

2019-21 WDFW Puget Sound Dungeness Crab Fishery Report

Prepared for the Fish and Wildlife Commission



Metacarcinus magister



Washington
Department of
**FISH and
WILDLIFE**

April 26, 2021

Purpose of this Report

This report fulfills Fish and Wildlife Commission Policy C-3609 by providing an annual summary describing the performance and harvest of commercial and recreational crab fisheries. Regulation compliance data collected by enforcement and fishery management staff is also provided to meet the policy reporting mandate. Due to limited staff and commission workload resulting from the COVID-19 pandemic, this report was not submitted in 2020; therefore this report covers both the 2019-20 and 2020-21 fishing years.

Introduction

Dungeness crab (*Metacarcinus magister*) is a native species to the Pacific Northwest and it is reportedly named after a small fishing village on the Strait of Juan de Fuca. Dungeness crab have been harvested commercially along the Pacific coast since the late 1800's and aboriginal harvests predate the discovery of North America by Europeans. The species range extends from central California to the Gulf of Alaska with the range of distribution in Washington State encompassing the waters of Puget Sound; Strait of Juan de Fuca, San Juan Archipelago, Hood Canal and inside waters of Central and South Puget Sound. Dungeness crab are generally more abundant in the northern areas of Puget Sound where recruitment patterns are consistent. They occupy nearshore waters ranging from the intertidal zone to depths of 600 feet and greater. The Puget Sound Dungeness crab fishery is managed separately from the Washington coastal fishery. Further, smaller harvest units (Crab Management Areas; Figure 1) have been established within Puget Sound to facilitate management by region and to align with established Tribal usual and accustomed areas.

In Washington, Dungeness crab are highly valued and are exploited in State commercial, State recreational, and Tribal fisheries. The basic fisheries management has been consistent over time, using a minimum size limit and protection of female and softshell crab to promote natural reproduction. In addition to basic management principles, current management strategies include assessment of recreational and commercial regional harvest, catch per unit effort (CPUE) in commercial and recreational fisheries, annual test fisheries in each region to assess relative abundance and age distribution. In 2019, the [Pacific Northwest Crab Research Group](#) (PCRG) launched a state-wide crab larval monitoring network. Data from the larval monitoring network could potentially be used as a predictive indicator for recruitment in Puget Sound and inform population health across management regions.

Each season, WDFW managers work in cooperation with Washington treaty tribes to develop co-manager harvest agreements pursuant to *U.S. v. Washington*, which includes determination of the total allowable catch (TAC), or quotas. Fisheries are structured and landings monitored to meet the requirements of these fishery harvest plans. For quota management, commercial crab landings are reported directly to WDFW for catch accounting and the catch record card (CRC) system is used to estimate harvest in the recreational fishery.

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This report provides information about fishery policy, current management practices, regional harvest trends, and compares fishery performance between regions and over time with an emphasis on the 2019-20 and 2020-2021 crab seasons. It also highlights emergent management topics for the Puget Sound Dungeness crab fishery.

Crab Policy

A revised [crab policy \(C-3609\)](#) was adopted by the Fish and Wildlife Commission on October 1, 2010. This policy protects and conserves Puget Sound Dungeness crab resource, while providing for recreational and commercial fishing opportunities. A base summer recreational season begins in July and extends through Labor Day; 5 days per week, Thursday through Monday. When quota remains following the base summer season, a winter recreational season can be conducted beginning in early October and extending through December 31; 7 days per week. The daily recreational limit for Dungeness crab is 5 per day.

The policy also directs the agency to use a “3-S” management strategy, which refers to **size, sex and season**. A minimum harvest size of 6 ¼ inch carapace (shell) width is measured at widest part of the carapace between the notches in front of the largest lateral spines. This size limit allows smaller crabs to mature and spawn several times before being vulnerable to exploitation in the fishery. Only the male sex is allowed to be taken and retained in the Dungeness crab fishery to protect reproductive females. The harvest season is structured to avoid softshell crab handling, thereby reducing handling mortality and enhancing the reproductive potential of the population.

The revised crab policy also provides direction to minimize Dungeness crab bycatch mortalities, improve harvest estimates, enhance enforcement strategies, develop programs to promote regulatory compliance and catch accounting, provide easily accessible fishery rules to the public, reduce and remove derelict crab pots, and structure a region-based sharing strategy with Treaty Tribes under *U.S. v. Washington*. In the San Juan Islands, Strait of Juan de Fuca and northern Whidbey Island areas recreational seasons are prescribed with commercial harvest opportunity designated to begin each year in the early fall. The State share of quota in Hood Canal, Central Puget Sound and South Puget Sound are allocated for the exclusive benefit of the recreational fishery.

Harvest Management Regions

Ten crab harvest management regions have been established in Puget Sound. These harvest regions are used to co-manage the crab fisheries with Puget Sound Treaty Tribes having marine water usual and accustom fishing areas, as well as allocating harvest opportunity between State commercial and recreational fisheries. Policy C-3609 provides for recreational and commercial harvest opportunity in Regions 1, 2E, 2W, and sub-regions 3-1, 3-2, and 3-3. The State share of quota in Crab regions 4, 5, 6 and 7 are reserved exclusively for recreational harvest opportunity (Figure 1). Dungeness crab harvest opportunity in Region 7 has only been identified in recent years and this region is not specifically



designated in the F&W Commission policy C-3609. Region 7 historically was part of Region 6, but in 2011 managers agreed that the lower portion of Region 6 should be managed independently out of conservation concerns. Region 7 allocation is reserved for recreational opportunity to conform to the intent of the policy. It has been closed since 2018.

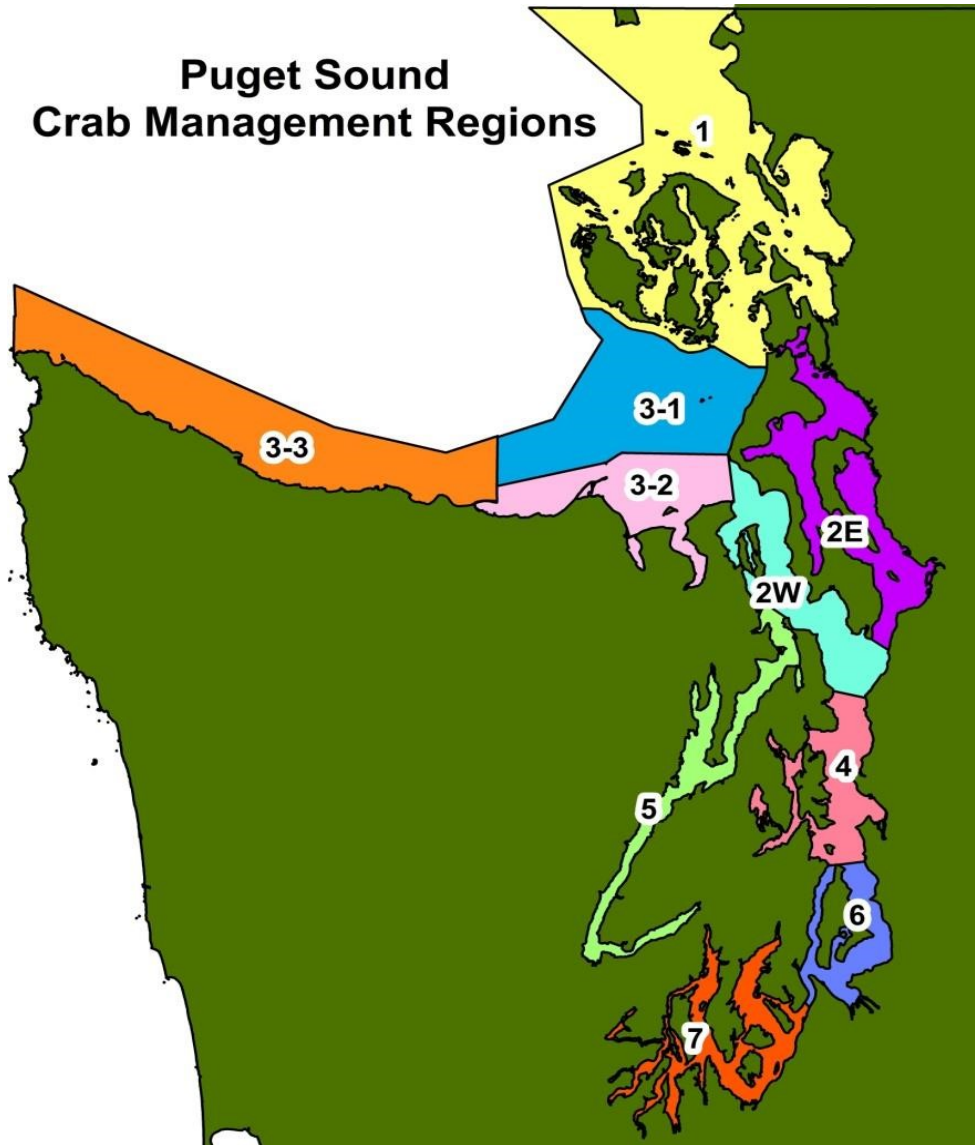


Figure 1. Crab harvest regions and sub-regions in Puget Sound.

Crab management region boundary lines take into consideration historic WDFW Marine Areas, WDFW Marine Fish – Shellfish Catch Areas (MF/SF), and tribal usual and accustomed areas at the time when shellfish harvest management plans were first negotiated in 1995. Table 1 (below) shows defined crab



regions and sub-regions and associated WDFW Marine Areas and WDFW Marine Fish/Shellfish Catch Areas.

Table 1. The relationship between Crab Regions, WDFW Marine Areas, and WDFW MF/SF Catch Areas

Crab Regions/Sub-regions	WDFW Marine Areas	WDFW MF/SF Catch Areas
1	7	20A, 20B, 21A, 21B, 22A, 22B, 23A
2E	8-1, 8-2	24A, 24C, 26A
2W	9	25B, 25D, 26A
3-1	7	23A, 23B
3-2	6	23D, 25A, 25E
3-3	4, 5, 6	23C, 29
4	10	26B, 26C
5	12	25C, 27A, 27B, 27C
6	11	26D
7	13	28A, 28B, 28C, 28D

Co-management harvest plans

Federal Sub-proceeding 89-3 of *US v. Washington* provides a framework for Treaty Tribe harvest of shellfish in Washington. Sub-proceeding 89-3 decisions are sometimes collectively referred to as the Rafeedie Decision. The first implementation order regarding Treaty Tribe shellfishing occurred in 1995. Implementation orders mandate that harvest must occur under harvest management plans developed by affected parties. Annual co-management harvest plans provide detailed conditions and responsibilities of parties when conducting their respective fisheries including management principles, annual shares of quota, timing and locations of fisheries, harvest reporting, gear restrictions and monitoring requirements. Fifteen Treaty Tribes participate in developing agreements to 7 crab harvest management plans in Puget Sound.

Fishery Performance

Harvest Trends

Over the last 10 years, Dungeness crab landings in the State and Tribal fisheries combined has ranged from 8.3 to 11.9 million pounds in Puget Sound (Figure 2). Catch trended upward between 2012 to a peak in 2015. Total catch has trended downward since 2015. Quotas are fully utilized, and State and Tribal catch trends have been equitable and moved in tandem from year to year. During the 2019-20 season, the total State catch was 4.29 million pounds and Treaty Tribe harvest was 4.31 million pounds, a less than 1% difference.



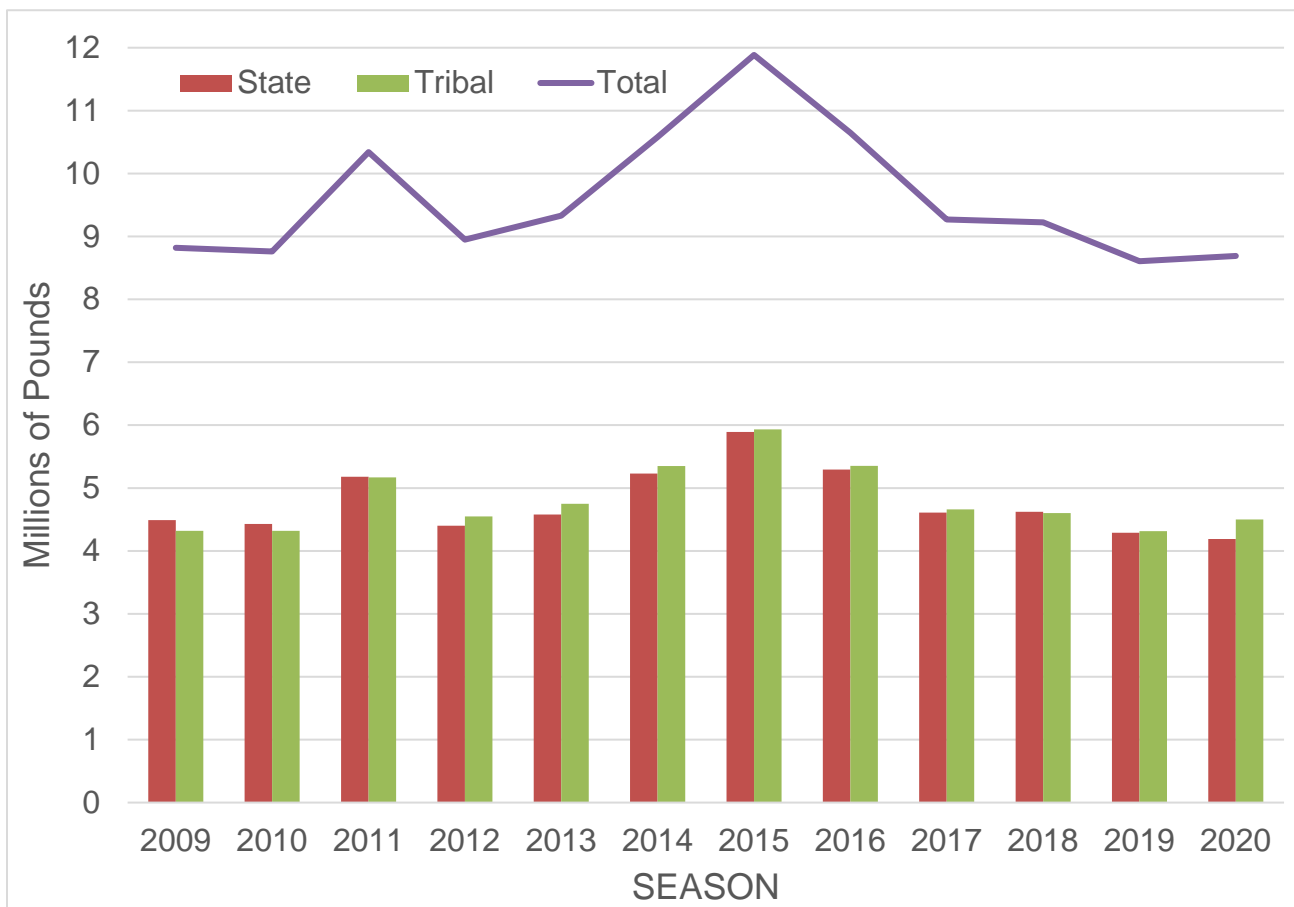


Figure 2. State, tribal and total Dungeness crab landings in Puget Sound from 2009 – 2020*. *2020 landings values are preliminary.

State commercial and recreational harvests

The State commercial Dungeness crab fishery landings have ranged from a low of 2.32 million pounds in 2012 to a high of 3.10 million pounds in 2015 (Figure 3), over the last ten years. Commercial landings have been consistent since they reached a peak in 2015, ranging from 2.7 and 3.1 million pounds over the last 5 years. However, recreational landings have trended significantly lower since 2015, declining from 2.80 to a low of 1.59 million pounds in 2018. In 2019, the overall recreational harvest was 1.7 million pounds. The recent decrease in recreational landings is attributable in part to lower Dungeness crab abundance in the southern reaches of Puget Sound and South Hood Canal, where the State share of quota is reserved for recreational harvest. In 2018, recreational harvest was closed in Crab Regions 6 and 7. In 2020, preseason test fishery results in Crab Region 6 indicated abundance was sufficient to allow a limited summer recreational opportunity, opening only 2 days a week (Sunday and Monday from



July 12 – September 7). Crab region 7 has remained closed. Low crab abundance has also led to closures of winter recreational crab fisheries in Crab Regions 4, 5, 6 and 7 (areas designated by policy for recreational harvest exclusively) in recent years.

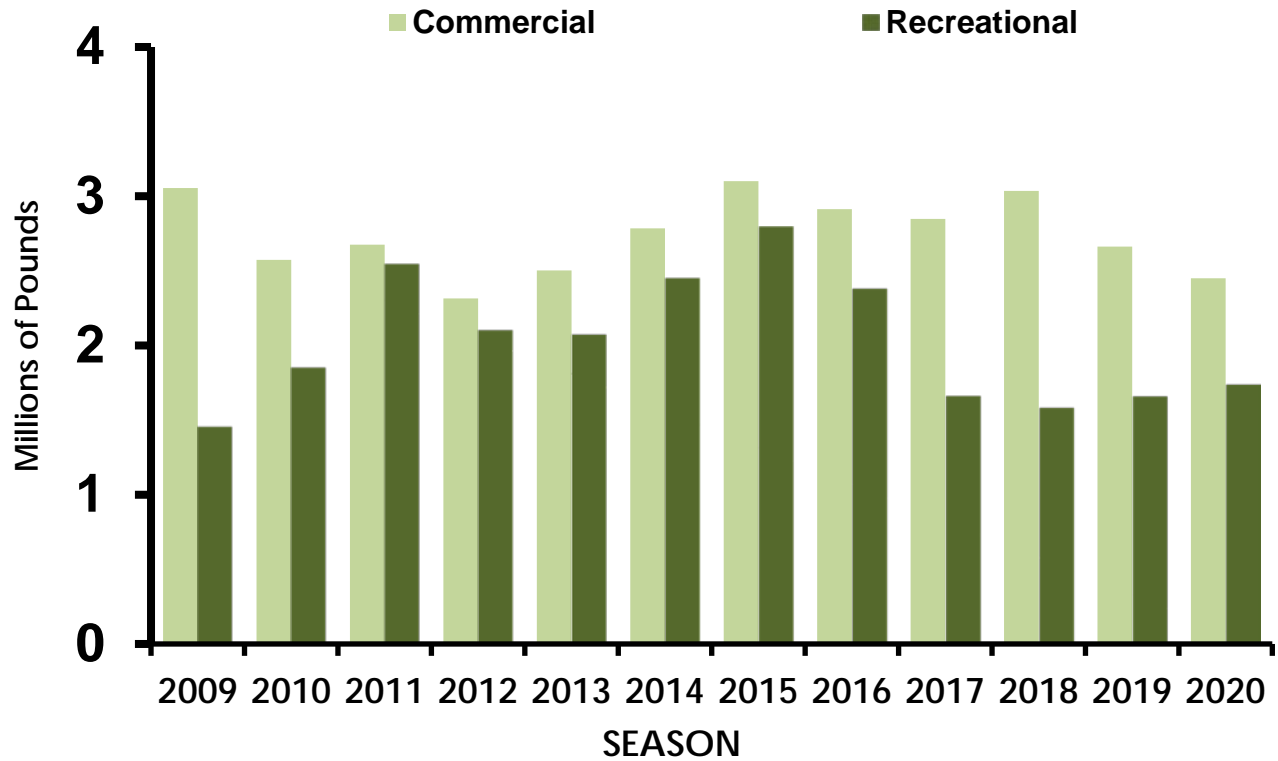


Figure 3. State recreational and commercial Dungeness crab landings in Puget Sound over last 10 seasons (2009 – 2020). 2020 landings values are preliminary.

Differences in the 2020-21 catch among crab regions is illustrated in Figure 4 (below). A total of 96.2% of the State Puget Sound crab catch came from the northern crab regions; 1, 2E, 2W and 3. In Region 1 (San Juan Islands) commercial catch (1.89 million pounds) greatly exceeded recreational catch (0.53 million pounds). During the 2020-21 season commercial harvest exceeded recreational harvest in Regions 1 and 3 whereas recreational harvest exceeded commercial in Regions 2E and 2W. In Region 2E, recreational harvest made up 75% of the total. Low abundance continues to limit harvest opportunity in Crab Regions 4-7.



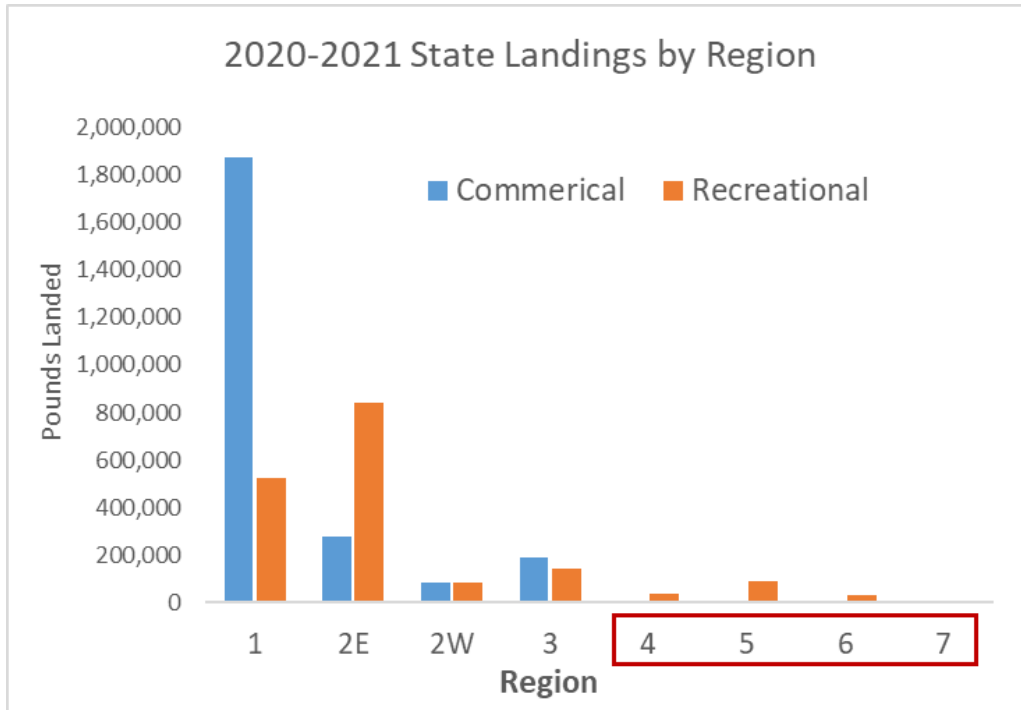


Figure 4. State recreational and commercial Dungeness crab landings in Puget Sound during the 2020-21 season by Region. Regions 4, 5, 6, and 7 (red box) are recreational exclusive harvest areas. Commercial crab harvest numbers are preliminary.

Low abundance and crab harvest closures around Vashon Island and in South Puget Sound

The Dungeness crab fishery in the Vashon Island area (Marine Area 11, Crab Region 6) and South Puget Sound (Marine Area 13, Crab Region 7) has grown in popularity since 2002. Interest in these fisheries increased after it became well-known that Dungeness crab were available for exploitation; specifically, information was revealed in 2002 following a WDFW investigation into illegal geoduck and Dungeness crab harvest in these areas. State and Tribal fisheries gradually increased, and the population supported harvests ranging from 180,434 to 222,792 pounds per season in the Vashon Island area between 2010 and 2015 (Figure 5). In 2015 and 2016, extended periods of higher than normal summer temperatures occurred throughout the Pacific Northwest, coincidentally, Dungeness crab harvest plummeted to 54,862 pounds in 2016 and 26,148 pounds in 2017 in the Vashon Island area.

The peak harvest occurred earlier in Crab Region 7 (South Puget Sound – Marine Area 13) than Crab Region 6 (Vashon Island – Marine Area 11) and was shorter in duration, lasting about one season instead of hitting a plateau for several seasons (Figure 5). Peak landings (State and Tribes) in South Puget Sound were 289,505 pounds in 2012 (Figure 6). From this point forward, landings declined each season



reaching a low of 9,457 pounds in 2017. In 2018, Crab Regions 6 and 7 were closed to harvest. In January 2020, test fishing conducted by the Puyallup Tribe showed a slight recovery in the Region 6 crab population which led to a limited re-opening of the Region 6 fishery with a total harvest of 66,000 pounds. The State recreational fishery was only open 2 days a week, Sunday and Monday only, to accommodate the small quota.

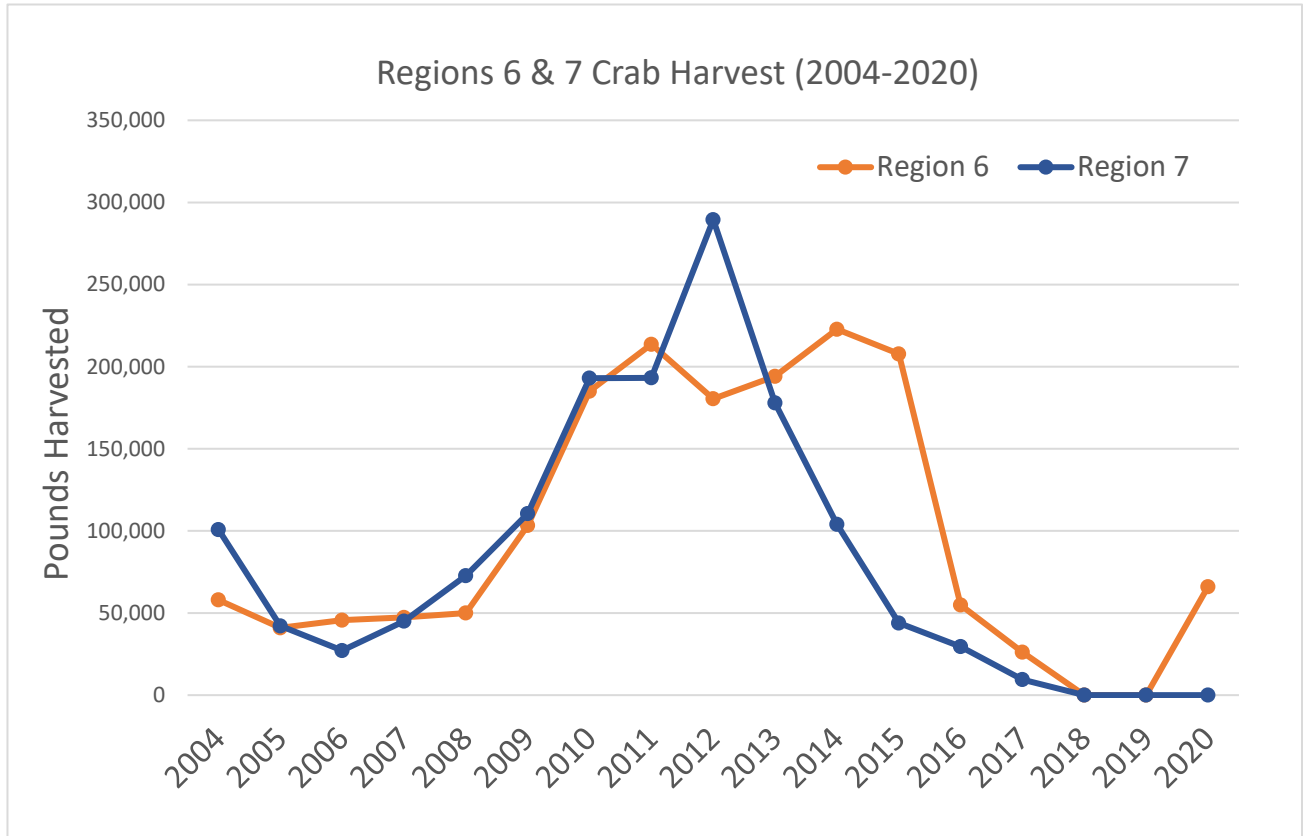


Figure 5. State recreational and Tribal Dungeness crab harvests in Crab Regions 6 and 7 (Marine Area 11 - Vashon Island and Marine Area 13 - South Puget Sound) from 2004 through 2020.

Catch Record Cards (CRCs) are used to estimate recreational catch

Recreational harvest is estimated using catch data reported on catch record cards (CRCs). This is a two-card system where summer and winter catch is reported separately (Figure 6). Summer catch is used to determine remaining quota share available for winter recreational fisheries and the State commercial fishery, which begins in early October each year.

The number of summer CRCs issued has decreased from a peak of 232,621 cards in 2015 to a low of 192,798 in 2019, or a decrease of about 17.1% (Table 2). Note that crab endorsements issued can be



lower than catch record cards issued, since there is a potential to issue multiple cards for each endorsement (CRCs are issued for summer fishery, winter fishery, and when crab landings fill a card and a new card is requested).

The introduction of CRC internet reporting (2007) and a rule implementing a \$10.00 fee for failure to report (2009) was intended to increase CRC reporting compliance. Return rates between 2010 and 2019 averaged 52% for the summer fishery and 61% in the winter fishery. Peak reporting rate was in 2013 for the summer and winter fishery (54% for summer and 66% for winter. In 2020, reporting rate for both the summer and winter reporting periods dropped significantly. Only 36% of CRCs were returned for summer and 50% of CRCs for winter, representing a 29% reduction for summer and 7.4% reduction for summer relative to the previous year. Overall, reporting rates in 2020 were at a 10-year low.

Report Crab Catch

OPTION 1

Return card to address below by 10/01/2018

Return To: WDFW CRC Unit
PO Box 43142
Olympia, WA 98504-3142

OPTION 2

Report catch card information online between
09/04/2018-10/01/2018 at
fishhunt.dfw.wa.gov

Season opening dates, closures, and restrictions are available in the Sport Fishing Rules pamphlet, on the toll-free shellfish rule change hotline 1(866)880-5431, and on the internet at wdfw.wa.gov

Use ballpoint pen only.
Do not use a felt tipped pen.

Immediately upon retaining a Dungeness crab, you are required to record your catch by completing the record below. Failure to do so is a violation of WRC 220-310-020.

SUMMER

2018 DOCH: D00000000000

Reporting Date	Month	Day	Check (X) one box for each crab kept					Crab Kept Per Day
08-02	7	5	X	X	X	X	X	5
08-12	8	7	X	X	X			3

EXAMPLE

Figure 6. Example of a Summer Catch Record Card (CRC).
Table 2. CRCs issued by season and reported by category, 2009-2020.



Summer	CRCs Issued	CRCs Reported Mail	CRCs Reported Online	CRCs Reported	CRCs Unreported	Endorsements Entire Year
2009	236,665	37,128 (16%)	72,172 (30%)	107,300 (45%)	129,365 (55%)	241,226
2010	208,462	29,406 (14%)	77,472 (37%)	107,418 (52%)	101,044 (48%)	213,013
2011	230,355	31,222 (14%)	89,095 (39%)	120,317 (52%)	110,038 (48%)	237,129
2012	200,711	26,504 (13%)	79,895 (40%)	106,399 (53%)	94,312 (47%)	209,957
2013	214,692	26,236 (12%)	90,379 (42%)	116,615 (54%)	98,077 (46%)	222,050
2014	213,741	25,296 (12%)	91,270 (43%)	116,566 (55%)	97,175 (45%)	223,184
2015	232,621	25,685 (11%)	94,336 (41%)	120,021 (52%)	112,600 (48%)	243,934
2016	216,977	23,734 (11%)	90,262 (42%)	113,996 (53%)	102,981 (47%)	223,443
2017	215,929	33,252 (15%)	72,601 (34%)	105,853 (49%)	110,076 (51%)	222,222
2018	200,962	31,316 (16%)	72,790 (36%)	104,106 (52%)	96,856 (48%)	207,557
2019	192,798	29,006 (15%)	69,087 (36%)	97,571 (51%)	95,227 (49%)	200,113
2020	213,831	23,716 (11%)	53,029 (25%)	76,745 (36%)	137,086 (64%)	222,181
Winter						
2009	89,259	11,909 (13%)	27,382 (31%)	39,291 (44%)	49,968 (56%)	241,226
2010	70,763	9,633 (14%)	27,346 (39%)	36,979 (52%)	33,784 (48%)	213,013
2011	28,514	4,675 (16%)	13,899 (49%)	18,574 (65%)	9,940 (35%)	237,129
2012	27,711	4,508 (16%)	13,357 (48%)	17,865 (65%)	9,846 (35%)	209,957
2013	29,638	4,419 (15%)	15,223 (51%)	19,642 (66%)	9,996 (34%)	222,050
2014	35,371	5,040 (14%)	17,401 (49%)	22,441 (63%)	12,930 (37%)	223,184
2015	36,398	5,039 (14%)	18,284 (50%)	23,323 (64%)	13,075 (36%)	243,934



2016	26,591	5,777 (22%)	10,577 (40%)	16,534 (62%)	10,057 (38%)	223,443
2017	23,277	4,431 (19%)	9,746 (42%)	14,177 (61%)	9,100 (39%)	222,222
2018	24,620	3,906 (16%)	9,896 (40%)	13,802 (56%)	10,818 (44%)	207,557
2019	23,578	4,178 (18%)	8,520(36%)	12,698 (54%)	10,880 (46%)	200,113
2020	36,459	5,015 (14%)	13,178 (36%)	18,193 (50%)	18,266 (50%)	222,181

*Percentages shown are rounded to nearest full percent.

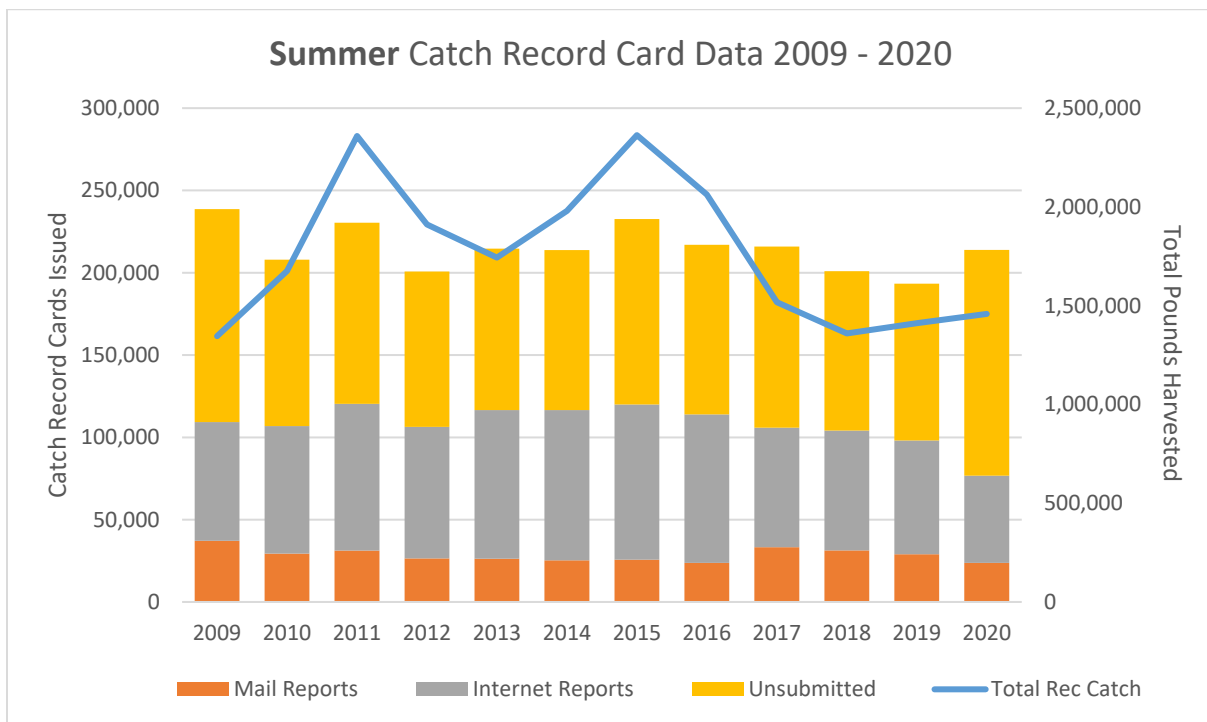


Figure 7. Summer CRCs by reporting category and the overall recreational harvest estimate for 2009-2020.



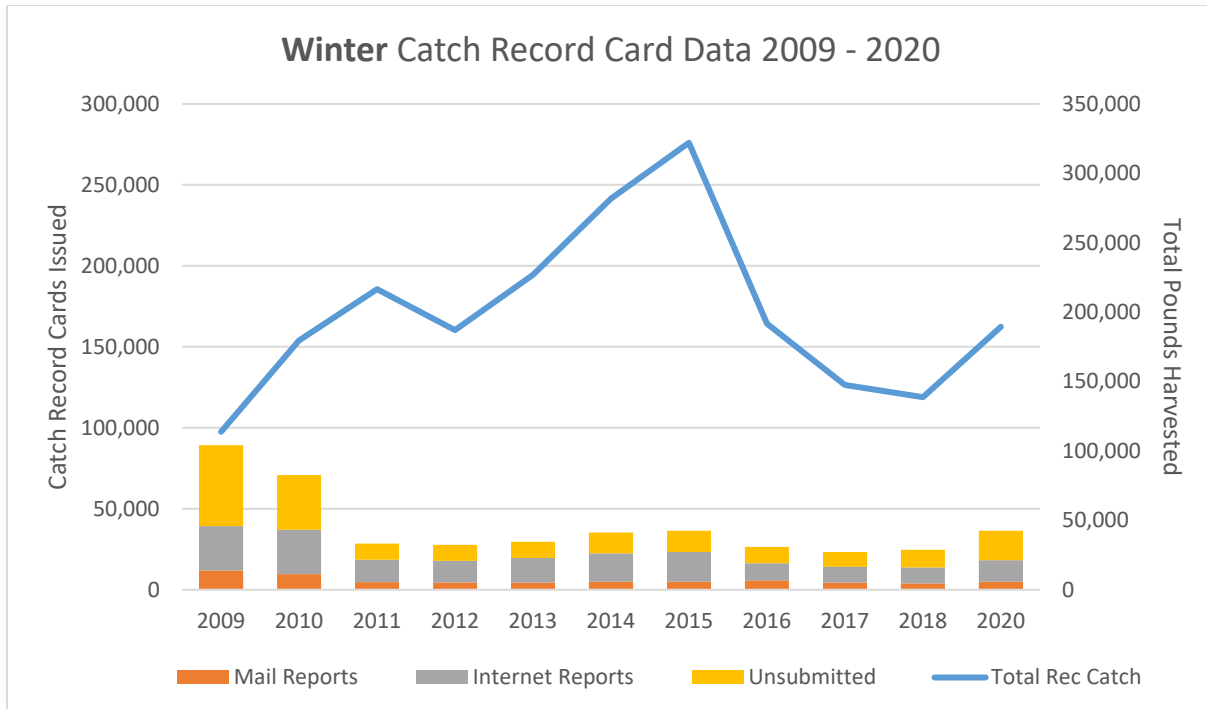


Figure 8. Winter CRCs by reporting category and the overall recreational harvest estimate for 2009-2020.



Commercial value

Commercial fisheries are commonly assessed in by their ex-vessel value, the amount paid to the fisher for their product. The ex-vessel commercial fishery value of Puget Sound Dungeness crab has increased significantly over the last 3 decades. Between the 1990-91 and 2020-21 seasons, the value of the State commercial fishery has ranged from \$2.04 million (1991-92 season) to \$15.2 million (2020-21 season), Figure 9. Since the 2015-16 season, the total value of the fishery declined from \$14.3 million down to \$10.4 in the 2019-2020 season. Total value of the Puget Sound commercial crab fishery has since increased to an all-time high of \$15.2 million in the 2020-21 season despite landing markedly fewer pounds in 2020-21 than in 2015-16, 2.43 million pounds and 3.11 million pounds, respectively. Mean ex-vessel price per pound (Figure 10) was \$4.82 in 2015-16 and \$4.09 in 2016-17. In 2017-18 and 2018-19 the mean ex-vessel price per pound was \$4.71 and \$4.58 respectively. Between the 2019-20 and 2020-21 season, the mean price saw one of the largest increases since 1990 where the price jumped from an average of \$4.21 to \$6.56. The decline in average price between the 2016-17 and 2019-20 was likely impacted by international markets and tariffs influencing the price of the crab live market where commercial crab from Puget Sound predominately end up. The highly variable market conditions created by the COVID-19 pandemic also likely influenced the variation in price between the 2019-20 and 2020-21 seasons.



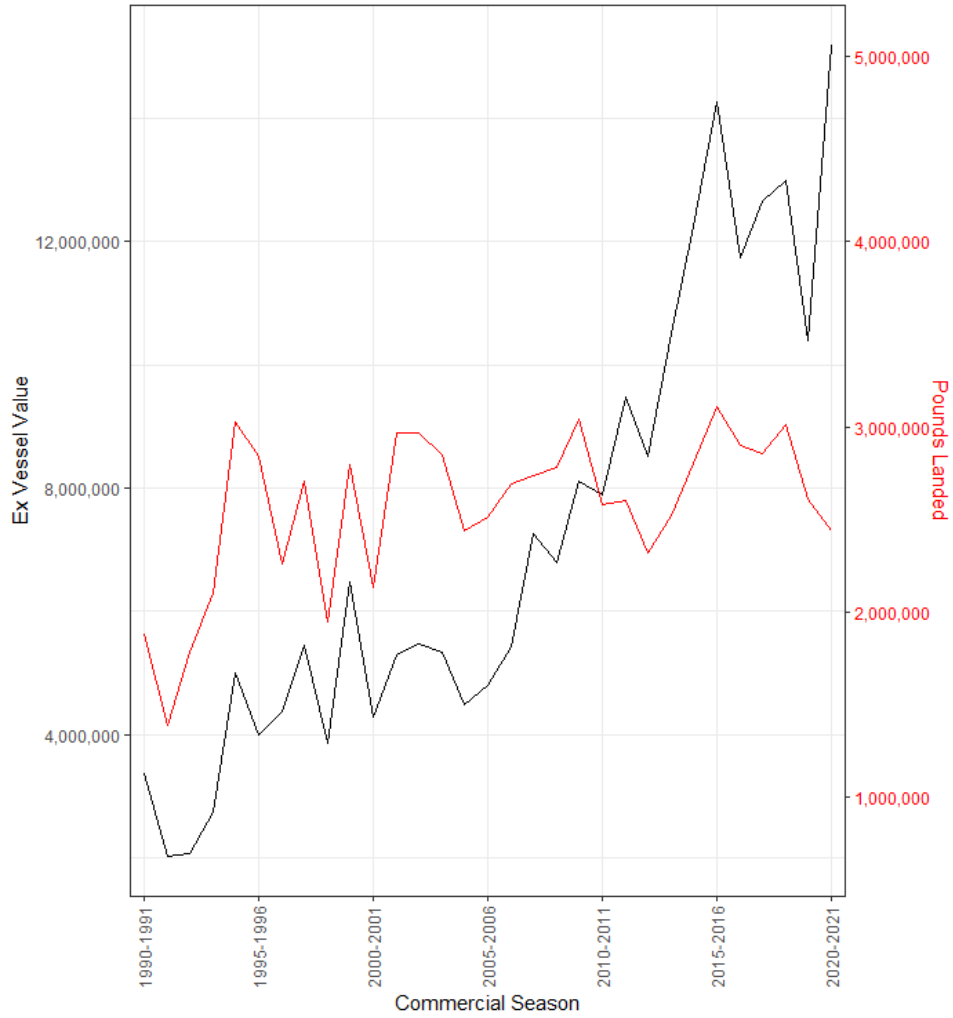


Figure 9. Puget Sound State commercial Dungeness crab fishery *ex-vessel value* (in \$US millions) and the total pounds landed by the State commercial fishery between the 1990-91 and 2019-20 seasons. Commercial *ex-vessel values* have not been adjusted for inflation.



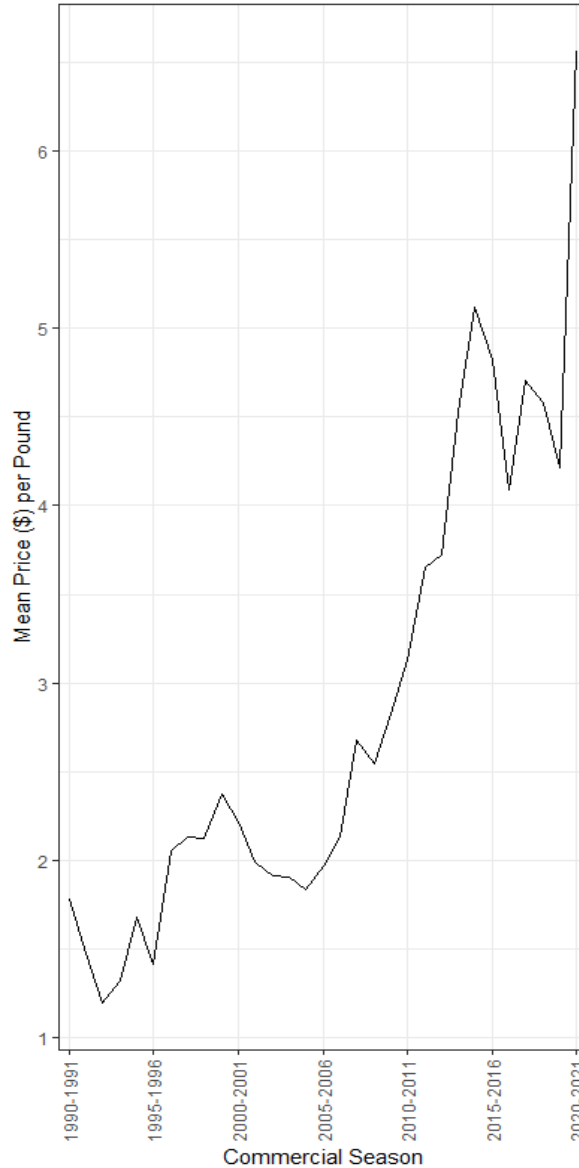


Figure 10. Puget Sound State commercial Dungeness crab fishery Mean Price per Pound (in \$US) for the State commercial fishery between the 1990-91 and 2019-20 seasons. Commercial prices have not been adjusted for inflation.

Education and outreach

The Puget Sound crustacean management unit focuses on providing education and outreach to recreational crabbers to reduce closed season crabbing, prevent loss of shellfish gear, reduce possession of undersized and female crab, promote rot cord use that allows crab escapement from derelict pots,



reinforce daily limits, and promote catch reporting. The target audience is all recreational crabbers with an extra emphasis on crabbers who are new to the fishery. The percentage of new crabbers each season has varied little since 2011. In 2020, about 30% of crabbers were new to the fishery (Table 3). This is a large number of crabbers (over 67,000) who are targeted for education and outreach efforts.

Table 3. Crab endorsements issued each year and the number and percentage of new entrants to the fishery.

Season	Crab Endorsements Issued	New Recreational Crabbers	New Recreational Crabbers (%)
2010	213,013	73,845	35
2011	237,129	82,944	35
2012	209,957	57,548	27
2013	222,050	62,291	28
2014	223,184	64,133	29
2015	243,934	70,613	29
2016	223,443	59,187	26
2017	222,222	61,994	28
2018	207,557	55,488	27
2019	200,113	52,322	26
2020	222,181	67,447	30

WDFW web pages provide a good source of information related to recreational crab harvest. These pages have practical information about crab fishing including licensing, harvest regulations, summer and winter catch card reporting requirements, and on-line reporting of catch. A WDFW webpage [link](#) to a 14 minute YouTube video titled “The Recreational Crab Fishery in Puget Sound, Washington” provides very useful information from agency staff about crabbing including marking buoys with name and address, providing sufficient line to reduce the risk of trap loss, escape rings and cords, bait to use, gauging for legal size, checking for soft shell, checking sex, releasing crab, and recording crab retained on a catch record card (Figure 11). The agency has also produced a crabbing pamphlet entitled “Crabbing in Puget Sound” with similar information (Figure 12).



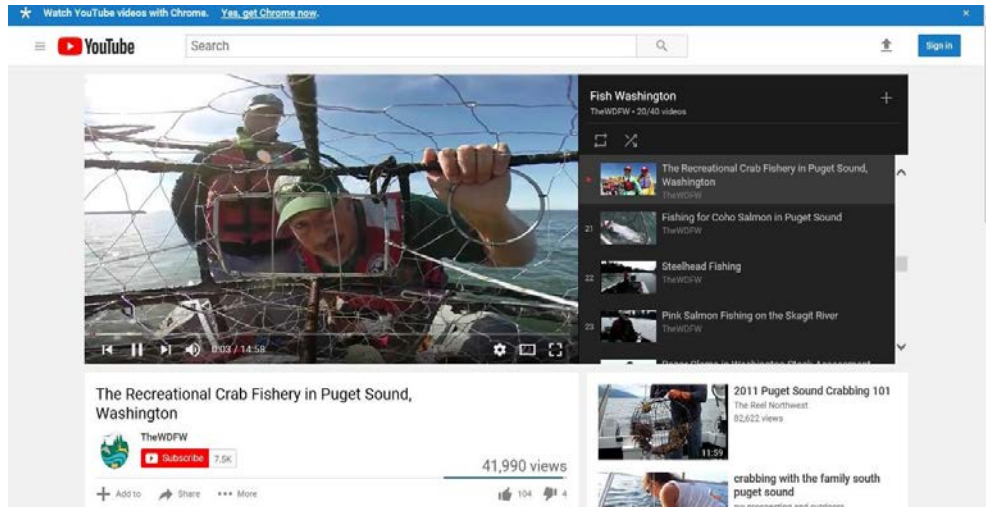


Figure 11. Instructional video on how to crab in Puget Sound.



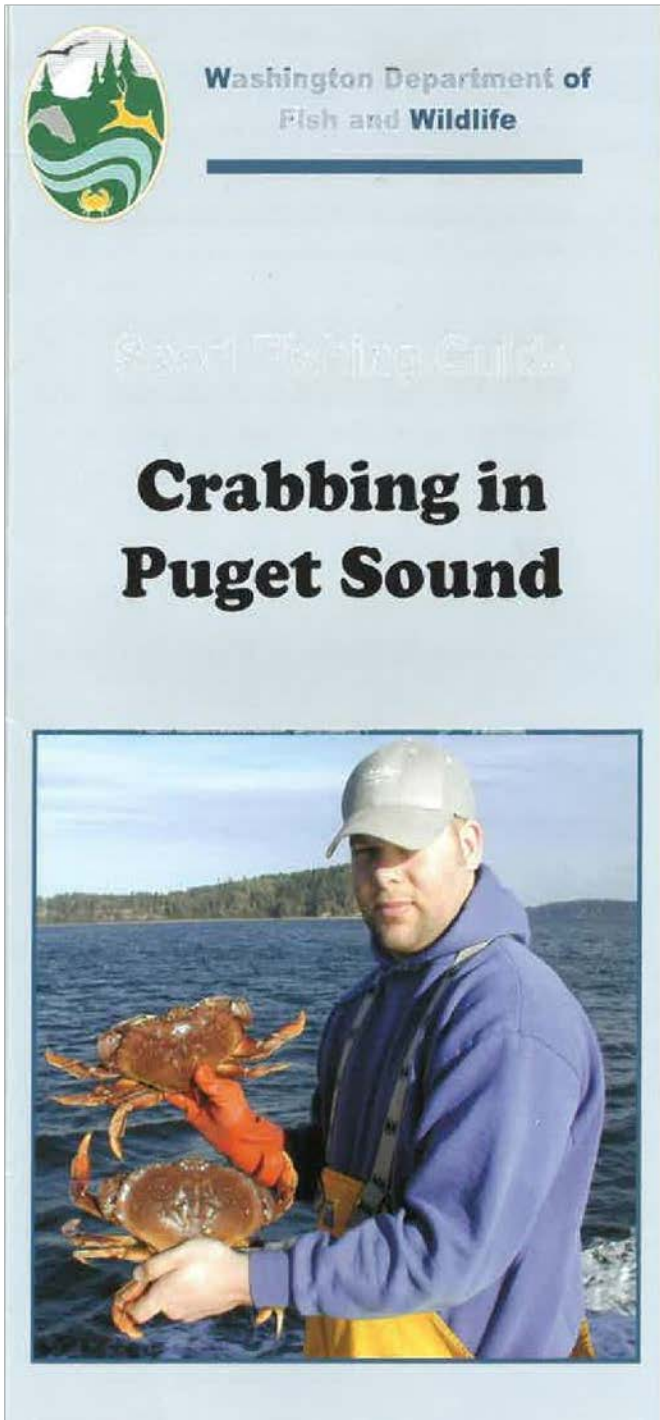


Figure 12. Cover of instructional pamphlet on how to crab in Puget Sound.



Marine Resource Committee volunteers, WDFW shellfish biologists and enforcement staff inform harvesters of crab regulations at boat ramps, during boat shows, outdoor sporting events, and during emphasis patrols. WDFW staff also routinely speaks to the recreational community at angler group meetings, volunteer events (such as Sound Waters University) and quarterly Marine Resource Committee meetings providing updates on rules, regulations, and seasons. In recent years, about 4,000 pamphlets were packaged with rot cords, crab guides and crab gauges (~1000 packages) and distributed to harvesters to provide more incentive to comply with rules. A Marine Resource Committee volunteer is shown in Figure 13 distributing packets at a boat launch. Additional outreach includes pre-season newspaper coverage and “report your catch” reminder cards distributed to purchasers of crab endorsements at the end of the summer and winter crab seasons. In 2018, WDFW implemented email reminders to harvesters to return Catch Record Cards (CRCs) to make compliance more efficient and effective.



Figure 13. A Marine Resource Committee volunteer distributing crab packets that include information brochures, rot cords, and crab calipers.



The Northwest Straits Initiative assisted with outreach by conducting a recent “catch more crab” campaign, which was geared toward educating new entrants to the crab fishery about derelict shellfish gear (Figure 14). Educational information developed included a brochure describing the problems associated with gear loss and ways to prevent gear loss.

CATCH MORE CRAB!

Seven helpful tips to prevent your crab pot from becoming one of the 12,000 pots lost in Puget Sound each year:

- **Avoid high traffic**, marine transit and ferry lanes.
- **Check tides and currents.** Avoid crabbing during strong tidal changes and currents.
- **Make buoys more visible.** Add a second buoy or a stick and flag.
- **Use a weighted line** to sink below the surface and avoid being cut by passing boats.
- **Weight your crab pots** so they do not move with currents or tidal changes.
- **Use longer line.** Use 1/3 more line than the water depth to allow for changes in tides and currents.
- **Secure lid and escape panels with cotton (biodegradable) escape cord.** Crabs can escape from lost pots after the cord degrades.

KEEP YOUR POTS CATCH MORE CRAB!

12,000 Crab Pots are Lost in Puget Sound each year. A single lost crab pot can kill up to 50 crabs until it deteriorates – that’s 180,000 harvestable crabs that could otherwise make it to the dinner table!

The Northwest Straits Initiative
Since 2002, we have removed more than 5,700 derelict nets, 4,800 derelict crab pots and restored 830 acres of critical marine habitat.

Who We Are
A nationally-recognized conservation initiative, the Northwest Straits Initiative brings together scientists and community volunteers in northwest Washington, coordinated by a non-profit Northwest Straits Foundation, a state government partner Northwest Straits Commission, and seven county-based Marine Resources Committees.

Enter to win!
To be entered into a prize drawing for new crabbing gear, please complete the brief survey found at the following link: <https://goo.gl/iwvhXB>

To learn more about lost crab pots in Puget Sound visit www.derelictgear.org

for more information visit derelictgear.org

Northwest Straits INITIATIVE
partners in marine conservation

1135 N. State St., 3rd. Fl., Suite 702
E: linham WA 98225
360.734.1124
www.nwstraitsinitiative.org

Figure 14. “Catch More Crab” brochure produced and distributed by the Northwest Straits Initiative. Informing harvesters of ways to prevent crab gear loss is a cost-effective way to improve the fishery.



On June 25, 2020 WDFW staff coordinated with the Northwest Straits Foundation to conduct a Virtual Crabber Workshop via Zoom. The recording of this workshop is still available on Youtube (<https://www.youtube.com/watch?v=babjcmfAWOM&t=2s>) and about 250 people registered for the workshop when it occurred. Plans for a similar workshop are being made for June 2021.

Closed season shellfish gear sweeps

By policy, the summer recreational crab fishery is open 5 days per week, Thursday through Monday. Despite efforts to inform the public about configuring shellfish harvest gear and practices that can be employed to prevent gear loss, there is inevitably some gear that gets swept away by currents and are presumed lost or stolen by harvesters. The 5-day fishery provides an opportunity to detect and retrieve lost pots on closed days, Tuesdays and Wednesdays, before these pots become derelict and create resource impacts by continuing to fish. In 2018, WDFW Enforcement Program and Fish Program staff began a concerted effort to detect and retrieve lost shellfish pots during and following the summer crab fishery. An example of lost pots recovered and transported to the Mill Creek District Office is shown in Figure 15, below.



Figure 15. One trailer and three truckloads of gear recovered during sweeps arrives at the Mill Creek storage area.

Several common themes were identified over the last three years of conducting this herculean effort:

- Secure storage and staff time is required to process the large volume of gear recovered
- Not able to identify fishers due to improperly marked buoys
- Fishers often assume gear was stolen
- Removing gear does provide an educational opportunity when owners are contacted



- Removing gear prevents continuous fishing by derelict pots and reduces unintended crab mortalities

The following is a summary of the data from derelict gear sweeps involving WDFW Enforcement Program and Fish Program staff for the 2019-20 and 2020-21 seasons:

2019-2020 Season

- Total # of individual gear sweeps = **35**
- Total # of WDFW staff participating = **22** officers and 6 shellfish staff
- Total # of pots processed by Crustacean staff = **1,237**
- **Recreational pots recovered = 1,193**
 - 700 were identifiable to an individual; 382 have been returned to owner; 230 stripped and scrapped ; 88 saved for donation
 - 493 were either incompletely labeled, illegible or unmarked (41.3%); 433 stripped and scrapped; 60 saved for donation
- **Tribal pots recovered = 40**
 - 36 were returned to the appropriate Tribe
 - These pots came from five different Tribes
- **State commercial pots recovered = 4**
 - Two of these pots were returned to the appropriate fisher
 - These pots came from four different fishers
- **Additional Highlights**
 - This season 420 crab pots with reunited with their owners (33.9%).
 - Non-profit organizations received 148 traps

2020-2021 Season

- Total # of individual gear sweeps = **53**
- Total # of WDFW staff participating = **31** officers and 6 shellfish staff
- Total # of pots processed by Crustacean staff = **1,410**
- **Recreational pots recovered = 1,383**
 - 726 were identifiable to an individual ; 394 were returned to owner; 240 stripped and scrapped ; 92 saved for donation
 - 657 were either incompletely labeled, illegible or unmarked (37.5%); 572 stripped and scrapped; 85 saved for donation
- **Tribal pots recovered = 20**
 - 5 were returned to the appropriate Tribe
 - These pots came from six different Tribes
- **State commercial pots recovered = 2**



- One of these pots 1 was returned to the appropriate fisher
- **Unknown pots recovered = 5**
- **Additional Highlights**
 - This season we have reunited 400 crab pots with their owners (28.4%).
 - Non-profit organizations received 177 donated traps
 - Staff was able to process, recycle, and return gear despite the extra safety protocols required for limiting transmission of Covid-19.



Figure 16. “The Storage Yard” Late Summer 2020 **Figure 17.** About 68% of the recreational crab pots recovered were the Danielson style

Crab managers have analyzed the information from the recovered gear, and the most popular type of gear being used by the recreational fleet is the “Danielson Style” trap (Table 4 and Figure 17).

Table 4. Trap styles recovered during the gear sweeps in 2019 and 2020.

Trap Style	2019		2020	
	#	%	#	%
Danielson Style	816	68.3%	951	68.8%
Small Round	56	4.7%	57	4.1%
Octagon	71	5.9%	75	5.5%
Round	107	9.0%	141	10.2%
Large Square	47	3.9%	38	2.8%



Mini Commercial	6	0.5%	4	0.3%
Ring Net	10	0.8%	17	1.2%
Commercial	42	3.5%	28	2.0%
Other	40	3.3%	70	5.1%
Total traps	1,195		1,383	

Additional analysis reveals the common errors made by crabbers when setting up their gear. Between 55-61% of the recreational gear recovered during the gear sweeps was not properly weighted. 63-68% of the gear does not have the buoy installed correctly. Most notably, 57-64% of the recovered gear did not have their buoys labeled in a manner that met the legal requirements. On the positive side, most crabbers are not using floating line (12-13%) or are not failing to use proper rot cord (6-8%).

The consequence of not recovering derelict or lost crab gear in a timely manner is the potential for crab mortality. The gear sweeps revealed that on average, recovered recreational gear was found to hold 1.6-1.7 legal size male crab per pot, and commercial gear was found to hold 4.1-4.9 legal size male crab per pot (Table 5).

Table 5. Common mistakes in setting up recreational crab gear from recovered traps.

Mistakes noted in setting up gear	2019		2020	
	#	%	#	%
Not weighted	732	61.3%	871	55.0%
Buoys incorrectly attached	816	68.3%	991	62.8%
Buoys not properly labeled	683	57.2%	767	64.3%
Floating line used	159	13.3%	199	12.2%
No rot cord	101	8.5%	84	6.1%
Total traps	1,195		1,383	



Table 6. Number of crab/pot and legal-size male crab/pot released from gear sweeps completed in 2019 and 2020. LSM refers to “legal-size males”.

Number of Crab in Pots Recovered by WDFW Enforcement

Year	Category	# of Pots Surveyed	Dungeness Crab Count	Dungeness Crab/Pot	LSM Dungeness Crab Count	LSM Dungeness Crab Count/Pot
2019	Recreational	1,082	2,842	2.6	1,711	1.6
	Commercial	115	637	5.5	561	4.9
	TOTALS	1,197	3,479	2.9	2,272	1.9
2020	Recreational	1,332	3,574	2.7	2,199	1.7
	Commercial	23	112	4.9	94	4.1
	TOTALS	1,355	3,686	2.7	2,293	1.7

Derelict shellfish gear recovery

In addition to WDFW pot sweeps, there is an effort to recover derelict shellfish pots under a contract with the NW Straits Foundation. The Foundation estimates that approximately 12,000 crab pots are lost every year in Puget Sound, costing the commercial fishery lost revenue and reducing opportunity for all crabbers. The recovery effort uses side-scan sonar to detect submerged gear and then divers use this information to retrieve abandoned pots. The Foundation reports that over the last 5 years, 723 recreational and 628 commercial pots have been recovered. In 2020, the NW Straits Foundation was able to detect and recover 50 commercial and 138 recreational derelict pots. Trapped inside the recovered pots were 89 live and 12 dead Dungeness crab, illustrating the need to remove derelict pots, which continue to fish if left in place.

Natural Resources Consultants (NRC) with the assistance of WDFW also recently concluded a Crab Pot Escapement Study to learn more about the effectiveness of escape mechanisms used on common crab pots styles in Puget Sound. Many of the derelict pots retrieved are still fishing even after escape cord has disintegrated, theoretically disabling the pot. The purpose of this study was to identify the most effective escape mechanisms, working towards the goal of minimizing impacts from derelict crab pots in Puget Sound. Since the conclusion of that study, NRC has proposed potential legislation that would reduce the minimum rot cord diameter used on recreational and commercial pots to minimize crab mortality associated with derelict pots.

Enforcement

Due to logistical constraints, updated data was not available prior to submitting this report. The 2021-22 report will also include enforcement data from the 2019 and 2020 fishing seasons. The previous 2018-19 report section is included below.



Enforcement officers make frequent compliance checks of crabbers and their catch. Prior to 2019, enforcement officers routinely kept records of recreational crab fishery violations for fishery managers to better understand regulatory compliance. In 2018, 21 officers were involved in 21 compliance emphasis patrols. Over 94% of these contacts were made on-the-water. Several hundred to several thousand contacts and crab checks are made each season between 2011 and 2018 (Table 6). The number of contacts and crab checked declined in 2017 and 2018 when emphasis was shifted from on the water contacts to shellfish gear sweeps.

Table 7. Number of crabbers contacted and crab checked by WDFW Enforcement officers (2013 through 2018).

	2013	2014	2015	2016	2017	2018
Fishers Contacted	3,494	4,809	3,659	2,457	1,234	728
Number of Crab Checked	4,013	5,952	6,717	3,885	1,329	934

Four general categories of violations are tracked by enforcement officers from contacts made with recreational crabbers. Possession of under-sized Dungeness crab (less than 6 ¼ inches standard carapace width measurement), possession of female crab, exceeding daily limit, and failure to accurately record catch on a valid Catch Record Card (CRC). Possession of undersize crab is a persistent problem and is little changed from 2011 through 2018, ranging from 6.0% to 9% of contacts (Table 8). Possession of female crab does not appear to be a significant problem, and of the successful crabbers contacted, only 0.2% possessed female crab in 2018. Exceeding the daily limit of 5 crab per valid license also does not appear to be a significant problem, and the percent of successful crabbers contacted who exceeded their daily limit has declined from 3.2% in 2011 to 1.0% in 2018. Failure to immediately record Dungeness crab catch on CRCs remains a significant problem during on-the-water enforcement contacts with crabbers. However, this category of violation has also declined from a high of 19.9% in 2012 to a low of 13.8% in 2018. It should also be noted that CRC compliance improves when crabbers are contacted by creelers at off-load site and further improvement has been observed when crabbers report at the end of the season. Overall, the improvements in compliance are potentially attributable to several factors including consistent enforcement presence, successful outreach and education, and crabbers growing accustomed to completing summer and winter CRCs.



Table 8. Historic comparison of various violation types from 2011-2018.

	Enforcement Contacts (Successful Crabbers Only)							
Category	2011	2012	2013	2014	2015	2016	2017	2018
Possession of undersize crab	8.0%	9.0%	8.0%	9.0%	7.0%	6.0%	7.0%	7.3%
Possession of female crab	0.9%	0.8%	1.0%	1.0%	1.2%	0.8%	0.4%	0.2%
Exceeding daily limit	3.2%	1.7%	1.4%	1.6%	2.6%	1.5%	1.2%	1.0%
CRC violation (fail to record)	19.4%	19.9%	16.5%	17.4%	17.2%	16.9%	16.7%	13.8%

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