast region, 1992-2001.

Processor class	Year									
	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Catcher/processors	1.12	1.00	0.52	0.87	0	0	0	0	0	0
Motherships	0	0	0	0	0	0	0	0	0	0
Shoreplants	0	0	0	0	0	0	0	0	0	0

Source: Derived tables, Northern Economics (1994) adapted from National Marine Fisheries Service (NMFS) blend data and work production report (WPR) data, September 2002.

Table 3.9-72. Groundfish retained harvest ex-vessel value, catcher vessels owned by Oregon coast region residents by Fisheries Management Plan subarea, 1999-2001.

Retained harvest	Fishery Management Plan subarea					
	Aleutian Islands	Bering Sea	Western Gulf	Central Gulf	Eastern Gulf	Total
1999 ex-vessel ($ millions)	0	13.16	0.34	9.05	0.22	22.78
2000 ex-vessel ($ millions)	0.01	14.37	0.50	8.86	0.33	24.07
2001 ex-vessel ($ millions)	a	11.72	0.20	6.06	0.20	18.18

Notes: a - Due to the confidentiality of the data presented, this value has been added to the Bering Sea.
Source: Alaska Department of Fish and Game (ADF&G) fish tickets and National Marine Fisheries Service (NMFS) observer data, September 2002.

Table 3.9-73. Number of boats and retained catch by weight and value, by species group, and by catcher vessel ownership for the Oregon coast region, 1992-2001.

Data	Year									
	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
A-R-S-O										
Number of catcher vessels	30	27	30	35	27	29	31	37	35	33
Retained tons (thousands)	0.5	0.4	0.3	0.6	1.6	1.4	1.9	1.5	2.4	2.7
Ex-vessel value ($ millions)	1.19	0.90	0.82	1.87	1.81	1.56	1.16	1.24	1.68	1.26
Flatfish										
Number of catcher vessels	21	17	17	27	18	22	23	29	27	24
Retained tons (thousands)	1.9	1.3	0.7	2.7	1.4	3.1	2.0	1.7	2.2	2.2
Ex-vessel value ($ millions)	0.57	0.41	0.22	0.57	0.54	0.86	0.50	0.35	0.39	0.44
Pacific cod										
Number of catcher vessels	35	25	24	32	27	30	29	31	35	31
Retained tons (thousands)	14.2	15.4	11.1	18.0	18.8	24.1	19.8	18.5	12.7	9.5
Ex-vessel value ($ millions)	6.15	5.16	3.47	6.89	6.58	9.29	6.76	10.23	8.35	5.29
Pollock										
Number of catcher vessels	26	22	20	25	24	24	27	27	26	26
Retained tons (thousands)	57.1	55.2	60.7	62.9	56.8	44.4	52.6	53.0	55.4	71.8
Ex-vessel value ($ millions)	14.91	8.42	10.10	13.08	10.04	10.16	7.51	10.96	13.65	11.21
All groundfish species										
Total number of catcher vessels	42	33	38	38	36	36	36	39	42	35
Total retained tons (thousands)	73.6	72.4	72.8	84.2	78.6	73.0	76.3	74.7	72.6	86.2
Total ex-vessel value ($ millions)	22.82	14.89	14.60	22.41	18.98	21.87	15.94	22.78	24.07	18.20

Source: Alaska Department of Fish and Game (ADF&G) fish tickets and National Marine Fisheries Service (NMFS) observer data, September 2002. Count information does not include "ghost" entities, while weight information includes "ghost" entities in order to minimize instances where data can not be reported due to NMFS confidentiality provisions. In all cases the values for Ghost Vessels are negligible.

Table 3.9-74. Retained harvests by Fisheries Management Plan area and species of Oregon coast regional catcher vessels, 1992-2001.

Year	Fisheries Management Plan area										Total
	Aleutian Islands		Bering Sea		Western Gulf		Central Gulf		Eastern Gulf		
	Pacific cod	Pollock	Pacific cod	Pollock	Pacific cod	Pollock	Pacific cod	Pollock	Pacific cod	Pollock	
Volume (thousands of tons)											
1992	0.22	1.02	3.57	50.86	1.50	1.22	2.74	10.12	0.01	0	71.25
1993	0.09	0.78	6.01	33.87	0.67	2.06	4.48	22.56	0.02	0.10	70.65
1994	0	1.03	5.21	42.66	0.44	1.78	2.48	16.79	0.03	1.36	71.78
1995	0.04	1.03	7.76	58.86	1.02	2.75	3.52	5.89	0.04	0.02	80.93
1996	0.45	0.22	9.74	54.65	0.69	2.37	2.98	4.42	0	0.07	75.60
1997	0.61	0.14	9.36	39.82	1.02	2.62	4.59	10.11	0.02	0.24	68.52
1998	1.57	0.05	8.70	27.68	1.02	4.59	4.49	24.21	0.03	0.12	72.47
1999	1.68	0.03	6.77	34.11	0.73	2.51	5.72	19.81	0.01	0.10	71.47
2000	1.53	0	5.52	44.18	0.62	2.34	2.51	11.1	0.01	0.29	68.1
2001	0	0	3.85	61.58	a	a	5.68	9.39	0.83	b	81.33
Value ($ millions)											
1992	0.1	0.33	1.57	13.61	0.65	0.36	1.49	2.95	0	0	21.06
1993	0.03	0.13	2.02	5.17	0.25	0.30	1.74	3.93	0.01	0.02	13.58
1994	0	0.19	1.59	7.19	0.15	0.30	0.90	3.01	0.01	0.24	13.57
1995	0.01	0.23	2.89	12.73	0.40	0.55	1.72	1.40	0.02	0	19.97
1996	0.16	0.04	3.51	9.85	0.25	0.48	1.31	1.00	0	0.02	16.62
1997	0.28	0.03	3.84	9.38	0.44	0.66	2.26	2.51	0.01	0.05	19.44
1998	0.54	0.01	3.07	3.89	0.38	0.67	1.78	3.90	0.01	0.02	14.28
1999	0.93	0.01	3.70	7.27	0.40	0.58	3.83	4.45	0.01	0.02	21.19
2000	1.07	0	3.78	11.28	0.43	0.62	1.85	2.90	0.01	0.08	22.00
2001	0	0	1.97	9.72	a	a	3.32	1.36	0.13	b	16.50

Notes: a - Due to the confidentiality of the data presented, this value has been added to the same species in Central Gulf.
b - Due to the confidentiality of the data presented, this value has been added to Pacific Cod in the same area.

Source: Alaska Department of Fish and Game (ADF&G) fish tickets and National Marine Fisheries Service (NMFS) observer data, September 2002.

Table 3.9-75. Alaska native percentage of total community population, Alaska community development quota communities, 2000.

Aleutian Pribilof Island Community Development Association	
Akutan	16.4%
Atka	91.3%
False Pass	65.6%
Nelson Lagoon	81.9%
Nikolski	69.2%
Saint George	92.1%
Bristol Bay Economic Development Corporation	
Aleknagik	84.6%
Clark's Point	92.0%
Dillingham	60.9%
Egegik	76.7%
Ekuk	0.0%
Ekwok	93.8%
King Salmon	30.1%
Levelock	95.1%
Manokotak	94.7%
Naknek	47.1%
Pilot Point	86.0%
Port Heiden	78.2%
Portage Creek	86.1%
South Naknek	83.9%
Togiak	92.7%
Twin Hills	94.2%
Ugashik	81.8%
Central Bering Sea Fishermen's Association	
Saint Paul	86.5%
Coastal Villages Fishing Cooperative	
Chefornak	98.0%
Chevak	95.9%
Eek	96.8%
Goodnews Bay	93.9%
Hooper Bay	95.8%
Kipnuk	98.0%
Kongiganak	97.2%
Kwigillingok	97.9%

Coastal Villages Fishing Cooperative (Continued)	
Mekoryuk	96.7%
Napakiak	96.6%
Napaskiak	98.2%
Newtok	96.9%
Nightmute	94.7%
Oscarville	100.0 %
Platinum	92.7%
Quinhagak	97.3%
Scammon Bay	97.4%
Toksook Bay	97.6%
Tuntutuliak	98.9%
Tununak	96.9%
Norton Sound Economic Development Corporation	
Brevig Mission	92.0%
Diomede	93.8%
Elim	94.9%
Gambell	95.8%
Golovin	92.4%
Koyuk	94.3%
Nome	58.7%
Saint Michael	93.2%
Savoonga	95.5%
Shaktoolik	94.8%
Stebbins	94.7%
Teller	92.5%
Unalakleet	87.7%
Wales	90.1%
White Mountain	86.2%
Yukon Delta Fisheries Development Association	
Alakanuk	97.9%
Emmonak	93.9%
Grayling	91.8%
Kotlik	96.1%
Mountain Village	93.5%
Nunam Iqua	93.9%
Total all villages	**86.8%**

Source: U.S. Census Bureau Census 2000.

Table 3.9-76. Community development quota group communities, populations and administrative locations.

Community Development Quota (CDQ) group	Member communities		2000 population[1]	Office locations
APICDA	Akutan Atka False Pass Nelson Lagoon	Nikolski St. George Unalaska[2]	1,143	Juneau Unalaska Staff also in Homer and Anchorage
BBEDC	Aleknagik Ckark's Point Dillingham Egegik Ekuk Ekwok King Salmon/ Savinoski Levelock Manokotak	Naknek Pilot Point Portage Creek Port Heiden South Naknek Togiak Twin Hills Ugashik	5,932	Dillingham Juneau Seattle
CBSFA	St. Paul		532	St. Paul Anchorage
CVRF	Chefornak Chevak Eek Goodnews Bay Hooper Bay Kipnuk Kongiganak Kwigillinook Mekoryuk Mountain Village Napakiak	Napaskiak Newtok Nightmute Oscarville Platinum Quinhagak Scammon Bay Toksook Bay Tuntutuliak Tununak	7,855	Anchorage Bethel
NSEDC	Brevig Mission Diomede/Ignaluk Elim Gambell Golovin Koyuk Nome Savoonga	Shaktoolik St. Michael Stebbins Teller Unalakleet Wales White Mountain	8,488	Anchorage Various
YDFDA	Alakanuk Emmonak Grayling	Kotlik Sheldon Point	3,123	Seattle Seward

Notes: [1]Estimates may include individuals who are not year-round residents.
[2]While not a qualified (CDQ) community, Unalaska is an *ex-officio* member of APICDA.
Source: DCED 2001, U.S. Census, 2000.

Table 3.9-77. Community development quota allocation percentages by species and group, 2001-2002.

Species (and area, if applicable)	Percent of community development quota allocation by group						
	APICDA	BBEDC	CBSFA	CVRF	NSEDC	YDFDA	Total
Pollock							
Bering Sea/Aleutian Islands/Bogoslof	14	21	4	24	23	14	100
Cod							
Pacific cod	16	20	10	17	18	19	100
Sablefish & turbot							
Sablefish, hook & line – Aleutian Islands	15	20	0	30	20	15	100
Turbot-Aleutian Islands	16	20	5	21	20	18	100
Sablefish, hook & line – Bering Sea	15	22	18	0	20	25	100
Turbot – Bering Sea	20	22	7	15	15	21	100
Atka mackerel							
Eastern	30	15	8	15	14	18	100
Central	30	15	8	15	14	18	100
Western	30	15	8	15	14	18	100
Yellowfin sole	28	24	8	6	7	27	100
Flatfish							
Other flatfish	25	23	9	10	10	23	100
Rocksole	24	23	8	11	11	23	100
Flathead	20	20	10	15	15	20	100
Other Species	18	20	10	16	16	20	100
Other rockfish							
O. Rockfish – Bering Sea	25	21	7	12	13	22	100
O. Rockfish – Aleutian Islands	23	17	7	18	17	18	100
Arrowtooth	24	22	9	11	10	24	100
Pacific ocean perch (POP) complex							
True POP – Bering Sea	18	21	7	18	18	18	100
Other POP – Bering Sea	23	18	8	16	16	19	100
True POP – Aleutian Islands							
Eastern	30	15	8	15	14	18	100
Central	30	15	8	15	14	18	100
Western	30	15	8	15	14	18	100
Sharp/Northern – Aleutian Islands	30	15	8	15	14	18	100
Short/rougheye – Aleutian Islands	22	18	7	18	17	18	100
Sablefish, trawl – Aleutian Islands	24	23	9	10	10	24	100
Sablefish, trawl – Bering Sea	17	20	10	17	18	18	100

Table 3.9-77 (cont.). Community development quota allocation percentages by species and group, 2001-2002.

Species (and area, if applicable)	Percent of community development quota allocation by group						
	APICDA	BBEDC	CBSFA	CVRF	NSEDC	YDFDA	Total
Halibut							
4B	100	0	0	0	0	0	100
4C	10	0	90	0	0	0	100
4D	0	26	0	24	30	20	100
4E	0	30	0	70	0	0	100
Crab							
Bristol Bay red king	18	18	10	18	18	18	100
Norton Sound red king	0	0	0	0	50	50	100
Pribilof red & blue king	0	0	100	0	0	0	100
St. Matthew blue king	50	12	0	12	14	12	100
Bering Sea *C. Opilio* Tanner	10	19	19	17	18	17	100
Bering Sea *C. Bairdi* Tanner	10	19	19	17	18	17	100
Prohibited species							
Halibut	22	22	9	12	12	23	100
Chinook salmon	15	21	4	23	23	14	100
Other salmon	15	21	5	23	22	14	100
Opilio	24	22	9	11	10	24	100
***C. Bairdi* – Zone 1**	26	24	8	8	8	26	100
***C. Bairdi* – Zone 2**	23	22	9	12	11	23	100
Red King Crab	29	23	8	7	7	26	100

Source: DCED (2001).

Table 3.9-78. Community development quota allocation amounts by species and group, 2001.

Community development quota (CDQ) species	2001 Total allowable catch	2001 Community development quota allocation	Community development quota group amounts (metric tons)					
			APICDA	BBEDC	CBSFA	CVRF	NSEDC	YDFDA
Bering Sea (BS) fixed gear sablefish	780	156	23	34	28	0	31	39
Aleutian Islands (AI) fixed gear sablefish	1,875	375	56	75	0	113	75	56
BS sablefish	780	59	10	12	6	10	11	11
AI sablefish	625	47	11	11	4	5	5	11
BS pollock - total	1,400,000	140,000	19,600	29,400	5,600	33,600	32,200	19,600
AI pollock	2,000	200	28	42	8	48	46	28
Bogoslof pollock	1,000	100	14	21	4	24	23	14
Pacific cod	188,000	14,100	2,256	2,820	1,410	2,397	2,538	2,679
Western Aleutian Islands (WAI) Atka mackerel	27,900	2,093	628	314	167	314	293	377
Central Aleutian Islands (CAI) Atka mackerel	33,600	2,520	756	378	202	378	353	454
Eastern Aleutian Islands (EAI)/BS Atka mackerel	7,800	585	176	88	47	88	82	105
Yellowfin sole	113,000	8,475	2,373	2,034	678	509	593	2,288
Rock sole	75,000	5,625	1,350	1,294	450	619	619	1,294
BS Greenland turbot	5,628	422	84	93	30	63	63	89
AI Greenland turbot	2,772	208	33	42	10	44	42	37
Arrowtooth flounder	22,011	1,651	396	363	149	182	165	396
Flathead sle	40,000	3,000	600	600	300	450	450	600
Other flatfish	28,000	2,100	525	483	189	210	210	483
BS Pacific ocean perch	1,730	130	23	27	9	23	23	23
WAI Pacific ocean perch	4,740	356	107	53	28	53	50	64
CAI Pacific ocean perch	2,560	192	58	29	15	29	27	35
EAI Pacific ocean perch	2,900	218	65	33	17	33	31	39
BS Other red rockfish	135	10	2	2	1	2	2	2
AI sharpchin/Northern	6,745	506	152	76	40	76	71	91
AI shortraker/rougheye	912	68	15	12	5	12	12	12
BS other rockfish	361	27	7	6	2	3	4	6
AI other rockfish	676	51	12	9	4	9	9	9
Other species	26,500	1,988	358	398	199	318	318	398
Prohibited species								
Zone 1 red king crab (number*)	97,000	7,275	2,110	1,673	582	509	509	1,892
Zone 1 *Bairdi* Tanner crab (number*)	730,000	54,750	14,235	13,140	4,380	4,380	4,380	14,235
Zone 3 *Bairdi* Tanner crab (number*)	2,070,000	155,250	35,708	34,155	13,973	18,630	17,078	35,708
Opilio crab (number*)	4,350,000	326,250	78,300	71,775	29,363	35,888	32,625	78,300
Pacific halibut (metric tons)	4,575	343	75,460	75,460	30,870	41,160	41,160	78,890
Chinook salmon (number*)	41,000	3,075	461	646	123	707	707	431
Non-chinook salmon (number*)	42,000	3,150	473	662	158	725	693	441

Notes: *For prohibited species listed (other than halibut), take is measured in number of individuals rather than by weight.

Table 3.9-79. Harvest quantity of community development quota allocations by species, 1993-2000.

Year	Reported metric tons (thousands)							
	AMCK	FLAT	OTHR	PCOD	PLCK	ROCK	SABL	Total
1993	0.75	0.76	0.20	0.45	126.23	0.04	0.02	128.44
1994	0.00	1.02	0.13	1.77	137.51	0.02	0.00	140.45
1995	0.01	0.40	0.19	0.87	97.39	0.03	0.00	98.90
1996	0.00	0.56	0.10	0.75	92.77	0.01	0.00	94.20
1997	0.02	0.64	0.36	0.44	87.58	0.07	0.09	89.21
1998	1.22	1.31	0.71	2.49	83.97	0.45	0.10	90.24
1999	2.59	4.52	1.93	11.63	100.16	0.96	0.15	121.95
2000	4.79	1.79	3.05	13.48	113.71	1.19	0.16	138.18

Source: National Marine Fisheries Service (NMFS) blend and work production report (WPR) data, June 2001.

Table 3.9-80. Wholesale value of community development quota allocations by species, 1993-2000.

Year	$ Millions							
	AMCK	FLAT	OTHR	PCOD	PLCK	ROCK	SABL	Total
1993	0.69	0.16	0.00	0.16	47.06	0.03	0.05	48.14
1994	0.00	0.10	0.00	0.59	60.36	0.00	0.00	61.05
1995	0.00	0.00	0.00	0.12	56.82	0.00	0.00	56.94
1996	0.00	0.01	0.00	0.08	51.71	0.00	0.00	51.80
1997	0.00	0.43	0.00	0.10	50.66	0.02	0.48	51.68
1998	0.43	0.65	0.00	2.00	43.10	0.16	0.35	46.70
1999	1.08	1.60	0.06	13.39	76.70	0.47	0.78	94.07
2000	2.06	0.72	0.03	16.01	91.66	0.55	0.77	111.80

Source: National Marine Fisheries Service (NMFS) blend and work production report (WPR) data, June 2001.

Table 3.9-81. Wholesale value[1] of community development quota allocations by target fishery and month, 1999-2000.

Year	Month	$ Millions							
		AMCK	FLAT	OTHR	PCOD	PLCK	ROCK	SABL	Total
1999	Jan	0.00	0.00	0.00	0.01	2.01	0.00	0.00	2.02
	Feb	0.00	0.00	0.00	0.00	28.87	0.00	0.00	28.87
	Mar	0.00	0.11	0.00	0.00	14.08	0.00	0.00	14.20
	Apr	0.00	0.00	0.00	0.52	0.00	0.00	0.00	0.52
	May	0.47	0.07	0.00	2.96	0.00	0.07	0.01	3.58
	Jun	0.70	0.05	0.00	0.89	0.00	0.05	0.18	1.86
	Jul	0.14	0.14	0.01	0.01	8.15	0.04	0.15	8.65
	Aug	0.04	0.02	0.02	1.46	4.21	0.07	0.13	5.95
	Sep	0.16	0.37	0.00	2.24	12.52	0.00	0.15	15.43
	Oct	0.01	0.28	0.00	0.85	4.10	0.00	0.12	5.36
	Nov	0.16	0.99	0.00	3.01	2.70	0.02	0.00	6.88
	Dec	0.00	0.09	0.00	0.67	0.00	0.00	0.00	0.76
2000	Jan	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Feb	0.00	0.00	0.00	0.00	23.18	0.00	0.00	23.18
	Mar	0.00	0.00	0.00	3.67	23.88	0.00	0.00	27.55
	Apr	0.00	0.05	0.00	5.71	2.59	0.00	0.06	8.41
	May	0.81	0.09	0.00	1.50	0.00	0.00	0.11	2.52
	Jun	0.25	0.50	0.00	0.24	0.00	0.00	0.00	0.99
	Jul	0.89	0.19	0.00	0.62	7.37	0.00	0.13	9.21
	Aug	0.39	0.02	0.00	1.41	10.79	0.00	0.00	12.61
	Sep	0.00	0.00	0.01	0.39	12.16	0.00	0.18	12.73
	Oct	0.00	0.00	0.00	0.00	10.79	0.00	0.07	10.86
	Nov	0.55	0.00	0.00	0.22	0.93	0.05	0.01	1.75
	Dec	0.02	0.00	0.00	1.81	0.00	0.16	0.00	1.99

Notes: [1]Value shown is the total value of all species caught by the target fishery.
Source: National Marine Fisheries Service (NMFS) blend and work production report (WPR) data, June 2001.

Table 3.9-82. Vessel acquisitions by community development quota groups as of 2000.

Community development quota (CDQ) Group	Vessel acquisitions (percent ownership in parentheses and vessel class in brackets)
APICDA	• Starbound (20%) 240' pollock factory trawler (fillet trawl catcher/processorss [FT-CP]). • Bering Prowler (25%) 124' longline vessel harvesting Pacific cod and sablefish (longline catcher/processorss [L-CP]). • Prowler (25%) 114' longline vessel harvesting Pacific cod and sablefish [L-CP]. • Golden Dawn (25%) 148' catcher vessel harvesting Pacific cod, pollock and crab (trawl catcher vessel Bering Sea pollock [TCV BSP = 125]). • Ocean Prowler (20%) 155' longline-processing vessel harvesting Pacific cod and sablefish [L-CP]. • Farwest Leader (25%) 105' pot vessel harvesting crab and Pacific cod (pot catcher vessel [PCV]). • Stardust (100%) 56' longline vessel harvesting Pacific cod and halibut (fixed gear catcher vessel [FGCV 33-59]). • Bonanza (100%) 38' longline vessel harvesting halibut [FGCV 33-59]. • AP#1, AP#2, AP#3 (100%) 36' longline vessels harvesting halibut and Pacific cod [GHOST or unclassified]. • AP#4, AP#5 (100%) 35.5' longline vessels harvesting halibut and Pacific cod [GHOST or unclassified]. • Konrad 1 (75%) 58' trawler/pot/tender vessel harvesting Pacific cod and pollock, salmon tender [TCV < 60]. • Nikka D (100%) 28' vessel harvesting halibut [unclassified]. • Agusta D (100%) 28' sportfishing charter vessel [unclassified]. • Grand Aleutian (100%) 32' sportfishing charter vessel [unclassified].
BBEDC	• Arctic Fjord (20%) 270' pollock factory trawler (Surimi trawl catcher/processors [ST-CP]). • Bristol Leader (50%) 167' longline vessel harvesting Pacific cod, halibut and sablefish [L-CP]. • Neahkahnie (20%) 110' pollock catcher/processors [TCV BSP 60-124]. • Northern Mariner (45%) crab vessel [PCV]. • Bristol Mariner (45%) 125' crab vessel [PCV]. • Nordic Mariner (45%) 121' crab vessel [PCV]. • Cascade Mariner (40%) 100' crab vessel [unclassified].
CBSFA	• American Seafoods, LP (22.5%) which owns the following 270-340' catcher/processors harvesting pollock, Pacific cod, yellowfin sole and rock sole: American Dynasty [ST-CP], Katie Ann [FT-CP], Northern Eagle [ST-CP], Ocean Rover [ST-CP], Northern Jaeger [ST-CP], American Triumph [ST-CP] and Northern Hawk [ST-CP] . • Zolotoi (20%) 98' crab vessel [PCV]. • Ocean Cape (35%) 98' crab vessel [FGCV 33-59].
CVRF	• American Seafoods, LP (22.5%) which owns the following 270-340' catcher/processorss harvesting pollock, Pacific cod, yellowfin sole and rock sole: American Dynasty [ST-CP], Katie Ann [FT-CP], Northern Eagle [ST-CP], Ocean Rover [ST-CP], Northern Jaeger [ST-CP], American Triumph [ST-CP] and Northern Hawk [ST-CP]. • Ocean Prowler (20%) 155' longline-processing vessel harvesting Pacific cod and sablefish [L-CP]. • Ocean Harvester (45%) 58' longline vessel harvesting halibut and Pacific cod [LCV]. • Silver Spray (50%) 116' crab vessel and Pacific cod freezer boat [P-CP].
NSEDC	• Glacier Fish Company (50%) which owns the following 201-276' catcher/processorss harvesting pollock and Pacific cod: Northern Glacier [FT-CP] and Pacific Glacier [ST-CP]. • Norton Sound (49%) 139' longline vessel [L-CP]. • Golovin Bay (100%) tender [unclassified]. • Norton Bay (100%) tender [unclassified].
YDFDA	• Emmonak Leader (75%) 103' catcher vessel harvesting pollock [TCV BSP 60-124]. • Alakanuk Beauty (75%) 105' catcher vessel harvesting pollock [TCV BSP 60-124]. • Golden Alaska (19.6%) 308' pollock mothership [MS]. • Blue Dolphin (100%) 47' longline/crab vessel [FGCV 33-59]. • Lisa Marie (100%) 78' trawl/pot/longline vessel [PCV].

Source: DCED (2001).

Table 3.9-83. Inshore processing plant acquisitions by community development quota groups as of 2000.

Community development quota (CDQ) Group	Inshore plant acquisitions (percent ownership in parentheses)
APICDA	• Atka Pride Seafoods, Inc. (100%) processes halibut. • Bering Pacific Seafoods (50%) processes Pacific cod, salmon and other species.
NSEDC	• Norton Sound Seafood Products (100%) processes mainly salmon. • Norton Sound Crab Company (100%) processes mainly crab.

Source: DCED (2001).

Table 3.9-84. Quantity of groundfish processed by catcher/processor vessels and onshore plants in which community development quota groups currently have an equity interest, 1999-2000.

Year	Source of Harvest	AMCK	FLAT	ROCK	OTHR	PCOD	PLCK	SABL	Total
1999	Non-community development quota (CDQ) (1,000 metric tons [mt])	0.00	10.46	0.09	2.63	18.79	211.14	0.33	243.45
	CDQ (1,000 mt)	0.00	0.52	0.03	0.86	5.42	66.55	0.05	73.43
	CDQ tons as % of total	15.4%	4.7%	23.0%	24.6%	22.4%	24.0%	13.8%	23.2%
2000	Non-CDQ (1,000 mt)	0.00	11.80	0.09	4.14	15.44	240.57	0.26	272.31
	CDQ (1,000 mt)	0.01	0.85	0.03	2.09	8.22	91.78	0.05	103.02
	CDQ tons as % of total	98.8%	6.7%	22.8%	33.5%	34.7%	27.6%	16.1%	27.4%

Source: NMFS Blend Data, June 2001; DCED (2001).

Table 3.9-85. Wholesale product value of groundfish processed by catcher/processors vessels and inshore plants in which community development quota groups currently have an equity interest, 1999-2000.

Year	Source of harvests	AMCK	FLAT	ROCK	OTHR	PCOD	PLCK	SABL	Total
1999	Non-community development quota (CDQ) ($ millions)	0.00	2.16	0.09	0.03	19.99	161.10	1.45	184.82
	CDQ ($ millions)	0.00	0.17	0.01	0.04	6.15	50.46	0.23	57.06
	CDQ value as % of total	0.0%	7.3%	11.5%	58.9%	23.5%	23.9%	13.5%	23.6%
2000	Non-CDQ ($ millions)	0.00	2.20	0.10	0.07	17.77	192.91	1.19	214.25
	CDQ ($ millions)	0.00	0.21	0.01	0.01	9.66	73.64	0.23	83.77
	CDQ value as % of total	77.1%	8.8%	9.0%	17.4%	35.2%	27.6%	16.4%	28.1%

Source: NMFS Blend Data, June 2001; DCED (2001).

Table 3.9-86. Quantity and ex-vessel value of groundfish harvested by catcher vessels in which community development quota groups currently have an equity interest, 1999-2000.

Year	AMCK	FLAT	ROCK	OTHR	PCOD	PLCK	SABL	Total
Retained tons (thousands)								
1999	0.04	0.04	0.01	0.00	2.17	30.13	0.14	32.54
2000	0.00	0.03	0.01	0.01	2.04	30.97	0.11	33.16
Ex-vessel value ($ millions)								
1999	0.00	0.02	0.02	0.00	1.14	5.84	0.57	7.59
2000	0.00	0.01	0.01	0.00	1.34	7.18	0.55	9.09

Source: NMFS Blend Data and Weekly Reports, June 2001; DCED (2001).

Table 3.9-87. Community development quota employment and wages for all groups, 1993-2000[1].

	1993	1994	1995	1996	1997	1998	1999	2000
Number of persons working								
Management/ administration	26	48	58	63	63	79	96	155
Community development quota (CDQ) pollock-related	186	213	228	261	227	443	244	297
Other fisheries	64	276	393	691	629	634	786	1,146
Other employment	95	531	157	138	130	194	213	236
Total	371	1,068	836	1,153	1,049	1,350	1,339	1,834
Total wages ($)								
Management/ administration	586,537	1,012,125	1,218,892	1,636,860	1,803,766	2,284,792	2,661,976	3,084,757
CDQ pollock-related	1,000,360	1,280,695	1,866,619	1,686,104	2,660,938	2,649,001	2,149,062	1,741,871
Other fisheries	609,058	1,000,103	1,132,824	2,280,554	2,756,688	2,075,495	4,201,775	5,959,516
Other employment	0	1,791,479	1,350,766	723,724	887,338	1,167,173	1,573,358	1,723,054
Total	2,195,955	5,084,402	5,569,101	6,327,242	8,108,730	8,176,461	10,586,171	12,509,198

Notes: [1]Employment figures may not represent full-time positions. In addition, some double-counting of employment and wages may have occurred in the compilation of data for quarterly reports.
Source: DCED (2001).

Table 3.9-88. Community development quota wages compared with total adjusted gross income in community development quota communities, 1997-1999.

Year	Total adjusted gross income	Community development quota (CDQ) wages*	CDQ wages as a percentage of total adjusted gross income
1997	$242,200,000	$8,108,730	3.3%
1998	$252,600,000	$8,176,461	3.2%
1999	$259,800,000	$10,586,171	4.1%

Notes: *Includes management and administration wages.
Sources: DCED (2001); Internal Revenue Service.

Table 3.9-89. Community development quota wages compared with total adjusted gross income in community development quota communities, by community development quota, 1997-1999.

	APICDA	BBEDC	CBSFA	CVRF	NSEDC	YDFDA
1997						
Community development quota (CDQ) wages*	$1,343,950	$1,480,979	$223,201	$1,193,590	$1,252,493	$1,831,355
Total adjusted gross income	$11,115,000	$74,730,000	$8,517,000	$33,381,000	$97,171,000	$17,256,000
CDQ wages as a percentage of total adjusted gross income	12.09%	1.98%	2.62%	3.58%	1.29%	10.61%
1998						
CDQ wages*	$1,061,750	$1,317,694	$714,288	$1,645,402	$1,663,439	$1,773,888
Total adjusted gross income	$10,209,000	$80,655,000	$8,010,000	$35,719,000	$100,375,000	$17,659,000
CDQ wages as a percentage of total adjusted gross income	10.40%	1.63%	8.92%	4.61%	1.66%	10.05%

Notes: *- Includes management and administration wages.
Sources: DCED (2001); Internal Revenue Service; Regional Economic Information System.

Table 3.9-90. Documented total community subsistence harvest and relative dependence on Steller sea lion harvest[1], Alaskan coastal communities.

Community	Region	Year	Total community subsistence harvest (edible pounds)	Steller sea lion		
				Number harvested	Edible pounds	% Community harvest
Alakanuk	W	1980	431,904	9	1,200	0.3%
Quinhagek	W	1982	536,584	16	2,286	0.4%
Sitka	SE	1996	1,749,772	2	400	0.0%
Chenega Bay	SC	1993	27,809	12	997	3.6%
Nanwalek	SC	1997	42,593	5	1,048	2.5%
Tatitluk	SC	1997	322,915	19	3,712	1.1%
Akhiok	SW	1992	25,735	3	600	2.3%
Akutan	SW	1990	47,397	38	7,688	16.2%
Aleknagik	SW	1989	54,079	2	221	0.4%
Atka	SW	1994	37,307	44	8,700	23.3%
False Pass	SW	1988	28,586	1	220	0.8%
Iliamna	SW	1991	82,915	1	130	0.2%
Ivanof Bay	SW	1989	15,677	1	150	1.0%
Manokotak	SW	1985	118,337	16	1,639	1.4%
Nikolski	SW	1990	36,945	26	5,143	13.9%
Old Harbor	SW	1997	88,851	37	7,442	8.4%
Ouzinkie	SW	1997	55,015	1	264	0.5%
Perryville	SW	1989	45,729	11	2,067	4.5%
Port Lions	SW	1993	78,371	2	356	0.5%
Saint George	SW	1994	11,330	3	556	4.9%
Saint Paul	SW	1994	131,814	141	28,214	21.4%
Unalaska	SW	1994	355,081	72	14,423	4.1%

Notes: [1]Numbers are for the "most typical" year for which information is available. ADF&G does only limited surveys and subsistence use can vary greatly from year-to-year. Communities with documented use but no harvest are not included. Numbers differ from, and are not included in, ADF&G 1997a; both are estimates based on samples.

Source: ADF&G CPDB, 2001b.

Table 3.9-91. Estimated subsistence take of Steller sea lions, by area in Alaska.

Area	Year							
	1992	1993	1994	1995	1996	1997	1998	2000[6]
Southeast Alaska	6	1	5	0	0	0	8	2[1]
North Pacific Rim	32	35	26	31	14	6	29	17[2]
Upper Kenai-Cook Inlet	10	11	1	0	3	0	0	0[3]
Kodiak Island	58	58	61	137	60	38	18	19
South Alaska Peninsula	2	6	6	8	5	8	9	14
Aleutian Islands	135	124	122	96	58	52	37	76[4]
Pribilof Islands	297	245	193	68	46	56	78	78[5]
South Bristol Bay	0	0	0	0	0	0	0	0
North Bristol Bay	8	7	1	0	0	4	0	0
TOTAL	548	487	415	340	186	164	179	206

Notes: [1]Harvest from Hydaburg for 2000 based on harvest from 1998.
[2]Harvest from Valdez for 2000 based on harvest from 1998.
[3]Harvest for entire region (Anchorage, Homer, Kenai, Tyonek) for 2000 based on harvest from 1998.
[4]Harvest for Atka and Nikolski for 2000 based on harvest for 1998.
[5]Harvest for entire region (St. George and St. Paul) for 2000 based on harvest for 1998.
[6]See text for discussion of 2000 estimates based on 1998 harvest
Source: ADF&G 2001a, values rounded to nearest integer.

Table 3.9-92. Estimated subsistence take of Steller sea lions, Aleutian and Pribilof communities[1,2].

Community	Year							
	1992	1993	1994	1995	1996	1997	1998	2000
Atka	39	25	54	40	17	12	17	17[3]
Akutan	30	23	16	6	16	6	6	5
Ivanof Bay	0	4	0	0	2	2	2	0
King Cove	1	1	4	5	0	4	4	4
Nikolski	8	6	0	0	3	3	1	1[1]
Perryville	1	0	1	3	3	2	1	5
Saint George	70	19	20	8	8	28	20	20[1]
Saint Paul	227	227	173	60	38	28	58	58[1]
Sand Point	0	0	0	0	0	0	2	5
Unalaska	59	43	42	47	22	30	13	53
TOTAL	434	344	309	166	109	115	122	168

Notes: [1]Numbers in this table have been rounded to the nearest integer.
[2]Numbers differ from, and are not included in, ADF&G CPDB, 2002. Both are estimates based on samples.
[3]Harvest for 2000 is assumed to be the same as for 1998 (see text).
Source: ADF&G 1995, 1996, 1997a, 1997b, 1998, 1999, 2001a.

Table 3.9-93. Estimated take of Steller sea lions, Kodiak and southcentral Alaska communities[1,2].

Community	Year							
	1992	1993	1994	1995	1996	1997	1998	2000
Tatitlek	13	5	16	3	5	4	22	2
Akhiok	4	0	3	2	7	8	3	3
Kodiak City	0	13	1	2	3	3	1	2
Larsen Bay	1	0	2	3	0	0	0	0
Old Harbor	46	33	48	113	50	26	13	13
Ouzinkie	3	8	7	16	0	0	0	0
Port Lions	3	5	0	0	0	1	1	0
Total	70	64	77	139	65	42	40	20

Notes: [1]Numbers in this table have been rounded to the nearest integer.
[2]Numbers differ from, and are not included in, ADF&G CPDB, 2002. Both are estimates based on samples.
Source: ADF&G 1995, 1996, 1997a, 1997b, 1998, 1999, 2001a.

Table 3.9-94. 1999 Subsistence salmon harvests by community Yukon Management area.

Community	Households/ permits total	Community	Households/ permits total
Alakanuk	128	Kotlik	90
Alatna	12	Koyukuk	38
Allakaket	54	Manley Hot Springs	16
Anvik	40	Marshall	68
Beaver	32	Minto	65
Bettles	20	Mountain Village	151
Birch Creek	14	Nenana	33
Central	12	Nulato	100
Chalkyitsik	35	Nunam Iqua (Sheldon's Point)	35
Circle	21	Pilot Station	95
Eagle	65	Pitka's Point	26
Emmonak	157	Rampart	29
Fairbanks	95	Ruby	73
Fort Yukon	173	Russian Mission	57
Galena	183	Saint Mary's	118
Grayling	51	Scammon Bay	76
Healy	8	Shageluk	32
Holy Cross	66	Stevens Village	31
Hooper Bay	194	Tanana	122
Hughes	24	Venetie	54
Huslia	84	Other Alaska Communities	54
Kaltag	57	**Totals**	**2,888**

Source: ADF&G 2001.

Table 3.9-95. Historic subsistence salmon harvests: Yukon management area.

Year	Estimated salmon harvest				
	Chinook	Summer chum	Fall chum	Coho	Total
1990	48,587	115,609	167,900	43,460	375,556
1991	46,773	118,540	145,524	37,388	348,225
1992	47,077	142,192	107,808	51,980	349,057
1993	63,915	125,574	76,882	15,812	282,183
1994	53,902	124,807	123,565	41,775	344,049
1995	50,620	136,083	130,860	28,377	345,940
1996	45,671	124,738	129,258	30,404	330,071
1997	57,117	112,820	95,141	23,945	289,023
1998	54,124	87,366	62,901	18,121	222,512
1999	50,515	79,250	83,420	19,984	233,169
1975-1999 Average	42,113	184,387	136,889	29,713	365,499
1990-1999 Average	51,830	116,698	112,326	31,125	311,978
1995-1999 Average	51,609	108,051	100,316	24,166	284,143

Source: ADF&G 2001

Table 3.9-96. 1999 Subsistence salmon harvests by community, Kuskokwim area.

Community	Households/ Permits total	Community	Households/ permits total
Akiachak	119	**Napakiak**	73
Akiak	58	**Napaskiak**	74
Aniak	163	**Newtok**	80
Atmautluak	53	**Nightmute**	67
Bethel	1,508	**Nikolai**	29
Chefornak	94	**Nunapitchuk**	100
Chuathbaluk	28	**Oscarville**	15
Crooked Creek	30	**Platinum**	19
Eek	67	**Quinhagak**	132
Goodnews Bay	53	**Red Devil**	18
Kalskag (Upper)	53	**Sleetmute**	35
Kasigluk	136	**Stony River**	16
Kipnuk	176	**Takotna**	14
Kongiganak	71	**Telida**	2
Kwethluk	142	**Toksook Bay**	133
Kwigillingok	95	**Tuluksak**	72
Lime Village	17	**Tuntutuliak**	74
Lower Kalskag	63	**Tununak**	109
McGrath	100	**Totals**	**4,180**
Mekoryuk	92		

Source: ADF&G 2001

Table 3.9-97. Historic subsistence salmon harvest, Kuskokwim area.

Year	Estimated salmon harvest					
	Chinook	Sockeye	Chum	Coho	"Small salmon"	Total salmon
1990	92,678	39,662	131,469	50,713	221,844	314,522
1991	90,224	56,404	96,308	55,581	208,293	298,517
1992	68,665	34,159	99,576	44,496	178,231	246,896
1993	91,721	51,363	61,726	35,295	148,384	240,105
1994	98,378	39,279	76,951	36,504	152,734	251,112
1995	100,159	28,622	68,942	39,165	136,729	236,888
1996	81,598	35,036	90,238	34,698	159,972	241,570
1997	85,506	41,270	40,976	30,714	112,960	198,466
1998	86,115	37,578	67,665	27,239	132,482	218,597
1999	77,660	49,388	47,612	27,753	124,753	202,413
1960-1999 Average	57,887	NA	NA	NA	186,232	244,118
1990-1999 Average	87,270	41,276	78,146	38,216	157,638	244,909
1995-1999 Average	86,208	38,379	63,087	31,914	133,379	219,587

Notes: NA - data not available.
Source: ADF&G 2001.

Table 3.9-98. Ethnic composition of population for selected Alaska Peninsula/Aleutian Islands region communities, 2000.

Race/ethnicity	Unalaska		Akutan		King Cove		Sand Point	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
White	1,893	44.2%	168	23.6%	119	15.0%	264	27.7%
Black or African American	157	3.7%	15	2.2%	13	1.6%	14	1.5%
Native American/ Alaska Native	330	7.7%	112	15.7%	370	46.7%	403	42.3%
Native Hawaiian/ other Pacific islander	24	0.6%	2	0.3%	1	0.1%	3	0.3%
Asian	1,312	30.6%	275	38.6%	212	26.8%	221	23.2%
Some other race	399	9.3%	130	18.2%	47	5.9%	21	2.2%
Two or more races	168	3.9%	11	1.5%	30	3.8%	26	2.7%
Total	4,283	100%	713	100%	792	100%	952	100%
Hispanic[1]	551	12.9%	148	20.8%	59	7.4%	129	13.6%

Notes: [1]Hispanic is an ethnic category and may include individuals of any race and, therefore, is not included in the total as this would result in double counting).
Source: U.S. Bureau of Census.

Table 3.9-99. Household income information for selected Alaska Peninsula/Aleutian Island region communities, 2000.

Community	Total housing units	Vacant housing units	Total house-holds	Average persons per house-	Median house-hold income	Family house-holds	Average family size	Median family income
Akutan	38	4	34	2.21	$33,750	18	3.00	$43,125
King Cove	207	37	170	2.90	$45,893	117	3.53	$47,188
Sand Point	282	53	229	2.67	$55,417	156	3.17	$58,000
Unalaska	988	154	834	2.51	$69,539	476	3.27	$80,829

Source: U.S. Bureau of Census.

Table 3.9-100. Employment and poverty information for selected Alaska Peninsula/Aleutian Island region communities, 1990.

Community	Total persons employed	Unemployed	Percent unemployment	Percent adults not working	Not seeking employment	Percent poverty
Akutan	527	2	0.4%	7.4%	40	16.6%
King Cove	276	5	1.8%	24.0%	82	10.0%
Sand Point	438	13	2.9%	32.1%	194	12.5%
Unalaska	2,518	26	1.0%	7.8%	186	15.3%

Source: U.S. Bureau of Census.

Table 3.9-101. Employment and poverty information, selected Alaska Peninsula/Aleutian Island region communities, 2000.

Community	Total persons employed	Unemployed	Percent unemployment	Percent adults not working	Not seeking employment	Percent poverty
Akutan	97	505	78.9%	84.84%	38	45.5%
King Cove	450	31	4.7%	31.50%	176	11.9%
Sand Point	427	190	22.8%	48.67%	215	16.0%
Unalaska	2,675	414	11.1%	27.93%	625	12.5%

Source: U.S. Bureau of Census

Table 3.9-102. Ethnicity and group quarters housing information, Unalaska, 1990.

Race/ethnicity	Total population		Group quarters population		Non-group quarters population	
	Number	Percent	Number	Percent	Number	Percent
White	1,917	62.06%	870	53.90%	1,047	70.98%
Black	63	2.04%	55	3.41%	8	0.54%
American Indian, Eskimo, Aleut	259	8.38%	20	1.24%	239	16.20%
Asian or Pacific Islander	593	19.20%	434	26.89%	159	10.78%
Other race	257	8.32%	235	14.56%	22	1.49%
Total Population	3,089	100%	1,614	100%	1,475	100%
Hispanic origin, any race	394	12.75%	337	20.88%	57	3.86%
Total Minority Population	1,252	40.53%	795	49.26%	457	30.98%
Total Non-Minority Population (White Non-Hispanic)	1,837	59.47%	819	50.74%	1,018	69.02%

Source: Census 1990 STF2

Table 3.9-103. Ethnicity and group quarters housing information, Unalaska, 2000.

Race/ethnicity	Total population		Group quarters population		Non-group quarters population	
	Number	Percent	Number	Percent	Number	Percent
White	1,893	44.19%	665	30.34%	1,228	58.73%
Black or African American	157	3.67%	146	6.66%	11	0.53%
Alaska Native/Native American	330	7.71%	62	2.83%	268	12.82%
Native Hawaiian/Other Pacific islander	24	0.56%	22	1.00%	2	0.10%
Asian	1,312	30.63%	931	42.47%	381	18.22%
Some other rRace	399	9.32%	318	14.51%	81	3.87%
Two or more races	168	3.92%	48	2.19%	120	5.74%
Unknown	0	0%	0	0%	0	0%
Total	4,283	100%	2,192	100%	2,091	100%
Hispanic[1]	551	12.86%	372	16.97%	179	8.56%

Notes: [1]Hispanic is an ethnic category and may include individuals of any race (and therefore is not included in the total as this would result in double counting). Hispanic group quarter populations data from the 2000 Census were not broken down by individual racial categories. As a consequence, the total minority population (all populations other than non-Hispanic Whites) cannot be calculated as it could for 1990 data.
Source: U.S. Census, 2000.

Table 3.9-104. Population by age and sex for Unalaska: 1970, 1980, 1990, and 2000.

	1970		1980		1990		2000	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Male	98	55%	858	65%	2,194	71%	2,830	66%
Female	80	45%	464	35%	895	29%	1,453	34%
Total	178	100%	1,322	100%	3,089	100%	4,283	100%
Median age	26.3 years		26.8 years		30.3 years		36.5 years	

Source: U.S. Bureau of Census.

Table 3.9-105. Ethnicity and group quarters housing information, Akutan, 1990.

Race/ethnicity	Total population		Group quarters population		Non-group quarters population	
	Number	Percent	Number	Percent	Number	Percent
White	227	37.52%	212	42.32%	15	17.05%
Black	6	0.99%	6	1.20%	0	0.00%
American Indian, Eskimo, Aleut	80	13.22%	7	1.40%	73	82.95%
Asian or Pacific islander	247	40.83%	247	49.30%	0	0.00%
Other race	29	4.79%	29	5.79%	0	0.00%
Total population	589	100%	501	100%	88	100%
Hispanic origin, any race	45	7.44%	45	8.98%	0	0.00%
Total minority population	342	56.53%	298	59.48%	73	82.95%
Total non-minority population (White non-Hispanic)	247	40.83%	203	40.52%	15	17.05%

Source: Census 1990 STF2.

Table 3.9-106. Ethnicity and group quarters housing information, Akutan, 2000.

Race/ethnicity	Total population		Group quarters population		Non-group quarters population	
	Number	Percent	Number	Percent	Number	Percent
White	168	23.56%	158	24.76%	10	13.33%
Black or African American	15	2.10%	15	2.35%	0	0%
Alaska Native/Native American	112	15.71%	47	7.37%	65	86.66%
Native Hawaiian/Other Pacific islander	2	0.28%	2	0.31%	0	0%
Asian	275	38.57%	275	43.10%	0	0%
Some other race	130	18.23%	130	20.38%	0	0%
Two or more races	11	1.54%	11	1.72%	0	0%
Unknown	0	0%	0	0%	0	0%
Total	713	100.00%	638	100.00%	75	100.00%
Hispanic[1]	148	20.76%	148	23.20%	0	0%

Notes: [1]Hispanic is an ethnic category and may include individuals of any race (and therefore is not included in the total as this would result in double counting).
Source: U.S. Census, 2000.

Table 3.9-107. Population by age and sex, Akutan: 1990 and 2000.

	1990		2000	
	Number	Percent	Number	Percent
Male	449	76%	549	77%
Female	140	24%	164	23%
Total	589	100%	713	100%
Median age	NA		40.2 years	

Notes: NA - data not available.
Source: U.S. Bureau of Census.

Table 3.9-108. Ethnicity and group quarters housing information, King Cove, 1990.

Race/ethnicity	Total population		Group quarters population		Non-group quarters population	
	Number	Percent	Number	Percent	Number	Percent
White	127	28.16%	57	30.16%	70	26.72%
Black	6	1.33%	6	3.17%	0	0.00%
American Indian, Eskimo, Aleut	177	39.25%	1	0.53%	176	67.18%
Asian or Pacific islander	125	27.72%	109	57.67%	16	6.11%
Other race	16	3.55%	16	8.47%	0	0.00%
Total population	451	100%	189	100%	262	100%
Hispanic origin, any race	53	11.75%	53	28.04%	0	0.00%
Total minority population	331	73.39%	139	73.54%	192	73.28%
Total non-minority population (White non-Hispanic)	120	26.61%	50	26.46%	70	26.72%

Source: Census 1990 STF2.

Table 3.9-109. Ethnicity and group quarters housing information, King Cove, 2000.

Race/ethnicity	Total population		Group quarters population		Non-group quarters population	
	Number	Percent	Number	Percent	Number	Percent
White	119	15.02%	37	12.37%	82	16.63%
Black or African American	13	1.64%	0	0%	0	0%
Alaska Native/Native American	370	46.72%	1	0.33%	369	74.85%
Native Hawaiian/Other Pacific islander	1	0.13%	0	0%	0	0%
Asian	212	26.77%	192	64.21%	20	4.06%
Some other Race	47	5.93%	0	0%	0	0%
Two or more races	30	3.79%	0	0%	0	0%
Unknown	0	0%	69	23.07%	22	4.46%
Total	792	100.00%	299	100.00%	493	100.00%
Hispanic[1]	59	74.49%	52	17.39%	7	1.42%

Notes: [1]Hispanic is an ethnic category and may include individuals of any race (and therefore is not included in the total as this would result in double counting).
Source: U.S. Census, 2000.

Table 3.9-110. Population by age and sex for King Cove: 1990 and 2000.

	1990		2000	
	Number	Percent	Number	Percent
Male	292	65%	472	60%
Female	159	35%	320	40%
Total	451	100%	792	100%
Median age	NA		34.9 Years	

Notes: NA - data not available.
Source: U.S. Bureau of Census.

Table 3.9-111. Ethnicity and group quarters housing information for Sand Point, 1990.

Race/ethnicity	Total population		Group quarters population		Non-group quarters population	
	Number	Percent	Number	Percent	Number	Percent
White	284	32.35%	48	25.40%	236	34.25%
Black	4	0.46%	4	2.12%	0	0.00%
American Indian, Eskimo, Aleut	433	49.32%	3	1.59%	430	62.41%
Asian or Pacific Islander	87	9.91%	80	42.33%	7	1.02%
Other race	70	7.97%	54	28.57%	16	2.32%
Total population	878	100%	189	100%	689	100%
Hispanic origin, any race	78	8.88%	58	30.69%	20	2.90%
Total minority population	601	68.45%	146	77.24%	455	66.04%
Total non-minority population (White non-Hispanic)	277	31.55%	43	22.76%	234	33.96%

Source: Census 1990 STF2.

Table 3.9-112. Ethnicity and group quarters housing information, Sand Point, 2000.

Race/ethnicity	Total population		Group quarters population		Non-group quarters population	
	Number	Percent	Number	Percent	Number	Percent
White	264	27.73%	104	30.59%	160	26.14%
Black or African American	14	1.47%	0	0%	0	0%
Alaska Native/Native American	403	42.33%	0	0%	403	65.85%
Native Hawaiian/other Pacific islander	3	0.32%	0	0%	0	0%
Asian	221	23.21%	209	61.47%	12	1.96%
Some other race	21	2.21%	0	0%	0	0%
Two or more races	26	2.73%	0	0%	0	0%
Unknown	0	0%	27	7.94%	37	6.04%
Total	952	100.00%	340	100.00%	612	100.00%
Hispanic[1]	129	13.55%	90	26.47%	39	6.37%

Notes: [1]Hispanic is an ethnic category and may include individuals of any race (and therefore is not included in the total as this would result in double counting).
Source: U.S. Census, 2000.

Table 3.9-113. Population by age and sex for Sand Point: 1990 and 2000.

	1990		2000	
	N	%	N	%
Male	557	63%	593	62%
Female	321	37%	359	38%
Total	878	100%	952	100%
Median age	NA		36.5 Years	

Notes: NA - data not available.
Source: U.S. Bureau of Census.

Table 3.9-114. Ethnic composition of population Kodiak City, 2000.

Race/ethnicity	2000	
	N	%
White	2,939	46.4%
Black or African American	44	0.7%
Native American/Alaska Native	663	10.5%
Native Hawaiian/other Pacific islander	59	0.9%
Asian	2,010	31.7%
Some other race	276	4.3%
Two or more races	343	5.4%
Total	6,334	100%
Hispanic[1]	541	8.5%

Notes: [1]Hispanic is an ethnic category and may include individuals of any race (and therefore is not included in the total as this would result in double counting).
Source: U.S. Bureau of Census.

Table 3.9-115 Household income information, selected Kodiak region communities, 2000.

Community	Total housing units	Vacant housing units	Total households	Average persons per household	Median household income	Family households	Average family size	Median family income
Kodiak	2,255	259	1,996	3.10	$55,142	1,362	3.64	$60,484
Kodiak Island Borough	5,159	735	4,424	3.07	$54,636	3,257	3.52	$58,834

Source: U.S. Bureau of the Census.

Table 3.9-116. Employment and poverty information, selected Kodiak region communities, 2000.

Community	Total persons employed	Unemployed	Percent unemployment	Percent adults not working	Not seeking employment	Percent poverty
Kodiak	3,053	160	3.6	29.62	1,170	7.4
Kodiak Island Borough	6,131	335	3.4	29.27	2,532	6.6

Source: U.S. Bureau of the Census.

Table 3.9-117. Ethnicity and group quarters housing information for Kodiak, 1990.

Race/ethnicity	Total population		Group quarters population		Non-group quarters population	
	Number	Percent	Number	Percent	Number	Percent
White	4,028	63.28%	192	53.93%	3,836	63.84%
Black	29	0.46%	3	0.84%	26	0.43%
American Indian, Eskimo, Aleut	811	12.74%	21	5.90%	790	13.15%
Asian or Pacific islander	1,282	20.14%	118	33.15%	1,164	19.37%
Other race	197	3.10%	22	6.18%	175	2.91%
Total population	6,365	100%	356	100%	6,009	100%
Hispanic origin, any race	407	6.39%	42	11.80%	365	6.07%
Total minority population	2,429	38.16%	181	50.84%	2,248	37.41%
Total non-minority population (White non-Hispanic)	3,936	61.84%	175	49.16%	3,761	62.59%

Source: Census 1990 STF2.

Table 3.9-118. Ethnicity and group quarters housing information for Kodiak, 2000.

Race/ethnicity	Total population		Group quarters population		Non-group quarters population	
	Number	Percent	Number	Percent	Number	Percent
White	2,939	46.40%	69	54.33%	2,861	46.23%
Black or African American	44	0.69%	0	0%	0	0%
Alaska Native/Native American	663	10.47%	10	7.87%	644	10.41%
Native Hawaiian/other Pacific islander	59	0.93%	0	0%	0	0%
Asian	2,010	31.73%	28	22.05%	1,982	32.03%
Some other race	276	4.36%	8	6.30%	268	4.33%
Two or more races	343	5.42%	5	3.94%	338	5.46%
Unknown	0	0%	7	5.51%	95	1.53%
Total	6,334	100.00%	127	100.00%	6,188	100.00%
Hispanic[1]	541	8.54%	17	13.39%	524	8.47%

Notes: [1]Hispanic is an ethnic category and may include individuals of any race (and therefore is not included in the total as this would result in double counting).
Source: U.S. Census, 2000.

Table 3.9-119. Population by age and sex, Kodiak City: 1990 and 2000.

	1990		2000	
	N	%	N	%
Male	3,496	55%	3,379	53%
Female	2,869	45%	2,955	47%
Total	6,363	100%	6,334	100%
Median age	NA		33.5 years	

Source: U.S. Bureau of the Census.

Table 3.9-120. Ethnic composition of population, Seattle-Tacoma consolidated metropolitan statistical area, 1990 and 2000.

Race/ethnicity	1990		2000	
	N	%	N	%
White	2,214,579	86.5%	2,819,296	79.3%
Black or African American	121,702	4.8%	165,938	4.7%
Native American/Alaska Native	32,980	1.3%	41,731	1.2%
Asian/Pacific islands[1]	164,386	6.4%	300,533	8.5%
Other[2]	25,517	1.0%	227,263	6.4%
Total	2,559,164	100%	3,554,760	100%
Hispanic[3]	71,069	2.8%	184,297	5.2%
Total minority population	383,198	15.0%	816,858	23.0%
Total non-minority population	2,175,966	85.0%	2,737,902	77.0%

Notes: [1]In the 2000 census, this was split into Native Hawaiian and Other Pacific Islander (pop 19,837 [0.6%]) and Asian (pop 280,696 [7.9%])
[2]In the 2000 census, this category was Some Other Race (pop 79,353 [2.2%]) and Two or More Races (pop 147,910 [4.2%]).
[3]Hispanic is an ethnic category and may include individuals of any race (and therefore is not included in the total as this would result in double counting).

Source: U.S. Bureau of Census.

Table 3.9-121. Ethnic composition of workforce for catcher/processor entities reporting detailed demographic information, 2000.

Race/ethnicity	2000	
	Number of workers	Percentage of workers
White non-Hispanic	704	36.9%
Hispanic	585	30.7%
Black or African American	121	6.3%
Alaska Native/Native American	164	8.6%
Asian/Pacific islands	310	16.3%
Other	22	1.2%
Total	1,906	100%

Source: Individual catcher-processor entities contacted through the At-Sea Processors Association, 2001.

Table 3.9-122. Percent of total weight of primary products obtained from Alaska groundfish fisheries by species or species group, 1992-2001.

Species	Year	Fillets	Whole/gut-and-head (G&H)/Kirimi	G&H&roe/roe	Meal/oil/other	Minced	Surimi	Total Product Weight (1,000's metric tons [mt])
		(Percent of total product weight)						
A-R-S-O	1992	0.1	97.5	0.0	0.9	0.2	1.3	64.2
	1993	0.1	99.0	0.0	0.9	0.0	0.0	72.9
	1994	0.1	96.5	0.0	1.0	0.0	2.3	61.3
	1995	0.4	96.4	0.0	1.1	0.0	2.1	62.8
	1996	0.6	97.5	0.0	0.7	0.0	1.1	83.2
	1997	0.9	93.6	0.0	2.2	0.0	3.3	55.4
	1998	2.0	94.4	0.0	1.5	0.0	2.2	51.0
	1999	1.5	96.1	0.6	1.2	0.0	0.5	59.5
	2000	2.6	94.8	0.0	2.0	0.0	0.6	49.0
	2001	2.3	94.5	0.0	2.6	0.0	0.6	51.1
FLAT	1992	3.8	82.4	11.4	2.0	0.0	0.4	83.6
	1993	2.5	82.8	13.0	1.6	0.0	0.0	81.4
	1994	1.7	83.3	13.0	1.5	0.0	0.5	92.8
	1995	2.2	86.1	8.5	2.5	0.0	0.7	95.3
	1996	2.6	85.2	9.2	3.0	0.0	0.0	92.3
	1997	1.5	86.7	8.7	1.7	0.0	1.4	126.2
	1998	1.4	88.4	9.0	1.3	0.0	0.0	82.4
	1999	1.3	83.7	12.7	2.0	0.0	0.3	57.1
	2000	2.4	84.9	10.5	1.6	0.0	0.6	73.0
	2001	2.3	82.6	11.7	3.4	0.0	0.0	59.0
PCOD	1992	13.6	72.9	1.8	9.0	2.4	0.3	110.0
	1993	16.8	64.7	2.4	13.4	2.7	0.1	74.5
	1994	16.1	68.1	2.1	11.3	2.4	0.1	82.6
	1995	17.7	60.1	3.3	15.1	2.6	1.3	108.6
	1996	17.1	59.4	3.4	17.3	2.6	0.2	112.9
	1997	19.9	60.3	3.5	12.7	2.4	1.1	123.2
	1998	18.2	65.0	3.5	10.9	1.3	1.2	100.7
	1999	16.3	66.7	2.5	12.9	0.8	0.7	106.5
	2000	15.3	68.8	3.4	11.2	0.7	0.5	110.1
	2001	10.0	73.8	3.2	12.0	0.7	0.4	93.3

Table 3.9-122 (cont.). Percent of total weight of primary products obtained from Alaska groundfish fisheries by species or species group, 1992-2001.

Species	Year	Fillets	Whole/gut-and-head (G&H)/Kirimi	G&H&roe/roe	Meal/oil/other	Minced	Surimi	Total Product Weight (1,000's metric tons [mt])
		(Percent of total product weight)						
PLCK	1992	13.7	2.4	5.6	21.7	4.7	52.0	318.2
	1993	21.5	1.8	3.8	20.6	5.2	47.3	318.3
	1994	17.9	0.7	3.6	20.1	4.0	53.7	335.2
	1995	17.9	1.1	4.8	19.8	2.9	53.5	333.2
	1996	19.2	1.2	4.6	19.2	4.5	51.2	314.0
	1997	15.4	1.3	6.3	19.7	3.2	54.1	295.5
	1998	21.0	3.2	4.0	19.7	5.5	46.6	317.4
	1999	18.7	3.8	3.7	21.7	3.1	49.0	313.1
	2000	17.2	3.8	4.2	19.6	3.6	51.7	369.4
	2001	23.8	3.2	5.0	20.5	6.5	41.0	452.8

Source: NOAA Fisheries Weekly Production Reports.

Table 3.9-123. Percent of total wholesale value of primary products obtained from Alaska groundfish fisheries by species or species group, 1992-2001.

Species	Year	Fillets	Whole/gut-and-head (G&H)/Kirimi	G&H&roe/roe	Meal/oil/other	Minced	Surimi	Total wholesale value ($ millions)
		Percent of total product wholesale value						
A-R-S-O	1992	0.2	98.3	0.0	0.3	0.0	1.2	172.8
	1993	0.2	99.4	0.0	0.5	0.0	0.0	179.3
	1994	0.2	97.8	0.0	0.7	0.0	1.3	165.7
	1995	0.8	97.4	0.0	0.4	0.0	1.4	186.1
	1996	1.0	98.2	0.0	0.3	0.0	0.5	192.5
	1997	1.5	96.1	0.0	0.6	0.0	1.8	151.9
	1998	4.3	93.9	0.0	1.1	0.0	0.8	103.7
	1999	2.6	96.1	0.1	1.0	0.0	0.3	115.4
	2000	4.1	94.5	0.0	1.1	0.0	0.4	122.7
	2001	3.2	94.2	0.0	2.3	0.0	0.3	132.1
FLAT	1992	9.9	60.2	28.4	0.7	0.0	0.8	105.6
	1993	8.2	67.3	23.9	0.7	0.0	0.0	115.4
	1994	5.4	59.7	33.5	0.4	0.0	0.9	135.2
	1995	7.5	68.6	22.1	0.9	0.0	0.9	136.9
	1996	8.7	67.1	23.5	0.6	0.0	0.0	135.2
	1997	5.7	71.8	19.7	0.7	0.0	2.0	134.5
	1998	6.8	74.1	18.3	0.7	0.0	0.0	85.4
	1999	4.3	70.6	23.2	0.7	0.0	1.1	72.6
	2000	9.3	69.4	19.2	0.7	0.0	1.4	92.2
	2001	7.1	68.4	22.6	1.9	0.0	0.0	66.1
PCOD	1992	28.9	56.5	1.7	11.0	1.3	0.6	223.9
	1993	34.5	48.4	2.4	13.6	1.1	0.0	145.4
	1994	31.0	57.8	1.8	8.3	1.0	0.1	153.1
	1995	36.3	44.8	2.7	13.8	1.0	1.4	217.8
	1996	32.1	47.8	2.7	16.2	1.1	0.1	225.1
	1997	43.6	42.6	2.7	9.0	1.2	0.9	226.1
	1998	32.7	56.3	2.1	7.8	0.5	0.6	228.6
	1999	31.2	57.4	1.8	9.0	0.3	0.3	306.4
	2000	29.3	60.0	2.7	7.5	0.3	0.2	314.2
	2001	15.4	66.8	5.5	11.8	0.3	0.2	235.3

Table 3.9-123 (cont.). Percent of total wholesale value of primary products obtained from Alaska groundfish fisheries by species or species group, 1992-2001.

Species	Year	Fillets	Whole/gut-and-head (G&H)/Kirimi	G&H&roe/roe	Meal/oil/other	Minced	Surimi	Total wholesale value ($ millions)
		Percent of total product wholesale value						
PLCK	1992	12.2	0.6	22.0	3.6	1.8	59.8	925.4
	1993	23.9	0.3	22.7	5.3	2.6	45.2	555.5
	1994	19.3	0.3	20.0	4.5	1.7	54.2	674.7
	1995	17.5	0.4	25.4	4.0	1.1	51.7	850.3
	1996	22.5	0.5	25.7	5.1	2.3	44.0	678.5
	1997	16.6	0.4	24.0	4.8	1.4	52.9	686.9
	1998	29.2	1.0	13.3	8.2	3.2	45.1	632.9
	1999	26.4	1.0	19.4	5.5	1.5	46.2	720.7
	2000	22.7	1.1	20.9	4.8	1.7	48.7	863.6
	2001	22.6	1.2	35.4	6.0	4.0	30.8	970.1

Source: NOAA Fisheries Weekly Production Reports.

Table 3.9-124. Categories of possible economic values assigned to a species or ecosystem.

Economic value	Description
Use value	
Consumptive direct use value	Value derived from extractive activities.
Non-consumptive direct use value	Value gained through activities such as observing a species or ecosystem.
Scientific value	Value stemming from new information about medicine, genetics or other areas of scientific research resulting from the study of a species or ecosystem.
Indirect value	Value of the ecological functions and services of a species or ecosystem that indirectly provides support and protection to people, economic activity, and property.
Non-use value	
Bequest value	Value derived from the knowledge that a species or ecosystem will be preserved for future generations.
Existence value	Value emanating from the satisfaction of knowing that a particular species or ecosystem survives in a natural state.

Sources: Bishop 1987; Cocheba 1987; Mendelsohn 1985; Mitchell and Carson 1989; Pearce and Moran 1994; Randall 1986.

Table 3.9-125. Past/present effects for harvesting and processing sector.

Catcher vessels

Direct/indirect effect	Past/present events		Past/present management actions		Comparative baseline
	External	Internal	External	Internal	
Number and type of vessels	• Changes in domestic and foreign demand for groundfish products (e.g., development of Japanese surimi market and processing technology during 1980's; collapse of Atlantic cod fisheries in 1990's). • Changes in economic conditions in other Alaska fisheries (e.g., changes in economic conditions in other Alaska fisheries) (e.g., collapse of Bering Sea and Aleutian Islands [BSAI] and Kodiak Island crab fisheries in 1980's and 1990's; high profits in salmon fisheries in late 1980's-early 1990's). • Changes in economic conditions in coastal communities (e.g., construction and operation of marine transportation facilities).	• Domestic and foreign private sector investment in groundfish fisheries. • Consolidation occurs in sablefish and halibut longline fleets and BSAI pollock fleet.	• In mid-1970's, State of Alaska implemented limited entry program for salmon and other state-managed fisheries. • 1980 American Fisheries Promotion Act required that allocations of fish quotas to foreign nations be based on nations' contributions to development of United States (U.S.) fishing industry. • U.S. Fishing Vessel/Fisheries Obligation Guarantee Program lowered capital investment costs. • In 1983, Secretary of Commerce disapproved proposed moratorium on new vessels entering Alaska halibut fishery. • In 1995, halibut longline fishery individual fishing quota (IFQ) program created incentives for a reduction in fleet size. • 1996 Sustainable Fisheries Act established Fishing Capacity Reduction Program. • 1996 Sustainable Fisheries Act directed National Academy of Sciences to convene Committee to Review IFQs.	• 1976 Magnuson-Stevens Act (MSA) and Fishery Management Plan (FMP) measures phased out foreign fishing activities by establishing total allowable level of foreign fishing (TALFF), domestic annual processing (DAP), and domestic annual harvesting (DAH). • In 1992, BSAI and Gulf of Alaska (GOA) pollock total allowable catch (TAC) and GOA Pacific cod TAC allocated between inshore and offshore sectors. • In 1994, BSAI Pacific cod TAC allocated among harvesting sectors. • In 1995, sablefish longline fishery IFQ program created incentives for a reduction in fleet size. • In 1995, moratorium established on new harvesting vessels entering groundfish fisheries. • 1998 North Pacific License Limitation Program partially stabilized groundfish fisheries and defines potential classes of persons eligible for fishing privileges under future rationalization programs.	• The number of catcher vessels in the groundfish fisheries was 917 in 2001. 100 vessels were American Fisheries Act (AFA)-eligible. Acronyms used below Trawl catcher vessel (TCV) Bering Sea pollock (BSP) Pot catcher vessel (PCV) Fixed gear catcher vessel (FGCV) Vessel type — Number TCV BSP ≥ 125 — 29 TCV BSP 60-124 — 51 TCV Div. AFA — 20 TCV Non-AFA — 42 TCV < 60 — 44 PCV — 89 LCV — 72 FGCV 33-59 — 514 FGCV ≤32 — 56 • Significant excess capacity remained in some Alaska groundfish fisheries.

Table 3.9-125 (cont.). Past/present effects for harvesting and processing sector.

Direct/indirect effect	Past/present events		Past/present management actions		Comparative baseline
	External	Internal	External	Internal	
Number and type of vessels (cont.)	See previous row.	See previous row.	• 1996 Sustainable Fisheries Act established a moratorium on IFQ programs. Moratorium expires in 2002. • In 1999, Food and Agriculture Organization (FAO) Committee on Fisheries established International Plan of Action for the Management of Fishing Capacity.	• 1998 AFA authorizes the creation of various cooperatives of Alaska pollock producers.	See previous row.
Vessel ownership	• Changes in economic conditions in coastal communities (e.g., construction and operation of marine transportation facilities).	• Regional private sector investment in groundfish fisheries. • Transfer of salmon licenses from Alaska to non-Alaska residents. • Transfer of sablefish and halibut longline fishery quota shares from non-Alaska to Alaska residents.	• In mid-1970's, State of Alaska implemented limited entry program for salmon and other state-managed fisheries. • In 1995, North Pacific Fishery Management Council (NPFMC) established halibut longline fishery IFQ program. • 1987 Commercial Fishing Industry Vessel Anti-Reflagging Act required fishing and processing vessels to have at least 50% U.S. ownership. • 1998 AFA required fishing and processing vessels to have at least 75% U.S. ownership.	• National Standard 4 of MSA prohibits management measures from discriminating between residents of different states. • Western Alaska community development quota (CDQ) program encouraged investment by Alaska residents in groundfish fisheries. • In 1995, sablefish longline fishery IFQ program established.	• In 2001, 40% of the catcher vessels were owned by residents of the Southcentral Alaska (AKSC) and Southeast Alaska (AKSE) Regions; 26% of vessel owners were from the Washington Inland Waters (WAIW) Region.

Table 3.9-125 (cont.). Past/present effects for harvesting and processing sector.

Direct/indirect effect	Past/present events		Past/present management actions		Comparative baseline
	External	Internal	External	Internal	
Groundfish caught and retained by species group	• Changes in domestic and foreign demand for groundfish products (e.g., development of Japanese surimi market and processing technology during 1980's; collapse of Atlantic cod fisheries in 1990's). • Collapse of GOA rockfish fishery in 1970's.		• In 2000, injunction issued by U.S. District Court prohibited fishing with trawl gear in Steller sea lion critical habitat.	• In 1970's and 1980's, prohibited species catch limits established that constrain harvests in some groundfish fisheries. • In 1984, BSAI optimal yeild (OY) cap implemented and framework procedure established for the determination and apportionment of amounts of groundfish specified for TAC, DAH, reserves, and TALFF. • 1998 AFA allocated BSAI pollock quota as follows - 10% to the western Alaska CDQ program, with the remainder allocated 50% to inshore sector, 40% to offshore sector and 10% to mothership sector.	• In 2001, the quantity of groundfish landed by catcher vessels and retained by processors was 909 thousand metric tons (mt) with an ex-vessel value of $287 million. Acronyms used below Atka mackerel - rockfish - sablefish - other groundfish species (A-R-S-O) Flatfish (FLAT) Pacific cod (PCOD) Pollock (PLCK) Species group / Percent of total groundfish ex-vessel value A-R-S-O 18.2 FLAT 1.3 PCOD 12.4 PLCK 68.2

Table 3.9-125 (cont.). Past/present effects for harvesting and processing sector.

Direct/indirect effect	Past/present events		Past/present management actions		Comparative baseline
	External	Internal	External	Internal	
Groundfish caught and retained by FMP subarea			• In 2000, injunction issued by U.S. District Court prohibited fishing with trawl gear in Steller sea lion critical habitat.	• In 1984, BSAI OY cap implemented and framework procedure established for the determination and. • apportionment of amounts of groundfish specified for TAC. • In 1980's and 1990's, no-trawl zones established to protect crab fisheries. • In 1990's and 2000's, area closures established to protect Steller sea lions • In 1996, use of trawl gear in southeast (SE) Alaska groundfish fisheries prohibited. • In 1999, Aleutian Islands (AI) pollock TAC reduced and target fishery closed to protect Steller sea lions.	Acronyms used below Aleutian Islands (AI) Bering Sea (BS) Western GOA (WG) Central GOA (CG) Eastern GOA (EG) FMP subarea — Percent of total groundfish landed AI 2.3 BS 58.1 WG 7.1 CG 19.5 EG 13.0
Ex-vessel value of groundfish retained	• Changes in domestic and foreign demand for groundfish products (e.g., development of Japanese surimi market and processing technology during 1980's; collapse of Atlantic cod fisheries in 1990's).	• Domestic and foreign private sector investment in groundfish fisheries. • IFQ program allows catcher vessels participating in sablefish longline fishery to increase their bargaining power with processors and to time harvests to meet specific market demands. • Establishment of cooperatives in the BSAI pollock fishery leads to improvements in product quality.	• Implementation of Hazard Analysis and Critical Control Point (HACCP) regulations and international standards related to seafood quality (e.g., International Organization for Standards [ISO] 9001 2000).	• In 1995, sablefish longline fishery IFQ program established. • 1998 AFA authorized the creation of various cooperatives of Alaska pollock producers.	• In 2001, the ex-vessel value of the groundfish landed by catcher vessels and retained by processors was $287 million.

Table 3.9-125 (cont.). Past/present effects for harvesting and processing sector.

Direct/indirect effect	Past/present events		Past/present management actions		Comparative baseline
	External	Internal	External	Internal	
Dependence on groundfish fisheries	• Changes in domestic and foreign demand for groundfish products (e.g., development of Japanese surimi market and processing technology during 1980's; collapse of Atlantic cod fisheries in 1990's). • Changes in economic conditions in other Alaska fisheries (e.g., collapse of BSAI and Kodiak Island crab fisheries in 1980's and 1990's; high profits in salmon fisheries in late 1980's-early 1990's; collapse of salmon fisheries in late 1990's).		• Establishment of limited access programs in non-groundfish fisheries in Alaska and elsewhere.		• In 1999, groundfish accounted for 50% of the ex-vessel value of the landings of catcher vessels participating in groundfish fisheries.
Employment	• Changes in domestic and foreign demand for groundfish products (e.g., development of Japanese surimi market and processing technology during 1980's; collapse of Atlantic cod fisheries in 1990's). • Changes in economic conditions in other Alaska fisheries (e.g., collapse of BSAI and Kodiak Island crab fisheries in 1980's and 1990's; high profits in salmon fisheries in late 1980's-early 1990's; collapse of salmon fisheries in late 1990's).	• Domestic and foreign private sector investment in groundfish fisheries. • Consolidation occurs in sablefish and halibut longline fleets and BSAI pollock fleet.		• In 1995, sablefish longline fishery IFQ program established. • 1998 AFA authorized the creation of various cooperatives of Alaska pollock producers.	• In 2001, the catcher vessel sector created 1,997 full time employee (FTE) positions.

Table 3.9-125 (cont.). Past/present effects for harvesting and processing sector.

Direct/indirect effect	Past/present events		Past/present management actions		Comparative baseline
	External	Internal	External	Internal	
Payments to labor	• Changes in domestic and foreign demand for groundfish products (e.g., development of Japanese surimi market and processing technology during 1980's; collapse of Atlantic cod fisheries in 1990's). • Changes in economic conditions in other Alaska fisheries (e.g., collapse of BSAI and Kodiak Island crab fisheries in 1980's and 1990's; high profits in salmon fisheries in late 1980's-early 1990's; collapse of salmon fisheries in late 1990's).	• Domestic and foreign private sector investment in groundfish fisheries. • Consolidation occurs in sablefish and halibut longline fleets and BSAI pollock fleet.		• In 1995, sablefish longline fishery IFQ program established. • 1998 AFA authorized the creation of various cooperatives of Alaska pollock producers.	• In 2001, the catcher vessel sector generated $115 million in labor income.

Table 3.9-125 (cont.). Past/present effects for harvesting and processing sector.

Direct/indirect effect	Past/present events		Past/present management actions		Comparative baseline
	External	Internal	External	Internal	
Average costs	• Changes in marine diesel fuel prices. • Changes in fishing technology. • Changes in state, borough and community taxes levied on fish landings.	• Consolidation occurs in sablefish and halibut longline fleets and BSAI pollock fleet and operating efficiency of these fleets increases.	• Various permit and license fees established by the State of Alaska.	• North Pacific Groundfish Observer Program established. • MSA authorized National Oceanic and Atmospheric Administration (NOAA) Fisheries to collect a fee to recover the costs directly related to the management and enforcement of an IFQ program. • 1988 Commercial Fishing Industry Vessel Safety Act and other safety initiatives implemented. • In 1995, sablefish longline fishery IFQ program established. • In 1980's and 1990's, no-trawl zones established to protect crab fisheries. • In 1990's and 2000's, area closures established to protect Steller sea lions. • 1998 AFA authorized the creation of various cooperatives of Alaska pollock producers.	• Firm-level cost data are unavailable.

Table 3.9-125 (cont.). Past/present effects for harvesting and processing sector.

Direct/indirect effect	Past/present events		Past/present management actions		Comparative baseline
	External	Internal	External	Internal	
Safety of human life at sea		• Activities organized by fishing vessel owner associations (e.g., North Pacific Fishing Vessel Owners' Association) have improved vessel safety. • With the end of race for fish, participants in sablefish longline fishery and BSAI pollock fishery adopt safer fishing practices.	• 1988 Commercial Fishing Industry Vessel Safety Act and other safety initiatives implemented. • U.S. Coast Guard (USCG) "Ready for Sea" program implemented.	• In 1995, sablefish longline fishery IFQ program established. • 1998 AFA authorized the creation of various cooperatives of Alaska pollock producers.	• An average of 16 persons were lost annually in Alaska fisheries in the 1990's.

Table 3.9-125 (cont.). Past/present effects for harvesting and processing sector.

Catcher/processors

Direct/indirect effect	Past/present events		Past/present management actions		Comparative baseline
	External	Internal	External	Internal	
Number and type of vessels	• Changes in domestic and foreign demand for groundfish products (e.g., development of Japanese surimi market and processing technology during 1980's; collapse of Atlantic cod fisheries in 1990's). • Changes in economic conditions in other Alaska fisheries (e.g., Changes in economic conditions in other Alaska fisheries (e.g., collapse of BSAI and Kodiak Island crab fisheries in 1980's and 1990's). • Changes in economic conditions in coastal communities (e.g., construction and operation of marine transportation facilities).	• Domestic and foreign private sector investment in groundfish fisheries. • Consolidation occurs in BSAI pollock fleet.	• 1980 American Fisheries Promotion Act required that allocations of fish quotas to foreign nations be based on nations' contributions to development of U.S. fishing industry. • U.S. Fishing Vessel/Fisheries Obligation Guarantee Program lowered capital investment costs. • 1996 Sustainable Fisheries Act established Fishing Capacity Reduction Program. • 1996 Sustainable Fisheries Act directed National Academy of Sciences to convene Committee to Review IFQs. • 1996 Sustainable Fisheries Act established a moratorium on IFQ programs. Moratorium expired in 2002. • In 1999, FAO Committee on Fisheries established International Plan of Action for the Management of Fishing Capacity.	• 1976 MSA and FMP measures phased out foreign fishing activities by establishing TALFF, DAP, and DAH. • In 1991, pollock roe is prohibited as a primary product. • In 1992, BSAI and GOA pollock TAC and GOA Pacific cod TAC allocated between inshore and offshore sectors. • In 1994, BSAI Pacific cod TAC allocated among harvesting sectors. • In 1995, moratorium established on new harvesting vessels entering groundfish fisheries.	• The number of catcher processors in the groundfish fisheries was 89 in 2001. 16 vessels were AFA-eligible. Acronyms used below Surimi trawl catcher processor (ST-CP) Fillet trawl catcher processor (FT-CP) head-and-gut trawl catcher processor (HT-CP) Pot catcher processor (P-CP) Longline catcher processor (L-CP) Vessel type — Number ST-CP 12 FT-CP 4 HT-CP 23 P-CP 7 L-CP 43 • Significant excess capacity remained in some Alaska groundfish fisheries.

Table 3.9-125 (cont.). Past/present effects for harvesting and processing sector.

Direct/indirect effect	Past/present events		Past/present management actions		Comparative baseline
	External	Internal	External	Internal	
Number and type of vessels (cont.)	See previous row.	See previous row.	See previous row.	• 1998 North Pacific License Limitation Program partially stabilized groundfish fisheries and defines potential classes of persons eligible for fishing privileges under future rationalization programs. • 1998 AFA authorized the buy-out of nine catcher processors. • 1998 AFA authorized the creation of various cooperatives of Alaska pollock producers.	See previous row.
Vessel ownership	• Changes in economic conditions in coastal communities (e.g., construction and operation of marine transportation facilities).	• Regional private sector investment in groundfish fisheries.	• 1987 Commercial Fishing Industry Vessel Anti-Reflagging Act required fishing and processing vessels to have at least 50% U.S. ownership. • 1998 AFA required fishing and processing vessels to have at least 75% U.S. ownership.	• National Standard 4 of MSA prohibits management measures from discriminating between residents of different states. • Western Alaska CDQ program encouraged investment by Alaska residents in groundfish fisheries.	• In 2001, 79% of vessel owners were from the WAIW Region.

Table 3.9-125 (cont.). Past/present effects for harvesting and processing sector.

Direct/indirect effect	Past/present events		Past/present management actions		Comparative baseline
	External	Internal	External	Internal	
Groundfish caught by species group	• Changes in domestic and foreign demand for groundfish products (e.g., development of Japanese surimi market and processing technology during 1980's; collapse of Atlantic cod fisheries in 1990's). • Collapse of GOA rockfish fishery in 1970's.		• In 2000, injunction issued by U.S. District Court prohibited fishing with trawl gear in Steller sea lion critical habitat.	• In 1970's and 1980's, prohibited species catch limits established that constrain harvests in some groundfish fisheries. • In 1984, BSAI OY cap implemented and framework procedure established for the determination and apportionment of amounts of groundfish specified for TAC, DAH, reserves, and TALFF. • In 1991, pollock roe is prohibited as a primary product. • 1998 AFA allocated BSAI pollock quota as follows - 10% to the western Alaska CDQ program, with the remainder allocated 50% to inshore sector, 40% to offshore sector and 10% to mothership sector. • 1998 AFA restricted AFA-eligible vessels from shifting their fishing effort into other fisheries.	• In 2001, the quantity of groundfish caught by catcher processors was 1,066 thousand mt. Species group / Percent of groundfish caught A-R-S-O 11.6 FLAT 10.8 PCOD 24.7 PLCK 53.0

Table 3.9-125 (cont.). Past/present effects for harvesting and processing sector.

Direct/indirect effect	Past/present events		Past/present management actions		Comparative baseline
	External	Internal	External	Internal	
Groundfish caught by FMP subarea			• In 2000, injunction issued by U.S. District Court prohibited fishing with trawl gear in Steller sea lion critical habitat.	• In 1984, BSAI OY cap implemented and framework procedure established for the determination and apportionment of amounts of groundfish specified for TAC. • In 1980's and 1990's, no-trawl zones established to protect crab fisheries. • In 1990's and 2000's, area closures established to protect Steller sea lions. • In 1996, use of trawl gear in SE Alaska groundfish fisheries prohibited. • In 1999, AI pollock TAC reduced and target fishery closed to protect Steller sea lions.	FMP subarea / Percent of total groundfish caught BSAI 97.1 GOA 2.9
Quantity and value of groundfish products	• Changes in domestic and foreign demand for groundfish products (e.g., development of Japanese surimi market and processing technology during 1980's; collapse of Atlantic cod fisheries in 1990's).	• Domestic and foreign private sector investment in groundfish fisheries. • Under IFQ program, freezer longline vessels participating in sablefish longline fishery allows them to time harvests to meet specific market demands. • Establishment of cooperatives in the BSAI pollock fishery leads to increased production of higher-valued products.		• In 1995, sablefish longline fishery IFQ program established. • In 1998, improved retention/improved utilization (IR/IU) regulations established for pollock and Pacific cod. • 1998 AFA authorized the creation of various cooperatives of Alaska pollock producers.	• In 2001, catcher processors produced 314 thousand mt of product with a gross product value of $744 million.

Table 3.9-125 (cont.). Past/present effects for harvesting and processing sector.

Direct/indirect effect	Past/present events		Past/present management actions		Comparative baseline
	External	Internal	External	Internal	
Product quality	• Changes in domestic and foreign demand for groundfish products. • Changes in processing technology.	• Under IFQ program, freezer longline vessels participating in sablefish longline fishery allows them to time harvests to meet specific market demands. • Establishment of cooperatives in the BSAI pollock fishery leads to improvements in product quality.	• Implementation of hazard analysis and critical control point (HACCP) regulations and international standards related to seafood quality (e.g., ISO 9001 2000).	• In 1995, sablefish longline fishery IFQ program established. • 1998 AFA authorized the creation of various cooperatives of Alaska pollock producers.	• In 2001, average product value was $2,369/mt.
Product utilization rates	• Changes in processing technology.	• Establishment of cooperatives in the BSAI pollock fishery leads to improvements in product utilization.		• In 1998, IR/IU regulations established for pollock and Pacific cod. • 1998 AFA authorized the creation of various cooperatives of Alaska pollock producers.	• In 2001, the average product utilization rate for catcher processors was around 30%.
Dependence on groundfish fisheries	• Changes in domestic and foreign demand for groundfish products (e.g., development of Japanese surimi market and processing technology during 1980's; collapse of Atlantic cod fisheries in 1990's). • Changes in economic conditions in other Alaska fisheries (e.g., collapse of BSAI and Kodiak Island crab fisheries in 1980's and 1990's; high profits in salmon fisheries in late 1980's-early 1990's; collapse of salmon fisheries in late 1990's).		• Establishment of limited access programs in non-groundfish fisheries in Alaska and elsewhere. • Changes in regulations in Pacific whiting fishery.		• In 2001, groundfish accounted for most of the gross product value of the fish processed by catcher processors (specific data unavailable).

Table 3.9-125 (cont.). Past/present effects for harvesting and processing sector.

Direct/indirect effect	Past/present events		Past/present management actions		Comparative baseline
	External	Internal	External	Internal	
Employment	• Changes in processing technology. • Changes in domestic and foreign demand for groundfish products (e.g., development of Japanese surimi market and processing technology during 1980's; collapse of Atlantic cod fisheries in 1990's). • Changes in economic conditions in other Alaska fisheries (e.g., collapse of BSAI and Kodiak Island crab fisheries in 1980's and 1990's; high profits in salmon fisheries in late 1980's-early 1990's; collapse of salmon fisheries in late 1990's).	• Domestic and foreign private sector investment in groundfish fisheries. • Consolidation occurs in BSAI pollock fleet.	• Changes in U.S. Immigration and Naturalization Service regulations.	• 1998 AFA authorized the creation of various cooperatives of Alaska pollock producers. • 1998 AFA authorized the buy-out of nine catcher processors. • Western Alaska CDQ program increased employment of Alaska residents in groundfish fisheries.	• In 2001, the catcher processor sector created 3,877 Full Time Equivalent (FTE) positions.
Payments to labor	• Changes in domestic and foreign demand for groundfish products (e.g., development of Japanese surimi market and processing technology during 1980's; collapse of .Atlantic cod fisheries in 1990's). • Changes in economic conditions in other Alaska fisheries (e.g., collapse of BSAI and Kodiak Island crab fisheries in 1980's and 1990's; high profits in salmon fisheries in late 1980's-early 1990's; collapse of salmon fisheries in late 1990's).	• Domestic and foreign private sector investment in groundfish fisheries. • Consolidation occurs in BSAI pollock fleet.	• Changes in U.S. Immigration and Naturalization Service regulations. • Changes in U.S. minimum wage level.	• 1998 AFA authorizes the creation of various cooperatives of Alaska pollock producers.	• In 2001, the catcher processor sector generated $266 million in labor income.

Table 3.9-125 (cont.). Past/present effects for harvesting and processing sector.

Direct/indirect effect	Past/present events		Past/present management actions		Comparative baseline
	External	Internal	External	Internal	
Average costs	• Changes in marine diesel fuel prices. • Changes in fishing and processing technology. • Changes in state, borough, and community taxes levied on fish landings.	• Consolidation occurs in BSAI pollock fleet and operating efficiency of these fleets increases.	• Various permit and license fees established by the State of Alaska. • 1988 Commercial Fishing Industry Vessel Safety Act and other safety initiatives implemented.	• In 1970's and 1980's, prohibited species catch limits established. • North Pacific Groundfish Observer Program established. • 1988 Commercial Fishing Industry Vessel Safety Act and other safety initiatives implemented. • In 1992, a catcher vessel operational area (CVOA) was established in the Bering Sea. • In 1980's and 1990's, no-trawl zones established to protect crab fisheries. • In 1990's and 2000's, area closures established to protect Steller sea lions. • In 1998, IR/IU regulations established for pollock and Pacific cod. • 1998 AFA authorized the creation of various cooperatives of Alaska pollock producers.	• Firm-level cost data are unavailable.

Table 3.9-125 (cont.). Past/present effects for harvesting and processing sector.

Direct/indirect effect	Past/present events		Past/present management actions		Comparative baseline
	External	Internal	External	Internal	
Safety of human life at sea		• Activities organized by fishing vessel owner associations (e.g., North Pacific Fishing Vessel Owners' Association) have improved vessel safety. • With the end of race for fish, participants in BSAI pollock fishery adopt safer fishing practices.	• 1988 Commercial Fishing Industry Vessel Safety Act and other safety. initiatives implemented. • USCG "Ready for Sea" program implemented.	• 1998 AFA authorizes the creation of various cooperatives of Alaska pollock producers.	• An average of 16 persons were lost annually in Alaska fisheries in the 1990's.

Table 3.9-125 (cont.). Past/present effects for harvesting and processing sector.

Inshore Processors and Motherships

Direct/indirect effect	Past/present events		Past/present management actions		Comparative baseline
	External	Internal	External	Internal	
Number and type of facilities/ vessels	• Changes in domestic and foreign demand for groundfish products (e.g., development of Japanese surimi market and processing technology during 1980's; collapse of Atlantic cod fisheries in 1990's). • Changes in economic conditions in other Alaska fisheries (e.g., changes in economic conditions in other Alaska fisheries) (e.g., collapse of BSAI and Kodiak Island crab fisheries in 1980's and 1990's; high profits in salmon fisheries in late 1980's-early 1990's).	• Domestic and foreign private sector investment in groundfish fisheries. • Consolidation of sablefish and halibut longline fleets and BSAI pollock fleet.	• In mid-1970's, State of Alaska implemented limited entry program for salmon and other state-managed fisheries. • 1980 American Fisheries Promotion Act required that allocations of fish quotas to foreign nations be based on nations' contributions to development of U.S. fishing industry. • 1996 Sustainable Fisheries Act established Fishing Capacity Reduction Program. • 1996 Sustainable Fisheries Act directed National Academy of Sciences to convene Committee to Review IFQs. • In 1999, FAO Committee on Fisheries established International Plan of Action for the Management of Fishing Capacity.	• 1976 MSA and FMP measures phased out foreign fishing activities by establishing TALFF, DAP, and DAH. • In 1992, BSAI and GOA pollock TAC and GOA Pacific cod TAC allocated between inshore and offshore sectors. • In 1995, sablefish longline fishery IFQ program supports establishment of small processors. • 1998 AFA allocated BSAI pollock quota as follows - 10% to the western Alaska CDQ program, with the remainder allocated 50% to inshore sector, 40% to offshore sector and 10% to mothership sector.	• In 2001, there were 53 shore plants, 3 motherships, and 3 floating inshore processors in the groundfish fisheries. Vessel/facility type — Number BSP-SP 6 APA-SP 8 K-SP 10 SC-SP 14 SE-SP 15 Motherships 3 Floaters 3 • Significant excess capacity remained in some Alaska groundfish fisheries.

Table 3.9-125 (cont.). Past/present effects for harvesting and processing sector.

Direct/indirect effect	Past/present events		Past/present management actions		Comparative baseline
	External	Internal	External	Internal	
Facility/vessel ownership			• 1987 Commercial Fishing Industry Vessel Anti-Reflagging Act required fishing and processing vessels to have at least 50% U.S. ownership. • 1998 AFA required fishing and processing vessels to have at least 75% U.S. ownership.	• National Standard 4 of MSA prohibits management measures from discriminating between residents of different states.	• In 2001, 29% of the facilities/vessels were owned by residents of the AKSC and AKSE Regions. 58% of facility/vessel owners were from the WAIW Region.
Groundfish retained by species group	• Changes in domestic and foreign demand for groundfish products (e.g., development of Japanese surimi market and processing technology during 1980's; collapse of Atlantic cod fisheries in 1990's). • Collapse of GOA rockfish fishery in 1970's.		• In 2000, injunction issued by U.S. District Court prohibited fishing with trawl gear in Steller sea lion critical habitat.	• In 1970's and 1980's, prohibited species catch limits established that constrain harvests in some groundfish fisheries. • In 1984, BSAI OY cap implemented and framework procedure established for the determination and apportionment of amounts of groundfish specified for TAC, DAH, reserves, and TALFF.	• In 2001, the quantity of groundfish caught by inshore processors and motherships was 932 thousand mt. Species group / Percent of total groundfish catch A-R-S-O 10.3 FLAT 1.1 PCOD 11.8 PLCK 76.7
Groundfish retained by FMP subarea			• In 2000, injunction issued by U.S. District Court prohibited fishing with trawl gear in Steller sea lion critical habitat.		FMP subarea / Percent of total groundfish catch BSAI 85.5 GOA 14.5

Table 3.9-125 (cont.). Past/present effects for harvesting and processing sector.

Direct/indirect effect	Past/present events		Past/present management actions		Comparative baseline
	External	Internal	External	Internal	
Quantity and value of groundfish seafood products	• Changes in domestic and foreign demand for groundfish products (e.g., development of Japanese surimi market and processing technology during 1980's; collapse of Atlantic cod fisheries in 1990's).	• Domestic and foreign private sector investment in groundfish fisheries. • Establishment of various cooperatives of catcher vessels leads to improvements in product quality.		• In 1998, IR/IU regulations established for pollock and Pacific cod.	• In 2001, inshore processors and motherships produced 343 thousand mt of product with a gross product value of $683 million.
Product quality	• Changes in domestic and foreign demand for groundfish products. • Changes in processing technology.	• Establishment of cooperatives in the BSAI pollock fishery leads to improvements in product quality.	• Implementation of HACCP regulations and international standards related to seafood quality (e.g., ISO 9001 2000).	• 1998 AFA authorizes the creation of various cooperatives of Alaska pollock producers.	• In 2001, average product value was $1,991/mt.
Product utilization rates	• Changes in processing technology.	• Establishment of cooperatives in the BSAI pollock fishery leads to improvements in product utilization.		• In 1992, BSAI and GOA pollock TAC and GOA Pacific cod TAC allocated between inshore and offshore sectors. • In 1998, IR/IU regulations established for pollock and Pacific cod. • 1998 AFA authorized the creation of various cooperatives of Alaska pollock producers.	• In 2001, the average product recovery rate for inshore processors and motherships was around 37%.

Table 3.9-125 (cont.). Past/present effects for harvesting and processing sector.

Direct/indirect effect	Past/present events		Past/present management actions		Comparative baseline
	External	Internal	External	Internal	
Dependence on groundfish fisheries	• Changes in domestic and foreign demand for groundfish products (e.g., development of Japanese surimi market and processing technology during 1980's; collapse of Atlantic cod fisheries in 1990's). • Changes in economic conditions in other Alaska fisheries (e.g., collapse of BSAI and Kodiak Island crab fisheries in 1980's and 1990's; high profits in salmon fisheries in late 1980's-early 1990's; collapse of salmon fisheries in late 1990's).			• In 1992, BSAI and GOA pollock TAC and GOA Pacific cod TAC allocated between inshore and offshore sectors. • 1998 AFA allocated BSAI pollock quota as follows - 10% to the western Alaska CDQ program, with the remainder allocated 50% to inshore sector, 40% to offshore sector and 10% to mothership sector.	• In 1999, groundfish accounted for 31% of the gross product value of the fish processed by inshore processors and motherships.

Table 3.9-125 (cont.). Past/present effects for harvesting and processing sector.

Direct/indirect effect	Past/present events		Past/present management actions		Comparative baseline
	External	Internal	External	Internal	
Employment	• Changes in domestic and foreign demand for groundfish products (e.g., development of Japanese surimi market and processing technology during 1980's; collapse of Atlantic cod fisheries in 1990's). • Changes in economic conditions in other Alaska fisheries (e.g., collapse of BSAI and Kodiak Island crab fisheries in 1980's and 1990's; high profits in salmon fisheries in late 1980's-early 1990's; collapse of salmon fisheries in late 1990's). • Changes in processing technology.	• Domestic and foreign private sector investment in groundfish fisheries.	• Changes in U.S. Immigration and Naturalization Service regulations. • Changes in U.S. minimum wage level.	• 1998 AFA authorized the creation of various cooperatives of Alaska pollock producers.	• In 2001, the inshore processor and mothership sectors created 4,491full time equivalent (FTE) positions.

Table 3.9-125 (cont.). Past/present effects for harvesting and processing sector.

Direct/indirect effect	Past/present events		Past/present management actions		Comparative baseline
	External	Internal	External	Internal	
Payments to labor	• Changes in domestic and foreign demand for groundfish products (e.g., development of Japanese surimi market and processing technology during 1980's; collapse of Atlantic cod fisheries in 1990's). • Changes in economic conditions in other Alaska fisheries (e.g., collapse of BSAI and Kodiak Island crab fisheries in 1980's and 1990's; high profits in salmon fisheries in late 1980's-early 1990's; collapse of salmon fisheries in late 1990's).	• Domestic and foreign private sector investment in groundfish fisheries.	• Changes in U.S. Immigration and Naturalization Service regulations. • Changes in U.S. minimum wage level.	• 1998 AFA authorizes the creation of various cooperatives of Alaska pollock producers.	• In 2001, the inshore processor and mothership sectors generated $267 million in labor income.

Table 3.9-125 (cont.). Past/present effects for harvesting and processing sector.

Direct/indirect effect	Past/present events		Past/present management actions		Comparative baseline
	External	Internal	External	Internal	
Average costs	• Changes in fuel and utility prices. • Changes in processing technology. • Changes in state, borough and community taxes levied on fish landings.		• Implementation of regulations related to product quality, environmental pollution, and occupational safety.	• North Pacific Groundfish Observer Program established. • In 1995, sablefish longline fishery IFQ program established. • 1998 AFA authorizes the creation of various cooperatives of Alaska pollock producers.	• Firm-level cost data are unavailable.

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.9-126. Past/present effects for regional socioeconomics (including regions and communities, Community Development Quota programs, subsistence and environmental justice issues).

Direct/indirect effect	Past/present events		Past/present management actions		Comparative baseline
	External	Internal	External	Internal	
Population	• Population of relevant coastal Alaska communities influenced by wide variety of events external to fishing in 20th centur. • Especially in Alaska Peninsula and Aleutian Islands (AKAPAI) and Kodiak regions, World War II brought large numbers of outsiders to the area, altering fishing community population dynamics. • General growth of Alaska from Territorial days through statehood and beyond fostered development of ports that became commercial fishing centers.	• Commercial fishing influenced establishment or growth of communities in different ways. Some fishing ports, like Unalaska, grew out of a traditional community; others, like King Cove (1911) and Sand Point (1898), were established or coalesced around fishing operations. • In the AKAPAI region especially, Native/non-Native population dynamic strongly influenced by commercial fishing. Communities with more commercial fishing development have become less Alaska Native over time. Similarly, communities with substantial commercial fisheries development have a greater male/female ratio imbalance due largely to presence of predominantly male processing workforces. • Another groundfish related influx of a relatively large numbers of workers in relation to local population in smaller communities began in the 1980's with onshore pollock processing.	• Engagement in groundfish fisheries spans much of coastal Alaska and parts of the Pacific Northwest. Influence of fishery on community population negligible in larger areas such as Seattle and Anchorage, but profound in small communities with a large industry presence, such as Akutan. • Changes in management of non-groundfish fisheries influenced temporal distribution of influx of fishing related workers in rural Alaska fishing communities. These changes (coupled with changes in resource abundance or demand) served to amplify or diminish impacts of groundfish related worker influxes.	• Americanization of the groundfish fishery fostered population growth due to influx of processing workers to rural Alaska communities with shore plants. • Inshore allocations resulting from inshore/offshore splits and American Fisheries Act (AFA) continued conditions for onshore processing worker demand. • Rationalization of Bering Sea and Aleutian Islands (BSAI) pollock fishery under AFA conditions diminished need for surges in workforce during race-for-fish period.	• Population varies considerably between regions; communities engaged include small rural communities and major metropolitan areas. 2000 populations were: AKAPAI 6,000 Kodiak Island 14,000 Southcentral Alaska (AKSC) 367,000 Southeast Alaska (AKSE) 75,000 Washington Inland Waters (WAIW) 3.9 million Oregon Coast (ORCO) 105,000

Table 3.9-126 (cont.). Past/present effects for regional socioeconomics (including regions and communities, Community Development Quota programs, subsistence and environmental justice issues).

Direct/indirect effect	Past/present events		Past/present management actions		Comparative baseline
	External	Internal	External	Internal	
Processing ownership and activity	• Groundfish processing takes place in a number of different types of facilities, with widely different histories, and this also varies widely by species. Cod processing traces it origins to the founding of a number of communities active in the fishery today; pollock processing, which today is a fundamental operation for a number of plants, has a significant onshore volume history dating back less than 20 years. • Integration of processing with local community social and economic structures varies by community and region. In general, larger processors in smaller communities evolve as enclave style developments, with this pattern most prominent in AKAPAI region.	• Capital in processing firms is international; within groundfish processing (as well as a number of other fisheries), much of product flows to Japan, vertical integration results in significant overseas ownership. • For the larger firms, groundfish processing ownership (or management, if ownership is overseas) is concentrated in WAIW region. Activity takes place in numerous coastal Alaska communities, but highest volume of activity occurs in AKAPAI area. Local activity, despite lack of local ownership, is critical to municipal revenues for a number of rural Alaska communities. • Groundfish processing varies considerably from region to region. With Americanization of the Bering Sea groundfish fisheries, in general, high volume, low value per unit species came to be proportionally more important to processing in the west regions of Alaska, and low volume, high value per unit species are more important to the east.	• Location of onshore processing plants (and floaters) results from balance of efficiency due to proximity to fishing grounds with increased operational costs associated in remote locations and decreased services availability.	• Inshore/offshore provisions provide designated quota allocation to entities operating in coastal Alaska. • AFA provisions effectively preclude entry of new processors into pollock processing, but no community level impacts are apparent to date.	• Product value and value per ton for in-region processing (2001): AKAPAI: $490.6 million (m), $727 Kodiak: $77.6m, $972 AKSC: $23.4m, $3,380 AKSE: $27.0m, $4,333

Table 3.9-126 (cont.). Past/present effects for regional socioeconomics (including regions and communities, Community Development Quota programs, subsistence and environmental justice issues).

Direct/indirect effect	Past/present events		Past/present management actions		Comparative baseline
	External	Internal	External	Internal	
Catcher vessel ownership and activity	• In general terms, fleets in smaller communities have higher proportion of smaller vessel classes, and these vessels are less specialized than larger vessel classes. Engagement in these communities may be relatively high, but dependence on groundfish tends to be balanced with participation in a number of other fisheries.	• Fleet is dispersed among a large number of communities in Alaska and the Pacific Northwest. Concentration of harvest capacity is present in Seattle area; trend is particularly evident with the increasing size of BSAI groundfish vessels and increasing capital requirements.	• Growth of larger volume processing plants make deliveries from smallest vessels in local fleets uneconomic in some communities.	• License limitation has not had a major impact on the distribution of the fleet. • Pollock co-ops under AFA serves to reduce effort, but substantial consolidation forecast has not yet been realized.	• Regional catcher vessels and ex-vessel values (2001): AKAPAI - 70 vessels, $6.4m Kodiak - 142 vessels, $19.3m AKSC- 155 vessels, $10.8m AKSE- 210 vessels, $19.1m WAIW - 239 vessels, $135.6m ORCO - 35 vessels, $18.2m
Tax and revenue	• Local fish taxes become an important source of local revenue from groundfish activity for a number of communities, especially in AKAPAI region. None of the regionally important groundfish communities in Southcentral or Southeast Alaska have a local or borough fish tax that applies to groundfish. • State shared fish tax provides groundfish related revenues to state as well as communities with groundfish related activity.	• In addition to local and state fish taxes associated with landings in the communities, the Fisheries Resource Landing tax, instituted to capture revenue from at-sea processing activity (and targeted at pollock especially) began to increase revenues to communities in the late 1990's. This tax has been most beneficial to AKAPAI communities.	• Changes in other fisheries have an impact on the relative value of groundfish associated revenues to communities. For example, with the sharp decline in BSAI crab revenues in the past few years, the importance of groundfish as a revenue source increased proportionately in communities where processing of both takes place.	• Onshore delivery requirements arising out of inshore/offshore amendments and AFA provisions have stabilized (and increased) proportion of landings of pollock subject to local taxation.	• Groundfish a significant component of local government revenues in a number of communities, especially in Unalaska/ Dutch Harbor and the communities of the Aleutians East Borough.

Table 3.9-126 (cont.). Past/present effects for regional socioeconomics (including regions and communities, Community Development Quota programs, subsistence and environmental justice issues).

Direct/indirect effect	Past/present events		Past/present management actions		Comparative baseline
	External	Internal	External	Internal	
Employment and income	• Commercial fishing often one of the very few (if not only) viable source of private sector employment and income in small coastal Alaska communities.	• Processing workforces for larger plants not typically drawn from local labor pool (workers most often recruited from Pacific Northwest). • Groundfish processing employment heavily concentrated in AKAPAI (shore processing) and WAIW (at-sea processing) regions. Kodiak employment intermediate, but relatively few total positions attributable to groundfish are found in Southcentral and Southeast Alaska regions due to relatively low volumes processed and more complete integration of groundfish operations with other plant operations. • Employment on catcher vessels drawn communities with residential fleets, and more evenly distributed between regions than processing employment. Much higher income per position for WAIW and Oregon coast regions than for other regions, reflecting the concentration of larger vessels classes.	• Nature of employment changes with the pollock fishery decreasing from a near year-round fishery following Americanization to relatively short seasons by the early 1990's. • Pollock roe demand still dictates conditions similar to “race for fish” operations during peak roe season, even under rationalized conditions with AFA.	• Pollock rationalization (though co-ops) under AFA conditions has resulted in less peak demand for processing employment; processing operations have responded by adjusting worker schedules to use smaller, more stable workforce. • Employment in support service businesses may have decreased in some communities with the elimination of the race-for-fish in the pollock fishery, but quantitative information is not available.	• Estimated processor employment (FTEs) and payments to labor (2001): AKAPAI - 3,525, $149.3m Kodiak - 617, $28.9m AKSC- 150, $15.3m AKSE- 106, $14.5m WAIW - 3,787, $317.0m ORCO - none • Estimated catcher vessel employment (FTEs) and payments to labor (2001): AKAPAI - 327, $2.56m Kodiak - 802, $7.73m AKSC- 1,049, $4.34m AKSE- 1,742, $7.65m WAIW - 1,238, $54.22m ORCO - 175, $7.28m

Table 3.9-126 (cont.). Past/present effects for regional socioeconomics (including regions and communities, Community Development Quota programs, subsistence and environmental justice issues).

Direct/indirect effect	Past/present events		Past/present management actions		Comparative baseline
	External	Internal	External	Internal	
Environmental justice	• Growth of groundfish fishery takes place in a number of predominantly Alaska Native communities.	• Relatively mobile processing workforces comprised largely of individuals from minority populations, substantially changes demographics of some communities.	• 1994 Executive Order 12898 on Environmental Justice requires analysis of minority populations and low income populations; projects subject to National Environmental Policy Act (NEPA) begin to include environmental justice (EJ) analysis.	• Establishment of community development quota (CDQ) program in 1992 (and subsequent expansion in later years) provides positive benefit to minority and low-income populations.	• Alaska Native populations directly participate in commercial groundfish fisheries primarily through harvest sector, and through the CDQ program. Additionally, a number of otherwise predominantly Alaska Native communities are the location of shore processing plants. Additional potential Alaska Native EJ issues are associated with subsistence. Minority (but non-Native) populations comprise vast majority of processing workforce in larger groundfish plants.

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.9-127. Past/present effects for market channels and value of the Bering Sea and Gulf of Alaska marine ecosystems (including non-consumptive and non-use benefits).

Market channels and benefits to United States consumers

Direct/indirect effect	Past/present events		Pastpresent management actions		Comparative baseline
	External	Internal	External	Internal	
Product quantity	• Alaska Seafood Marketing Institute product promotion activities. • Research demonstrating health benefits of seafood consumption. • Public awareness of health benefits of seafood consumption. • Aquaculture development increases overall demand for seafood, but products (e.g., farmed catfish) may compete with groundfish products.		• See external management actions listed above related to groundfish caught or products produced.	• See internal management actions listed above related to groundfish caught or products produced.	• In 2001, 656 thousand metric tons (mt) of primary product were produced with a wholesale value of $1.4 billion. • By decreasing both the quantity and quality of groundfish products available to consumers, the race for fish, which continues in some groundfish fisheries, prevents some potential consumer benefits from being attained.
Product year-round availability		• Under individual fishing quota (IFQ) program, participants in sablefish longline fishery distribute their catch throughout the year.		• In 1995, sablefish longline fishery IFQ program established.	• Groundfish fisheries provide high and relatively stable levels of seafood products to domestic and foreign markets.

Table 3.9-127 (cont.). Past/present effects for market channels and value of the Bering Sea and Gulf of Alaska marine ecosystems (including non-consumptive and non-use benefits).

Direct/indirect effect	Past/present events		Pastpresent management actions		Comparative baseline
	External	Internal	External	Internal	
Product quality	• Changes in processing technology.	• IFQ program allows participants in sablefish longline fishery to time harvests to meet specific market demands. • Establishment of cooperatives in the Bering Sea and Aleutian Islands (BSAI) pollock fishery leads to improvements in product quality.	• Implementation of hazard analysis and critical control point (HACCP) regulations and international standards related to seafood quality (e.g., International Organization for Standardization [ISO] 9001 2000).	• In 1995, sablefish longline fishery IFQ program established. • 1998 American Fisheries Act authorized the creation of various cooperatives of Alaska pollock producers.	• In 2001, average product value was $2,174/mt. • By decreasing both the quantity and quality of groundfish products available to consumers, the race for fish, which continues in some groundfish fisheries, prevents some potential consumer benefits from being attained.
• **Product diversity**	• Alaska Seafood Marketing Institute product promotion activities. • Research demonstrating health benefits of seafood consumption. • Public awareness of health benefits of seafood consumption. • Aquaculture development increases overall demand for seafood products. • Changes in processing technology.		• See external management actions listed above related to groundfish caught or products produced.	• See internal management actions listed above related to groundfish caught or products produced.	• Groundfish fisheries provide a relatively high diversity of seafood products to domestic and foreign markets.

Table 3.9-127 (cont.). Past/present effects for market channels and value of the Bering Sea and Gulf of Alaska marine ecosystems (including non-consumptive and non-use benefits).

Direct/indirect effect	Past/present events		Past/present management actions		Comparative baseline
	External	Internal	External	Internal	
Benefits (including non-market and non-consumptive benefits) derived from marine ecosystems and associated species	• Increased public awareness of marine ecosystems (e.g., BSAI and Gulf of Alaska [GOA] marine ecosystems) and associated endangered species (e.g., Steller sea lions). • Increased participation in recreational fishing and eco-tourism activities. • Lawsuit brought by environmental groups challenging National Oceanic and Atmospheric Administration (NOAA) Fisheries for failing to meet the requirements of the Endangered Species Act in its management of Alaska groundfish fisheries.		• In 2000, injunction issued by United States (U.S.) District Court prohibited fishing with trawl gear in Steller sea lion critical habitat.		• A contingent valuation study found that the value of an expanded recovery program for Steller sea lions was positive and substantial. • Evidence suggests that the benefits (including non-market and non-consumptive benefits) derived from the BSAI and GOA ecosystems as a whole are substantial.

Notes: External – Natural, climatic, and human controlled events and actions not directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.
Internal – Events and actions directly associated with the federal Alaska groundfish fisheries as managed under the Magnuson-Stevens Act.

Table 3.10-1. Russian mercantile records of eighteenth century fur harvests in the Bering Sea and Aleutian Islands.

Vessel	Year dispatched	Year returned	Sea otter pelts	Fox pelts	Fur seal pelts
St. Nikolai	1769	1773	2,450	1,127	
St. Andrei	1769	1773	1,200	3,008	
St. Prokop	1769	1773	250[1]	60[1]	
Alexandr Nevski	1770	1774	2,340	1,130	
St. Pavel	1770	1774	1,900	4,883	
St. Vladimir[2]	1772	1779	4,372	3,949	1,725
Arkhangel St. Mikhail	1776	1777	3,720	2,024	143
St. Nikolai[3]	1778	1785	2,521	3,300	
Kliment[4]	1778	1785	1,118	830	
St. Ioann Rylskoi	1780	1786	900		18,000
St. Georgiy	1781	1789	2,720	8,000	31,000

Notes: [1]"No reason for the ill-success of this venture has been transmitted" (Bancroft 1886, note 25, p. 169).
[2]Cargo also included pelts of 92 river otters, 1 wolverine, 3 wolves, 18 mink, and 12,600 lb (350 Russian lb) of walrus ivory.
[3]Cargo also included pelts of 230 river otters. This vessel, completed in 1778, was not the *St. Nikolai* that sailed in 1769.
[4]Cargo also included pelts of 500 river otters.
Source: Adapted from Bancroft (1886).

Table 3.10-2. Fur seal harvests from the Pribilof Islands, 1817-1837.

Year	St. Paul harvest	St. George harvest	Total	% change (+/-)
1817	47,860	12,328	60,188	
1818	45,932	13,924	59,856	-0.6
1819	40,300	11,924	52,224	-12.8
1820	39,700	10,520	50,220	-3.8
1821	35,750	9,245	44,995	-10.4
1822	28,150*	8,319	36,469	-19.0
1823	24,100*	5,773	29,874	-18.1
1824	19,850*	5,550	25,400	-15.0
1825	24,600	5,500	30,100	+18.5
1826	23,250	0**	23,250	-22.8
1827	19,700	0**	19,700	-15.3
1828	18,450	4,778	23,228	+17.9
1829	17,150	3,661	20,811	-10.4
1830	15,200	2,834	18,034	-13.3
1831	12,950	3,084	16,034	-11.1
1832	13,150	3,206	16,446	+2.6
1833	13,200	3,212	16,412	-0.2
1834	12,700	3,051	15,751	-4.0
1835	4,052***	2,528	6,580	-58.2***
1836	4,040***	2,550	6,590	+0.2***
1837	4,200***	2,582	6,802	+3.2
Total	464,259	114,665	578,224	-88.7

Notes: * - In 1822, 1823, and 1824, respectively, the following numbers of St. Paul seals were released to encourage a population increase: 2,700, 6,000, and 2,500.
** - To encourage a population increase, St. George seals were not harvested in 1826 and 1827.
*** - In 1835, 1836, and 1837, respectively, the following numbers of St. Paul seals were released to encourage a population increase: 8,000, 7,750, and 7,000.

Source: Adapted from Veniaminov 1840.

Table 3.10-3. Bering Sea and Aleutian Islands and Gulf of Alaska ecosystem past/present effects.

Internal effect indicators	Direct/ indirect effect	Past/present events		Past/present management actions	
		External	Internal	External	Internal
• Catch/bycatch of forage and herring. • Population trends in pollock and Atka mackerel, Bering Sea herring.	• Pelagic forage availability.	• State of Alaska directed capelin and herring fishery (1960's–present). • Subsistence. • Foreign groundfish fishery pre-Magnuson-Stevens Act (MSA) (1960's–1976) forage fish bycatch and directed pollock and Atka mackerel catch. • State of Alaska groundfish fisheries forage fish bycatch. • Climate variability effects on recruitment and distribution.	• Joint venture (JV) groundfish fishery forage fish bycatch and pollock and Atka mackerel catch. • Domestic groundfish fishery forage fish bycatch (i.e., Bering Sea and Aleutian Islands [BSAI] pollock and Gulf of Alaska [GOA] rockfish fisheries) and pollock and Atka mackerel catch.	• State of Alaska capelin and herring fishery regulations.	• Annual acceptable biological catch (ABC) and total allowable catch (TAC) limits. • BSAI and GOA Fishery Management Plan (FMP) Amendment 36/39 – protect forage fish from developing into a commercial fishery, forage fish established as bycatch only. • B20 rule for prey species.
• Degree of spatial/temporal concentration of fishery on herring, pollock, Atka mackerel, forage species.	• Spatial and temporal concentratio n of fishery impact on forage.	• State of Alaska directed capelin and herring fishery (1960's–present) by area and season. • Subsistence removals by area and season. • Foreign groundfish fishery pre-MSA (1960's–1976) forage fish and herring bycatch and directed pollock and Atka mackerel catch by area and season. • State of Alaska groundfish fisheries forage fish bycatch by area and season. • Climate variability effects on recruitment and distribution.	• JV groundfish fishery forage fish and herring bycatch and pollock and Atka mackerel catch by area and season. • Domestic groundfish fishery forage fish bycatch (i.e., BSAI pollock and GOA rockfish fisheries), herring bycatch and pollock and Atka mackerel catch by area and season.	• State of Alaska capelin and herring fishery regulations. • State of Alaska time/area closures.	• BSAI and GOA groundfish fishery time/area closures. • BSAI and GOA groundfish fishery seasonal/spatial TAC allocations. • Marine mammal buffer zones, Steller sea lion (SSL) closures. • Split Aleutian Islands into three management areas.
• Trophic level of the catch. • Population status of harvested, sensitive top predator species (whales, pinnipeds, seabirds) relative to minimum biologically acceptable limits. • Shark, seabird and pinniped bycatch.	• Removal of top predators.	• Commercial whaling and seal harvests. • Shark, pinniped, and seabird bycatch in State of Alaska fisheries. • Foreign groundfish fishery shark, pinniped and seabird bycatch. • Climate variability effects on top predator species recruitment and distribution. • Subsistence mammal harvest.	• JV groundfish fishery shark, seabird and pinniped bycatch. • Domestic groundfish fishery shark, seabird and pinniped bycatch.	• State of Alaska fishery regulations. • Marine Mammal Protection Act (MMPA) provisions.	• Annual ABC and TAC limits. • Seabird avoidance measures.

Table 3.10-3 (cont.). Bering Sea and Aleutian Islands and Gulf of Alaska ecosystem past/present effects.

Internal effect indicators	Direct/ indirect effect	Past/present events		Past/present management actions	
		External	Internal	External	Internal
• Total catch levels.	• Introduction of nonnative species.	• Commercial shipping. • Climate variability effects on probability of successful introduction.	• JV groundfish fishery ballast. • Domestic groundfish fishery ballast	• International laws regarding ballast water exchange.	• Annual ABC and TAC limits.
• Discard and offal production, scavenger population trends, bottom gear effort.	• Energy re-direction.	• State of Alaska directed fisheries discards, offal production, and bottom gear effort. • Subsistence discards and offal. • Foreign groundfish fishery pre-MSA (1960's–1976) discards, offal, and bottom gear effort. • Halibut fishery discards and offal. • Climate variability effects on energy cycling.	• JV groundfish fishery discards, offal production, and bottom gear effort. • Domestic groundfish fishery discards, offal production, and bottom gear effort.	• Environmental Protection Agency (EPA) and State of Alaska water quality regulations.	• Improved retention/improved utilization (IR/IU). • Annual ABC/TAC limits. • Reduced wastage of cod and rockfish in sablefish fishery. • Inshore/offshore. • Ban pollock roe stripping. • Reduce regulatory discard of halibut and salmon. • Bottom gear restrictions and mesh size changes.
• Total catch removals and mass balance model measures of system maturity.	• Energy removal.	• State of Alaska directed fisheries removals. • Subsistence removals. • Foreign groundfish fishery pre-MSA (1960's–1976) removals. • Halibut fishery removals. • Climate variability effects on system production.	• JV groundfish fishery removals. • Domestic groundfish fishery removals.	• State of Alaska fishery regulations.	• Prohibited species catch (PSC) limits. • Annual ABC/TAC limits. • Optimum yield (OY) cap. • Initiate and improve Observer Program.
• Population levels of target, nontarget species relative to minimum biologically acceptable limits. • Bycatch amounts of sensitive species that lack population estimates. • Number of Endangered Species Act (ESA) listed marine species. • Area closures.	• Species Diversity.	• State of Alaska directed fisheries removals. • Subsistence removals. • Foreign groundfish fishery pre-MSA (1960's–1976) removals. • Halibut fishery removals. • Climate variability effects on species level diversity.	• JV groundfish fishery removals. • Domestic groundfish fishery removals.	• State of Alaska fishery regulations. • ESA provisions.	• Annual ABC/TAC limits. • Initiate and improve observer program. • PSC limits. • Prohibit sale of coral and sponge. • Area closures.
• Guild diversity or size diversity changes linked to fishing removals. • Bottom gear effort. • Habitat area of particular concern (HAPC) biota bycatch.	• Functional Diversity.	• State of Alaska directed fisheries removals. • Subsistence removals. • Foreign groundfish fishery pre-MSA (1960's–1976) removals. • Halibut fishery removals. • Climate variability effects on trophic diversity.	• JV groundfish fishery removals. • Domestic groundfish fishery removals.	State of Alaska fishery regulations.	• Annual ABC/TAC limits. • Prohibit sale of coral and sponge. • Bottom gear restrictions.

Table 3.10-3 (cont.). Bering Sea and Aleutian Islands and Gulf of Alaska ecosystem past/present effects.

Internal effect indicators	Direct/ indirect effect	Past/present events		Past/present management actions	
		External	Internal	External	Internal
• Degree of fishing on spawning aggregations or larger fish. • Older age group abundances of target groundfish stocks.	• Genetic Diversity.	• State of Alaska directed fisheries removals. • Subsistence removals. • Foreign groundfish fishery pre-MSA (1960's–1976) removals. • Halibut fishery removals. • Climate variability effects on genetic diversity.	• JV groundfish fishery removals. • Domestic groundfish fishery removals.	• State of Alaska fishery regulations.	• Protection of Aleutian Basin spawning pollock stock. • Seasonal TAC allocations for pollock.

Comparative Baseline:

- Pelagic forage availability shows BSAI pollock and Atka mackerel above Maximum stock size threshold (MSST), GOA pollock at low abundance levels, Bering Sea herring is stable, biomass estimates for forage species are not available but bycatch estimates in groundfish fisheries are above average and relative abundance indices from bottom trawl surveys indicate possible increase in eulachon and capelin in the GOA.
- Spatial and temporal concentration of fisheries on forage - Seasonal and temporal catch allocations of pollock and Atka mackerel and SSL closures have spread out fishing removals in space and time though recent results show Bering Sea pollock fisheries increasing catch in fur seal foraging habitat.
- Removal of top predators - Historical whaling has resulted in low present day abundance of whale species in the North Pacific. Shark bycatch rates are variable by region and present day groundfish fishery impacts are unknown. There is no evidence that present levels of seabird and mammal bycatch in groundfish fisheries are an important source of mortality for most species.
- Introduction of nonnative species - Total groundfish fishery catch levels (and thus level of ballast water and hull fouling organisms release by fishing vessels) have been stable. No evidence of groundfish fishery related successful introductions of nonnative species.
- Energy re-direction - Target species discards have decreased since IR/IU. Scavenger populations (skates, gulls, etc.) do not show relationship to discard levels. Bottom trawl effort (and thus unobserved benthic organism mortality and increased availability to predators due to trawl disturbance) has decreased over time.
- Energy removal - Total groundfish catches have been relatively stable. Mass balance models indicate total amount of energy removed is a very small proportion of total biomass and that biomass and energy flow are distributed fairly well throughout the system. Bering Sea is a relatively mature (i.e., undisturbed) system compared to other shelf systems.
- Species diversity - Species level diversity has not been well-assessed. Indicators of assessed species abundance show most target species are above MSST, number of endangered/threatened marine species is not linked to present fishery removals although historical whaling has been the cause of the listing status of most whales, bycatch levels of many nontarget (nonspecified) species are unknown.
- Guild diversity - Trophic guild diversity changes are mostly related to climate induced recruitment changes and not to fishing. Bottom gear effort, which is an indicator of benthic community guild disturbance, has been decreasing. HAPC biota, a group of benthic organisms that might be considered a structural habitat guild, do not show fishing-related declines and some groups (sponge, sea anemone, and sea pens) show increasing or relative high abundance indices in recent bottom trawl surveys of the BSAI and GOA.
- Genetic diversity - There has been heavy exploitation of certain spawning aggregations historically (Bogoslof pollock) but present day spatial/temporal management of groundfish has tended to reduce fishing pressure on spawning aggregations. There is unknown effects on the genetic diversity of stocks that might have distinct genetic components occurring at finer spatial scales than the present groundfish fishery management regions.

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