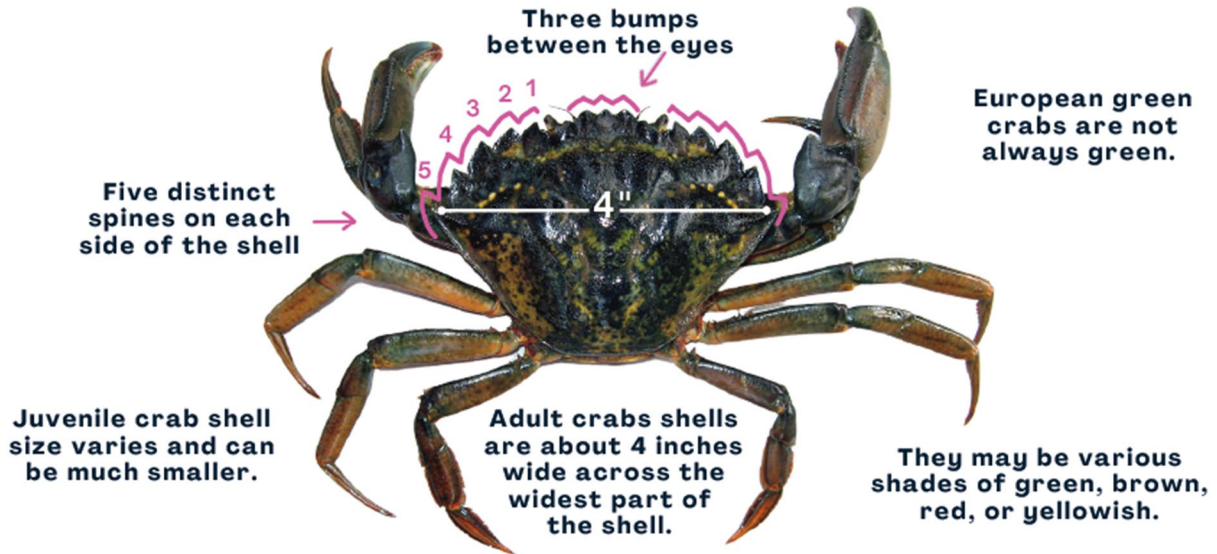


# How to Identify a European Green Crab



## European Green Crab

### Community-Based Monitoring Network

#### Manual

Developed by

Kachemak Bay National Estuarine Research Reserve

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This manual provides detailed instructions on monitoring for Green crabs with folding, minnow, and pit traps.

**SAFETY:**

Please be aware that coastlines can be hazardous areas to work in. If you are concerned an area is potentially unsafe, seems difficult to access or has hazards, DON'T DO IT! Be mindful of the tides and whenever possible, conduct your surveys during low tides. Be sure to let someone know where you are going and when you plan to return. Take a field buddy with you when possible.

When accessing monitoring sites, please respect private property boundaries, and only access sites via private property if you have permission from the owner.



*Figure 1. KBNERR student volunteers setting Fukui traps.*

**COLLECTION PERMITS:**

An Aquatic Resource Permit from the Department of Fish and Game (ADF&G) is required to study and/or collect any live organisms in the state of Alaska. All traps must be labeled with a current year Aquatic Resource Permit number, a contact name, and contact number.

Permit applications are available on the ADF&G website or by contacting the Permit Coordinator:

[https://www.adfg.alaska.gov/index.cfm?adfg=otherlicense.aquatic\\_resource](https://www.adfg.alaska.gov/index.cfm?adfg=otherlicense.aquatic_resource)

Permit Coordinator: [dfg.fmpd.permitcoordinator@alaska.gov](mailto:dfg.fmpd.permitcoordinator@alaska.gov)

Tammy Davis, the Invasive Species Coordinator, (Division of Sport Fish, Juneau, 1-877-INVASIV) must be informed within 24 hours when a European green crab or other aquatic invasive species is caught. The carcass must be turned into ADF&G within 24 hours after notification so that identification can be confirmed and genetic samples taken.

## TRAPPING SURVEY PROTOCOL

### EQUIPMENT:

**Dress appropriately for all types of weather.** The most important equipment is that which protects you. Rain boots, hip waders or other waterproof foot ware are needed. Raingear, hat and gloves are recommended.

Before leaving to deploy or check traps, make sure your kit includes all of the following:

#### Deployment equipment:

Minnow traps (1)	Folding Fukui traps (5)
Bucket	Bait/bait jars
Hammer	Stakes: metal, wood, plastic (may be attached to traps)
Zip ties	Tide book
Flagging tape	

#### Monitoring equipment:

Clipboard/pencils (3)	Water quality multi-parameter instrument, or Salinity meter (refractometer)
Watch or Phone	Thermometer
Data sheets	Tide book
Bucket for holding crabs	ID resources for crabs, invertebrates, fish
Ruler or calipers	Gloves
GPS unit or camera	Knife or Clippers

**NOTE:** The mesh on traps should be no larger than ½” with an opening at either end. The trap opening must be 1½” wide.

### MONITORING SITE:

All monitoring sites should be identified as safe for you and any volunteers, are ecologically important, provide suitable habitat for European green crab to establish, and are areas where equipment can be retrieved relatively easily.

### DEPLOYING TRAPS:

Arrive at site at least ½ to 1 hour before desired time of deployment according to the tide. All sites will deploy 5 folding traps and 1 minnow trap. For each trap you will need stakes and bait containers.

Location: Deploy traps at a minimum of a -1 ft and no more than +2 ft mean low tide.

Distance: Set traps far enough apart so adjacent traps don’t interfere with the fishing range. Setting traps approximately 10 meters (30 feet) is effective. The longer the shoreline you are sampling, the farther apart the traps should be situated. If the habitat on the beach you’re sampling varies widely, look for suitable habitat instead of placing traps a uniform distance apart. If eelgrass is present, put at least one trap in that area. Be sure to place traps as low in the intertidal as possible, but not so low that they will underwater at the following days low tide.

Securing traps: These traps are light and need to be anchored to the ground. Secure your traps to the beach by pounding a tent stake or rebar on each side of the trap. Pound in so that only 4 – 5 inches remain exposed. Tie traps to stakes with approximately 4 ft of line and weigh them down with a rock or other heavy item to prevent floating away. Use bright flagging tape or float on stakes to help locate the traps for retrieval. Rocky habitat may require rebar or other sturdy stake to secure the trap(s).

Time Period: Deploy gear for a minimum 24 hour soak period that covers a full tidal and day/night cycle. It is important to check and empty your traps after the designated soak period so crabs and other bycatch are not out of water too long. To avoid trapped animals dying from sun and air, plan to arrive not more than 24 hrs. after trap set time.

Other details: All traps should have an escape hatch and contact tag with aquatic resource permit number and your contact information in case of the unlikely event of a trap being washed away with the tide.

Frequency: During the sampling period from April through September, the preferred minimum sampling frequency is at least three times. If monitors can survey more often, we encourage once per month per site if time and capacity allows. Sampling more often increases the chances of finding an invasive European green crab and contributes to long-term data.

***If a green crab is found anywhere in Alaska waters, contact the Alaska Department of Fish and Game Invasive Species Program: (907) 465-6183 or call the Invasive Species Hotline: 1-877-INVASIVE immediately. You may be asked to increase sampling frequency and trapping density.***

Baiting Traps: Specify type of bait used on data sheet. Herring is the preferred bait, when available. Fish such as herring, halibut, or salmon can be used. In a pinch, canned cat food is an alternative bait. Place bait in supplied container. You may need zip ties to close the traps.

**Note:** When walking to and from your monitoring site, it is important to do a visual scan of your beach for European green crab molts (exoskeletons) and carapaces (back shell). A shoreline molt/carapace survey should be done at least once at the end of the season or it can be done monthly. Initial observations of European green crab presence in Alaska was initially revealed through the discovery of molts/carapaces, before live crabs were seen in a trap.

#### **DEPLOYING AND RETRIEVING TRAPS BY BOAT:**

If you are deploying traps by boat, you will need to have a buoy with a line attached to the trap in order to retrieve it. Make sure the line is long enough to float at high tide. Traps can be staked or weighted to keep them in place. If you have chosen a calm site, the buoy and line should be enough to find the trap again and you shouldn't need a weight. If your site is subject to currents or wave action, you may need to use a set of anchors and a longline or use weighted line. What type of anchor you use will depend upon the type of bottom substrate. Use what works best in your area (fishermen are a good resource for such information). If necessary, traps may be placed closer together than in a land based deployment, though about 30 ft apart is still the goal. You may also find it helpful to use a digital recording device in lieu of a data sheet, if the weather is rough or rainy. The data can then be transferred directly to the computer upon return to the lab.

## **MONITORING:**

Traps should be checked only after being submerged for 24 hours, or a full tide cycle. Having at least two people working a trap is best. Have one person assigned as data recorder and another person removing crabs from trap. One person should be measuring and figuring out the sex of each crab. Other monitors can be charged with releasing crabs into the water where they will not be accidentally stepped on, taking pictures, or completing molt/carapace surveys.

### **1. Fill out monitoring information:**

Site Monitors: Fill out site information prior to pulling traps for ease and accuracy. Each site should have a documented site name and site description. Make sure all observer names are recorded.

Fill out datasheets as completely as possible. If there are no data to enter for a particular line, fill with a zero or other marking to indicate there was nothing to enter. This assists with data quality checks. Enter trap deployment date and time on the datasheet, as well as the trap check/retrieval date and start time on the datasheet. Capture GPS coordinates for each trap whenever possible. Draw a sketch of the trap layout and habitat on the back of the datasheet. Circle all appropriate habitat descriptions. Take temperature and salinity, enter results on the data sheet. Collect salinity and water temperature data and enter it on the datasheet. All lines of a datasheet should have data or a marking to indicate no data available.

### **2: Fill out crab information:**

Crab Removal: Open trap and put all captured organisms into the bucket. This is most easily done by gently shaking the trap upside down and collecting crabs as they shake loose. Wear gloves so as not to get pinched. Be gentle removing crabs from trap, and hold them gently by their main body cavity, not by claws or legs. If you turn them upside down when holding them, they will hold still. If crabs are missing appendages or have parasites, be sure to note this on data sheet. **If the trap is empty, write “Empty” next to trap number. For each individual crab, record the following:**

Trap number: Assign each organism to a trap number. Record and list information for all catch individually on a separate line. If more space is needed than is available on the datasheet, begin another datasheet and fill in the number of pages.

Crab ID: Use available guides to help identify the crabs in the trap. All crabs in each trap should be identified if possible. Any crab that is not easily identified or is suspected of being an invasive crab should be photographed.

Crab Size: Measure carapace lengthwise using ruler or caliper. The size of a crab is determined by measuring its carapace (shell) width. The carapace width is the distance across the back of the crab at the widest point. Measure total length (fish and other organisms) or crab carapace width and record on the datasheet. See Figure 2.



Figure 2. Calipers (shown above) or a ruler can be used to measure the carapace of each crab from the widest point across the back.

**Crab Sex:** The sex of a crab is determined by the width of its abdomen (shaded area in Fig. 3) which curls around the crab's underside. The male crab has a narrow, triangular abdomen, while the female has a much broader abdomen. See Figure 3 for details.



Figure 3. Graphic description of physical cues of the abdomen to determine sex of crabs.

**Unidentified Crabs:** If a crab is not easily identified or if you suspect it may be an invasive species:

- a. Hold the crab on your data sheet so that your name and date are visible along with crab, jot a number next to the crab (starting with 1) and capture the crab and information in the photo. This will give us an idea of the size and location of where the crab was observed. If more than one unidentifiable crab is found, change the number (2,3,4, etc.) so that each crab has a unique number included in the photo.

**Reporting Green Crabs:** In the event that you catch a European green crab - or any other unidentifiable crab – after you have recorded the data, place the animal in a sealed container or Ziploc bag marked “preserved specimen” and place it in your freezer. Fill out some kind of label with the date the trap was set, trap location (be specific, GPS coordinates are best), the names of team that found the crab, and a phone number, as well as your affiliation, if applicable, and place the label in the container with the crab. Contact the ADF&G Invasive Species Program (907) 465-6183 or the Invasive Hotline at 1-877-INVASIV (1-877-468-2748). It is important to get identification confirmation as soon as possible.

**Bycatch:** Any other non-crab organisms caught in the trap should also be identified (or photographed), counted, and recorded at the bottom of the data sheet.

**Check End Time:** Note your finishing time on the data sheet.

**Report data:** The data sheet provided (see attached) should be filled out completely. If no European green crab were observed, either return datasheet to a monitoring coordinator or the ADF&G permit coordinator at the end of the season to comply with the Aquatic Resource Permit. See your permit for details. If you think it will be misplaced, scan and submit by email or mail it in sooner.

If European green crabs were observed during your season, send a copy to the ADF&G invasive species program coordinator:

Invasive Species Program  
ADF&G, HQ  
P.O. Box 115526  
Juneau, AK 998011-5526

### **TRAP REMOVAL:**

Please be sure to clean all debris, plants, and animals out/off your traps between surveys. Remove stakes, clean traps with freshwater and fold them flat. If continuing your monitoring during the next tide series, store them in a safe place. If you will no longer be trapping, to return the traps contact ADF&G invasive species program coordinator (907) 465-6183.

## **BEACH WALK CRAB MOLT AND CARAPACE SURVEY PROTOCOL**

All crabs must molt to grow, and molted exoskeletons, known as carapaces, are often deposited by the high tide onto the upper beach with seaweed and other beach wrack and debris (Fig. 4). In addition to the live trapping, searching for molts and carapaces provides another opportunity for volunteers to look for evidence of European green crabs in nearby waters.

Volunteers begin at the established site marker (collect GPS coordinates), then for 20 total person minutes (20 mins for one person, 10 mins each for two people and so on) to collect as many molts as observed. Volunteers should target the highest concentration of molts in the general area, but pick up molts as they see them. Once the time has lapsed, volunteers meet at a location where they can comfortably count, identify and record the information on a datasheet for all observed crabs. Note on the datasheet if a full carapace (shell) or a full molt (shell and legs.) If you're unable to identify the crab carapace, take a photo with a ruler or standard sized item and capture as much detail as possible. Submit photos to ADF&G for identification assistance. After carapace data has been recorded, crush all the carapaces. This ensures the same carapaces will not be counted again.



*Figure 4. Crab molts, including European green crab carapace (top left) in beach wrack. Photo: WASG, Jeff Adams.*

## On-Site Checklist

### Trap Deployment:

- Securely place number stakes in ground at least 30 feet apart. Stakes should be placed deep enough, that only 4 -5 inches are exposed.
- Enter the number of traps deployed on data sheet.
- All traps should have permits and be tied securely to numbered stakes.
- Weigh all traps down with either bricks or rocks.
- Place bait containers (with bait!) in each trap. Either attach containers to trap with zip ties, or weigh them down with water.
- Fill out date and time of deployment on data sheet.
- Collect GPS coordinates of each trap location and draw a sketch of the traps and fill out the habitat description on data sheet.

### Checking Traps:

- Enter all monitor names on data sheet.
- Enter date and time on data sheet.
- For each trap:
  - Removed crabs gently and place in holding bucket if necessary
  - If trap is empty:
    - Enter trap number and “empty” on data sheet.
  - For each crab enter on the data sheet:
    - trap number
    - crab species (use identification card)
    - sex (abdominal flap is pointed in males, rounded in females)
    - carapace length (widest part of carapace measured in mm using calipers)
    - any appropriate notes (parasites, broken appendages)
  - For any non-crab species enter on data sheet under bycatch:
    - trap number
    - species
    - any appropriate notes
  - For any unidentified crabs, take photo for identification. If you think it may be an invasive crab, do not release it! Place unknown crab species in a sealable container and contact ADF&G or coordinator for identification assistance. Retain invasive European green crabs.
  - Release all other crabs and bycatch back into the water.
- Make sure all data is easy to read.
- Remove bait from traps.
- Fold traps, remove any debris
- Remove stakes if not monitoring at next tide cycle.
- Return data to coordinator or ADF&G in timely manner.
- Submit a report and data to ADF&G in compliance with permit stipulations.