Green Crab Control Management Trapping and Population Prevalence, Abundance Survey in St Mary's Bay, Newfoundland and Labrador

(Riverhead, Mall Bay, St. Joseph's Beach, Mt. Carmel, North Harbour, O'Donnells, and Colinet)

AQUATIC CONSERVATION INITIATIVE

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Project Objectives

The objective of this contract is to continue to conduct controlled trapping to manage Green Crab populations and also to determine the prevalence, abundance, and seasonal changes of Green Crab (*Carcinus maenas*) in Riverhead, Mall Bay, St. Joseph's Beach, Mt. Carmel, North Harbour, O'Donnells, and Colinet NL. Green Crab will be trapped using Fukui traps and will be counted and sexed per trap, and data will be recorded. Caught Green Crab will be killed by freezing for 7 days and disposed of in a landfill after freezing. If Green Crabs are to be transported out of St Mary's Bay for freezing, they will be contained at all times in a locked location (ie. locked truck bed). During trapping efforts, contractors will increase awareness on aquatic invasive species with a focus on Green Crab through outreach events, online media posts, and in-person communications during fieldwork. The information gained from the successful completion of this contract will assist the Department in focusing mitigation efforts in coming years, to control the spread and impact of Green Crab.

Scope of Work

1.1. The contractor may designate trappers to set Fukui Traps in the area of Riverhead, Mall Bay, St. Joseph's Beach, Mt. Carmel, North Harbour, O'Donnells, and Colinet. Soak time of traps will be 24 hours, and all Green Crab will be disposed of by freezing following collection, and then discarded in an agreed-upon location (e.g. Robinhood Bay landfill). All bycatch will be returned immediately to the water where removed. There is no catch limit or carapace size restrictions on captured Green Crab, and both females and males may be retained for purposes of disposing as agreed. All of these conditions will be set within the AIS control license issued to the contractor by DFO. The contractor will conduct trapping using 40 Fukui traps provided by Fisheries and Oceans Canada in the areas of Riverhead, Mall Bay, St. Joseph's Beach, Mt. Carmel, North Harbour, O'Donnells, and Colinet. Trapping will occur up to twice per month within the scope of time of the contract (July-November 2025), with the following schedule – 2 trap events in August, 2 trap events in September, 2 trap events in October, and 1 trap event in November. During each trap event, a minimum of 30 traps will be set. Trapping will be focused in the Riverhead, St. Josephs, and Mt. Carmel areas where catch per unit was found to be high (>10) in the previous year 2024. The next focal areas will be Mall Bay, Colinet, and North Harbour where catch per unit was found to be moderate (>4) in the previous year 2024. Trapping will also continue in O'Donnell's where catch per unit was found to be low (<4) in the previous year 2025 but will be tertiary to the aforementioned sites with higher catch rates. If additional sites are selected based on known habitat for Green Crab, contractors will include these as trapping sites. The traps will be set one day, soaked 24 hours and hauled. The contractor will deem when safe to do so in line with safe weather conditions. Traps should be set ~50-60m apart, and GPS coordinates recorded for each trap (see document on 'Criteria for Collection of Point Data' provided at the end of the Statement of work). The contractor will target areas for trap setting that are known habitat for Green Crab, this includes areas of known eelgrass beds, shellfish beds, barachois, freshwater runoff, muddy bottomed, head of bays, and shallow water. During trapping efforts, field teams will inform interested locals on the impacts of the invasive Green Crab and hand out control trapping licenses to those interested. Staff will organize a field trip with the local school, to teach students about aquatic invasive species in a classroom setting and take the students out to trap green crabs at one of the selected field sites. Contractors will also promote information on aquatic invasive species through social media and website posts.

Green Crab caught will be counted per trap, after the removal of by-catch. Crab will be sexed. All bycatch will be identified and counted. Details of catch site, GPS coordinates, calendar date, bycatch and number of Green Crab contained within must be clearly recorded on the log sheets.

1.2. Contractor will provide any required fishing vessel (not necessary for these locations, as shoreline work is recommended), fuel and bait (cod is recommended, but herring is also acceptable), GPS unit, travel costs (in line with Government of Canada travel directive), and will be responsible for the crushing/freezing and disposal of all caught Green Crab, as predetermined with DFO.

1.3. Contractor will complete a log book of catch (Green Crab and by-catch) provided by Fisheries and Oceans Canada and submit to the AIS Coordinator at DFO St John's (contact MacGregor Parent, email: macgregor.parent@dfo-mpo.gc.ca) no later than December 31st, 2025. Log of catch will also be submitted to the survey developed by the DFO AIS on the Survey123 app if applicable.

1.4. Contractor will use equipment that is outlined in the protocol including:

- 40 Fukui Traps, equipped with snaps, bait bucket, rope, and float*
- GPS (please use WGS84 datum for collection – if another is used please record the datum chosen)
- AIS Control License *
- Green Crab and Aquatic Invasive Species Information booklets

DFO will provide this equipment, which will be returned back to DFO at end of contract prior to final payout.

1.5. Trapping will not extend beyond November 30th, 2025.

Project Trapping Locations

Aquatic Conservation Initiative field staff trapped European green crab at 7 different locations in St. Mary's Bay, Newfoundland and Labrador as shown in Figure 1 and Table 1. Trapping locations were selected based on known green crab presence.

Figure 1. Green Crab Trapping locations in St. Mary's Bay, Newfoundland and Labrador, Canada

Table 1. Green Crab Trapping locations in St. Mary's Bay, Newfoundland and Labrador, Canada

Location Description	Latitude	Longitude	Specific Location	Measures Taken	Threats/Impact
Colinet	47.21128	-53.55604	Colinet	Abundance of Green Crab	Invasive Species
Mall Bay	46.98535	-53.57819	Mall Bay	Abundance of Green Crab	Invasive Species
Mount Carmel	47.13072	-53.4985	Mount Carmel	Abundance of Green Crab	Invasive Species

North Harbour	47.15856,	-53.65929	North Harbour	Abundance of Green Crab	Invasive Species
O'Donnells	47.06596	-53.56904	O'Donnells	Abundance of Green Crab	Invasive Species
Riverhead	46.97613	-53.51962	Riverhead	Abundance of Green Crab	Invasive Species
St. Joseph's Beach	47.14818	-53.46888	St. Joseph's	Abundance of Green Crab	Invasive Species

Green Crab Trapping

Observed Catch Effort

Based on the efforts of European Green Crab removal from St. Mary's Bay area in 2025-2026, Aquatic Conservation Initiative set 360 Fukui traps and removed 5645 European Green Crab from coastal habitats in St. Mary's Bay. As shown in Table 2, field crews set traps at 7 locations: Colinet, Mall Bay, Mt Carmel, North Harbour, O'Donnells, Riverhead, and St. Joseph's. To observe the efficacy of our trapping efforts, the catch per effort was calculated for each field site by dividing total catch by total traps set. Green Crab population counts as shown in Table 2, indicate that the Colinet field site was the most successful in the greatest removal of European Green Crab. The Colinet and St. Joseph's field sites scored the highest in catch per effort at 23.783 and 21.533 crabs per trap respectively. With 1,427 green crabs removed, Colinet was the field site with the highest catch total. However, the high catch ratio in St. Joseph's indicates that additional efforts could be focused on in that area in future years, given the catch per effort was the second highest with only 30 traps set, compared to Colinet which had 60 traps set. For all of St. Mary's Bay, the catch per effort value was 15.680 crabs per trap set.

While the catch per effort at O'Donnell's is the lowest out of all 7 trapping sites this year, it is notable that the catch was predominantly large males. The males were significantly larger than the males at the other sites. Additionally, only 7 out of the 524 green crabs caught being female, the sex ratio is heavily skewed. This could be due to the lack of trapping efforts prior to the last two years allowing the crabs to grow larger without interference. The eel grass ecosystem at the sites appears to still be in good condition. The eel grass beds have not yet been destroyed by the green crabs and trapping should continue at this site to prevent more damage.

Conversely, the North Harbour site yielded the only catch to have a higher female to male ratio. North Harbour also had the second highest total catch (1180) and a high catch per effort (19.66). North Harbour experienced some difficulties with trapping during intense weather as the tides beached several traps the first night. This influenced the total catch and the catch per effort. With the high female catch ratio, it could be worthwhile to focus more efforts on trapping at North Harbour, since there is an abundance of crabs, and removing more females than males is productive for invasive species mitigation.

A berried female was trapped at the Mitchells Brook site this year. This is particularly notable as berried females typically do not eat and will stay hidden whilst carrying their eggs. It is uncommon to observe them trapped in the fukui nets, as they are baited traps. Trapping this berried female removed up to 185,000 eggs from the system. The berried female can be seen in Figure 2.

We also observed a completely yellow European Green Crab at Colinet, this is a good example of how much the morphology can vary within European green crabs. A photo of the crab is seen in Figure 3.

Figure 2. A berried female found at Mitchell's Brook trapping site.

Figure 3. Observed a European green crab with total yellow coloration at the Colinet trapping site.

Table 2. Summary Of Green Crab catch counts, number of traps set, and catch per effort for each trapping location

Location	Total Traps Set	Total Catch	Catch per Effort
Colinet	60	1427	23.783
Mall Bay	60	643	10.716
Mt. Carmel	60	758	12.633
North Harbour	60	1180	19.66
O'Donnells	60	524	8.733
Riverhead	30	468	15.633
St. Joseph's	30	645	21.5
All Locations	**360**	**5645**	**15.681**

Observed Catch Sex Ratio

During our efforts of European Green Crab removal from St. Mary's Bay all trapped green crabs were sexed by observing the morphology of the telson. For all trapping sites, a breakdown of sex ratios is shown in Table 3. Across all trapping sites, 1512 females and 4133 males were removed by field staff from the St. Mary's Bay area. A male dominated catch could be due to sex ratio differences in the population or because males are more likely to enter the trap due to physiological and metabolic differences between sexes at the time of trapping. All sites except for North Harbour yielded more males than females. North Harbour however trapped 677 females and 584 males. This is a significant difference as all other sites, the highest male to female ratio was at Riverhead with 148 females and 320 males. A potential reason for the high prevalence of females at North Harbour may be due to trapping later in the season. Berried females do not eat, and as a consequence are not attracted to baited traps which could reduce the number of females being trapped during peak spawning season. Later in the season females may not be carrying eggs anymore and therefore more likely to be trapped. Focused efforts on sites like North Harbour could be beneficial since removing more females reduces the amount of crabs capable of reproducing in that area. Trapping will continue at North Harbour and next season will indicate if the female abundance was a one-time phenomenon or a characteristic of this area. Specific abundance values for males and females collected during each trapping trip can be found documented in the raw data spreadsheet, titled *EGC Catch Data 2025-26*.

Table 3. Green Crab Sex Ratios by Location

Location	Females	Males
Colinet	289	1138
Mall Bay	59	584
Mt Carmel	174	584
North Harbour	677	503
O'Donnells	7	517
Riverhead	148	320

St. Josephs	158	487
All locations	**1512**	**4133**

By-Catch

During controlled trapping efforts for European green crab, field staff documented all by-catch caught in the Fukui traps. Several species were identified as by-catch including Rock Crab, American Eel, cunner, and sculpin. A comprehensive list of all by-catch is noted in Table 4. All rock crabs that were caught as by-catch were sexed and an example photo of rock crabs is shown in Figure 4. An example photo of an American eel and its release is shown in Figure 5.

Table 4. Summary of by-catch counts for each trapping location

Location	Rock Crab	Sculpin	American Eel	Stickleback	Cunner
Colinet	0	1	2	0	0
Mall Bay	33 male, 17 female	1	0	0	2
Mt. Carmel	15 Female, 13 male	0	0	0	0
North Harbour	1 male	1	0	5	1
O'Donnells	1 male	0	3	0	1
Riverhead	1 male	0	0	0	0
St. Joseph's	1 male	0	0	0	0
All Locations	**50 males, 30 females**	**3**	**5**	**5**	**4**

Figure 4. Rock Crab (*Cancer irrotus*) by-catch at Mall Bay trapping site

Figure 5. American Eel bycatch release from Colinet trapping site.

Disposal of Green Crab

Green Crabs transported out of St Mary's Bay for freezing were contained at all times in a locked location (ie. locked truck bed). All caught green crab were killed by freezing for 7 days and disposed of at Robin Hood Bay Landfill in St. John's, Newfoundland and Labrador. Alternatively, all catch could be returned to the Northwest Atlantic Fisheries Centre for disposal instead of the Robin Hood Bay Landfill.

Communications

Aquatic Conservation Initiative led a successful outreach and communications portion of the project. In total 14 communication actions were taken through several media forms ie. in-person presentations, distribution of print media, website post, and through social media as shown in Table 4. An example of an educational social media post that demonstrates key factors for identifying green crab is shown below in Figure 6. Additionally, an infographic made this year is also shown in Figure 7. The infographic contains information on prevention, invasive species, how they spread, the harm caused, and more. Presentations are included in Table 4, some examples include presenting at Memorial University and Marine Institute, as well as an ENGO Caucus presentation on European Green Crab trapping efforts completed by ACI and IBEC. During trapping efforts, staff recorded a total of 17 interactions, where they discussed aquatic invasive species, green crab, and available trapping licenses to locals who stopped to chat with staff. These interactions happened at the Mount Carmel, Mall Bay, North Harbour, and Colinet trapping sites. Locals did not have interest in trapping crabs through a controlled trapping license, and were most interested in population size in the area and what we did with the removed green crab. We were able to bring two local schools this year to participate. Twenty-nine students plus staff from Dunne Memorial Academy joined ACI to the Riverhead trapping site on October 16, 2025 and participated in green crab collection, sex identification, and data recording. Nine students plus staff from St. Catharines Academy joined ACI at St. Joseph's trapping site on October 29, 2025. The students participated in green crab collection, sex identification, and data recording. See Figure 6 for a photo of some students participating in counting the European green crab catch.

Figure 6. Example of a summary post covering the catch total and educational content taught on the trip posted October 17, 2025.

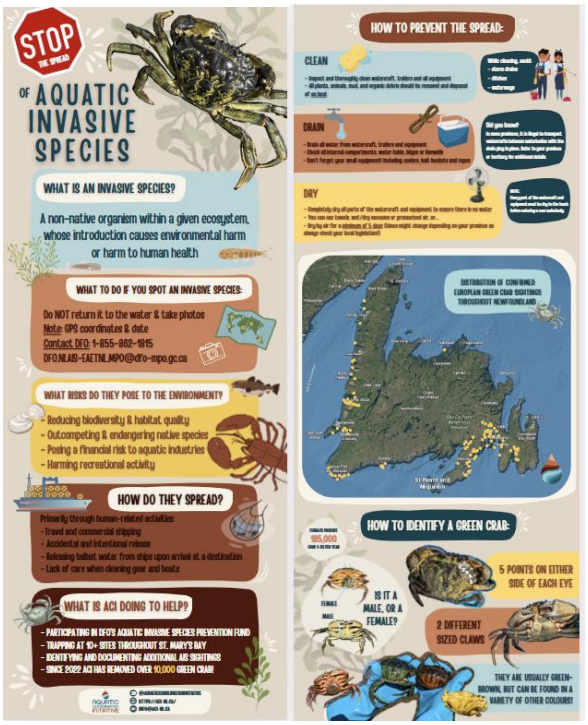

Figure 7. Infographic made in 2025 summarizing information on invasive European green crabs. The infographic covers topics such as how to identify green crabs, prevention, and what ACI is doing to help.

Figure 8. Students from Dunne Memorial Academy participating in the European green crab counting at the Riverhead trapping site.

Table 4. Record of Communications

Type of Communication (e.g. media/public event, newspaper, newsletter, magazine article, blog)	Communication Details (e.g. title, distribution size, number of participants)	Date of Communication	Web Link (if not posted to the Web, submit a copy with report)
Presentation	Marine Institute Marine Environmental Tech Student Presentation	November 4, 2025	https://docs.google.com/presentation/d/1ebZFBssbDRX3-oV3FC1H_H_bQ3DUE0vW/edit?slide=id.p1#slide=id.p1
Presentation	ENGO Caucus Presentation	November 27, 2025	https://docs.google.com/presentation/d/1geMcwl9NYDhQoOJO092E8wXc4BNh-6zG/edit?usp=drive_link&ouid=105595868031874150098&rtpof=true&sd=true
Presentation	Memorial University BIology Student Presentation	December 4, 2025	https://docs.google.com/presentation/d/1ebZFBssbDRX3-oV3FC1H_H_bQ3DUE0vW/edit?slide=id.p1#slide=id.p1
Print Media	DFO produced “Stop Aquatic Invasive Species” infographic made available at several outreach events for general public to keep	Ongoing throughout project August-November 2025	https://drive.google.com/file/d/1CgqQgLyeqyF5VjescxlIgsBp9NfGZcH9/view?usp=drive_link
Website	Green Crab Counter Banner	December 3, 2025	https://aci-nl.ca/
Website	Green Crab Project News Post	December 3, 2025	https://aci-nl.ca/2025/12/03/6541/
Social Media	Colinet Trapping Summary Distribution: *Instagram* 591 views, 146 reach, 19 likes *Facebook* 307 views, 177 reach, 5 likes, 1 share	August 13, 2025	https://www.instagram.com/p/DNS-wadMdcd/?utm_source=ig_web_copy_link&igsh=MzRlODBiNWFlZA== https://www.facebook.com/share/p/17D7tUhsio/
Social Media	Green Team Summary Distribution: *Instagram* 654 views, 148 reach, 27 likes, 1 comment *Facebook* 876 views, 478 reach, 13 likes, 1 comment, 1 share	September 8, 2025	https://www.instagram.com/p/DOWvh3AiYJE/?utm_source=ig_web_copy_link&igsh=MzRlODBiNWFlZA== https://www.facebook.com/share/p/17ZpPsf2o5/

Social Media	Mitchell's Brook Trapping Summary Distribution: *Instagram* 516 views, 122 reach, 14 likes, 1 save *Facebook* 1204 views, 650 reach, 7 likes, 1 comment, 3 shares	September 10, 2025	https://www.instagram.com/p/DOa4ulxFOK_/?utm_source=ig_web_copy_link&igsh=MzRlODBiNWFlZA== https://www.facebook.com/share/p/1A9Zcd61rX/
Social Media	Mall Bay Trapping Summary Distribution: *Instagram* 373 views, 82 reach, 9 likes *Facebook* 236 views, 134 reach, 8 likes	September 11, 2025	https://www.instagram.com/p/DOeKXD0E9Ir/?utm_source=ig_web_copy_link&igsh=MzRlODBiNWFlZA== https://www.facebook.com/share/p/17A9Zvuy4r/
Social Media	O'Donnells Trapping Summary Distribution: *Instagram* 585 views, 110 reach, 21 likes *Facebook* 248 views, 136 reach, 9 likes	September 22, 2025	https://www.instagram.com/p/DO6DhkDEm4d/?utm_source=ig_web_copy_link&igsh=MzRlODBiNWFlZA== https://www.facebook.com/share/p/1R5ipqnZiE/
Social Media	Riverhead Trapping Summary Distribution: *Instagram* 476 views, 112 reach, 18 likes *Facebook* 6250 views, 2313 reach, 11 likes, 2 comments, 12 shares	October 17, 2025	https://www.instagram.com/p/DP6en94D-zq/?utm_source=ig_web_copy_link&igsh=MzRlODBiNWFlZA== https://www.facebook.com/share/p/17xLNCMP7H/
Social Media	St. Joseph's Trapping Summary Distribution: *Instagram* 429 views, 100 reach, 17 likes, 1 save *Facebook* 337 views, 209 reach, 7 likes, 1 share	November 5, 2025	https://www.instagram.com/p/DQrfPxmjeke/?utm_source=ig_web_copy_link&igsh=MzRlODBiNWFlZA== https://www.facebook.com/share/p/1G1PsxRrYk/
Social Media	North Harbour Trapping Summary Distribution: *Instagram* 296 views, 103 reach, 14 likes, 1 save *Facebook* 346 views, 6 likes	November 24, 2025	https://www.instagram.com/p/DRcP8Q_kjUM/?utm_source=ig_web_copy_link&igsh=MzRlODBiNWFlZA== https://www.facebo

			ok.com/share/p/1DECmKybqo/

Project Outcomes

As discussed above, Aquatic Conservation Initiative completed monitoring and controlled trapping efforts of the invasive European green crab at several locations in St. Mary's Bay, Newfoundland and Labrador. This is the fourth year we have completed trapping in the region and in comparison to previous years, for the 2025 trapping season we removed the most amount of green crab to date (5647 total). In 2022 we removed 2,438 green crabs, in 2023 we removed 3,200 green crabs, and in 2024 we removed 4,358 green crabs. The increase of catch could be the result of several factors including a growing population of green crab in St. Mary's Bay, improved trapping efforts with experience, increased trap setting from the initial year of trapping efforts, or other unknown factors. Given the counts of green crab recorded this year, the population of green crab in St. Mary's Bay should be continued to be managed into future years to prevent ecological destruction of valuable habitats such as eel grass and shellfish beds, and limit inter-species competition between native crustaceans.

Aquatic Conservation Initiative hosted several outreach events, online media posts, and discussed aquatic invasive species through in-person communications during fieldwork. We connected with undergraduate students, researchers, ENGOs, and several departments within Fisheries and Oceans Canada at the ENGO Caucus meeting and undergraduate presentations. Social media was used to highlight project updates but also provide educational information on what an invasive species is, why green crabs are invasive, the impacts green crabs have on coastal ecosystems, and how to identify green crab. Website posts detailed project updates such as the launch of the project and final results.