


BIVALVE MOLLUSC CARE
SOP# = Moll1



PURPOSE: To describe methods of care of bivalve molluscs.



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:



Common Name	Scientific Name	Identifying Characteristics
Swimming scallop	<i>Chlamys hastata</i>	<ul style="list-style-type: none">- Shell is about 6cm high- Ribs radiate across the shell and are roughened by small, arched spines- Shell margins are also rough- Lies with its right valve against the substrate- Green eyes are iridescent and almost luminous around the edge of the mantle on both valves.- Left valve Often colonized by sponges that form a thick coating 



<p>Heart cockle</p>	<p><i>Clinocardium nuttattii</i></p>	<ul style="list-style-type: none"> - Found in fine, muddy sand and in beds of eelgrass on mud - Shell reaches a length of about 10cm - Valves are vaguely triangular with rounded corners - About 35 strong ribs radiate from the umbo (the protuberance of the valve that rises above the line of articulation) - Young specimens are colored a warm brown with some mottling while older ones tend to be a monotonous darker brown 
<p>Giant Pacific oyster</p>	<p><i>Crassostrea gigas</i></p>	<ul style="list-style-type: none"> - Large specimens can exceed 25cm in length - The left valve is much deeper than the nearly flat right valve, and is partly or almost completely cemented into the substrate - Tends to settle on species of its own kind creating a pile of oysters - Shells are often grotesquely twisted and deformed - No two specimens are alike 



<p>Nesting clam</p>	<p><i>Hiatella arctica</i></p>	<ul style="list-style-type: none"> - Siphon tips are crimson in color - Shell length reaches about 3cm 
<p>Rock scallop</p>	<p><i>Hinnites giganteus</i> (aka <i>Crassedoma giganteum</i>)</p>	<ul style="list-style-type: none"> - Found firmly attached to rocks by the right valve of its heavy shell - The left valve is generally somewhat irregular and may be grotesquely misshapen - It is coarsely ribbed and ribs have small spines on them - Both valves are white internally with a large blotch of rich purple close to the hinge - The outside of the free valve is brownish but can become colonized by sponges, giving it varying colors. - The shell is also often eaten away by the boring sponge, giving it a honeycomb look - The diameter of large specimens can exceed 15cm 


<p>Pointed macoma</p>	<p><i>Macoma inquinata</i></p>	<ul style="list-style-type: none"> - About the same size and appearance as <i>M. nasuta</i> (below) - Its valves are not bent and the shell is slightly more inflated - Siphons are barely yellowish 
<p>Bent nose macoma</p>	<p><i>Macoma nasuta</i></p>	<ul style="list-style-type: none"> - Maximum length of about 5cm - Valves are bent sharply to the right near the posterior end - Generally lies 10 or 15 cm below the surface of muddy sand, with its left valve down - Siphons are orange - The periostracum (the exterior of the shell) is a dirty brown but the rest of the valves are white 

<p>California mussel</p>	<p><i>Mytilus californianus</i></p>	<ul style="list-style-type: none"> - Found in areas of rough wave action - Can reach 20cm in length but usually are 15cm long - Tightly attached to rock by the byssus - Tend to aggregate in large numbers - Typically have several strong ribs - Usually associated with the goose barnacle - Older specimens tend to be brownish in colour 
<p>Bay mussel</p>	<p><i>Mytilus trossulus</i></p>	<ul style="list-style-type: none"> -Reaches a length of 7cm -Similar to M californianus, but not as large - Older specimens tend to be black and dark blue in colour 

<p>Jingle shell</p>	<p><i>Pododesmus cepio</i></p>	<ul style="list-style-type: none"> - Tightly attached to the substrate by a byssus that emerges through a hole in one of the valves - The valves are nearly circular, sometimes 10cm in diameter - Flat shells will deform to follow the contour of the substrate, bending to 90 degrees if necessary - Valves are unequal in size, the one attached to the substrate being smaller - The flesh of the animal is bright orange 
<p>Littleneck clam</p>	<p><i>Protothaca staminea</i></p>	<ul style="list-style-type: none"> - Found in protected habitats where the substrate is gravel mixed with sand or mud - Shell reaches a length of about 6cm - Valves are sculptured with both radiating and concentric ridges - Younger specimens may have brown markings on white shell, but older ones are uniformly pale brown and may have a pinkish tone - Valves are sculptured like a file just inside the ventral margins - Siphons are fused together and extremely short 

<p>Manilla clam</p>	<p><i>Venerupis philippinarum</i></p>	<ul style="list-style-type: none"> - Up to 7.5 cm in diameter - Shells more elongate than littleneck clam 
<p>Butter clam</p>	<p><i>Saxidomus giganteus</i></p>	<ul style="list-style-type: none"> - Thick shelled, about 10cm or longer - Basically whitish, though it may have blackish discolorations due to iron sulfide -The surface of the valves are marked by raised concentric growth lines and grooves - The hinge is very thick - May be buried up to 30cm deep, but is often found close to the surface 

<p>Horse clam</p>	<p><i>Tresus capax</i></p>	<ul style="list-style-type: none"> - The largest bivalve found in the area, valves can attain a length of 20cm - These clams may be buried up to 50cm depth, but are usually less than 30cm below the surface - The periostracum (exterior of the shell) is a dull brown color and the rest of the shell is chalky white unless blackened by sulfides - The tip of the siphon is covered by two small, leathery plates - Almost always has soft-bodied crabs in its mantle cavity 
<p>Softshell clam</p>	<p><i>Mya arenaria</i></p>	<ul style="list-style-type: none"> - Up to 17 cm in diameter - The chondrophore (a spoon-shaped structure) is the obvious protrusion at the hinge of the clam 

Varnish clam	<i>Nuttaillia obscurata</i>	<ul style="list-style-type: none"> - It has a solid purple tinge with a brown periostracum - Shell is flat 
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CAPTURE:

Location	<i>Crassostrea gigas</i>	Can be found on shell or pebble beaches intertidally
	<i>Clinocardium nuttattii</i> , <i>Macoma inquinata</i> , <i>Macoma nasuta</i> , <i>Protothaca staminea</i> , <i>Venerupis philippinarum</i> , <i>Saxidomus giganteus</i> , <i>Tresus capax</i> , <i>Mya arenaria</i> , and <i>Nuttaillia obscurata</i>	Found in mud and/or sand, shell intertidal areas.
	<i>Mytilus californianus</i> and <i>Mytilus trossulus</i>	Commonly found on rocky intertidal sites. <i>M. trossulus</i> can be found on protected or exposed rocky sites whereas <i>Mytilus californianus</i> is generally found on exposed or semi-exposed sites. Both are attached to substrate by byssal threads.
	<i>Chlamys hastata</i> , <i>Hinnites giganteus</i>	Must be collected subtidally from rocky substrates by scuba diving or dredging.
	<i>Pododesmus cepio</i>	Can be collected by collecting the rock it is attached to by diving or dredging. Occasionally found very low in the intertidal.

Methods	<i>Clinocardium nuttattii</i> , <i>Macoma inquinata</i> , <i>Macoma nasuta</i> , <i>Protothaca staminea</i> , <i>Venerupis philippinarum</i> , <i>Saxidomus giganteus</i> , <i>Tresus capax</i> , <i>Mya</i> <i>arenaria</i> , and <i>Nuttallia</i> <i>obscurata</i>	Must be dug out of the substrate using shovels.
	<i>Mytilus californianus</i> , <i>Mytilus trossulus</i> and <i>Chlamys hastata</i>	Can be pulled off rocks by hand or use scissors/knife to cut the byssal threads attaching it to the rock.
	<i>Crassostrea gigas</i> , <i>Hinnites giganteus</i> , <i>Pododesmus cepio</i>	Must be collected with the rock that they are attached to.

ANIMAL CARE:

Holding	<ul style="list-style-type: none"> - All bivalves should be held in continually strong flowing seawater - Lids are unnecessary
Feeding	<ul style="list-style-type: none"> - Almost all bivalves are filter feeders, actively processing water for microscopic food - They need supplemental feedings of plankton if held for periods longer than 3 weeks as the amount of plankton in the seawater system is not adequate to sustain them for long periods
Tank Cleaning	<ul style="list-style-type: none"> - Once a week the bivalves 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 bivalves replaced
Daily Activities	<ul style="list-style-type: none"> -Ensure water is flowing into the tank at a reasonable rate. -Ensure the standpipe is in place and not blocked. -Check for and remove dead animals. -Check for and remove any uneaten prey organisms. -Check for and remove foreign organisms.
Animal Return	Animals should always be returned to site of collection

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