



ALASKA DEPARTMENT OF FISH AND GAME

DIVISION OF COMMERCIAL FISHERIES

MEMORANDUM

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Commercial Fisheries Division
Headquarters - Juneau

DATE: September 28, 2006

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THRU: Jim McCullough
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FROM: Douglas Pengilly
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SUBJECT: Bristol Bay Red King
Crab TAC for
2006/2007

cc: Distribution

This memo summarizes results of the teleconference meeting held at 1 PM on 21 September 2006 to determine the total allowable catch (TAC) for the Bristol Bay red king crab fishery in the 2006/2007 season. ADF&G staff attending were Wayne Donaldson, David Barnard, Douglas Pengilly, Leslie Watson, Skip Gish, Jie Zheng, Shareef Siddeek, Forrest Bowers, and Barbi Failor. NOAA Fisheries staff attending were Lou Rugolo, Jack Turnock, and Gretchen Harrington. Diana Stram (NPFMC) was not available. In preparation for the teleconference, I distributed via email on 15 September 2006 a review document for the Bristol Bay red king crab stock. That document reviewed the Federal minimum stock size threshold (MSST), the State harvest strategy, stock assessment methods, fishery and stock history, results of the 2006 NMFS eastern Bering Sea trawl survey, 2006 stock status relative to the federal overfished definition, and computation of the 2006/2007 TAC according to the harvest strategy in regulation. That review document (with corrections made to some minor typographical or formatting errors that were brought to my attention after being distributed on 15 September 2006) is attached.

It was concluded during the teleconference, without any objection from meeting participants, that the Bristol Bay red king crab fishery will open for the 2006/2007 season with a TAC of 15.527-million pounds (including the portion allocated to the CDQ fishery).

Bristol Bay Red King Crab

MSST (Federal Minimum Stock Size Threshold for “overfished” status)

- **FMP definition:** 44.8-million pounds of total mature biomass
 - **2006 total mature biomass estimate:** 157.2-million pounds (NOAA Fisheries estimate)
- ⇒ **Stock is above MSST “overfished” level**

State harvest strategy fishery threshold and minimum TAC for fishery opening

- **Harvest strategy fishery threshold definition:** 8.4-million mature females and 14.5-million pounds of effective spawning biomass (ESB)
- **State minimum TAC:** 4.444-million pounds (including portion allocated to CDQ fishery)
- **2006 estimate for abundance of mature females:** 40.469-million crabs (ADF&G LBA estimate)
- **2006 estimate for ESB:** 67.158-million pounds (ADF&G LBA estimate)
 - ⇒ **Stock is above threshold for a fishery opening**
 - ⇒ **15% exploitation rate on estimated mature male abundance applies**
- **TAC computed according to harvest strategy:** 16.272-million pounds (including portion allocated to CDQ fishery)
- **TAC adjusted for potential “high-grading” (95.42% of computed TAC):** 15.527-million pounds (including portion allocated to CDQ fishery)
 - ⇒ **TAC after adjustment for potential “high-grading” is above minimum TAC**
 - ⇒ **2006/2007 season open with TAC of 15.527-million pounds** (including portion allocated to CDQ fishery)

Stock status summary

This stock was estimated to be above the threshold in the State’s harvest strategy for a fishery opening. With ESB estimated to be above 55-million pounds (at 67.158-million pounds), a 15% exploitation rate on the estimated abundance of mature-sized males was used to determine the TAC. Estimated abundance of mature-sized males in 2006 is 17.364-million crabs (ADF&G length-based analysis, LBA, estimate). The TAC computation assumed that the average weight for legal males harvested during the 2006/2007 season will be 6.25 pounds; that average weight was derived by multiplying the estimated weight of legal males captured during the survey (5.95 pounds) by 1.05, an adjustment that has been effective in predicting fishery average weight from survey average weight. The TAC computed according to the harvest strategy was reduced to 95.42% of the computed TAC to adjust for potential “high-grading” during the 2006/2007 season. That adjustment of the TAC for high-grading assumes the same level of high-grading will occur in the 2006/2006 season as occurred in the 2005/2006 season, during which it was estimated that 20% of all captured legal males were discarded. The Industry was informed of the department’s plans to so adjust the computed TAC for high-grading in an 11 August 2006 letter from Denby Lloyd to the Steve Minor, Chair of the Pacific Northwest Crab Industry Advisory Committee. The TAC for the 2006/2007 season, 15.527-million pounds, assumes that 2.486-million crabs will be harvested, which represents 24% of the estimated abundance of legal-sized males (10.452-million crabs, ADF&G LBA estimate).

Estimated total mature biomass in 2006 (157.2-million pounds, NOAA Fisheries estimate) is down slightly from the estimates of the preceding 3 years (approximately 180-million pounds), but remains well above the MSST and MSY biomass defined for this stock in the Federal FMP (44.8-million pounds and 89.6-million pounds, respectively). Although far below the levels estimated to have existed in the late 1970s, ADF&G's LBA model for 2006 estimates that abundance of mature males, legal males, and mature females and effective spawning biomass are each at their highest levels since the early 1980s. A mode of juvenile-sized crabs centered at approximately 72.5-mm CL that appeared in the 2005 male and female size-frequency distributions apparently tracked to a mode centered at approximately 87.5-mm CL in the size-frequency distribution for each sex in 2006. Crabs in that size class in 2006 should provide good recruitment into the mature female size class in 2007, but would not provide strong recruitment to the mature male size class until 2008. Representation of juvenile crabs <70-mm CL, however, was poor for both sexes in the 2006 survey as compared to the 2002-2005 surveys.

New recruits to legal size were a large component (approximately one half) of the legal-sized males captured during the 2006 trawl survey. The strong contribution of new recruits to legal size accounts for the low average weight of legal-sized males and a high percentage of legal males in new-shell condition in this year's survey. The average weight of harvested crabs assumed for computation of the 2006/2007 season (6.25 pounds) compares with an average weight of 6.7 pounds for crabs harvested during the 2005/2006 season. The percentage of legal males in new-shell condition from the 2006 survey was estimated at 84%; that is the highest percentage since at least the 2000 survey and compares to 58% in the 2005 survey.

Timing of molting, mating, and egg-extrusion for female red king crab was late relative to standard EBS trawl survey timing for the Bristol Bay area in 2006 (presumably due to colder-than-normal bottom temperatures), necessitating a resurvey of 30 stations important for mature female abundance estimates approximately 6 weeks after having been sampled by the standard survey. The 30 stations were sampled by the standard survey during 3-8 June 2006 and sampled by the resurvey during 19-24 July 2006. Mature females had molted and mated by the time of the resurvey; no empty clutches were recorded from mature females captured during the survey and virtually all clutches were scored as full.

Distribution:

ADF&G: Wayne Donaldson, Forrest Bowers, Mary Schwenzfeier, Ryan Burt, Jie Zheng, Shareef Siddeek, Doug Woodby, Earl Krygier, Herman Savikko, Ivan Vining, David Barnard, Robert Gish, Susie Byersdorfer, Leslie Watson, Jan Rumble
NOAA Fisheries: Lou Rugolo, Gretchen Harrington, Jack Turnock
NPFMC: Diana Stram

Attachment:

Review for 2006/2007 Bristol Bay Red King Crab TAC