

9 Pribilof District Golden King Crab

In accordance with the approved schedule, the Pribilof Islands golden king crab (PIGKC) assessment is conducted triennially with the previous assessment in 2020. Therefore, a full stock assessment was conducted in 2023 with results to be applied for the 2024–2026 specifications. The PIGKC stock is managed by calendar year, rather than a crab year, basis. Additional information listed below summarizes the 2023 assessment.

Fishery information relative to OFL setting

The PIGKC fishery began in the 1981/82 season. The directed fishery mainly occurs in Pribilof Canyon of the continental slope. Peak directed harvest was 388 t by 50 vessels during the 1983/84 season; fishery participation has since been sporadic and retained catches vary from 0 to 155 t. A guideline harvest level (GHL) was first established in 1999 at 91 t and the fishery was managed with a GHL of 68 t from 2000 to 2014, which was reduced to 59 t in 2015. Discarded (non-retained) catch has occurred in the directed golden king crab fishery, the eastern Bering Sea snow crab fishery, the Bering Sea grooved Tanner crab fishery, and in Bering Sea groundfish fisheries. Estimates of annual total fishery mortality during 2001–2021 due to crab fisheries range from 0 to 73 t. Estimates of annual fishery mortality during 1991/92–2022 due to groundfish fisheries range from negligible to 9 t.

Data and assessment methodology

The authors used a modified tier 4 approach, whereby OFL is computed using natural mortality as a proxy exploitation rate so that $E = M = F_{\text{OFL}}$ and $\text{OFL} = E \times B$ (NPFMC 2010). This approach was based on SSC recommendation to reference the methodology of the 2010 Gulf of Alaska spiny dogfish assessment (Tribuzio and Kruse 2010). For Pribilof District golden king crab, we computed OFL specifications using $E = 0.22 \text{ yr}^{-1}$ (Siddeek et al., 2023) and B was equal to the average MMB from the NMFS-AFSC EBS Slope Survey from 2002-2016.

Fish ticket and observer data are available, as are size-frequency data from samples of landed crabs and pot lifts sampled during crab fisheries, and from the groundfish fisheries. Much of the directed fishery data are confidential due to low participation levels. A random effects model for moving toward a Tier 4 assessment was explored during the 2023 assessment; however, there is no indication that the slope survey will be conducted with any regularity in future years. The CPT recommends that the Tier 4 model not be adopted until updated survey data become available.

Stock biomass and recruitment trends

NMFS-AFSC EBS Slope Survey data are available for 2002, 2004, 2008, 2010, 2012, and 2016, though size composition information necessary to estimate MMB are only available from 2008-2016. MMB estimates for 2002 and 2004 were estimated from the ratio of MMB to total biomass in 2008-2016.

In the absence of an updated MMB estimate for 2023, we computed biomass B as the average MMB for 2002-2016 surveys ($B = 517 \text{ t}$) to capture the range of potential productivity of the stock. ABC was computed a $\text{ABC} = (1 - 0.25)\text{OFL}$, consistent with tier 4 calculations for EBS crab stocks (NPFMC 2007).

Tier determination/Plan Team discussion and resulting OFL and ABC determination

The CPT recommends this stock be managed under Tier 5 in 2024-2026. The CPT concurs with the author's recommended status quo OFL of 94.7 t and an ABC of 71.1 t. **However, the SSC recommended an average survey biomass approach, resulting in an OFL of 114 t and an ABC of 85**

t. The ABC was derived by applying a 25% buffer of the OFL, $ABC = 0.75 * OFL$, the same buffer used for other Tier 5 stocks with similar levels of concern.

Total catches in 2020-2022 were below the OFL thus, overfishing did not occur.

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Status and catch specifications (t) for Pribilof Islands golden king crab. Shaded values are new estimates or projections based on the current assessment. Other table entries are based on historical assessments and are not updated except for total and retained catch.

Year	MSST	Biomass (MMB)	GHL	Retained Catch	Total Catch	OFL	ABC
2019			59	Conf.	Conf.	93	70
2020			59	49	52	93	70
2021			59	16	21	93	70
2022			59	Conf.	Conf.	93	70
2023			59			93	70
2024						114	85.3
2025						114	85.3
2026						114	85.3

Status and catch specifications (million lb) for Pribilof Islands golden king crab. Shaded values are new estimates or projections based on the current assessment. Other table entries are based on historical assessments and are not updated except for total and retained catch.

Year	MSST	Biomass (MMB)	GHL	Retained Catch	Total Catch	OFL	ABC
2019			0.13	Conf.	Conf.	0.20	0.15
2020			0.13	0.11	0.12	0.20	0.15
2021			0.13	0.03	0.05	0.20	0.15
2022			0.13	Conf.	Conf.	0.20	0.15
2023			0.13			0.20	0.15
2024						0.25	0.19
2025						0.25	0.19
2026						0.25	0.19

