

7 EFH descriptions for BSAI king and Tanner crab species

7.1 What are the BSAI crab species?

Since the 2005 EFH EIS, an FMP amendment has removed certain crab species from the BSAI Crab FMP (further described in Section 4.3)¹⁴. The managed species currently identified in the BSAI Crab FMP, and which were reviewed as part of this process, are the following:

- red king crab
- blue king crab
- golden king crab
- Tanner crab
- Snow crab

7.2 Summary of EFH review for individual species changes

Each stock assessment author was asked to review the current FMP text relating to EFH for the assessed species or species complex, based on new information that has become available in the five years since EFH was last evaluated. The author completed a worksheet with some general questions about new habitat information available since the 2005 EFH EIS, and recommendations on potential HAPC or EFH conservation recommendations. The author also revised the existing FMP text with recommended changes or updates. There are several components in the FMP that relate to EFH for each species:

- EFH description by life history stage, in text and in maps, including an indicator for how much habitat information is known about each life history stage
 - This is the legal description of EFH, based on which EFH consultations for fishing and non-fishing effects on EFH are held as directed by the Magnuson-Stevens Act
- General information about the life history and distribution of the species/complex, the fishery, relevant trophic information, and habitat and biological associations
- A literature section that cites references of where habitat information on the species/complex can be found, and a section listing contact people for more information on the species
- Conclusions from the evaluation of fishing effects on EFH for the species, summarized from the 2005 EFH EIS

Table 8 provides an overall summary of the EFH reviews by species. To further explain the summary table, the major changes recommended to the EFH text for each species are detailed in bulleted form in Section 7.3. The detailed changes to the FMP text for each species, as suggested by the authors, are included in Appendix 3 to this document (which is posted online at www.alaskafisheries.noaa.gov/npfmc). The authors incorporated relevant findings from the EFH research projects described in Section 4.2, as well as other new information available on crab habitat (also detailed in Appendix 3) in their individual species reviews, and reviewed the change in fishing intensity maps described in Section 10.1.1.

¹⁴ Note, there is some discrepancy as to whether EFH text relating to scarlet king crab, Grooved tanner crab, and Triangle tanner crab is still intended to be in the FMP, even though these species were clearly removed under Amendment 24. The removal of this EFH text would constitute a housekeeping amendment to the FMP, however, and these species were not evaluated as part of this 5-year review.

The BSAI Crab Plan Team reviewed the stock assessment authors' recommended changes during their March 2010 Plan Team meeting, and provide recommendations for the SSC and the Council. Table 8 incorporates the changes that were recommended coming out of the Plan Team meeting. The Plan Team also had recommendations about a suggested HAPC priority for Council consideration (see Section 12.3), and EFH research for crab species (see Section 13.3).

Overall, the Plan Team recommended that further analysis should be undertaken to evaluate fishing effects on crab stocks, and consequently identified that their EFH recommendations for the Council should be considered a high priority for Council action. Distribution of crab stocks, particularly red king crab, has changed since the analysis in the 2005 EFH EIS. Additionally, the methodology used in the 2005 effects of fishing analysis may not adequately capture actual impacts of fishing on crab populations. Other parameters may need to be considered for crab stocks, such as the importance of oceanographic currents for crab settlement. This is applicable to the assessment of all crab stocks. Also, the conclusions in the 2005 EFH EIS imply that more is known about the effects of fishing on the habitat needs and life history stages of crab (especially growth to maturity) than can be substantiated, based on research-to-date. Therefore the Crab Plan Team recommends further evaluation of the effects of fishing be undertaken, to decide whether the conclusions in the FMP are valid.

Table 8 EFH review of BSAI crab species, with recommended changes to the existing EFH FMP text

KEY: yes = Plan Team has recommended updates to the existing FMP text, based on new information
e/c = author has recommended editorial changes or clarifications to the existing FMP text
“-“ = no changes to the existing text have been recommended

Species	Recommended changes to the FMP text										Worksheet recommendations		Plan Team: priority recommendation	
	EFH description			General information							2005 evaluation of fishing effects on EFH	HAPC ¹⁵		EFH conservation and enhancement
	text	map	available level of information	tables of associations	life history, gen. distribution	trophic information	biological/ habitat associations	literature	description of fishery					
Red king crab	-	-	-	yes	yes	yes	-	-	yes	yes	yes	-	high	
Blue king crab	-	-	-	yes	e/c	yes	e/c	-	e/c	yes	-	-	high	
Golden king crab	-	-	-	yes	yes	yes	yes	yes	yes	yes	-	-	high	
Tanner crab	e/c	-	-	yes	yes	yes	yes	yes	yes	yes	-	-	high	
Snow crab	-	-	-	yes	yes	yes	yes	yes	yes	yes	-	-	high	

7.3 Description of recommendations for EFH text for individual species

A description of the recommendations that are captured in the summary table (Table 8) is provided below for each individual species or species complex for which EFH is defined in the BSAI Crab FMP. The complete review for each species may be found in Appendix 3 to this document (which is posted online at www.alaskafisheries.noaa.gov/npfmc).

Red king crab

- updates to prey associations, natural mortality, recent fishery information
- author suggests change to evaluation of fishing effects; effects of fishing on spawning and breeding may be more than minimal and not less than temporary in southern Bristol Bay, specifically. The area is an important spawning ground for red king crab and also subject to high trawling intensity, which may greatly impact crab spawning success. Most of the distribution of red king crab was north and east of the high intensity fishing areas, however a high density of mature female crab were found in the area during 2008-2009, and it appears that mature female crab may have moved back to this historical important spawning ground. Given this current overlap, professional judgment indicates that trawling fisheries have currently adversely affect the EFH of red king crab. Beyond southern Bristol Bay, other fishing may have minimum impacts on red king crab EFH.
- Plan Team comments: agreed with the author that there is evidence that the effect of fishing on spawning/ breeding populations could be substantial. As per the general recommendation above, further evaluation is required to determine whether a change to the FMP's conclusions is warranted. The Plan Team also recommended the Council consider red king crab spawning habitat as a HAPC priority type.

Blue king crab

- updates to age at maturity, editorial clarifications
- author suggests that insufficient information is available to determine EFH for late juvenile and adult life stages
- author recommends changing determination of effect of fishing on growth to maturity to "unknown"
- Plan Team comments: disagreed with author's recommendation to change EFH information from Level 1 (information is available to describe EFH) to Unknown, based on the clarification that EFH has been defined by the Council as the general distribution of the species. Recommended that this clarification be explicitly added to the FMP text. Agreed with author's modification of the effects of fishing on growth to maturity from MT (minimal and not more than temporary) to unknown. No available studies are available on growth to maturity, such that a conclusion of MT could be supported.

Golden king crab

- author suggests that insufficient information is available to determine EFH for late juvenile and adult life stages; current EFH distribution for these species is equivalent to stock distribution
- updates to size at sexual maturity, reproductive cycle, depth associations by life history stage
- recent fishery information updated
- literature references added
- author recommends changing determination of effect of fishing on spawning/breeding to "unknown", however notes that there is no information suggesting that overall fishing effects on golden king crab EFH are beyond minimal and temporary
- Plan Team comments: as with blue king crab, disagreed with author's recommendation to change the status of available EFH information, but recommended that appropriate clarification be added to the document to note that EFH is defined based on general distribution. A minor edit was recommended to the water column association for larvae, to replace pelagic with unknown. For the evaluation of fishing effects, the CPT recommended that the MT conclusion be provisionally retained for spawning and breeding (consistent with the rationale for blue king crab, some

information is available on the number of breeding crab caught as bycatch in fishing operations). The Team supported 'unknown' for the other conclusions.

Tanner crab

- editorial clarifications to EFH text description and evaluation of fishing effects summary
- updates to size and age at maturity, natural mortality, fecundity, reproduction, and predator and prey associations
- substantial clarifications and additions to life history and general distribution, and fishery description
- literature references added
- Plan Team comments: disagreed with the author's proposed change to the EFH text description for eggs based on the clarification that the rationale for this determination is that egg distribution can be reasonably inferred from adult distribution. Recommended that the fishing effects evaluation conclusions be modified to 'unknown' for consistency with the approach used to evaluate other species.

Snow crab

- updates to prey associations, natural mortality, molting and mating cycle, recent fishery information
- literature reference added
- Plan Team comments: As with Tanner crab, recommended modifying the fishing effects conclusions to 'unknown' to be consistent with other reviews. The Team noted that the summary text for this species should also be edited to include this rationale.