

**Status and Trends
of Principal Groundfish and Shellfish Stocks
in the Alaska EEZ, 2001**

by
David Witherell, Nicole Kimball, and Jane DiCosimo



North Pacific Fishery Management Council
605 West 4th Avenue, Suite 306
Anchorage, AK 99501

November 15, 2000

Table of Contents

BSAI Groundfish	1
GOA Groundfish	4
Pacific Halibut	8
Pacific Herring	8
Bering Sea Crabs	9
Weathervane Scallops	12

Acronyms and Definitions

ABC	= acceptable biological catch
AI	= Aleutian Islands
BSAI	= Bering Sea and Aleutian Islands
BS	= Bering Sea
CDQ	= community development quota
c/p	= catcher processor
CVOA	= catcher vessel operational area
EBS	= Eastern Bering Sea
EEZ	= exclusive economic zone
F	= instantaneous fishing mortality rate
FMP	= fishery management plan
H&G	= headed and gutted fish
IFQ	= individual fishing quota
M	= instantaneous natural mortality rate
m	= meters
MSY	= maximum sustainable yield
mt	= metric tons
OFL	= overfishing level
OY	= optimum yield
POP	= Pacific ocean perch
TAC	= total allowable catch

For more detailed information, please refer to the 2001 Stock Assessment and Fishery Evaluation (SAFE) reports, available from the Council office (907) 271-2809, or on the web at www.fakr.noaa.gov/npfmc

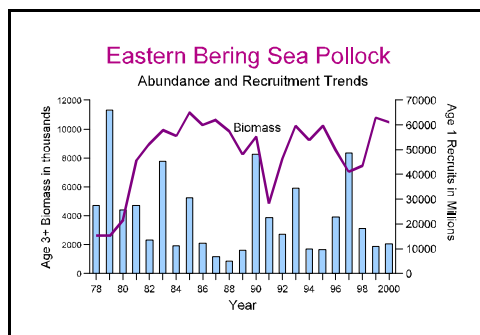
Acknowledgments: Figures were prepared by Sandra Lowe, Dr. Loh-lee Low, and Maria Shawback.

BSAI Groundfish Stocks

Pollock

Three stocks of pollock inhabit the BSAI area: the eastern Bering Sea, Aleutian Islands, and Aleutian Basin stock. Exploitation and abundance of these stocks are very different. The eastern Bering Sea pollock stock increased to a peak in 1985, and has since fluctuated at about the Bmsy level.

For 2001, spawning biomass of Eastern Bering Sea pollock was estimated to be well above the biomass level that produces maximum sustainable yield (MSY). Projected 2001 biomass of age 3+ pollock in the Eastern Bering Sea stock was estimated at



10.1 million mt. Biomass has increased with recruitment of a strong 1996 year-class, and is expected to decline somewhat as this year class passes through the fishery. Although the maximum allowable ABC for this stock based on an MSY fishing rate is 2.13 million mt, the Plan Team recommended a more conservative harvest strategy for 2001 to account for uncertainties in recruitment and other information. The Plan Team recommended a 1,842,000 mt ABC for Eastern Bering Sea pollock, an increase of about 700,000 mt from 2000. Seasonal and area allocations of the pollock TAC have been established to protect Steller sea lions.

Projected biomass and Plan Team recommended ABC (mt) of eastern Bering Sea pollock (Model 1), based on F40% harvest strategy.		
Year	Spawning Biomass	ABC
2001	3,066,000	1,842,000
2002	2,432,000	1,725,000
2003	2,079,000	1,313,000

The Aleutian Islands pollock stock is considerably smaller than the eastern Bering Sea and Aleutian Basin stock. Biomass in the Aleutian area as estimated by the bottom trawl survey declined from a peak of 778,700 mt in 1983 to about 106,000 mt in 2000. A harvest strategy based on natural mortality ($F=0.75M$) resulted in a recommended ABC for 2001 of 23,800 mt. In 1999 and 2000, the Council recommended that no directed fishing for pollock occur in the AI area given current low abundance and the importance of pollock as prey for Steller sea lions.

The Aleutian Basin pollock stock is at low levels. Biomass in the Aleutian Basin area is estimated by the hydroacoustic survey in the Bogoslof area. Biomass in the Bogoslof area declined from 2,400,000 mt in 1988 to only 54,000 mt in 1994. An increase was observed in 1995, and the projected 2001 exploitable biomass is 301,000 mt. This stock has historically contributed to the Donut Hole fishery, which provided catches of 1.0 to 1.4 million mt during the years 1986 through 1989. No directed fishing has occurred on this stock since 1991.

The BSAI pollock TAC has been allocated among fishing sectors. The first inshore/offshore Amendment 18 allocated the pollock TAC 35% inshore and 65% offshore, with a catcher vessel operational area established for the pollock 'B' season. Additionally, 7.5% of the pollock TAC was allocated to the community development program of Western Alaska. These allocations were extended under Amendment 38. The Community Development quota was increased to 10% of the pollock TAC beginning in 1999 under the American Fisheries Act. The American Fisheries Act also changed the pollock allocation to 50% catcher vessels delivering inshore, 40% to catcher processors offshore, and 10% to catcher vessels delivering to motherships.

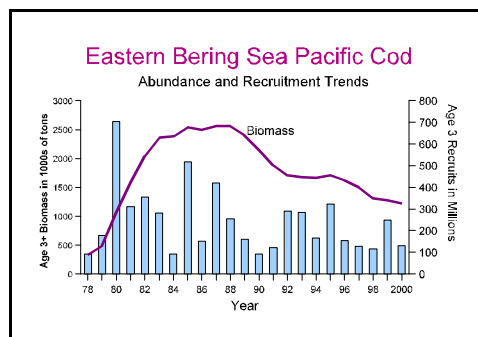
The pollock fishery has been affected by management measures designed to protect Steller sea lions. In 1990, roe-stripping of pollock was prohibited, and the Bering Sea pollock fishery was divided into roe and non-roe fishing seasons. Beginning in 1998, 100% retention was required for pollock. In December 1998, NMFS issued a biological opinion that the pollock fishery jeopardized the recovery of Steller sea lions. In response,

the Council took emergency action to prohibit pollock fishing within 10 nautical miles of numerous rookeries and haulouts; reduce the catch of pollock within critical habitat areas; prohibit pollock fishing in the Aleutian Islands area; and create four pollock seasons in the Bering Sea to spread out effort over time.

Measures have also been implemented to reduce bycatch in the pollock fishery. Bycatch limits for chum salmon (42,000), chinook salmon (37,000), and herring (1%) trigger hotspot area closures that affect the pollock fisheries in particular. Regulations were recently adopted to prohibit the use of bottom trawl gear for directed pollock fishing to reduce bycatch of halibut and crabs. The bycatch limit for chinook salmon will be incrementally reduced to only 29,000 salmon by the year 2003. Beginning in 1998, 100% retention was required for pollock under the improved retention/improved utilization program adopted as Amendments 49/49.

Pacific cod

The BSAI Pacific cod stock increased to high levels in the mid 1990s, then declined. The 2001 exploitable biomass was projected to be 1,320,000 mt. An $F_{40\%}$ harvest strategy ($F=0.29$), adjusted downward by a risk-averse optimization procedure, resulted in a Plan Team recommended ABC for 2001 of 188,000 mt. The cod stock is declining as a result of below average year-classes in recent years.



Projected spawning biomass and Plan Team recommended ABC (mt) of Pacific cod in the BSAI.		
Year	Spawning Biomass	ABC
2001	371,000	188,000
2002	340,000	154,000
2003	314,000	135,000

The BSAI Pacific cod TAC is currently allocated two percent to jig gear, 51 percent to fixed gear, and 47 percent to trawl gear. Amendment 24 regulations allow seasonal apportionment of the Pacific cod TAC allocated to vessels using hook-and-line or pot gear. Seasonal apportionments are divided among trimesters and established through the annual specifications process. Any unused TAC from the jig gear quota becomes available to

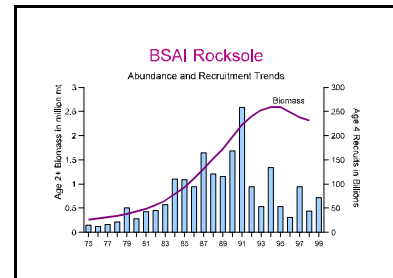
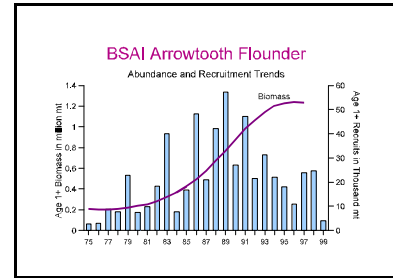
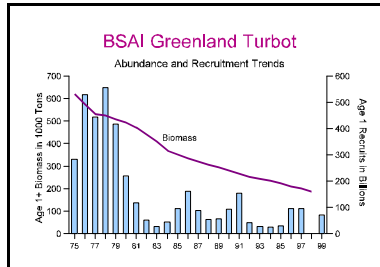
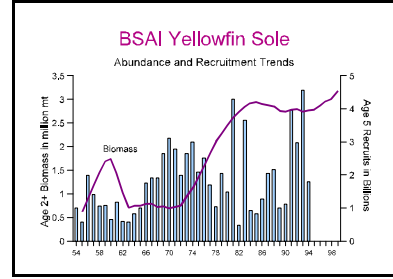
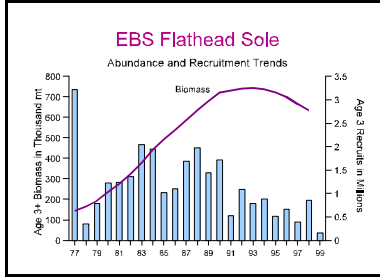
fixed gear on September 15. Under Amendment 64, 80 percent of the fixed gear apportionment is reserved for freezer longline vessels, 18.3 percent for pot vessels, 0.3 percent for longline catcher vessels, and 1.4 percent for fixed gear catcher vessels less than 60' length overall. Beginning in 1998, 100% retention was required for Pacific cod under the improved retention/improved utilization program adopted as Amendments 49/49.

Flatfish

Flatfish species comprise a large proportion of groundfish exploitable biomass in the BSAI. Dominant species include yellowfin sole and rock sole. Other abundant or commercially important BSAI flatfish species include arrowtooth flounder, flathead sole, Alaska plaice, and Greenland turbot. Biomass of most BSAI flatfish stocks remains relatively high. For many flatfish species, recruitment in more recent years has been low; consequently, stock declines are expected in coming years. Fisheries have been unable to fully harvest the exploitable biomass of any of the flatfish species or complexes due to halibut and crab bycatch limits and conservative quotas. The current catch specifications for BSAI flatfish stocks are summarized in the above table.

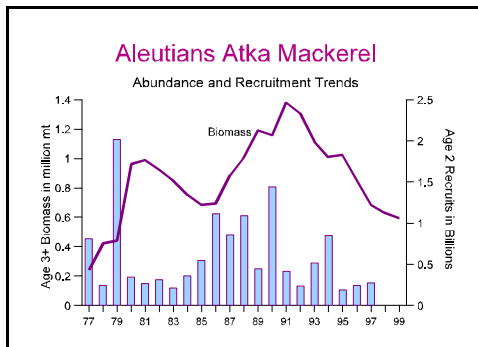
Catch specifications (mt) for BSAI flatfish, 2001, recommended by the Plan Team.		
Species	Exploitable Biomass	ABC
yellowfin sole	2,380,000	176,000
rock sole	1,940,000	228,000
arrowtooth	701,000	130,000
flathead sole	618,000	84,000
other flatfish	865,000	122,000
Greenland turbot	210,000	8,400

Unlike biomass of other BSAI flatfish species, biomass of Greenland turbot is at low levels and declining. Biomass has declined due to poor year classes from 1981-1997. Catch has also declined from a peak of 57,000 mt in 1981 to only about 7,000 mt in 2000. Biomass is projected to continue declining due to poor recruitment. Greenland turbot were harvested almost exclusively (>90%) by trawl gear until the early 1990s when longlines became the dominant gear type for this species. No halibut bycatch has been apportioned for a directed trawl fishery since 1996, effectively prohibiting this gear type from targeting turbot.



Atka Mackerel

Atka mackerel are found along the Aleutian Islands, and to a lesser extent in the western Gulf of Alaska. Biomass in the Aleutian Islands area is based on model estimates which incorporate the NMFS bottom trawl surveys. Biomass increased from 1977 to a peak in 1992, and has since declined. Catches increased from 15,000 mt in 1989 to 104,000 in 1996. The projected 2001 BSAI exploitable biomass is 553,000 mt, with a Plan Team recommended ABC of 58,700 mt. The most recent assessment suggests that this stock will continue to decline in the near term. Atka mackerel in the Gulf of Alaska are essentially from the same stock as the BSAI. No reliable estimate of biomass exists for GOA Atka mackerel, but the population is significantly smaller than found in the Aleutian Islands.



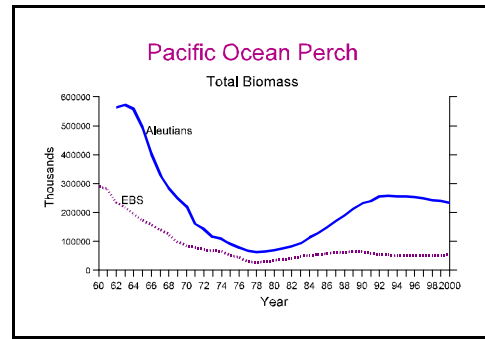
Amendment 34 established a gear allocation for Atka mackerel beginning in 1998. A total of 1% of the Eastern Aleutian Islands/Bering Sea subarea TAC is allocated to jig gear. Once the jig fleet takes its 1% allocation, their allocation will increase to 2% for future years.

Management measures have also been taken to reduce the impacts of an Atka mackerel fishery on Steller sea lions. Atka mackerel are an important prey for Steller sea lions. In June 1998, the Council adopted regulations to disperse the Atka mackerel fishery, both temporally and spatially, to reduce localized depletions of

Atka mackerel. The TAC will now be equally split into two seasons, and the amount taken within sea lion critical habitat will be limited.

Pacific Ocean Perch

Pacific ocean perch (commonly referred to by its acronym POP) are the dominant species of red rockfish in the north Pacific, and are caught primarily along the Aleutian Islands, and to a lesser extent in the eastern Bering Sea and Gulf of Alaska. Biomass has greatly increased following heavy exploitation by foreign fleets prior to 1978. Above average year classes in the early 1980s has boosted the AI Pacific ocean perch exploitable biomass from the early 1980s though the late 1990s.



Projected spawning biomass of Pacific ocean perch in the BS and AI.

Year	Aleutians	Bering Sea
2001	84,900	18,100
2002	82,700	18,000
2003	80,600	18,000

Exploitation has been relatively low during this period, with catches less than 10,000 mt per year. The 2001 total biomass was projected to be 191,000 mt, with a Plan Team recommended ABC of 10,200 mt. Biomass of Pacific ocean perch in the Aleutian Islands area is projected

to remain relatively stable in coming years.

Other Rockfish

Projected 2001 biomass and Plan Team recommended ABC (mt) of other rockfish in the BSAI.

Species	Biomass	ABC
BSAI Northern	150,000	6,760
BSAI Rougheye	14,000	262
BSAI Shortraker	34,000	766
EBS Other rockfish	6,880	361
AI Other rockfish	12,900	676

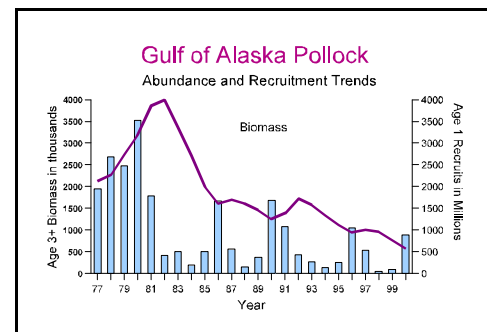
Through 2000, the other red rockfish complex was split out into northern/sharpchin and rougheye/shortraker groups in the AI, and a combined other red rockfish group for the eastern Bering Sea. For 2001, the Plan Team recommended that the complex be broken out to separate species and managed accordingly. The Team felt that establishing ABCs for each species would help prevent overfishing. Because sharpchin rockfish are at the extent of their range in the BSAI, and are not common, the Plan team recommended that sharpchin rockfish be moved into the other

rockfish category. The other rockfish category includes thornyhead rockfish and many other *Sebastes* rockfish species. Amendment 53 allocated the AI shortraker/rougheye TAC between trawl and fixed gear fisheries. Thirty percent of the TAC is allocated to fixed gear and 70% to vessels using trawl gear.

GOA Groundfish Stocks

Walleye Pollock

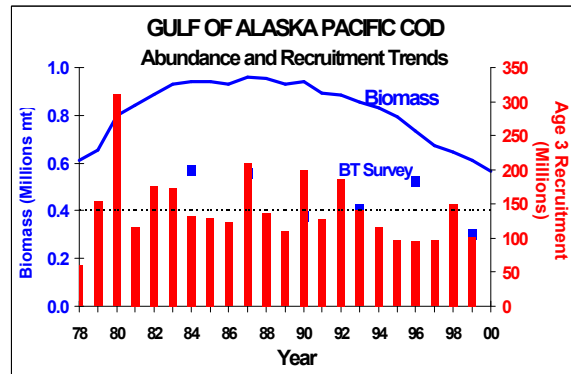
Pollock in the Gulf of Alaska (GOA) are managed as a single stock that is separate from the Bering Sea and Aleutian Island pollock stocks. For 2001, exploitable biomass (age 3+) in the entire GOA was projected at 699,000 mt. The Plan Team recommended a 2001 ABC of 105,810 mt (includes Western Central and Eastern Gulf ABC). The 1994 year-class was above average, and has contributed to recent fisheries. The 1996 and 1997 year-classes appear to be weak, but the 1998 and 1999 year-classes appear to be average or stronger. Biomass is projected to bottom out in 2002 and then increase with recruitment of these year-classes.



The pollock fishery has been affected by management measures designed to protect Steller sea lions. In 1990, roe-stripping of pollock was prohibited. Beginning in 1998, 100% retention was required for pollock. In December 1998, NMFS issued a biological opinion that the pollock fishery jeopardized the recovery of Steller sea lions. In response, the Council took emergency action to prohibit pollock fishing within 10 nautical miles of numerous rookeries and haulouts, reduce the catch of pollock within critical habitat areas, and spread out effort over time. In 1993, the Council apportioned 100% of GOA pollock to the inshore sector. Beginning in 1998, 100% retention was required for pollock under the improved retention/improved utilization program adopted as Amendments 49/49.

Pacific Cod

The Pacific cod stock in the GOA has also declined since peaking in the late 1980s. The 2001 exploitable biomass (age 3+) was projected to be 526,000 mt. The Plan Team recommended a 2001 ABC or 67,800 mt. The population is projected to continue to decrease in the near term.



The Pacific cod stock is exploited by a multiple-gear fishery, principally by trawls and smaller amounts by longlines, jigs, and pots. For trawl fisheries in the EEZ, cod harvests have been constrained by halibut bycatch limits. A state water fishery for pot and jig gear began in

1997, with a guideline harvest level set at 15% of the federal GOA quota in the Western and Central areas and 25% in the Eastern area. The state fishery ramped up to 20% in the Western Area and Kodiak and Chignik subareas of the Central area for 1999, and ramped up in the Western Area again to 25% in 2000. The state GHLs are allowed to ramp up to 25% of the federal quota when area guideline harvest levels are achieved.

In 1993, the Council apportioned 90% of GOA Pacific cod TAC to the inshore sector and 10% to the offshore sector. Beginning in 1998, the IR/IU program was implemented, requiring full retention of all Pacific cod caught.

Flatfish

The flatfish assemblage has been divided into several categories for management purposes. Catch limits for flatfish are specified separately for flathead sole, rex sole, arrowtooth flounder, the deep water flatfish complex (Dover sole, Greenland turbot, and deep-sea sole), and the shallow water flatfish complex (rock sole, yellowfin sole, Alaska plaice, and other flatfish). Summary information for the flatfish assemblages is provided in the adjacent table.

Species	Biomass	ABC
deepwater flats	74,460	5,300
rex sole	81,020	9,440
shallowwater flats	299,100	37,860
flathead sole	207,520	26,270
arrowtooth	1,586,530	148,150

Far and away the dominant flatfish species in the Gulf of Alaska is arrowtooth flounder. Arrowtooth flounder biomass in the GOA appear to be at peak levels, but is lightly exploited. Arrowtooth flounder are presently of limited economic importance. Only some effort is currently directed at catching this species, but commercial interest is growing. Prior to 1996, they frequently served as “ballast” against allowable retainable bycatch of other species. The bycatch limits for halibut constrain flatfish trawl fisheries.

Rockfish

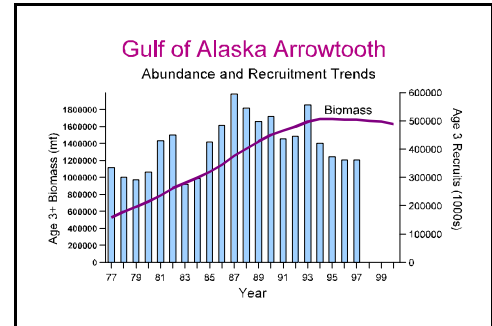
At least 30 rockfish species of the genus *Sebastes* inhabit the Gulf. Since 1988, rockfish have been divided into three management assemblages based on their habitat and distribution: slope, pelagic shelf, and demersal shelf rockfish. In 1991, the slope assemblage was divided into three management subgroups: Pacific ocean perch (POP), shortraker/rougheye rockfish, and all other species of slope rockfish. In 1993, a fourth management subgroup, northern rockfish, was also created. In 1997, black rockfish and blue rockfish were removed from the pelagic shelf complex, and designated for management by the State of Alaska.

In 1998, a prohibition on trawling in the Gulf of Alaska east of 140° W. longitude affected rockfish trawl fisheries that are now prohibited in the East Yakutat/Southeast Outside portion of the Eastern Area. Eastern Gulf TACs have been since apportioned between West Yakutat and East Yakutat/Southeast Outside for some species. Summary information for the slope, pelagic shelf, and demersal shelf rockfish assemblages is provided below.

Slope Rockfish - The primary commercial rockfish species in the Gulf of Alaska is Pacific ocean perch. For 2001, exploitable biomass was projected to be 211,160 mt. The Plan Team recommended a 2001 ABC of 13,510 mt. POP are at medium abundance after reaching a low point in the mid 1980s. A rebuilding plan for POP was implemented in 1995. Relatively strong recent year-classes appear to have contributed to increased abundance. However, the spawning stock is still below the B_{40%} level.

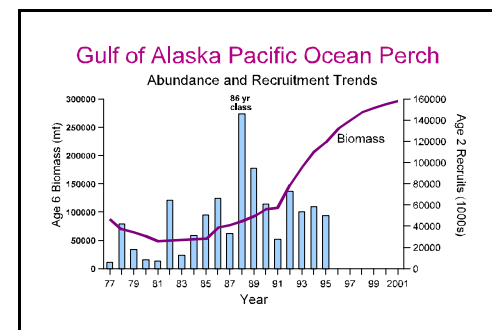
Pelagic Shelf Rockfish - The pelagic shelf rockfish (PSR) assemblage in the Gulf includes three species: dusky rockfish, widow rockfish, and yellowtail rockfish. This assemblage was separated from slope rockfish in 1988. The PSR exploitable biomass for 2001 is projected at 66,440 mt, and the Plan Team recommended an ABC of 5,980 mt.

Demersal Shelf Rockfish - The demersal shelf rockfishes (DSR) assemblage is comprised of seven species of shallow, nearshore, bottom-dwelling rockfishes: canary rockfish, China rockfish, copper rockfish, quillback rockfish, rosethorn rockfish, tiger rockfish, and yelloweye rockfish. Yelloweye rockfish accounts for 90% of all DSR landings. Density is estimated using line transect techniques in the Eastern Gulf. ABC/TAC recommendations for the entire assemblage are keyed to adult yelloweye abundance. The 2001 exploitable biomass estimate is projected to be 14,695 mt; ABC was recommended at 330 mt. DSR were excluded from the Council license limitation program because ADF&G planned to initiate an analysis for a separate DSR license limitation program. In June 1999, the Council adopted an amendment requiring full retention of all DSR caught off Southeast Alaska.



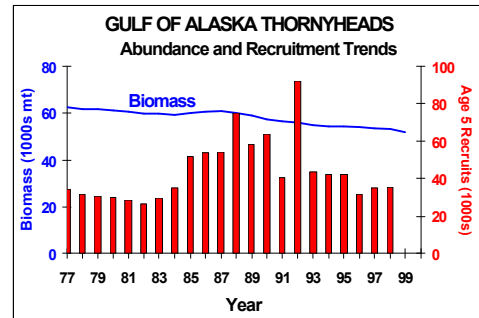
Rockfish assemblages in the Gulf of Alaska.

Slope Rockfish	Pelagic Shelf Rockfish	Demersal Shelf Rockfish
Pacific Ocean Perch	Dusky	Canary
Shortraker/Rougheye	Widow	China
Northern	Yellowtail	Copper
Other rockfish		Quillback
- harlequin		Rosethorn
- sharpchin		Tiger
- redstripe		Yelloweye
- many others		



Thornyhead Rockfish

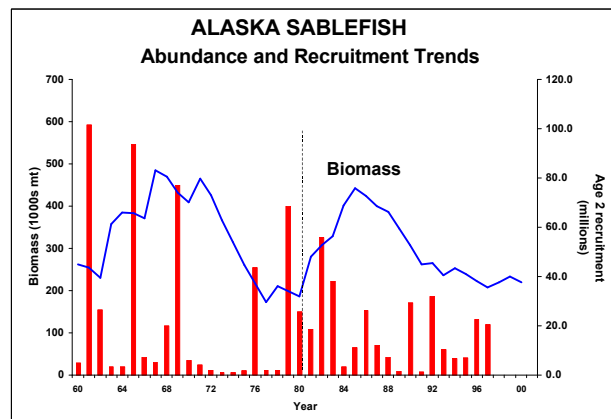
The thornyhead rockfish assemblage consists of two species: shortspine and longspine thornyheads. The current assessment for thornyheads is based on a size-based, age-structured model. The 2001 estimate of exploitable biomass for thornyheads is projected at 52,100 mt. The Plan Team recommended an ABC of 2,310 mt. The abundance of this complex is relatively high and recent harvests have been between 50-90% of the ABC. Due to the long-lived nature of this species, the overall harvest rate recommendation is low at about 4% of the total age 5+ biomass.



Sablefish

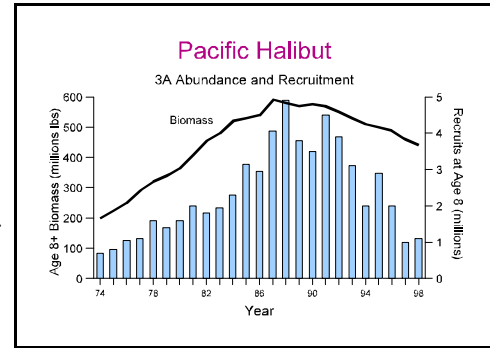
The sablefish resource of the Bering Sea, Aleutian Islands, and Gulf of Alaska are considered one stock. However, the resource is managed by discrete regions to distribute exploitation throughout its range. Large catches of sablefish (up to 26,000 mt) were made in the Bering Sea during the 1960s, but have since declined. Smaller catches have been made in the Aleutian Islands area, peaking at 3,800 mt in 1987. The projected 2001 exploitable biomass is 20,000 mt in the Bering Sea, with a recommended ABC of 1,560 mt. In the Aleutians, projected 2001 biomass is 33,000 mt with ABC recommended at 2,500 mt. The recommended 2001 GOA ABC was 12,840 mt. According to the most recent stock assessment, biomass of the sablefish stock off Alaska appears low and stable.

It is important to note that the TAC for sablefish is apportioned among gear types. In the Bering Sea, 50% of the sablefish is allocated to trawl gear, and 50% to fixed gear. In the Aleutians region, 25% is allocated to trawl gear, and 75% to fixed gear. Longlined pots are a legal gear type for sablefish in the Bering Sea and Aleutian Islands, but not in the Gulf of Alaska. Sablefish in the Western and Central Gulf of Alaska is allocated 80% to hook-and-line gear and 20% to trawl gear. In the Eastern Gulf of Alaska, the sablefish TAC is allocated 95% to hook-and-line gear and 5% to trawl gear. The fixed gear apportionment of the sablefish TAC is managed under an individual fishing quota (IFQ) program, which began in 1995. Twenty percent of the fixed gear allocation is reserved for use by CDQ participants. Important state water sablefish fisheries occur in Chatham Strait, Clarence Strait, Prince William Sound, and the Aleutians.



Pacific Halibut Stock

Large year-classes produced in the late 1970s and into the mid-1980s resulted in a buildup of halibut biomass to current high levels. The 2000 total exploitable biomass was projected to be 395.7 million pounds. Over half of the biomass is found in areas 3A and 3B (central and western Gulf of Alaska). Recruitment of 8 year-olds appears to have fallen off after a strong 1987 year-class recruited in 1995. Declines in halibut biomass should be expected in the near term.

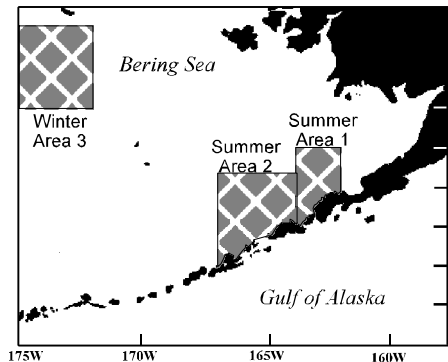


The directed halibut longline fishery is prosecuted under the halibut/sablefish individual fishing quota (IFQ) program, which began in 1995. The Pacific halibut stock is managed by the International Pacific Halibut Commission (IPHC), who sets the annual catch specifications. In conjunction with a continued decline in recruitment and analysis of setline survey data, the IPHC stock assessment produced lower catch limit recommendations for Areas 2A, 2B, 2C, and 3A in 2000. Areas 3B and 4 change relatively little from 1999. The IPHC reported that the only major change in the assessment for 2000 was a lowering of the pre-1993 IPHC setline survey catch rates to account for a bait change, which reduced the population estimates by 20-30% in the eastern and central GOA (IPHC news release, 1/14/00). The 2000 catch limit is about a 9% decrease from 1999, to 67,500,000 million pounds. The 2000 total IFQ TAC for all areas (2C to 4E) was established at 56 million pounds.

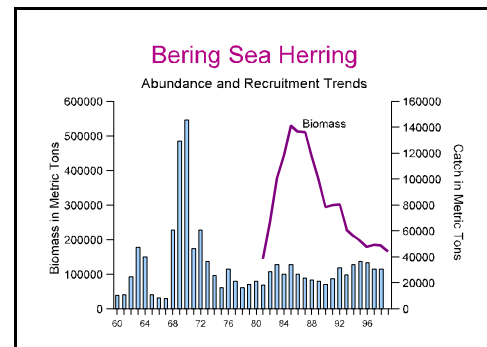
Limits are placed on halibut taken as bycatch in groundfish target fisheries. In the Bering Sea, 900 mt of halibut mortality is allocated to longline fisheries as bycatch, and 3,775 mt of mortality allocated as trawl bycatch. In 1998, the Council adopted a provision to reduce trawl halibut mortality by 100 mt as part of the regulation prohibiting the use of bottom trawl gear for BSAI pollock fisheries. In the GOA, 300 mt of halibut mortality is allocated to longline fisheries as bycatch, and 2,000 mt of mortality allocated as trawl bycatch.

Pacific Herring Stock

Pacific herring fisheries are managed by the State of Alaska. Fisheries occur in specific areas of the Bering Sea and Gulf of Alaska when fish come inshore to spawn. In the Bering Sea, catches peaked dramatically in 1970 at more than 108,000 mt, then declined to about 19,000 mt in 1977. Since then, catches have risen steadily to about 35,000 mt per year. In the Gulf of Alaska, catches peaked at over 100,000 mt in 1936.



Following years of reduced catches in the late 1960s, herring catches have increased in recent years.



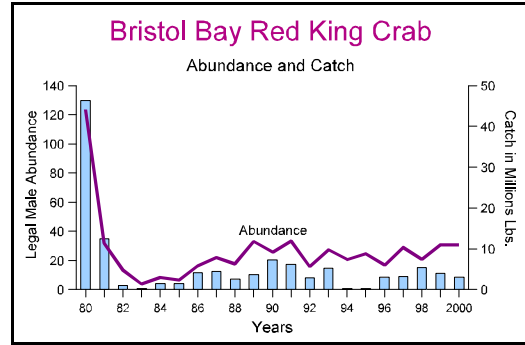
Following years of reduced catches in the late 1960s, herring catches have increased in recent years.

Herring are also taken incidental to groundfish trawl fisheries, particularly in the pollock fishery. In the Bering Sea, the herring PSC limit for trawl gear is determined each year as part of the TAC specification process. Bycatch of herring is limited to 1% of the estimated eastern Bering Sea adult biomass, and the limit is further apportioned by target fishery. If a fishery reaches its herring apportionment, then that fishery is prohibited from fishing in specified Herring Savings Areas. These Herring Savings Areas are depicted in the adjacent figure.

Principal Bering Sea Crab Stocks

Bristol Bay Red King Crab

After declining abundance throughout the 1960s and reaching a low during the years 1970-1972, recruitment to the Bristol Bay red king crab stock increased dramatically. New all-time record landings were established in each year from 1977 to 1980. Declining recruitment, fishing pressure, and probably increased incidence of disease and predation led to an abrupt decline in fisheries in 1981 and 1982. These precipitous declines led to a closure of the Bristol Bay fishery in 1983. In 1984, the stock showed some recovery and a limited fishery was reestablished. Between 1984 and 1993, the fishery continued at levels considerably below those of the late 1970s. Throughout the 1980s and 1990s there was little sign of a large year-class in this stock. Because the abundance of female crab was below threshold, the Bristol Bay red king crab fishery was closed in 1994 and 1995, as was the fishery for Tanner crab in Zone 1 east of 163° West longitude. The fishery reopened in 1996, and catches increased to 16.4 million pounds in 1998, then decreased to 11.1 million in 1999, and to 8.4 million in 2000.



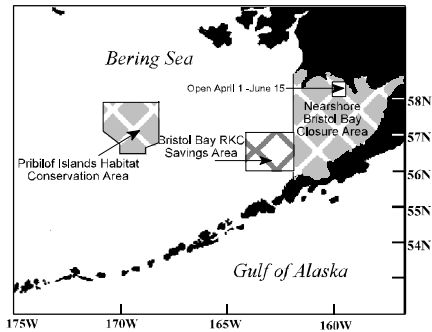
The effective spawning biomass in 2000 was estimated to be 39.9 million pounds from the assessment model, and the target rebuilding level is 55 million pounds. Because the effective spawning biomass is below the target level, a 10% harvest rate was applied to the mature male abundance for the GHL, resulting in a 2000 GHL of 8.35 million pounds of legal males. While the abundance of mature males has increased recently due to a large 1990 year-class, the fishery may continue to decline next year as the 1990 year-class passes through the fishery. However, a large 1994 year-class is expected to enter the mature female stock next year and may allow for higher harvest rates and increased catches in a few years.

Crab abundance affects groundfish fisheries because bottom trawl fisheries in specific areas are closed when prohibited species catch (PSC) limits of C. bairdi Tanner crab, C. opilio crab, and red king crab are taken. Amendment 37 established a stairstep procedure for determining PSC limits for red king crab taken in Zone 1 trawl fisheries. PSC limits are based on abundance of Bristol Bay red king crab as shown in the adjacent table. Given NMFS and ADF&G's 2000 abundance estimate for Bristol Bay red king crab, a Zone 1 PSC limit was established at 97,000 red king crabs for 2001. Beginning in 1998, the red king crab bycatch limit was further reduced by an additional 3,000 crab as part of the regulation prohibiting the use of bottom trawl gear for pollock fisheries.

PSC limits for Zone 1 red king crab.

Crab Abundance	PSC Limit
Below threshold or 14.5 million lbs of effective spawning biomass (ESB)	35,000
Above threshold, but below 55 million lbs of ESB	100,000
Above 55 million lbs of ESB	200,000

Several areas have been closed to trawling to reduce potential adverse impacts on crab and other resources. The Pribilof Islands Conservation Area is closed to all trawling year-round to protect blue king crabs. Fishing is prohibited with non-pelagic trawl gear in the Red King Crab Savings Area (162° to 164° W, 56° to 57° N) year-round. This area is known to have high densities of adult red king crab. To allow some access to productive rock sole fishing areas, the area bounded by 56° to 56°10' N latitude would remain open (with a separate bycatch limit) during the years when the directed crab fishery is open. To protect juvenile red king crab and critical rearing habitat, all trawling is prohibited on a year-round basis in the nearshore waters of Bristol Bay, except for one small area that remains open to trawling during the period April 1 to June 15 each year.

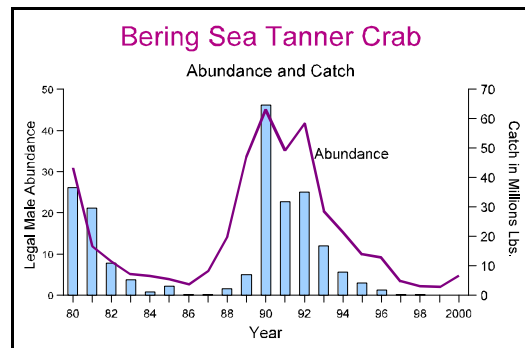


Tanner Crab

The Bering Sea Tanner stock has undergone two large fluctuations. Catches increased from 5 million pounds in 1965 to over 36 million pounds in 1980. The 1980 peak catch was followed by a collapse resulting in low landings (<0.5 million lbs) from 1981-1985, and finally no fishery in 1986 and 1987. The fishery reopened in 1988, and landings increased to over 60 million pounds in 1990. A decline followed, and the fishery has been closed since 1997. ADF&G will reopen the fishery when the female biomass is above the threshold (21 million lbs of female biomass) and the fishery GHL is above the

minimum identified in the rebuilding harvest strategy.

Abundance of this stock bottomed out in 1998, and is now increasing. The 1998 estimates of legal males and large females were the lowest in the history of the NMFS bottom trawl survey. The survey biomass estimate declined to 36.9 million lbs in 1998 and increased to 70.1 million lbs in 1999. Based on overfishing definitions adopted under Amendment 7, the bairdi stock continues to be below the established minimum stock size threshold, and was consequently declared to be in an “overfished” condition. A rebuilding plan was developed for this stock in October 1999. The plan bases the GHL on a harvest rate of 20% of molting mature males when the biomass of females >79mm CW is ≥ 45 million lbs and a harvest rate of 10% of molting mature males when the biomass of females >79mm CW is less than 45 million lbs and at least 21 million lbs. Signs of good year-classes from the survey data suggest that crabs should begin recruiting to the spawning biomass next year.



For groundfish trawl fisheries, separate Tanner (*C. bairdi*) crab PSC limits are set for Zone 1 and Zone 2. These limits may be further allocated among the pollock/mackerel/other species, Pacific cod, rock sole, turbot/sablefish/arrowtooth, rockfish, and yellowfin sole fisheries. When a fishery exceeds its PSC limit in one zone, trawling is closed for that zone for the remainder of the year. Under Amendment 41, PSC limits for bairdi in Zones 1 and 2 are based on total abundance of bairdi crab as indicated by the NMFS trawl survey. Based on 2000 abundance (219 million crabs), the PSC limit for *C. bairdi* in 2001 will be 730,000 crabs in Zone 1 and 2,070,000 crabs in Zone 2. The bairdi crab bycatch limit was further reduced by an additional 50,000 crabs as part of the regulation prohibiting the use of bottom trawl gear for pollock fisheries.

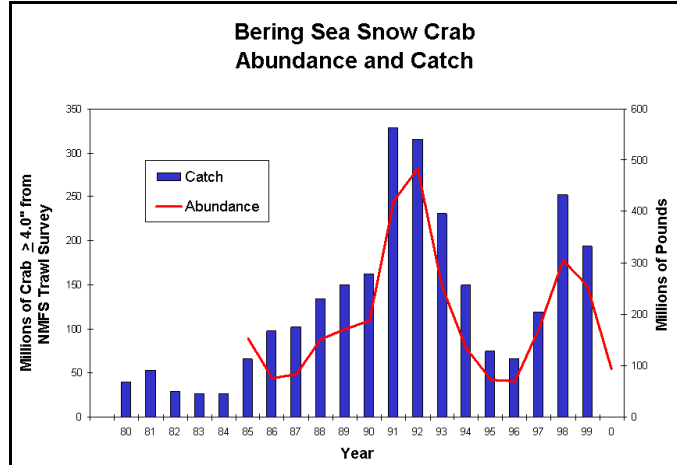
Amendment 41 PSC limits adopted for bairdi Tanner crab.

<u>Zone</u>	<u>Abundance</u>	<u>PSC Limit</u>
Zone 1	0-150 million crabs	0.5% of abundance
	150-270 million crabs	750,000
	270-400 million crabs	850,000
	over 400 million crabs	1,000,000
Zone 2	0-175 million crabs	1.2% of abundance
	175-290 million crabs	2,100,000
	290-400 million crabs	2,550,000
	over 400 million crabs	3,000,000

Snow Crab

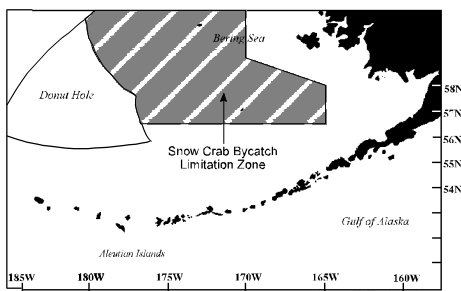
Catch of Bering Sea snow crab (*C. opilio*) increased from under 1 million pounds in 1974 to over 315 million pounds in 1992. The 1992 peak catch was followed by reduced landings through 1996. The stock quickly rebounded with good recruitment, however, and landings increased to 250 million pounds in 1998.

The 1999 mature biomass survey estimate (283 million lbs) indicated that the stock is well below the minimum stock size threshold (460.8 million pounds) established for this stock. Therefore, a reduced exploitation rate of 22% was used to establish the 2000 GHL of 28.5 million pounds. The abundance of this stock has peaked and is expected to remain at very low levels in the near-term. The 2001 fishery GHL was set at 27.3 million pounds. Based on length frequency data from the NMFS trawl survey, a good year-class is expected to recruit to the fishery in 3-4 years. A rebuilding plan for this stock was adopted as Amendment 14.



The 1999 mature biomass survey estimate (283 million lbs) indicated that the stock is well below the minimum stock size threshold (460.8 million pounds) established for this stock. Therefore, a reduced exploitation rate of 22% was used to establish the 2000 GHL of 28.5 million pounds. The abundance of this stock has peaked and is expected to remain at very low levels in the near-term. The 2001 fishery GHL was set at 27.3 million pounds. Based on length frequency data from the NMFS trawl survey, a good year-class is expected to recruit to the fishery in 3-4 years. A rebuilding plan for this stock was adopted as Amendment 14.

Under Amendment 40, PSC limits of snow crab (*C. opilio*) for groundfish trawl fisheries are based on total abundance of *opilio* crab as indicated by the NMFS survey. The snow crab PSC cap is set at 0.1133% of the Bering Sea snow crab abundance index, with a minimum PSC of 4.5 million snow crab and a maximum of 13 million snow crab. Snow crab taken within the “C. Opilio Bycatch Limitation Zone” accrue towards the PSC limits established for individual trawl fisheries. Upon attainment of a snow crab PSC limit apportioned to a particular trawl target fishery, that fishery is prohibited from fishing within the snow crab zone. The 2000 survey indicated a total population of 3.2 billion crabs. Therefore the 2001 snow crab PSC limit was established at 4,350,000 crabs. The snow crab bycatch limit was further reduced by an additional 150,000 crab as part of the regulation prohibiting the use of bottom trawl gear for pollock fisheries.



Location of the *C. opilio* bycatch limitation zone.

Weathervane Scallop Stock

Weathervane scallops have been the target of a very small fishery since the late 1960s. The overall magnitude of the weathervane scallop resource off Alaska is thought to be very limited based on survey and fishery information. Although Amendment 6 establishes OY at 0 to 1.24 million pounds of shucked meats, catches are constrained by crab bycatch limits. Recent landings have been in the order of 800,000 pounds.

Scallop stocks in Alaska have been managed under a Federal fishery management plan (FMP) since July 26, 1995. In June 1995, the Council adopted a 3-year vessel moratorium to restrict new entry into the scallop fishery while a more comprehensive plan was being developed. The moratorium was approved as Amendment 2, and became effective August 1, 1997. Amendment 3 deferred all management (except limited access) to the State. Regulations include permits, registration areas and districts, seasons, closed waters, gear restrictions, efficiency limits, crab bycatch limits, scallop catch limits, inseason adjustments, and observer monitoring. In February 1999, the Council adopted Amendment 4, which will establish a permanent license limitation program for the scallop fishery. In 2000, the fishery formed a cooperative, and the GHL was apportioned among participants based on catch history. Approximately 850,000 pounds was caught in the 2000 scallop fishery.

