

WDFW – European Green Crab Update

Public Update on European Green Crab Management – Nov/Dec. 2023



Female (left) and male (right) European green crabs removed from Washington waters. Photo: WDFW

Report Purpose: These regular updates are intended to inform the public, local stakeholders, media, and others regarding the status of European green crab (EGC) management and emergency measures deployment in Washington state, supporting the public information responsibilities of the Incident Command System (ICS) and Public Information Officer (PIO).

For additional information, please see: wdfw.wa.gov/species-habitats/invasive/carcinus-maenas European green crab news, communications and outreach materials are available under the “Resources” tab.

To report European green crab sightings or obtain identification resources, visit: wdfw.wa.gov/greencrab

Nov/Dec. 2023 updates

This report includes a summary of EGC captures, monitoring, and other emergency measures from November and December 2023 as well as field, partner, and science highlights and other updates.

European Green Crab Incident Command objectives continue to include reduction of EGC populations to below levels harmful to environmental, economic, or cultural resources.

2023 European green crab capture/removal totals

Total	339,589 as of Dec. 11, 2023
Latest Operational Period	52,346 (Oct. 30 to Dec. 3, 2023)

Coastal Management Branch EGC removal totals:

Year to date	333,263
Latest Operational Period	52,136

Salish Sea Management Branch EGC removal totals:

Year to date	6,326
Latest Operational Period	210

Please note that these numbers are best estimates and may have gaps or overlaps due to reporting challenges. Visit the new European Green Crab Hub for more detailed capture data: wdfw-egc-hub-wdfw.hub.arcgis.com.

Governor’s 10-Day Emergency Measures Status Update (Dec. 18, 2023): Per RCW 77.135.090, the WDFW Director continues to evaluate the effects of the European Green Crab emergency measures as provided under Proclamation 22-02, finds that the emergency continues to persist, and advises that all emergency measures should be continued. Details of the evaluation will be provided directly to you in Situation Reports (SitReps) reflecting each Incident Command System (ICS) operational period.

Intensive trapping continues on Washington’s Pacific coast

Since July 1, 2023, WDFW has been working with Pacific and Grays Harbor Conservation Districts as the local leads in Willapa Bay and Grays Harbor for European green crab (EGC) trapping. There are many coastal partners working on the front lines to trap and remove EGC, including Shoalwater Bay Indian Tribe, Pacific County Vegetation Management, and staff from both Conservation Districts. Trappers take actions to minimize impacts to valuable commercial, recreational, and cultured species and their habitats. WDFW would like to especially thank the many shellfish growers who are removing large numbers of EGC while working their shellfish beds. The Willapa Grays Harbor Oyster Growers Association (WGHOGA) continues to be a great partner in 2023.

“Shellfish farmers have long been stewards of the waters that provide for our way of life,” said David Beugli, Executive Director of WGHOGA. “Part of the stewardship includes the proper management and monitoring of invasive species before they can inflict irreversible damage to the health and ecology of the estuaries we rely on. Currently, trapping is the only recourse to control the seemingly inevitable spread of EGC in Willapa Bay and Grays Harbor.”

In 2023, participating WGHOGA shellfish farmers have so far removed more than 180,000 EGC from Willapa Bay and Grays Harbor. In Willapa, most of the trapping occurs around shellfish beds between Nahcotta and Oysterville. An exceptional number of gravid females (females carrying eggs) are concentrated here in the spring. In Grays Harbor, Pacific Shellfish Inc. traps beds in North and South Bays and has removed more than 50,000 EGC in 2023. Two research studies are using telemetry to study EGC movement and Washington State University is currently studying EGC food preferences by age and sex.

Some shellfish farmers will continue trapping through the winter, in slightly deeper water which EGC seem to prefer in the colder months. Present funding appears adequate but there are concerns regarding what happens after the end of the budget for the 2023-2025 biennium.



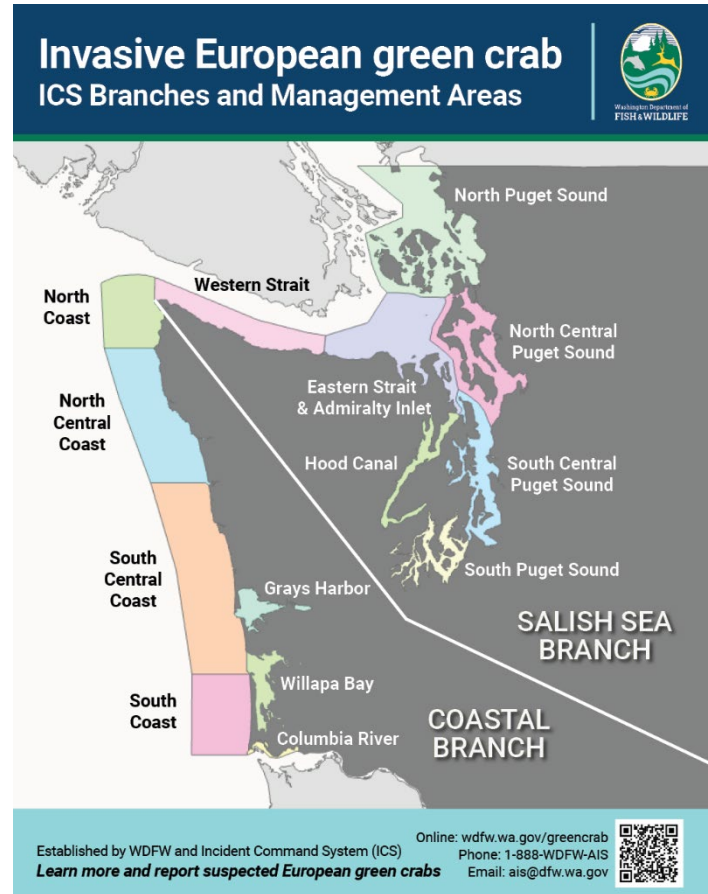
Additionally, questions remain if current efforts are going to have an impact on controlling EGC, something WDFW and partners are studying.

Strait of Juan de Fuca divided into two Management Areas

The Strait of Juan de Fuca Management Area (MA) was recently divided in two to create the Western Strait and Eastern Strait & Admiralty Inlet MAs.

The large size of the original Strait of Juan de Fuca MA made coordinating trapping efforts in that area challenging. The division of the area into two MAs was meant to address this issue and to take into better account the local movement of water, and thus the patterns of EGC dispersal as zoea (the planktonic form of young crabs).

A larger map of EGC management areas is [available online here](#).



Nov/Dec. news and media coverage highlights

Coverage from state, local, and national outlets included:

- The Willapa Harbor Herald ran an article reminding residents not to tamper with EGC traps: **Don't remove stray crab traps**
<https://hometowndebate.com/31-10-2023-10-42-47-am-7419289.pdf>
- KIRO NewsRadio aired a radio segment on EGC featuring Pacific Seafood that emphasized the threat EGC pose to the seafood industry as well as trapping efforts that are being used to try to control the invasive crab. The segment starts at about 12 minutes: **European green crab - a big threat to Washington's seafood industry**
<https://play.cdnstream1.com/s/bonneville/seattles-morning-news-w-7c908d/signing-up-for-health-co-04e13b>
- The Skagit Valley Herald published an article on the recent State of the Sound report on the overall health of the Puget Sound, including EGC monitoring as a project that is helping to improve the health of the Sound: **Report shows mixed results for Puget Sound health**
https://www.goskagit.com/news/environment/report-shows-mixed-results-for-puget-sound-health/article_470c3848-7a9e-11ee-9d1f-d35594d62518.html



- CBC Newfoundland and Labrador ran a TV segment on the impacts of EGC on eelgrass: **What is eelgrass — and why is it crawling with green crabs?**
<https://www.youtube.com/watch?v=LV-ZeeZad4w>
- Radio Pacific, Inc. published an article about the recent detection of EGC at Salt Creek Recreation Area by the Coastal Watershed Institute (CWI), emphasizing how important reports of suspected EGC are for managing the problem: **Invasive European green crabs found at Salt Creek**
<https://www.myclallamcounty.com/2023/11/17/invasive-european-green-crabs-found-at-salt-creek/>
- Pacific Northwest Ag Network published a similar article about the EGC detection at Salt Creek, including information about how to report EGC: **Invasive European green crab found at Salt Creek Recreation Area**
<https://pnwag.net/egc-found-salt-creek-wa/>

Field Highlight: European green crabs; after the trap

One of the most common questions WDFW gets about managing European green crabs (EGC) is— what do you do with all those crabs caught throughout the year? For most EGC, after they are caught, they are first frozen by the group doing the trapping. Freezing is considered the most humane way to euthanize crabs. They are then usually sent to WDFW.

On the coast, where catches are much more numerous, EGC are generally composted. EGC collected by the Shoalwater Bay Indian Tribe are utilized directly as fertilizer in their tribal community garden. Additionally, WDFW has partnered with Tidal Grow Agriscience (TGA), an organic fertilizer manufacturer based in Raymond, Washington. TGA accepts EGC and used bait from WDFW and participating co-managers, tribes, and partners for processing into a liquid fertilizer free of charge. This productive partnership allows organic material that would otherwise be dumped in landfills to be used productively. As of Sept. 30, 2023, ~12,000 lbs. of fish waste were delivered to TGA for processing.

For EGC caught within the Salish Sea, many are sent to Washington Sea Grant for genetic testing. This testing provides invaluable information about how EGC are spreading throughout the Salish Sea and where they are coming from, details that aid EGC management efforts. EGC that are not sent for genetic testing are usually composted by TGA as well.

Partner Highlight: Detections in Western Strait Management Area Makah Tribe Fisheries Management detects EGC in Neah Bay

On Nov. 8, Makah Tribe Fisheries Management caught live European green crabs (EGC) within Neah Bay for the first time during a routine trapping operation. This resulted in rapid response trapping on Nov. 20-21, when an additional twelve EGC were caught.

Neah Bay is within the Western Strait EGC Management Area approximately three nautical miles east of Cape Flattery. Significant numbers of EGC were previously captured within Makah Bay in the North Coast Management Area.



“We are both surprised and unsurprised with regards to the positive detection of EGC in Neah Bay,” said Adrienne Akmajian, Makah Fisheries Management marine ecologist. “Previously, we have found molts of green crab along shorelines of the bay, so it seemed that detecting a live green crab was only a matter of time.”

Makah Fisheries Management staff, with the help of a few dedicated local volunteers, deployed 60 traps where the EGC were found during the rapid response. Trapping effort has occurred in this area as early as 2018 with no positive detections; however, the size of EGC caught (65-85 mm) indicates that these crabs likely settled in 2020-2021.

“We plan to conduct a larger rapid response event in Neah Bay in 2024 but must wait due to winter tide and weather conditions,” said Akmajian. “Additionally, we will inform the tribal community of this update of EGC presence in Neah Bay, promoting methods of reporting sightings to Makah Fisheries Management.”

Going forward, Makah Fisheries Management plans to increase the frequency of regular trapping in this area in the 2024 field season to help monitor and mitigate the spread of EGC within Neah Bay.

Partner report leads to rapid response at Salt Creek Recreation Area

In late October, the Washington Department of Fish and Wildlife (WDFW) received a report from the Coastal Watershed Institute (CWI) of an EGC at Salt Creek Recreation Area. The site is a popular Clallam County park on the Strait of Juan de Fuca.

Within days of the report, WDFW worked with the county to gain access to the area and trap for EGC, catching three additional crabs between Oct. 24 and 26.

“This incident and the rapid response trapping that followed is a prime example of how important reports of suspected European green crabs are for managing this harmful invasive species,” said Justin Bush, WDFW’s Aquatic Invasive Species policy coordinator and Incident Commander for the state’s EGC emergency response.

More information is [available in WDFW’s Nov. 16 news release](#).

Science highlight: Impacts of European green crabs on Washington’s marine animals and where to view them

The direct impacts that European green crabs (EGC) have on some species may seem obvious. For example, laboratory trials have shown EGC to be voracious predators who gobble up a variety of shellfish. Outside the lab, EGC are a concern for shellfish and the shellfish industry—EGC have been blamed for the decline of Maine’s softshell clam industry—but there are other species that are less obvious that may also be impacted by EGC.

Though more research is needed into the exact impacts, we can make some educated guesses about the species that could be impacted by EGC based on food webs (in other words, who eats who). Below we share a few examples of animals that could be harmed by EGC as well as information about how and where to go and view these species.

Salmon and Pacific herring



Potential impacts from European green crabs

Washington is home to five types of salmon – chum, coho, Chinook, sockeye, and pink. Many salmon smolts use estuaries and eelgrass for cover and to feed on marine invertebrates before heading out into open waters. Adult salmon feed on Pacific herring that use the same eelgrass and estuaries to spawn and feed.

[Digging by EGC can have significant negative impacts on the eelgrass](#) and estuaries, [threatening native fish communities](#), including salmon and Pacific herring.



View of chum salmon spawning. Photo by U.S. Fish and Wildlife Service – Pacific Region.

Viewing

In spring, [thousands of herring can gather and release eggs and milt](#) into the water and amongst eelgrass along shorelines of Puget Sound, creating a milky appearance.

To view spawning locations of forage fish, visit our Spawning Location map: [Forage fish ecology in Washington State | Washington Department of Fish & Wildlife](#)

Salmon viewing is seasonal and depends on the species, run, and environmental conditions. Generally, the best time to view salmon is in the fall, but viewing can be done July through December.

Popular viewing sites to see salmon include: Rocky Reach Dam in Wenatchee, Tumwater Falls Hatchery, Ballard Locks in Seattle, Issaquah Hatchery, and Chuckanut Creek in Arroyo Park in Bellingham. Visit our [Salmon Viewing webpage](#) (check back for updates!) to find salmon viewing spots near you. Salmon and steelhead can also be viewed live on our [Live Cameras webpage](#) (disclaimer: fish viewing on these cameras may be seasonal).

Native crabs

Potential impacts from European green crabs

Research has shown that EGC have the potential to [outcompete a native Dungeness crab of approximately equal size](#) for food and habitat. Research has also shown that smaller native shore crabs, such as hairy shore crabs (*Hemigrapsus oregonensis*), are [heavily preyed upon by the voracious green crab](#). If EGC populations were to increase dramatically, their substantial appetites could lead to a decline in native shore crab populations.



Dungeness crab buried in the sand during low tide. Photo by Lori Myers.

Viewing

You can see shore crabs at any saltwater beach in Washington that offers hiding spots. They are often found wedged between rock crevices, amongst kelp and other vegetation, and in tidepools. If you are interested in exploring Washington's tidepools for shore crabs, make sure to check the tide charts! The



lowest tides expose more of the beach and are the best for tidepooling. When you go, make sure to review your [tidepool etiquette](#) to ensure a safe and respectful visit.

Sites to go tidepooling include Salt Creek Recreation Area, Dash Point, Damon Point, Olympic National Park Beaches (Rialto Beach is popular), Deception Pass State Park, Double Bluff Beach, and Constellation Park.

Seabirds, shorebirds, and waterfowl

Potential impacts from European green crabs

Many types of shore birds and waterfowl rely on the eelgrass and shellfish that EGC threaten for food and habitat. For example, brant geese feed almost exclusively on eelgrass and surf scoters feed mostly on mussels, clams, and eelgrass. Dunlins eat invertebrates that live in soft, muddy sand such as clams and polychaete worms, another species that EGC will eat. If EGC numbers were to increase enough they could [deplete these food sources and harm the habitat](#) that many birds rely on. EGC also may impact the [health of shore birds by transmitting the worm *Profilocollis botulus*](#).



Dunlins on the beach. Photo by Doug Kuehn.

Viewing

You can see shorebirds on coastal mudflats, tidal estuaries, rocky or sandy seashores. Sea ducks can be found along ocean coasts, bays, and estuaries during various times of the year. Spring and fall bring best viewing months for migrating shorebirds. The best time of day for viewing shorebirds is 2 hours before/after high tide.

Popular viewing locations include: Grays Harbor National Wildlife Refuge, Dungeness National Wildlife Refuge, Olympic National Park beaches, Fort Worden State Park, South Whidbey State Park, Commencement Bay, Bottle Beach State Park, Nisqually National Wildlife Refuge, Long Beach, and Lewis Unit of Willapa National Wildlife Refuge. [The Great Washington State Birding Trail](#) features birding loops to visit. Check out the Olympic Loop, Puget Loop, and Southwest Loop for shorebird and waterfowl viewing locations along Washington's marine waters.

General Updates

These sections are meant to highlight the hard work of dozens of co-managers, tribes, and partners working to manage and control EGC populations in Washington waters. The efforts described do not capture all the work done or all entities involved in EGC trapping and management. For more information about the co-managers, tribes, and partners currently involved in EGC trapping or management, please visit the [European Green Crab Hub](#).

European green crab 5-year management plan



WDFW is working on a 5-year management plan for European green crabs. As of Dec. 1, 2023, WDFW has conducted 32 initial one-on-one meetings with co-managers, tribes, and partners to gather information on activities, goals, and concerns to inform the initial draft of the EGC 5-year management plan. Several entities were unable to meet but have submitted documentation outlining this information.

An initial document outlining the structure and objectives of the plan is being distributed this month, with a complete first draft to be sent for review in early January 2024. The final draft of the plan is scheduled for completion by December 1, 2024.

European Green Crab Quarterly Progress Report - Fall 2023

The [fifth EGC Quarterly Report \(Q5\)](#) to the State Legislature was submitted on Dec. 1. This report has been authored as the fifth in a series of ongoing quarterly progress reports.

The report outlines the successes and challenges of ongoing EGC emergency response efforts in Washington state from July 1 to Sept. 30, 2023. In addition, this report puts the work during Q5 in the context of the work completed in 2022 and early 2023 (reports for Quarter 1 - 4).

European Green Crab Multi-Agency Coordination Group

The EGC Multi-Agency Coordination (MAC) Group, an advisory body whose members represent various co-managers, tribes, and partners participating in European green crab control or management, met on November 15. Federal funding, the development of the 5-year management plan, and U.S. Geological Survey research updates were discussed.

European Green Crab Research Task Force

The European Green Crab Research Task Force (RTF) had monthly meetings on November 21 and December 18. RTF recently designated several working sub-groups to take on specific issues. The Impact Thresholds Group, Impact Assessment Methods Group, Alternative Detection Monitoring Group, Management Area Monitoring Methods Group, and Other Human Pathways Group held meetings in November.

Field operations

Statewide

All WDFW seasonal scientific technicians ended their field season Oct. 31, 2023. WDFW staff are currently performing data quality assurance and quality control for year-end finalization. WDFW is in the process of hiring an EGC Salish Sea Regional Biologist.

Washington Sea Grant (WSG) and WDFW are working together to continue defining trapping and training protocols for new trappers. WDFW is also developing guidance for local entities leading EGC trapping in their locales.

The Washington State Recreation and Conservation Office (RCO) is discussing the Fiscal Year 2025 (FY25) interagency agreement funding allocations that support EGC trapping. They aim to notify sponsors of final allocations by April 2024 to assist with sponsor work planning.

Washington Coast

On Washington's Pacific coast, co-managers, tribes, and partners continue trapping to control and monitor EGC populations. In November alone, over 52,000 EGC were caught.



In November, the Makah Tribe, which works in both the Coastal and Salish Sea Management Areas, performed control trapping in Wa'atch and Tsoo-Yess Rivers.

Pacific County Vegetation Management, which traps in Willapa Bay, noticed that they were trapping more females than males in November. Willapa-Grays Harbor Oyster Growers Association (WGHOGA) has observed lower catches compared to last year at this time. Of note, one WGHOGA member is responsible for more than 100,000 of the total catch in Willapa Bay. WDFW briefed the Willapa-Grays Harbor Estuary Collaborative on EGC response in South Bend on Nov. 2.

The U.S. Fish and Wildlife Service (USFWS) organized three trapping efforts in Long Beach North (Leadbetter) and one in Nemah at Needle Point. They also did reconnaissance of Tongue Point, Oregon, to investigate situation and determine if future trapping efforts could take place.

In Grays Harbor, Grays Harbor Conservation District initiated a rapid response at east Hoquiam River after a landowner reported a sighting of EGC. Seven EGC were trapped at a site approximately 3 miles upriver. Nearby, GHCD trapped ten female crabs gravid with eggs at the Quinault Marina in Ocean Shores. From Oct. 30 to Dec. 3, 2023, GHCD captured 38% of their annual total of EGC. This was accomplished by focusing on hotspots and using what staff learned to identify new potential hot spots.

Trapping by the Washington Department of Natural Resources (DNR) focused on Grass Island in Grays Harbor. During the other weeks of this month the DNR team attended to Washington State Vegetation Management Association Conference and aided with a restoration effort on Damon Point in Grays Harbor.

Salish Sea

Co-managers, tribes, and partners operating in the Salish Sea in November and December have also been very productive. More than 200 EGC were caught in November, most of which were caught by Lummi Natural Resources.

As described in the above Partner Highlight, the Makah Tribe detected EGC in Neah Bay for the first time, following up with rapid response trapping including deployment of 60 traps.

Communications, outreach, and community events

Throughout November and December, WDFW, co-managers, tribes, and partners have engaged in numerous outreach events and actions in support of EGC management. In total, about 500 members of the public were reached at these events.

Northwest Straits Commission (NWSC) staff presented on the collaborative monitoring and removal efforts of green crabs in Drayton Harbor & Samish Bay to the Whatcom Watershed Information Network. There were approximately 50 attendees, and the live recording of the presentation is available on the [WWIN website](#).

NWSC staff had two presentations at the Coastal and Estuarine Research Federation Conference in Portland, OR. One presentation highlighted the outcomes of trapping and removal efforts in Drayton Harbor and Samish Bay and the other emphasized the positive impact of community engagement in trapping initiatives. The Washington Sea Grant (WSG) Crab Team presented a poster on green crab impacts in Washington at the conference.

Washington Sea Grant Crab Team staff hosted the 3rd annual Trappers' Summit last week, bringing together all groups trapping green crab across the state of Washington. The goal of the meeting is to build community, co-develop a picture of 2023 green crab status and trends, and



facilitate dialogue around best practices. Over 50 trappers attended to present their work and engage with others to learn more about trapping results from within their own regions to across the state. Half of the day was spent in poster sessions focused on data sharing from all trapping groups, while the other half was spent in discussions around 2023 patterns, successes, and challenges.

WDFW staff supported the Washington Sea Grant and Pacific States Marine Fisheries Commission booths at the Pacific Marine Expo in Seattle on Nov. 8-10, providing information about EGC to more than 200 visitors. WDFW also had a table at Kitsap Salmon Tours at Chico Salmon Park in Bremerton on Nov. 4.

WDFW updated the [Map of Washington European green crab ICS Branches and Management Areas](#) to reflect the division of the Strait of Juan de Fuca Management Area into the Western Strait and Eastern Strait & Admiralty Inlet Management Areas. Staff also posted 22 [European green crab identification and reporting signs](#) at water access points in WDFW Region 4, including at Cama Beach Historical State Park and Zuanich Point in Bellingham.

Please reach out to Jessica.Ostfeld@dfw.wa.gov if you would like digital or printed copies of any of the materials described above, or if you are interested in acquiring these or other EGC materials in additional languages. You can find a list of all EGC outreach materials on the [WDFW EGC webpage under the “Resources” tab](#).

Photos and Multimedia Highlight:

The Pacific Shellfish Institute recently released a video of a European green crab devouring a polychaete worm. If you want to witness how voracious EGC can be, you can view the video at <https://www.youtube.com/watch?v=ZsVxXRZZqqM>



Left: Kelsey Sapp (DNR) with a gravid female EGC at Grass Island on Nov. 29, 2023. Photo by DNR.



Right: Kelsey Sapp, Tim Teets, and Alexa Brown (DNR) trapping from Crab'n Fever (airboat). Photo by DNR.



Left: Alexa Brown and Tim Teets with traps next to Crab'n Fever. Photo by DNR.

Right: WDFW technicians weighing captured EGC for compost.



Public reporting and crab identification

WDFW continues to receive reports from the public of native crab species misidentified for invasive European green crabs. While we appreciate the public interest in helping to identify invasive species, **these incidents are examples of why WDFW calls on the public to photograph and report suspected green crabs at: wdfw.wa.gov/greencrab**, returning the crab in question unharmed to the water where it was found.



Most of these native crabs, including Graceful, Kelp, and Hairy shore crabs, are regulated as Unclassified Marine Invertebrates and are illegal to kill, harvest, retain, or possess. If verified as European green crabs, WDFW will follow up with trapping and monitoring if found in a new area if needed.

Crab identification guides and resources are also available [on the EGC Hub](#) and WDFW's [webpage](#), as well as at www.wdfw.wa.gov/greencrab.

European green crabs are shore crabs and are found in shallow areas—typically less than 25 feet of water—including estuaries, intertidal zones, and beaches. They are not likely to be caught by shrimpers or crabbers operating in deeper water, but may be encountered by beachgoers, waders, clam and oyster harvesters, or those crabbing off docks or piers in shallow areas.

Volunteering opportunities

Washington Sea Grant (WSG) and Washington State University Extension have teamed up to launch a new volunteer-based early detection program to complement the existing WSG Crab Team monitoring network.

Molt Search aims to support broader participation in early detection along inland Washington's shorelines by teaching volunteers what to look for and how to report the presence of European green crab molts. These molts can serve as an early indicator of the presence of European green crab in an area.

All scheduled trainings for Molt Search for 2023 have passed. For information about future training opportunities, sign up for the WSG newsletter at wsg.washington.edu/moltsearch. You can also email crabteam@uw.edu to share your interest and be kept in the loop.

Summary statement for background

On January 19, 2022, Washington State Governor Inslee issued Emergency Proclamation 22-02 which ordered the Washington Department of Fish and Wildlife (WDFW) “to begin implementation of emergency measures as necessary to effect the eradication of or to prevent the permanent establishment and expansion of European green crab.” This is a statewide proclamation for all marine and estuarine waters of the state that to be effective, will require coordination across state, tribal, and federal jurisdictions. To address this large and complex task, WDFW has implemented an Incident Command System (ICS) structure to facilitate a statewide European green crab (EGC) management strategy. The state Emergency Management Division has assigned this as Mission #22-1085. Since this is a relatively slower-moving emergency (as compared to earthquake or wildfire response), the ICS structure will be used as the overall framework for WDFW communications and coordination.

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Public updates on European Green Crab Management are posted at:

<https://wdfw.wa.gov/species-habitats/invasive/carcinus-maenas>

For more information or for media inquiries, please contact the European Green Crab Public Information Officer at chase.gunnell@dfw.wa.gov or contact ais@dfw.wa.gov.

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