

**GASTROPOD CARE**  
**SOP# = Moll3**

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

**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.

**IDENTIFICATION:**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Identifying Characteristics</b>
<b>Blue topsnail</b>	Calliostoma ligatum	<ul style="list-style-type: none"> <li>- Whorls are sculptured spirally with alternating light ridges and pinkish-brown furrows</li> <li>- Height reaches a little more than 2cm and is a bit greater than the width</li> <li>- There is no opening in the base of the shell near its center (umbilicus)</li> </ul> 
<b>Purple-ringed topsnail</b>	<i>Calliostoma annulatum</i>	<ul style="list-style-type: none"> <li>- Alternating whorls of orange and fluorescent purple make for spectacular colouration</li> <li>- The apex is sharply pointed</li> <li>- The foot is bright orange</li> <li>- They are often found amongst hydroids which are one of their food sources</li> <li>- These snails are up to 4cm across</li> </ul> 

<p><b>Leafy hornmouth</b></p>	<p><i>Ceratostoma foliatum</i></p>	<ul style="list-style-type: none"><li>- Spiral ridges on shell</li><li>- Three lengthwise frills</li><li>- Frills vary, but are generally discontinuous and look unfinished</li><li>- They reach a length of about 8cm</li></ul> 
<p><b>Rough keyhole limpet</b></p>	<p><i>Diodora aspera</i></p>	<ul style="list-style-type: none"><li>- Likely to be found in the intertidal region</li><li>- Have a single apical aperture to allow water to exit</li><li>- Reach a length of about 5 cm</li></ul> 

<b>Limpet</b>	<i>Lottia sp</i>	<ul style="list-style-type: none"><li>- This genus covers quite a few species of limpets, at least 4 of them are commonly found near BMSC</li><li>- Different <i>Lottia</i> species vary greatly in appearance</li><li>- See Eugene N. Kozloff's book, "Seashore Life of the Northern Pacific Coast" for in depth descriptions of individual species</li></ul>  A photograph showing three Lottia limpets attached to a dark, textured rock surface. The limpets have a yellowish, scalloped edge and a darker, mottled center.
<b>Limpet</b>	<i>Tectura sp.</i>	<ul style="list-style-type: none"><li>- This genus covers quite a few species of limpets, at least 6 of them are commonly found near BMSC</li><li>- Different <i>Tectura</i> species vary greatly in appearance</li><li>- See Eugene N. Kozloff's book, "Seashore Life of the Northern Pacific Coast" for in depth descriptions of individual species</li></ul>  A photograph showing two Tectura limpets attached to a light-colored, textured rock surface. The limpets have a rounded, dome-like shape with a mottled, greyish-brown coloration.

<p><b>Whitecap Limpet</b></p>	<p><i>Acmaea mitra</i></p>	<ul style="list-style-type: none"> <li>- These limpets are often coated with species of encrusting coralline algae and covered with many small bumps</li> <li>- When they are not coated with algae the shell is very white and conically symmetrical</li> <li>- They can be up to 5cm across.</li> </ul> 
<p><b>Hairy triton</b></p>	<p><i>Fusitriton oregonensis</i></p>	<ul style="list-style-type: none"> <li>- These are the largest shelled gastropods found in this region other than the abalone</li> <li>- The shell has distinct rounded whorls with spiral ridges as well as axial ribs</li> <li>- Is conspicuously hairy</li> <li>- They are more abundant subtidally than intertidally</li> <li>- Large specimens are about 10cm long</li> </ul> 

<p><b>Northern abalone</b></p>	<p><i>Haliotis kamtschatkana</i></p>	<ul style="list-style-type: none"> <li>- Abalone are sometimes found intertidally but more abundant in the domain of scuba divers</li> <li>- Shell reaches a length of about 12cm</li> <li>- Much of the shell surface is wavy</li> <li>- Has a series of holes through which water exits</li> <li>- Due to their threatened status, there will be no collecting of the northern abalone</li> </ul> 
<p><b>Red turban snail</b></p>	<p><i>Astraea gibberosa</i></p>	<ul style="list-style-type: none"> <li>- The low spiral shell is usually red-brown</li> <li>- The oval shaped, calcareous operculum has a shallow groove and is smooth</li> <li>- Shell diameter is about 0.5 cm</li> </ul> 

<p><b>Checkered periwinkle</b></p>	<p><i>Littorina scutulata</i></p>	<ul style="list-style-type: none"> <li>- Its shell is more slender than that of <i>L. sitkana</i> (below).</li> <li>- It does not have any significant spiral sculpturing</li> <li>- Color is brown to bluish black, usually mixed with some white in a checkerboard pattern</li> <li>- These rarely exceed a height of about 1cm</li> </ul> 
<p><b>Sitka periwinkle</b></p>	<p><i>Littorina sitkana</i></p>	<ul style="list-style-type: none"> <li>- Commonly has a fat, globose shell</li> <li>- Reaches a height of a little more than 1.5cm</li> <li>- Generally has strong spiral sculpturing in the form of continuous ridges and furrows</li> <li>- Colour varies from monotonous brown or gray to lighter bands on the upper sides of the whorls</li> <li>- Lighter areas may be a pretty orange or yellow</li> <li>- Commonly found on the upper reaches of rocky shores and also found on rocks scattered near the high tide marks and sometimes abundant in salt marshes</li> </ul> 

<p><b>Channeled dog whelk</b></p>	<p><i>Nucella canaliculata</i></p>	<ul style="list-style-type: none"> <li>- Usually pale tan in colour</li> <li>- Have deep grooves or channels spiraling around shell</li> <li>- They are up to 4 cm in length</li> </ul> 
<p><b>Wrinkled dogwhelk</b></p>	<p><i>Nucella lamellosa</i></p>	<ul style="list-style-type: none"> <li>- Specimens found in protected areas usually have attractive axial frills, while those from exposed areas tend to be nearly smooth</li> <li>- Extremely variable shell colour which is almost uniform, ranging from white to pale brown, gray, and occasionally bright orange</li> <li>- Shell length up to 12.5cm</li> </ul> 

<b>Northern striped dogwhelk</b>	<i>Nucella ostrina</i>	<ul style="list-style-type: none"><li>- These snails have strongly developed spiral ribs</li><li>- Heavier ribs alternate with more delicate ones</li><li>- Extremely variable shell colour: ribs are usually white and the furrows are yellow, orange, brown, gray or almost black</li><li>- Reach 2.5cm in length</li></ul> 
<b>Carpenter's rocksnail</b>	<i>Ocenebra interfossa</i>	<ul style="list-style-type: none"><li>- Have sharper axial ribs than <i>O. lurida</i> (below)</li><li>- The spire is tall relative to body whorl.</li></ul> 

<p><b>Lurid rocksnail</b></p>	<p><i>Ocenebra lurida</i></p>	<ul style="list-style-type: none"> <li>- Common all along the open coast</li> <li>- They are about 2 cm long</li> <li>- Less slender than <i>Amphissa</i>, with which they could be confused</li> <li>- Their canal is better developed and the aperture is oval</li> <li>- Yellow-brown or orange-brown in color</li> <li>- Axial ribs cross the body whorl</li> </ul> 
<p><b>Moon snail</b></p>	<p><i>Polinices lewisii</i></p>	<ul style="list-style-type: none"> <li>- The most massive intertidal snails found around here</li> <li>- Shells may reach a height of about 12cm and is composed almost entirely of the body whorl</li> <li>- The remaining (about 5) whorls form a low spire</li> <li>- The periostracum (exterior of the shell) is very smooth and generally a soft brownish-gray</li> <li>- The aperture is large and its mantle, when extended, is enormous and covers most of the shell</li> </ul> 

<p><b>Dire whelk</b></p>	<p><i>Lirabuccinum dirum</i></p>	<ul style="list-style-type: none"> <li>- On rocky shores they reach a length of 3cm</li> <li>- They are larger in bays where they live in gravel or mud</li> <li>- The shell is gray but darker in the furrows than on the fine spiral ridges</li> <li>- There are some low axial ribs on the upper whorls, but these are not continued on the body whorl</li> </ul> 
<p><b>Black turban snail</b></p>	<p><i>Tegula funebris</i></p>	<ul style="list-style-type: none"> <li>- The most conspicuous snails of the intertidal, found along the open coast</li> <li>- The shell is nearly black when wet, purplish black when dry</li> <li>- In most large specimens the periostracum (exterior of the shell) that covers the shell is seriously eroded, especially near the apex, so that the pearly calcareous material shows through</li> <li>- Diameter reaches 2.5cm and the height is sometimes a little greater</li> </ul> 

<p><b>Dusky turban</b></p>	<p><i>Tegula pulligo</i></p>	<ul style="list-style-type: none"> <li>- These are found along exposed shores sheltering amongst rocks</li> <li>- Mottled dusty pink and dull red in colour</li> <li>- 'Taller' than <i>T. funebrails</i>, up to 4.3 cm</li> </ul> 
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**CAPTURE:**

<p><b>Location</b></p>	<p>- Intertidal and subtidal sites are found on the shores of the Deer Group Islands, Dixon L, Scott's Bay, off the Blowhole, along Grappler Inlet and at the Harbor mouth across from Aguilar Pt.</p>
<p><b>Methods</b></p>	<p>Snails are simply picked up by hand off the intertidal or subtidal habitats. Of the above listed species ones found only intertidally are <b><i>Tectura sp.</i></b>, <b><i>Lottia sp.</i></b>, <b><i>Nucella osterina</i></b>, <b><i>Nucella canaliculata</i></b>, <b><i>Littorina sitkana</i></b>, <b><i>Littorina scutulata</i></b>. All others can be found in the intertidal or at least shallow subtidal to a deeper subtidal. Although found intertidally, the following species are more likely to be found subtidally: <b><i>Calliostoma ligatum</i></b>, <b><i>Calliostoma annulatum</i></b>, <b><i>Diodora aspera</i></b>, <b><i>Fusitriton oregonensis</i></b>, <b><i>Haliotis kamtschatkana</i></b>, <b><i>Astraea gibberosa</i></b>, <b><i>Polinices lewisii</i></b></p>

## ANIMAL CARE:

<b>Holding Requirements</b>	<ul style="list-style-type: none"> <li>- Snails should not be held in open sea tables due to the snail's ability to crawl out</li> <li>- Should be held in a lidded container</li> <li>- Continually flowing, cold seawater</li> </ul>
<b>Feeding</b>	<p><b><i>Calliostoma ligatum</i></b>: Feed partly on plant material, partly on low-growing sessile animals such a hydroids.</p> <p><b><i>Ceratostoma foliatum</i></b>: Feed on <i>Semibalanus cariosus</i> or <i>Balanus glandula</i> and various bivalve molluscs. They drill a hole in any shell with their proboscis to get at the soft tissue.</p> <p><b><i>Diodora aspera</i></b>: Feed mostly on encrusting sponges, but also on diatom films</p> <p><b><i>Fusitriton oregonensis</i></b>: Feed on ascidians and sea urchins</p> <p><b><i>Haliotis kamtschatkana</i></b>: Abalone are herbivores and scrape plant material from rocks. <i>Macrosystis</i> and in particular <i>Nereocystis</i> are preferred foods.</p> <p><b><i>Nucella sp.</i></b>: All <i>Nucella</i> species are carnivores and feed mostly on intertidal barnacles.</p> <p><b><i>Polinices lewisii</i></b>: Moon snails are carnivores, feeding on clams by drilling a hole through the shell.</p> <p><b><i>Lirabuccinum dirum</i></b>: These scavengers feed on periwinkles, barnacles, worms and other animals.</p> <p><b><i>Tegula funebris</i></b>: Feed on algal coatings.</p>
<b>Tank Cleaning</b>	<ul style="list-style-type: none"> <li>- Once a week the snails should be removed from the tank and placed into a holding bucket</li> <li>- The tanks should be drained and the sides and bottom should be scrubbed and rinsed with warm freshwater.</li> <li>- The tanks should then be rinsed with cold seawater and allowed to refill, and the snails replaced.</li> </ul>
<b>Daily Activities</b>	<ul style="list-style-type: none"> <li>-Ensure water is flowing into the tank at a reasonable rate.</li> <li>-Ensure the standpipe is in place and not blocked.</li> <li>-Check for and remove dead animals.</li> <li>-Check for and remove any uneaten prey organisms.</li> <li>-Check for and remove foreign organisms.</li> </ul>
<b>Animal Return</b>	Animals should be returned to the site of their collection