
Alaska Shellfish Fisheries



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INTRODUCTION

Alaska's major shellfish fisheries developed in the 1960's in the Gulf of Alaska and then later expanded to the Bering Sea and Aleutian Islands region. Shellfish landings in 2006 generated an estimated ex-vessel value of over \$153 million. King and snow crabs account for a majority of this value (about \$127 million); Tanner crab contributed little to the total value due to low harvest limits while the stock was rebuilding. Other miscellaneous invertebrate fishery resources include shrimp and sea snails. Recent shrimp harvests continue to be low due to depressed stock abundance levels, and there has been no reported harvest of sea snails since 1997. Landings of non-crab invertebrates in Alaska added about \$13.7 million to ex-vessel revenue in 2006.

The State of Alaska Department of Fish and Game (ADFG) is the primary management authority for a majority of Alaska shellfish resources.

Although a Federal fishery management plan (FMP) exists for crab stocks in the Bering Sea and Aleutian Islands, the North Pacific Fisheries Management Council has deferred management authority to ADFG. Crab fisheries in the Gulf of Alaska, as well as shrimp and other miscellaneous invertebrate resources in Alaska, are also managed by ADFG.

SPECIES AND STATUS

Crabs

The fleet fishing for Alaskan crabs is comprised of 200–250 vessels, many of which are based in the Pacific Northwest. Crabs are captured with baited pots, and most of the catch is landed in Dutch Harbor, Alaska. Quotas, seasons, and size and sex limits restrict catches, with landings limited to large male crabs. Seasonal closures are set to avoid fishing during times when crabs are molting or mating,

Photo above:
Red king crabs.

Table 20-1
Productivity in metric tons (t)
and status of Alaska shellfish
fisheries resources.

Species/stock	Recent average yield (RAY) ¹	Current yield (CY)	Sustainable yield (MSY)	Stock level relative to B_{MSY}	Harvest rate	Stock status
King crabs²						
Blue king crab						
Pribilof Islands	0	0	1,179	Unknown	Not overfishing	Overfished
Saint Lawrence Island	0	0	45	Unknown	Not overfishing	Undefined
Saint Matthews Island	0	0	1,995	Unknown	Not overfishing	Rebuilding
Golden (brown) king crab						
Aleutian Islands	2,435	2,495	6,803	Unknown	Unknown	Undefined
Northern District	0	0	136	Unknown	Unknown	Undefined
Pribilof Islands	32	0	136	Unknown	Unknown	Undefined
Red king crab						
Aleutian Islands, Adak	0	0	680	Unknown	Unknown	Undefined
Aleutian Islands, Dutch Harbor	0	0	Unknown	Unknown	Not overfishing	Undefined
Bristol Bay	7,895	8,303	7,125	Unknown	Not overfishing	Not overfished
Norton Sound	175	204	227	Unknown	Unknown	Undefined
Pribilof Islands	0	0	590	Unknown	Not overfishing	Not overfished
Scarlet king crab						
Aleutian Islands	0	0	0	Unknown	Unknown	Undefined
Eastern Bering Sea	0	0	0	Unknown	Unknown	Undefined
Subtotal, king crab	10,537	11,002	18,916			
Snow and Tanner crabs						
Grooved Tanner crab ³						
Eastern Aleutian Islands	0	0	91	Unknown	Unknown	Undefined
Eastern Bering Sea	0	0	680	Unknown	Unknown	Undefined
Western Aleutian Islands	0	0	816	Unknown	Not overfishing	Undefined
Snow crab	12,976	16,774	125,397	Below	Not overfishing	Rebuilding
Southern Tanner crab ³						
Adak (western Aleutians)	41	41	181	Unknown	Not overfishing	Undefined
Eastern Aleutian Islands	Unknown	Unknown	317	Unknown	Not overfishing	Undefined
Eastern Bering Sea	464	962	25,805	Unknown	Not overfishing	Not overfished
Gulf of Alaska ⁴	1,230	1,561	Unknown	Unknown		
Triangle Tanner crab ³						
Eastern Bering Sea	0	0	136	Unknown	Unknown	Undefined
Eastern Aleutian Islands	0	0	454	Unknown	Unknown	Undefined
Subtotal, snow and Tanner crab	14,711	19,338	155,438			
Other shellfishes						
Sea snails ⁴	0	0	3,062	Unknown		
Shrimp ⁴	853	513	14,722	Below		
Subtotal, other shellfish	853	513	17,784			
Total	26,101	30,853	192,138			



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Top photo: close-up of a large male red king crab. Lower photo: Alaskan pink shrimp.

¹2004–06 average.

²Stock level determinations are not available for individual stocks; collectively, the stock level of king crabs is below B_{MSY} .

³Stock level determinations are not available for individual stocks; collectively, the stock level of Tanner crabs is below B_{MSY} .

⁴Harvest rate and stock status are not available for this stock.

and during soft-shell periods. These regulations are in place both to protect the crab resource and to maintain product quality.

Three king crab species (red, blue, and golden or brown), snow crab, and southern Tanner crab have traditionally been harvested commercially off Alaska. Exploratory fisheries on deep-water stocks of scarlet king crab, grooved Tanner crab, and triangle Tanner crab have occurred sporadically, producing minor landings to date. Yield values from these fisheries are presented in Table 20-1. Information on current and maximum sustainable yields is not available for king and Tanner crabs; values presented in Table 20-1 were derived from historical data. Stock status is determined by comparison of the short-term average catches against sustainable production. Alaska crab resources are fully utilized.

The recent average yields for king (10,537 metric tons [t]), snow (12,976 t) and southern Tanner (1,735 t) crabs are all below their respective sustainable yields. Harvest of snow crab has been lower than the sustainable yield since 2000 due to low abundance and lower harvest rates established under a rebuilding plan.

The ex-vessel value in 2006 was about \$84.5 million for king crabs, \$6.7 million for Tanner crabs, and \$42.9 million for snow crabs (ADFG, 2007). Landings in 2006 were: king crab (11,003 t), Southern Tanner crab (1,564 t), and snow crab (16,774 t). Almost all this production came from the Bering Sea, which contributes a majority of king crab landings and all snow crab landings. Snow crab dominates the total crab landings, accounting for 54% of the catch; however, king crabs comprise 55% of the ex-vessel value.

Catch and abundance trends (Rugolo et al., 2007) for king crabs are shown in Figure 20-1. After a peak in 1964–66, declines were evident. Until 1967, Japanese and Russian fisheries dominated Bering Sea landings, but those fisheries were phased out by 1974. In the Bering Sea, domestic catches peaked at 74,000 t in 1980 and then dropped precipitously in 1981. Since then, catches have remained low. Gulf of Alaska catches peaked in 1965, varied at a relatively low level for a decade, and then dropped lower still in 1983. Almost all Gulf of Alaska king crab fisheries have been closed since 1983.

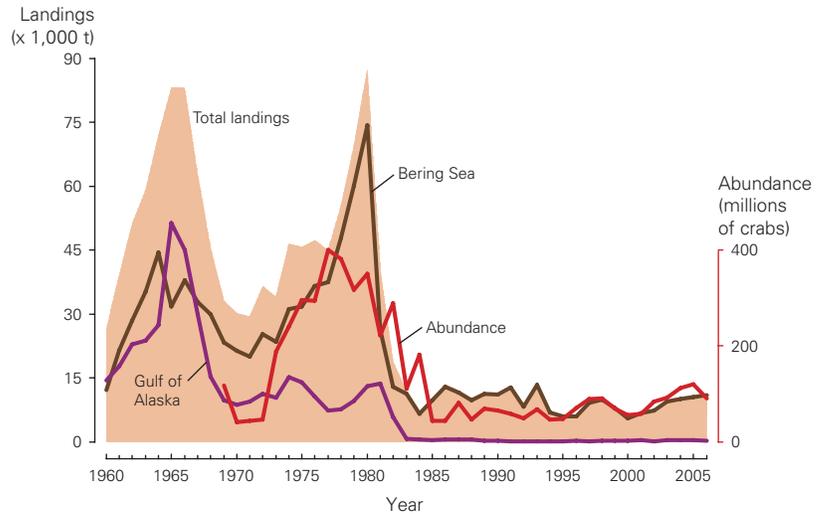


Figure 20-1

King crab landings in metric tons (t) for the Gulf of Alaska and Bering Sea, 1960–2006. Abundance trends are for Bering Sea red, Pribilof Island blue, and Saint Matthews Island blue king crab stocks combined.

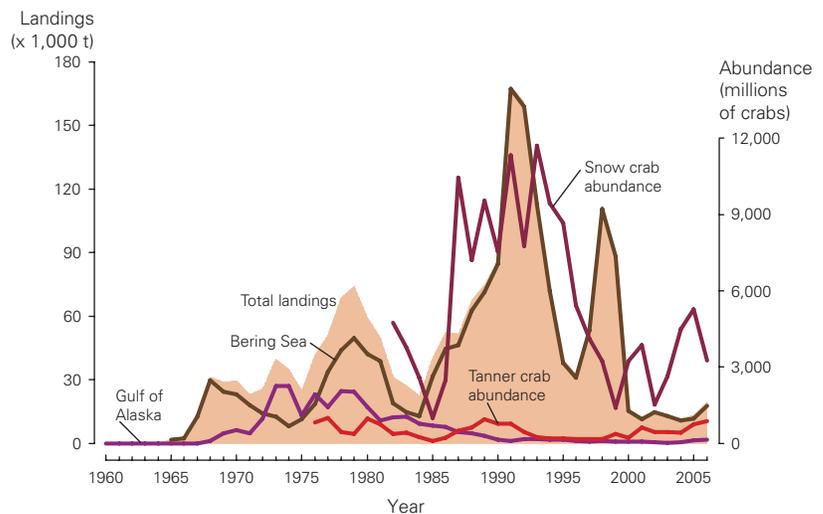


Figure 20-2

Southern Tanner and snow crab landings in metric tons (t) and abundance in individuals for the Gulf of Alaska and Bering Sea, 1960–2006.

Southern Tanner and snow crab trends (Rugolo et al., 2007) are shown in Figure 20-2. The 1965–75 period was a developmental phase for this fishery. During 1975–85, the catch peaked at about 75,000 t in 1979 and then declined thereafter. The catch began to increase again beginning in 1984, reaching an all-time high of 168,000 t in 1991. Landings again decreased until 1997 when the Tanner crab fishery was closed. Abundance trends for the Bering Sea indicate that the Tanner crab stock declined from a relatively high level in the late 1970's to a

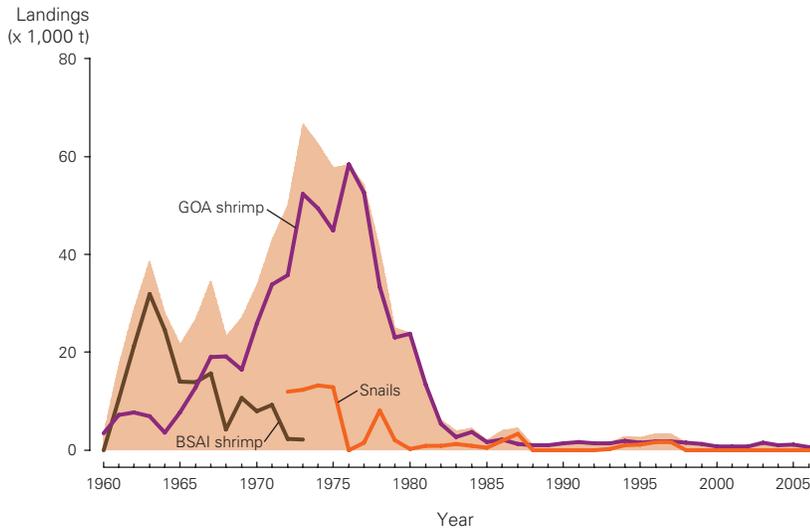


Figure 20-3
Shrimp and snail landings in metric tons (t) for the Gulf of Alaska (GOA) and Bering Sea and Aleutian Islands (BSAI), 1960–2006.

low in 1985. The stock recovered and then declined again subsequent to 1989. Tanner crab abundance has increased in the last two years and is now above the B_{MSY} level. Similarly, snow crab reached a low in 1985 but then sharply rebounded and produced high catches in the 1990's. The stock then declined and reached low levels in 1999. The catch of snow crab has decreased in recent years due to low stock abundance.

Shrimp and Sea Snail

Pink shrimp are the most important of the five species making up Alaskan shrimp landings. The domestic shrimp fishery in western Alaskan waters is currently at a low level; in the Bering Sea, shrimp abundance is too low to support a commercial fishery. The western Gulf of Alaska has been the main area of operation. During the 1970's, when the fishery was more productive, 50–100 vessels trawled for shrimp at Kodiak Island and along the Alaska Peninsula.

Shrimp landings in the western Gulf during 1960–90 rose steadily to about 58,000 t in 1976 and then declined precipitously (Figure 20-3). Since 1988, negligible amounts have been landed, almost all of it coming from Southeast Alaska. Ex-vessel revenue from the western shrimp fisheries averaged \$4 million annually, and yielded peak revenue of \$14 million in 1977. Bering Sea shrimp catches by Russia and Japan peaked at 32,000 t in 1963, declining gradually thereafter, until the

fishery ended in 1973. As with crabs, the sustainable yields of shrimp stocks in Alaska are not well understood, and they have been equated to average catches. Shrimp are managed by regulating catch levels according to stock abundance. In addition, spring “egg hatch” closures are used to protect breeding stocks.

The Japanese pot fishery for snails, conducted from about 1972 until 1987, peaked at about 13,000 t in 1974. Annual catches averaged about 4,800 t during the period of the fishery. The snail stocks of the Bering Sea are underutilized, with no reported catch since 1997. Recent average yield and current yield equal the 2004–06 average catch, and the maximum sustainable yield equals the 1972–97 average.

ISSUES AND PROGRESS

Bycatch and Multispecies Interactions

In general, crab and shrimp resources are depressed throughout Alaska. However, several stocks have recently increased under rebuilding plans where directed fisheries were closed. Eastern Bering Sea Tanner crab has increased to above the B_{MSY} level in 2006 with the fishery closed since the 1996–97 season. Snow crab and St. Matthews Island blue king crab are showing signs of increases as well. Although the Bristol Bay red king crab stock is still well below the high levels that occurred in the 1970's, the stock has increased from the low levels of the mid 1980's. The bycatch of crabs in pot fisheries is an issue, due to uncertainty in the mortality of discarded crab. Bycatch in groundfish trawl fisheries is regulated with caps and/or closed areas for most stocks.

LITERATURE CITED

- ADFG. 2007. 2006 preliminary Alaska commercial shellfish catches & exvessel values. Alaska Department of Fish and Game, Juneau, AK. Internet site—<http://www.cf.adfg.state.ak.us/geninfo/shellfish/06value.php>.
- Rugolo, L. J., E. A. Chilton, C. E. Armistead, and J. A. Haaga. 2007. Report to industry on the 2006 eastern Bering Sea crab survey. NMFS Alaska Fisheries Science Center Processed Report 2006-17, 59 p.