



Washington  
Department of  
**FISH and  
WILDLIFE**

# **Coastal Dungeness Crab Summer Fishery Management Plan**

**Washington Department of Fish and Wildlife  
48 Devonshire Road  
Montesano, WA 98563**

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# **WASHINGTON DEPARTMENT OF FISH AND WILDLIFE 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 to provide protection for soft-shelled crab during the peak male recruitment molt period when they are more susceptible to handling mortality (see Appendix B). 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. The decision to open the season on December 1 is made by mutual agreement between WDFW and the Oregon Department of Fish and Wildlife (ODFW) and California Department of Fish and Wildlife (CDFW) based on the results of coastwide testing according to consistent sampling criteria. The crab season in Washington and Oregon north of Cascade Head, OR 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.

## **Summer Fishery Management History**

WDFW has collected shell condition data during ship board trips with commercial fishermen and on crab landed at the dock for many years. However, it is rare that poor crab condition results in an early closure of the fishery. The most recent early closure occurred 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 considered a permanent regulation that would close the crab fishing area outside four miles, effective July 1, to protect soft-shelled crabs that are typically found further offshore than hard-shelled crab. Rather than adopt a permanent closure of the area outside 4-miles WDFW instead chose to use in-season shell condition data to determine if a closure is necessary to protect soft-shelled crab.

In June 2001, WDFW was notified that large quantities of soft-shelled crab were being caught in the commercial fishery. In response, WDFW closed the area outside four miles on June 18, 2001 and imposed a 4,000-pound per week landing limit on August 12, 2001. WDFW staff continued to collect shell condition data and monitored the fishery to evaluate the effectiveness of these regulations. Staff 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 held a series of meetings with the Coastal Dungeness Crab Advisory Board 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.

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 and the Fish and Wildlife Commission.

### **Summer Fishery Management 2002-2008**

Summer fishery management measures developed with input from the coastal crab industry were implemented in June 2002. The measures included a specific schedule for collecting shell condition during ride along trips with consenting commercial fishermen. If shell condition data indicated that more than 50% of the crab sampled during any ride along a weekly landing limit of 2,500 pounds would be implemented. Following the implementation of the landing limit

WDFW staff will continue to sample crab and if crab condition improves prior to the close of the commercial season the trip limit can be raised or removed as appropriate.

The Summer Fishery Management Plan includes a provision to consider a closure in the area deeper than 4-miles from shore as early as July 1. The deep water closure is based on historical data that suggests that soft shelled crab can often be found in larger quantities in deeper water in the summer months. Each year WDFW collects shell condition data during ride along trips targeting the area west of the 4-mile line and will implement a closure if in season data shows that the majority of crabs in deeper waters are soft shelled.

The Summer Fishery Management Plan has provided WDFW and the commercial crab industry with some certainty as to a specific process that will be followed if large quantities of soft shelled crab began to show up before the end of the commercial season. However, there are challenges to implementing the management measures each year. The summer management plan relies on the cooperation of the commercial fishing industry and their willingness to take WDFW staff onboard to collect shell condition data. It is typically fairly easy to get a ride along with a commercial vessel when crab condition is good but as soon as soft shelled crab begin to appear it becomes more difficult as no one wants to be associated with the fishing trip that results in the implementation of a weekly landing limit. Since the implementation of the plan in 2002 the program has relied on a few fishermen that are committed to the success of the plan and have been willing to take WDFW staff on board.

#### **Summer Fishery Management 2009-to-2014**

During the summer of 2009, shell condition data collected during ride along trips was inconsistent with data collected dockside at fish buying stations. Data collected on shipboard trips showed that less than 50% of the crab sampled were soft shelled and suggested that there was no reason to implement a trip limit. At the same time, shell condition data collected at buying stations showed that significant amounts of soft shelled crab were being landed. By the end of August, the condition of crab being delivered to buying facilities was so poor that the Department implemented a 4,000 pound weekly landing limit for the last two weeks of the commercial season ending September 15. The decision to implement a weekly landing limit higher than specified in the management plan was based on discussions with members of the crab industry and the fact that the end of the season was just two weeks away. Later in September, the decision by WDFW to implement the 4,000 pound weekly trip limit was upheld in Thurston County Superior Court following a legal challenge brought by a group of commercial crab fishers who thought the decision to implement the limit was outside of the terms of the Summer Fishery Management Plan.

To address problems experienced in the summer of 2009, the Summer Fishery Management Plan was revised to include dockside shell condition data collected at crab buying stations. Effective in June 2010, a weekly landing limit of 2,500 pounds will be implemented if shell condition collected on shipboard ride along trips indicates that less than 50% of the crab sampled are hard shelled **OR**, if three dockside crab samples collected during a two week period indicates that less than 75% of the crab sampled are hard shelled. Following the implementation of the 2,500 pound limit if three dockside samples collected during the next two week period again indicate that less than 75% of the crab sampled are hard shelled, the weekly landing limit will be reduced to 1,200 pounds. If dockside and at-sea samples show improvement in shell condition the weekly landing limits will increase.

## Summer Fishery Management- 2015 to date

Changes in market conditions with higher ex-vessel prices during the 2014 season encouraged an unprecedented number of vessels to reenter the fishery and the measures in place to protect crab in the soft-shell condition became increasingly less effective. After a series of meetings with the Coastal Crab Advisor Board and one general meeting of all Washington license holders, WDFW adopted changes supported by a strong consensus of the industry. Effective for the 2015 season, a 2,500 pound trip limit was put into place starting on July 1. Both dockside and shipboard sampling will continue and can trigger a reduced trip limit as detailed below.

## Summer Crab Fishery Management Measures

- A. Summer management period is July 1 – September 15
- B. Beginning on July 1 a 2,500 pound trip limit is implemented.
- C. WDFW will consider shell condition data collected inseason to determine if it is necessary to close the area west of four miles to protect soft shelled crab located in deeper water. The 4-mile line will be implemented if sufficient shell condition data indicates that the majority of crabs sampled in that area are soft-shelled.
- D. Beginning the third week of June, WDFW will begin bi-weekly crab condition testing using ride-along trips with consenting commercial fishers. Also beginning the third week in June, WDFW will begin collecting dockside crab condition data at crab buying facilities. The condition sampling will be consistent with the summer crab condition sampling protocols listed in Appendix B.
- E. If any single shell condition test conducted during a ride-along trip indicates that less than 50% of the male crabs sampled are grades 1A and/or 1B **OR**, if any three shell condition tests conducted during random dockside sampling within a two week period as described in Appendix B indicates that less than 75% of the crab sampled are grades 1A and 1B, WDFW will impose a 1,200 pound weekly landing limit.
- F. WDFW will continue to test the shell condition of crab both at dockside buying facilities and on shipboard ride along trips.
- G. If any single shell condition test conducted during a ride-along trip indicates that more than 50% of the male crabs sampled are grades 1A and/or 1B **AND**, if any three shell condition tests conducted during random dockside sampling within a two week period following the implementation of the 1,200 pound landing limit indicate that more than 75% of the crab in the sample are grades 1A and 1B, WDFW will increase the weekly landing limit to 2,500 pounds.

H. WDFW will continue to test the shell condition of crab both at dockside buying facilities and on shipboard ride along trips.

Appendix A.

**SUMMER SHELL CONDITION SAMPLING PROTOCOLS**

I. Sampling periods for summer fishery management are as follows:

Period 1: Third and fourth week in June

Period 2: First and second week in July  
Period 3: Third and fourth week in July  
Period 4: First and second week in August  
Period 5: Third and fourth week in August  
Period 6: First and second week in September

- II. Shell condition data will be collected from a minimum of one shipboard ride along trip and a minimum of three dockside buying stations during each period.
- III. Sampling should be conducted with the intent of collecting shell condition the range of fishing grounds that are covered by the commercial fishing industry.
- IV. Shipboard sampling protocols:
  - i. Shell condition from all male crab sampled (regardless of size) will be collected. Definitions of shell condition grades are described below.
  - ii. A separate data sheet will be used to record shell condition data from different depths.
  - iii. A pot will be included in the sampled only if all crabs in the pot can be sampled.
  - iv. Other information collected will be: date, location (Latitude/ Longitude), number of pots sampled and soak time.
  - v. Notes providing additional details of the trip and observations are encouraged.
- IV. Dockside sampling protocols:
  - i. Shell condition from all male crab sampled will be collected. Definitions of shell condition grades are described below.
  - ii. A sample must consist of a minimum of 100 legal sized male crabs.
  - iii. Sampling will be spread out to include a range of vessels and buying stations sampled during each period.
- V. 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-shelled - **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.

**Appendix B.**

## **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).