

## **CRAB CARE**

SOP# = ARTH3

**PURPOSE:** To describe methods of care for crabs.

**POLICY:** To provide optimum care for all animals.

**RESPONSIBILITY:** Collector and user of the animals. If these are not the same person, the user takes over responsibility of the animals as soon as the animals have arrived on station.

**PROCEDURE:** At present there are many crab species found around BMSC, some of the most common below

### **True crabs**

Furrowed rock crab	<i>Cancer branneri</i>
Graceful crab	<i>Cancer gracilis</i>
Dungeness crab	<i>Cancer magister</i>
Redrock crab	<i>Cancer productus</i>
Pygmy rock crab	<i>Cancer oregonensis</i>
Purple shore crab	<i>Hemigrapsus nudus</i>
Green shore crab	<i>Hemigrapsus oregonensis</i>
Black-clawed crab	<i>Lophopanopeus bellus</i>
Foliate Kelp crab	<i>Mimulus foliates</i>
Graceful Decorator crab	<i>Oregonia gracilis</i>
Graceful kelp crab	<i>Pugettia gracilis</i>
Northern kelp crab	<i>Pugettia producta</i>
Cryptic kelp crab	<i>Pugettia richii</i>
Sharp-nosed crab	<i>Scyra acutijrons</i>
Longhorn decorator crab	<i>Chorillia longipes</i>

### **Porcelain crabs**

Flattop crabs	<i>Petrolisthes eriomerus</i>
Flat porcelain crab	<i>Petrolisthes cinctipes</i>

### **Galatheid crabs**

Squat lobster	<i>Munida quadrispina</i>
Butterfly crab	<i>Cryptolithodes typicus</i>
Umbrella crab	<i>Cryptolithodes sitchensis</i>
Heart Crab	<i>Phyllolithodes papillosus</i>
Puget Sound king crab	<i>Lopholithodes mandtii</i>

### **Hermit crabs**

Widehand Hermit	<i>Elassochirus tenuimanus</i>
Blakeyed hermit	<i>Pagurus armatus</i>
Maroon Hermit	<i>Pagurus hemphilli</i>
Grainyhand hermit	<i>Pagurus granosimanus</i>
Bering Hermit	<i>Pagurus beringanns</i>
Hairy hermit	<i>Pagurus hirsutiusculus</i>
Greenmark hermit	<i>Pagurus caurinus</i>
Blueband hermit	<i>Pagurus samuelis</i>
Whiteknee hermit	<i>Pagurus dalli</i>
Furry hermit	<i>Pagurus ulreyi</i>
Tubeworm hermit	<i>Discorsopagurus schmitti</i>

### **Identification**

Refer to Eugene N. Kozloff's book, "Seashore Life of the Northern Pacific Coast" and Gotshall's "Guide to Marine Invertebrates: Alaska to Baja California" for in depth descriptions of individual specimens.

***Cancer branneri***: Characterized by hairy carapace, legs, and chelipeds. Carapace is bright orange-red. The most posterior tooth on the carapace is prominent and sharp. Carapace is about 7.5cm wide.

***Cancer gracilis***: Resembles *C. magister* (below) but the upper surface of its carapace is smooth rather than bumpy and its legs are relatively slender. Color ranges from grayish-brown to brownish-red, and the upper surfaces of the legs are purple. Width of the carapace does not often exceed 7cm. These crabs are regularly associated with eelgrass.

***Cancer magister***: The upper surface of the carapace is grayish brown, sometimes with a purplish tinge. Carapace is relatively smooth with 10 small teeth on each side. Large specimens may have a carapace 20cm wide.

***Cancer oregonensis***: The chelipeds are black-tipped but the rest of the carapace is dull red. It has a number of equal and evenly spaced teeth between the eyes and the widest part of the carapace. The outline of the carapace is nearly circular and their legs are notably hairy. These animals like to fit into neat holes just barely big enough for their bodies and often occupy empty giant barnacle shells. Only about 4cm across at it's widest.

***Cancer productus***: Similar to *C. oregonensis* (above) in that it is dull red with black-tipped claws, but it is much larger, being about 15cm wide in a large specimen.

***Hemigrapsus nudus***: Has nearly rectangular carapace, usually reddish with a number of distinct purple spots on pincers and first pair of legs. Legs not particularly hairy and the carapace is only about 2.7 cm across. Found under loose rocks and in cracks, more likely to be in exposed, rocky areas.

***Hemigrapsus oregonensis***: Has a nearly rectangular carapace as in *H. nudus* (above) but tends to be grayish green and lacks purple spots on the pincers. Its legs have conspicuous fringes of hairs. 4.8 cm across carapace, typical of quiet water and rocky habitats within estuaries.

***Lophopanopeus bellus***: Claws are black-tipped. Varies a great deal in color. Has three teeth on each side at the widest part of the carapace. A large specimen is rarely larger than 2.5cm wide. Tends to go into 'rigor mortis' when handled.

***Mimulus foliaius***: Looks like a *Pugettia* except for its carapace, which is about 3cm long, and is as wide or slightly wider than it is long. Often overgrown by sponges, bryozoans and hydroids. Reaches 7.5cm in length. Found along exposed and open coast.

***Oregonia gracilis***: Carapace is up to 5cm across and almost triangular in shape. It becomes encrusted by sponges, bryozoans, and hydroids. The narrowed anterior end is elongated into two long, nearly parallel rostral horns. Color is mostly light tan. Legs are very long, smooth and slender relative to the body as a whole. Carapace is rough. Chelipeds are delicate

***Pugettia gracilis***: *Pugettia* are spider crabs with long, slender legs, both are found in eelgrass beds or on rocky shores. Upper surface is somewhat roughened and usually has algae or animals growing on it so that its reddish brown color is obscured. Carapace is distinctly longer

than wide, slightly smaller than *P. producta* (below), rarely exceeding 3cm length. Has a few sharp spines on the upper surface of the carapace.

***Pugettia producta*:** *Pugettia* are spider crabs with long, slender legs, and both are found in eelgrass beds or on rocky shores. Color is olive or olive brown and may have some red or orange tones on the lower surface. Carapace is distinctly longer than it is wide, reaching a length of 5cm or more. Upper side of the carapace is smooth and remains free of other encrusting organisms.

***Pugettia richii*:** This crab differs from the graceful kelp crab in that its carapace is covered with spines. Spines on the edges of the carapace are more curved and project at sharper angles, and its pincers are tipped with white, not orange. Carapace reaches 4.3cm across.

***Scyra acutifrons*:** The shape of the carapace is almost triangular with short and very flattened rostral horns protruding out of the narrow anterior end. The carapace and legs are roughened which helps colonizing organisms encrust on the surface of the crab. Carapace is about 3.5cm long in a large specimen.

***Chorillia longipes*:** Uses very little if any decorative material, very slender appendages, colour is orange and white. Carapace is around 4.5 cm across. Often associated with cloud sponges.

***Petrolisthes cinctipes*:** The finger-like palps on last pair of the mouthparts (the 3<sup>rd</sup> maxillipeds) are orange red. The flattened carapace is sometimes blue, sometimes purplish-red, with a nearly circular body about 2cm across. The second antennae, which are longer than the first, are widely spaced and lateral to the eyes. The fifth pair of legs is small and tucked under the body. This crab can easily autotomize a leg that is immobilized and regenerate another limb within a few months.

***Petrolisthes eriomerus*:** Has characteristic blue mouthparts and blue spots at the 'thumb' joints. Mouthparts must be open to see colouration. Carapace around 2.5 cm across.

***Munida quadrispina*:** Dwells in sponges or crevices. Bright orange in colour and looks like combination of a crab and small crayfish. Swims in projectile manner using telson, chelipeds are long and usually extended out in threatening manner. Carapace around 12.5 cm long.

***Cryptolithodes typicus*:** Has a soft abdomen but the abdomen is pressed tightly to the underside of the cephalothorax. As in hermit crabs, the 5<sup>th</sup> pair of legs are reduced and tucked up under the carapace. The carapace is expanded laterally so that the legs can be hidden away and is about 8 cm across.

***Cryptolithodes sitchensis*:** Has a broader shell than *C. typicus*, found intertidal to 18 meters. Rostrum (head spike) is flared at outer end. Carapace reaches 10 cm across.

***Phyllolithodes papillosus*:** Named for raised heart-shaped pattern on carapace, legs and pincers covered with prominent hard spines. Carapace up to 10 cm across.

***Lopholithodes mandtii*:** Juveniles start as brightly orange coloured but become more dull red and purple as adults. Carapace is up to 30cm across. They are like small, underwater tanks.

***Pagurus armatus*:** Chelae are unequal in size, the right claw is larger. Colour is usually orange with white bands. Legs and claws have spines. Carapace length is about 2cm.

***Pagurus hemphilli***: Have reddish antennae and dark red legs. It has a white spot on the tip of the claw of each walking leg. Legs and claws are hairless. Also has a triangular projection at the anterior end of the carapace. Carapace can reach a length of 1.5cm.

***Pagurus granosimanus***: Dark olive green colour with numerous light tiny granules covering the appendages, has orange antennae, almost hairless and antennae do not have white spots as in *P. hirsutiusculus* (below). Body/shell is about 2 cm in length.

***Pagurus beringanus***: The claw of the 2<sup>nd</sup> and 3<sup>rd</sup> leg is distinctive: they have two orange bands separated by a white band. Younger individuals do not show this but can be recognized by an orange band at the joint below the claw. They have iridescent green eyes at all ages. Large specimens are 4cm long.

***Pagurus hirsutiusculus***: Generally hairy, have white spots on the antennae and a white or pale blue band around the base of the next-to-last article of the 2<sup>nd</sup> and 3<sup>rd</sup> legs. They are abundant in tide pools, between and under rocks, and under masses of seaweed. They often occupy shells that are a little too small and cannot withdraw their heads completely.

***Pagurus caurinus***: Their pincers are tipped with orange and they have unbanded orange antennae. There is white banding on the legs. Body/shell length is about 1 cm.

***Pagurus samuelis***: They have bright blue bands on olive-coloured legs, red antennae with no bands and a white striped carapace. 2cm in body/shell length.

***Pagurus dalli***: It has white or light markings on its 'knees' and is usually tan-coloured. 1.8cm body/shell length.

***Pagurus ulreyi***: They have short stout antennae with a definite fringe of long hairs used for filter feeding. Pincers and the recurved ends of the walking legs are black tipped. They are orange in colour and very hairy. 2.2cm body/shell length

***Discorsopagurus schmitti***: These hermits have straight abdomens unlike other hermit species and are suited to use empty tubes. Females live in attached tubes, but the males wander around in broken pieces. These hermits have obvious white banding on their legs. 0.6cm shell/body length.

### **Sites**

Shallow intertidal sites along sandy or rocky shores to deep sandy depths. Intertidal sites are found on the shores of the Deer Group Islands, Dixon I., Scott's Bay, off the Blowhole, along Grappler Inlet and at the Harbor mouth across from Aguilar Pt.

### **Methods**

***Cancer branneri*, *Cancer gracilis*, *Cancer magister*, *Cancer productus*, *Munida quadrispina*, *Lopholithodes mandtii*** can be caught in crab traps on sandy bottoms in deep water.

***Hemigrapsus nudus*, *Hemigrapsus oregonensis*, *Petrolisthes eriomerus*, *Petrolisthes cinctipes*** and most of the hermit crabs can be collected intertidally.

Shore and porcelain crabs can be found under loose rocks and most of the hermit crabs can be found in tidepools and under surf grass.

It is more likely that *P. ulreyi*, *Elassochirus tenuimanus*, *P. armatu* and *Discorsopagurus scmitti* will be collected by dredging or scuba diving than by intertidal collecting.

*Cancer oregonensis*, *Lophopanopeus bellus*, *Mimulus foliates*, *Oregonia gracilis*, *Pugettia gracilis*, *Pugettia producta*, *Pugettia richii*, *Scyra acutijrons*, *Chorillia longipes*, *Cryptolithodes typicus*, *Cryptolithodes sitchensis*, *Phyllolithodes papillosus*, *Lopholithodes mandtii*, *Pagurus ulreyi*, and *Discorsopagurus schmitti* can be collected by scuba diving or dredging.

### **Holding**

Held in continually flowing seawater. Lids are necessary as all crabs are good climbers. Tank should be large enough to give crabs plenty of space to avoid one another and prevent 'squabbles'. Rocks, sediment and seaweed should be put in tanks to provide habitat and minimize stress.

### **Feeding**

All the above-mentioned crabs will feed on chopped frozen fish or mussels. The smaller species, particularly the hermit crabs, porcelain crabs, and shore crabs will feed on fish flakes.

*C. magister*: feeds largely on small clams as well as a variety of other small invertebrates and fishes.

*Hemigrapsus nudus* & *H. oregonensis*: will also feed on algae such as *Ulva*.

*Pagurus sp.* Will also feed on detritus but may also scavenge on dead plant and animal material.

*Pugettia sp.* Will also feed on brown algae and eelgrass.

### **Tank Cleaning**

Once every two weeks the crabs should be removed from the tank and placed into a holding bucket. The tanks should be drained and the sides and bottom should be scrubbed and rinsed with warm freshwater. The tanks should then be rinsed with cold seawater and allowed to refill, and the crabs replaced.

### **Animal Return**

Return animals to the site of their collection.

### **DAILY ACTIVITIES**

1. Ensure water is flowing into the tank at a reasonable rate.
2. Ensure the standpipe is in place and not blocked.
3. Check for and remove and dead animals.
4. Check for and remove any uneaten prey organisms.
5. Check for and remove and foreign organisms.

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