

Coastal Dungeness Crab Summer Fishery Management Plan

Purpose

The purpose of the Coastal Dungeness Crab Summer Fishery Management Plan is to guide Washington Department of Fish and Wildlife (WDFW) staff, and provide predictability to the coastal crab industry, on the implementation of specific management measures to protect soft-shelled crab.

Background

The Washington coastal Dungeness crab season is open from December 1 through September 15 of the following year. The fishery is closed provide protection for soft-shelled crab during the peak male recruitment molt period when they are more susceptible to handling mortality (see Appendix A). However, historical shell condition data shows that peak molt timing varies annually, particularly in Northern Oregon and Washington, and the primary recruitment molt often occurs prior to the season closure. In some cases, the molt may occur in late fall causing a delay in the opening of the following season.



A test fishery is conducted in the fall to assess the shell condition of male crabs. In order for the commercial crab season to open on December 1, less than 50% of the crabs sampled must be in shell grades II and III. If more than 50% of the crabs sampled are in shell grade II and III, then additional testing is required. Following additional tests, the decision of whether to open the season on December 1 is made by mutual agreement between WDFW and the Oregon Department of Fish and Wildlife (ODFW). The crab season in Washington and Oregon will open on December 1 if it can be determined with reasonable certainty that meat recovery testing in all areas will be 23% by December 1. If the meat recovery does not meet the criteria, then further testing is conducted. If the season opening is delayed as a result, then WDFW and ODFW will take consistent regulatory action.

Recent Management

While test fishing to determine shell condition does occur in the summer, it is rare that the fishery closes prior to September 15. In the last ten years, this has occurred once in 1998 when the fishery closed on September 3 after it was discovered that large quantities of soft-shelled crab were being sold in Westport. Also in 1998, WDFW promulgated a permanent regulation to close the crab fishing area outside four miles, effective July 1, because shell condition data indicate that soft-shelled crabs are typically found further offshore than hard-shelled crab. WDFW believes that by closing the area outside four miles, the majority of the soft-shelled crab will be protected during the peak of the molt cycle.

In June 2001, WDFW was notified that large quantities of soft-shelled crab were being caught in the commercial fishery. In response, we closed the area outside four miles two weeks early (June 18) and imposed a 4,000-pound per week landing limit on August 12. WDFW staff continued to collect shell condition data and monitored the fishery to evaluate the effectiveness of these regulations. We then began working with coastal crab industry members to prepare a management plan to address management issues associated with the summer crab fishery to be implemented in June 2002.

Development of Management Options

In September 2001, the Director of WDFW requested that staff and industry work together to prepare a plan that would address summer fishery issues to be implemented in 2002. In response, WDFW staff have held a series of meetings with the Coastal Dungeness Crab Advisory Group and members of the industry to develop options for the management of the summer crab fishery. These meetings are summarized below.

March 5, 2002:

Seventeen crab fishermen and industry members attended this initial meeting to begin developing alternatives for summer crab fishery management measures. Two options were discussed—one option similar to the current Oregon regulations which would place a weekly landing limit on all fishers beginning in June and cap the summer harvest level at 7% of the previous winter's catch. This would essentially be a passive management approach that would not require in-season sampling and monitoring.



Commercial Crab Fishing
off the coast of Washington State.

The second option would require weekly sampling to collect shell condition data to indicate the need for additional restrictions on the fishery, such as trip limits, smaller pot limits and closures. This option would also allow the restrictions to be removed if shell condition improved prior to the season closure.

April 1, 2002:

Thirty crab fishermen and industry members attended this meeting to continue discussing options for the summer fishery. Some fishers indicated that they favored an active management option that would implement restrictions when crab condition demonstrated a need. WDFW staff proposed a plan that would use shell condition data from shipboard trips to guide management restrictions.

It was also decided that the summer management period would be defined as July 1 through September 15.

April 19, 2002:

Twenty-five fishermen and others attended this meeting. Staff presented a flexible

option that includes landing limits if crab shell condition does not meet minimum criteria. These measures are contingent upon bi-weekly shell condition testing, which was acceptable to the majority of the fishers present.

It was decided that this was the appropriate course of action to manage the coastal Dungeness crab fishery and that WDFW staff would be recommending these measures to the Director.

Summer Crab Fishery Management Measures

- Management period is July 1 – September 15
- The area west of four miles will be closed each year from July 1 - September 15. The four-mile line is defined in WAC 220-52-046.
- Beginning the third week of June, WDFW will begin bi-weekly crab condition testing using ride-along trips with consenting commercial fishers. The condition sampling will be done consistent with the summer crab condition sampling protocols listed in Appendix B.
- If any single shell condition test indicates that less than 50% of the male crab sampled are grades 1A and/or 1B, WDFW will impose a 2,500 pound weekly landing limit.
- Following the implementation of the 2,500-pound landing limit, WDFW will continue to test the shell condition of crab.
- If any single shell condition test indicates that 60% - 79% of the male crab are grades 1A and/or 1B, the weekly landing limit will be increased to 4,000 pounds.
- If any single shell condition test indicates more than 80% of the male crab are grades 1A and/or 1B, the weekly landing limit will be removed for the balance of the season (September 15).

Term

The term of this Coastal Dungeness Crab Summer Fishery Management Plan is from July 1, 2002, through September 15, 2006. WDFW staff will evaluate the effectiveness of the plan at the end of each summer period, and will modify as needed.

Appendix A.

Dungeness Crab Handling Mortality Studies

Washington Coast 1949:

Tag return data from this study indicated that survival of “new soft shell” and “new slightly soft” crab was reduced by 68.5% and 8.1% respectively, compared to “new hard shell” crab (Cleaver, 1949).

Washington Coast 1970:

To test whether mortality was a function of time, additional handling or both, triplicate lots of 25 soft-shelled crab were held for 2 days, 4 days or 6 days in tanks kept in 3-7 fathoms of water in the same location they were caught (Tegelberg, 1970).

- Crabs that were held for 2-days were handled once, crabs held for 4 days were handled twice and crabs that were held for 6 days were handled three times.
- In all cases, for comparable holding periods, additional handling caused higher mortality.
- Mortality of untagged crabs ranged from 15% for crabs that were held for 2 days/handled once to 33% for crabs held 6 days/handled three times.
- Mortality of tagged crabs ranged from, 23% for crabs held 2 days/handled once to 41% for crabs held 6 days/handled three times.

Washington Coast 1972:

Testing to estimate mortality from specific injuries and treatments. (Tegelberg, 1972)

- Mixtures of hard and soft crabs (stage 3) were placed in posts to test cannibalism effects. Mortality was 6.8% for soft crab and 0.0% for hard crab.
- Soft crabs were thrown into a 30-gallon box of water to simulate being thrown from the boat during normal fishing operations. Mortality of these crabs was 8.9%.
- To simulate being pinched by another crab the carapace was crushed with needle nose pliers, mortality was 6.7%.
- One claw or one of the first walking legs was broken to simulate typical injuries caused when crab are removed from traps, mortality was 42.2%.
- Tegelberg notes that stage 3 crab were difficult to obtain so some of the "stage 3" crab were actually stage 2.

Oregon Coast 1958:

Tag return data from a study conducted in Oregon coastal waters showed that 19.8% fewer tags were recovered from crab tagged at stage 2 compared to crab tagged at stage 1 crab (Waldron, 1958).

Appendix B.

Summer Shell Condition Sampling Protocols

I. Shell condition data will be collected during at least one ride-along trip during each of the sampling periods described below:

- Third week in June
- First week in July
- Third week in July
- First week in August
- Third week in August
- First week in September

II. Shell condition from all male crab sampled will be collected. Definitions of shell condition grades are described below.

III. A separate data sheet will be used to record shell condition data from different depths.

IV. A pot will be included in the sampled only if all crabs in the pot can be sampled.

V. Other information collected will be: date, location (Latitude/ Longitude) and soak time.

VI. If needed, shell condition data may also be collected by fishing WDFW gear, working with WDFW enforcement officers while they do routine checks of commercial gear for compliance with existing regulations, or by chartering commercial vessels and their gear.

Shell Condition Grades

Crab shell condition grading is based on shell flexibility when moderate pressure is applied with the fingers to the underside of the carapace. Shell condition grades are defined as:

- **Grade 1A Hard-shell** - Inflexible carapace and leg segments
- **Grade 1B** - Slightly flexible carapace or moderately flexible leg segments, lateral shell of merus on first pair of walking legs breaks if bent
- **Grade II Intermediate** - Moderately flexible carapace and leg segment, on the first pair of walking legs bends without breaking
- **Grade III Soft-shell** - Very flexible carapace and leg segments

Grade 1A Dungeness crab are noted as "old shell" when the exoskeleton is dark yellow and fouled with barnacles, some crabs soften as the development of the underlying, new exoskeleton assimilates calcium from the old exoskeleton.