



VALDES ISLAND CONSERVANCY NEWSLETTER

President's Message Marja de Jong Westman, Biologist



I write this message to you, the members of our island community and Conservancy, embraced in smoke from a forest on fire miles away. It is a difficult reminder of the struggles nature faces as the engines of climate change roar on.

Leey'qsun (Valdes) Island, for all of us, is a family gathering place and one, for many, that has been so across four generations. It is as well a refuge from whatever we each find complicated in the urban landscape! We are so not like many other recreational communities in the Gulf Island as we are willing to risk life and limb to get to the island, haul in supplies to live off the grid for several weeks at a time, when there collect rainwater, live by candle and kerosene light, walk for miles through tangled forests to visit with neighbours, all the while gratefully acknowledging that we are on Lyackson's homeland and that our time in this place pales in comparison to the deep history of the Lyackson Mustimuhw (people).

The Conservancy continues to work toward all these complicated aspects of our lives on the island. Our binoculars

are especially trained on the fact that Valdes Island is a refuge for some of British Columbia's and Canada's ecosystems and species of special concern and at risk. The coastal Douglas-fir zone, with its assemblage of ecological communities, is found nowhere else in Canada. Many species of these communities are thriving on Leey'qsun (Valdes) Island away from the pressures they face on the more inhabited islands in the Strait of Georgia Lowlands natural region.

<https://www.cdfcp.ca/about-the-cdfcp/>.

Once again this year's BioBlitz attempted to capture a snapshot of these special ecological communities and bring the human communities of the island together. Over 50 souls - Conservancy members, Lyackson community members, biologists - came together to support and share in the joy of knowledge gathering.

And, what a bonus to have "Valdes Days" back. A long-awaited post-covid reboot of this historical community event was hosted this year in Starvation Bay - a place where no one ever starves and a place where over 80 islanders reconnected and had such a lot of fun! Passing the baton now to Noel Bay for the next time.

It is easy to be grateful for so many things, isn't it, when you are on the island?

Thank you for your continued support of the work of the Conservancy. You are represented by a very thoughtful and diverse group of islanders. I am grateful for the energy and commitment of the Conservancy board.

Marja



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Mission Statement

To conserve and protect the existing biological and cultural communities of Valdes Island and its environs.

Vision Statement

That Valdes Island be recognized for its globally-significant and locally-rare biological diversity.

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Fishes of the Intertidal

Andy Lamb

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Given their needs for a watery environment, a surprisingly large number of fish species can be found during low tides along the Valdes (Leey'qsun) Island shoreline. Curious children are often the keenest to find them during their poking about under rocks and seaweeds and net-swirling in tidepools. Both common and rare species may be found.

The array of finned intertidal denizens is limited to those that can live in this environment. Intertidal fishes must be able to survive potential exposure to air as well more extreme temperature, salinity and surface changes and conditions than their subtidal kin. Many adaptations have been selected for to make this happen.

“Look at the eels!!” are shrieks commonly heard from young beach combers! Having found them, the excited youngsters try to grab slippery little fish as they attempt to escape and wriggle away.

These are NOT eels. There are no true eels (Family Anguillidae) on the west coast of North America nor of course, along the Island's shore but there are numerous eel-shaped species of fishes along the Pacific coastline. The objects of previously mentioned youthful attention are either pricklebacks (Family Stichaeidae) or gunnels (Family Pholidae).

A fundamental difference between true eels and the other eel-shaped fish (including the “little wrigglers”) is fin support structure. For true eels, every fin is supported by soft, flexible and segmented rays. Prickleback and gunnel species all have dorsal (along back) and anal (along the underside) fins that are supported by hard, solid and uniform spines. The “spininess” is easily noticeable via touch – hence the name prickleback.



High cockscomb *Anoplarchus purpureus*

Photo: Doug Swanston

The most common intertidal prickleback is the high cockscomb *Anoplarchus purpureus*. Virtually every rock easily accessed has many of these small (to 20 cm), variably coloured fish. Notice the name-giving crest between the eyes. These fish can breathe air and if kept moist, may survive extended periods out of water. Light is a key cue when navigating to and from home shelter.

Three different gunnels usually huddle under intertidal seaweed. These are difficult to distinguish from one another, particularly when they are trying mightily to escape. The largest at up to 40 cm, is the penpoint gunnel *Apodichthys flavidus*.



Penpoint gunnel *Apodichthys flavidus* Photo: Jim Hester

It comes in three colours – golden brown, emerald green and wine red, beautifully camouflaged with the three shades of available algal cover. Also, the most easily recognized of the three, the penpoint usually has no body markings and a simple, distinctive black line through each eye.

The other two, the saddleback gunnel *Pholis ornata* and the crescent gunnel *Pholis laeta* are smaller at maximums of about 25 cm.



Saddleback gunnel *Pholis ornata* Photo: M.Chamberlain



Crescent gunnel *Pholis laeta*

Photo: Jim Auzins

While these excellent images show the differences in the markings (saddles vs crescents) along the upper sides, this duo is often more difficult to identify.

A large group of fishes with intertidal representatives is the sculpin family. Members of this family (Cottidae) are ambush predators which employ large heads, mouths and fan-like pectoral fins for advantage while lurking to surprise unsuspecting prey which can include crabs, other fish and worms of various sizes.

The most often encountered intertidal cottid is the 9 cm tidepool sculpin *Oligocottus maculosus*.



Tidepool sculpin *Oligocottus maculosus*

Photo: Scott Stevenson

It populates tidepools but will also hide amid seaweed and under rocks. Studies demonstrate, if displaced, it can relocate to its "home" tidepool via chemical recognition.

As a juvenile, the buffalo sculpin *Enophrys bison* usually spends its first few months in the intertidal zone.



Buffalo sculpin *Enophrys bison* Photo: M Chamberlain

Two other "look-a-likes," the padded sculpin *Artedius fenestralis* and the smoothhead sculpin *Artedius lateralis* may be found seeking intertidal shelter.



Padded sculpin *Artedius fenestralis* Photo: iNaturalist



Smoothhead sculpin *Artedius lateralis* Photo: L Taylor

In most sculpin species, a male establishes a nest site and then guards/tends the developing eggs. Yep, eggs grow up under the paternal care of the male parent! An especially attractive "dandy" may have more than one female visitor as evidenced by clutches of different coloured eggs. A female can lay many tens of thousands of eggs and care of these will last over a month. While a guarding male sculpin is not always found, beach combers who turn over rocks may locate colourful evidence of his presence.



This photo collage features an amazing palate of such discoveries. Of course, the exact species identity isn't possible without a male fish to examine.

Photos: Left; Bert Bartleson, Top right; J. Hester Bottom right; Jackie Hilderling.

Occasionally, while strolling along a sand or gravel beach, one might encounter a small, elongate silvery fish on the surface of the substrate. Exposing itself in

Fishes of the Intertidal Continued...

this way is the Pacific sand lance *Ammodytes hexapterus* (grow up to 28 cm). Their body shape allows for burrowing, but it also allows them to be easily swallowed. Its simple form and lifestyle underscore its significant ecological role. It is a very important species of forage fish meaning that many species rely on it as a key source of food.



Pacific sand lance *Ammodytes hexapterus*
Photos: Top; Marc Chamberlain. Bottom; Rick Harbo

The sand lance feeds on minute zooplankton and then is fed upon by a variety of predators which include 9 species of marine mammals including humpback whales, squid, and 16 species of fish!
<https://www.usgs.gov/programs/cmhrp/news/quintessential-forage-fish-understanding-crucial-role-sand-lance>.

Many species of fish which live subtidally are encountered by beach combers only at very low tides and often at the receding water's edge. One of these found around the Island is the blackeye goby *Rhinogobiops nicholsi*. At up to 15 cm, this diminutive fish has two dorsal fins but not always black eyes. Like all gobies, this species has a cone-shaped pelvic fin (fusion of the pair that most other fishes have) and uses it to prop itself up for an optimal view of its surroundings—like a small aircraft. And aren't the lives

of fish forever interesting, in this species males set up harems!



Blackeye goby *Rhinogobiops nicholsi*
Photo: Marc Chamberlain

During previous BioBlitz studies at Blackberry Point, males of the plainfin midshipman *Porichthys notatus* were found guarding their under-rock nest sites. Members of the toadfish family, these fish can have over 700 photophores which provide luminescence during courtship.



Plainfin midshipman *Porichthys notatus*
Photo: Linda Schroeder

Individuals of all the fish species included in this article can exhibit variations in colours and patterns so it is best to try to examine specific anatomical features to make a correct identification. At the risk of shameless promotion, I suggest consulting Coastal Fishes of the Pacific Northwest, edition 2, Harbour Publishing for help with your beachcombing.

Finally, species referred to as “common intertidally” can vary greatly from site to site, season to season and year to year. Many other fish species might be encountered by Valdes Islanders who routinely explore its shorelines. The accompanying photo and caption gallery captures a few other treasures which could be encountered.



An unusual and exciting find. A Pacific spiny lumpsucker *Eumicrotremus orbis* -- full size at 13 cm. Here, it hides in an empty Lewis' moonsnail shell. Photo: Tom Sheldon



A very exciting find! A 120 cm long giant wrymouth *Cryptacanthodes giganteus* languishes in a shallow pebbly tidepool. Photo: A. Olsen



A 30 cm long black prickleback *Xiphister atropurpureus* -- notice the white margined black bands radiating. Photo: Jim Hester



Young of the year white spotted greenlings *Hexagrammos stelleri* are sometimes found amid seaweed during a summer beach walk. Photo: Jim Hester

Several species of very similar and difficult to distinguish snailfish (Liparidae) represent opportunity for serious searching in intertidal habitats. This one is the lobefin snailfish *Liparis greeni* -- easily identified by its large lobe on the dorsal fin.

Photo: Larry Taylor



Normally the northern clingfish *Gobiesox maeandricus* (maximum length of 16 cm) uses its belly suction "cup" to hold onto the undersides of intertidal rocks. This one clings to a kelp frond. Photo: Larry Taylor



The usually gray, green or brown bay pipefish *Syngnathus leptorhynchus* sometimes gets tangled up among intertidal seaweed. This is an unusual red one. Photo: Bruce Kerwin



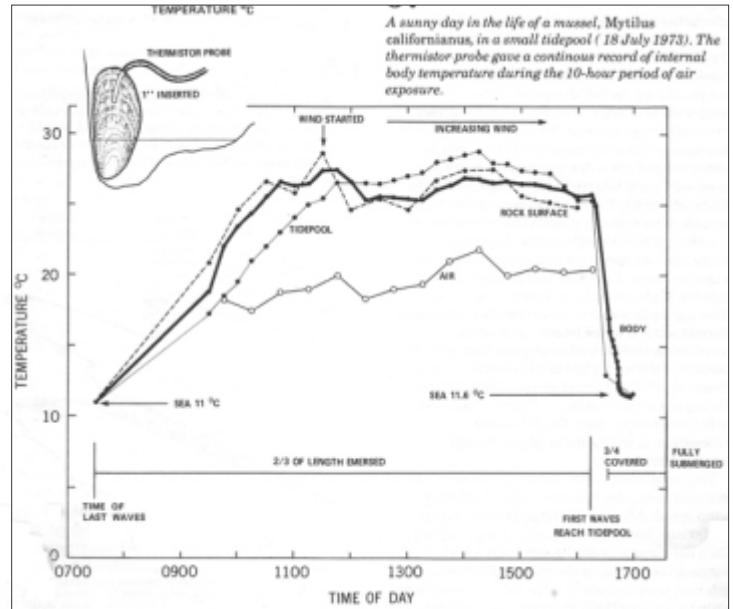
Life on our rocky shores took a tremendous beating in June of 2021. You recall the heat dome which sat still around us for many days. Very unfortunately that still heat coincided with some of the lowest tides of the year and those lowest tides were at high noon. Together these combined to create near impossible conditions for the survival of intertidal organisms.

Life in the intertidal is complicated in the first place. For part of the day, animals at low tide are exposed to air, sunlight, freshwater as rain, aerial and terrestrial predators and then, and so quickly things change. As the tide returns, organisms are thrashed and covered by waves of saltwater, sought after by fish and seastars and exposed to dramatic differences in light and temperature. Intertidal species tend to show remarkable adaptations to these changing daily conditions and are found zonally positioned on the seashore based on their structural and physiological tolerances to such conditions.



Mussels, pink-tipped anemones (the shiny blobs with shell bits attached), barnacles and various limpets at low tide. Photo: Marja de Jong Westman

But despite these built-in physiological tolerances of high temperatures and quick variations, the heat dome of June 2021 proved too much. The combination of 32 degree Celsius temperatures and midday low tides was too extreme for most to survive. Within hours many died. Animals were cooked in their shells. Mussels gaped, normally permanently cemented barnacles could be slid off rocks by a child's gentle touch, tide pools became depositories for the dead. In one tidepool at Detwiller Point, the shell debris came up to my knees. I remember gasping. I remember weeping. It was tragic.

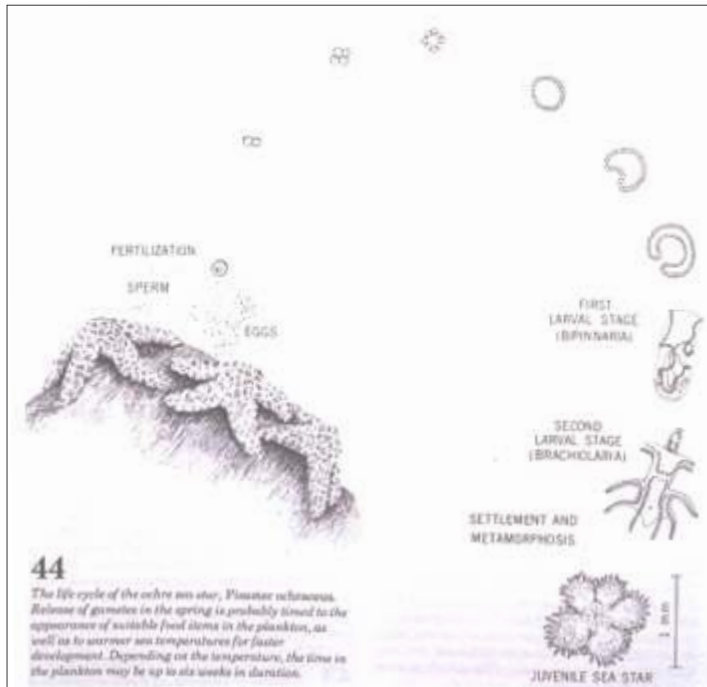


This image illustrates the dramatic daily stresses intertidal species must endure. This mussel started its day exposed to air as the tide retreated. Thermometers set in place captured rock surface, air and tidepool water temperatures. The little beast's internal temperature reached 27.5 degrees C around noon and then around 4:00 pm when the rising seas returned the temperature of the animal dropped 15 degrees in 25 minutes. Credit: Pacific Seashores, Thomas Carefoot, 1977

Biologists then had to wait and did so anxiously to see the response of species recovery. This year, the Conservancy started a 10-year seashore inventory at Blackberry Point to document species diversity and abundance with the backdrop of knowing past richness. This year we noted that many species were once again present but, even when present, were there in low numbers. The species which have returned to once again cover the rocks in the intertidal are a few species of barnacles and mussels. So, a question posed to me during this year's BioBlitz was, "Well, if they all died a couple of years ago, how have they returned?"

It is all about sex... sexual reproduction that is! Many invertebrate animals simply broadcast their eggs and sperm into the water column and leave fertilization to luck and chance. Some like the hermaphroditic barnacles fertilize their neighbour and then release mobile larvae. Sea urchins of all species, as separate males and females, release their gametes synchronously and cued to chemicals given off by blooms of phytoplankton

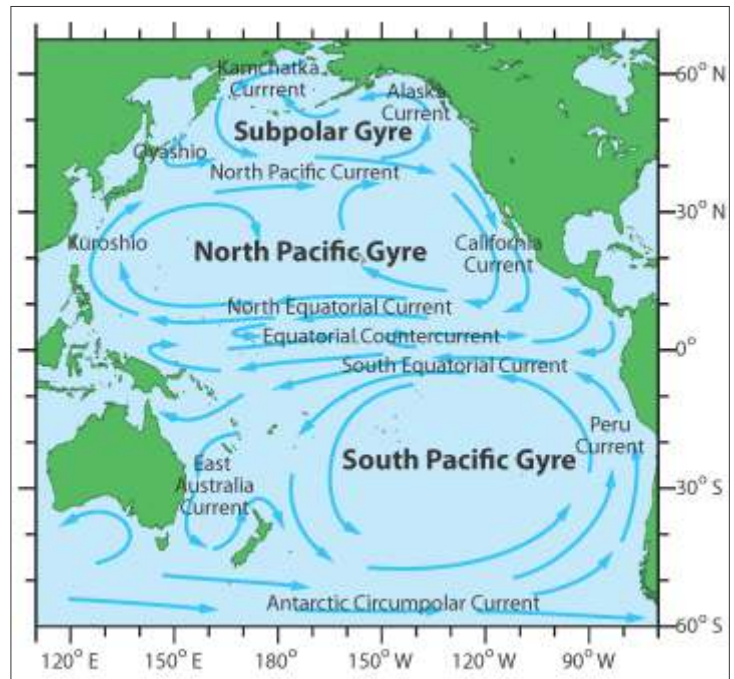
which serve as food for their larvae. Segmented sand worms undergo body renovations and emerge from the muck to see body units stuffed with gametes released and burst open at the ocean's surface on moonlit nights.



Credit: Pacific Seashores, Thomas Carefoot, 1977

The key point with these quirky solutions to reproduction is that the water column serves as a marine highway. Released gametes and larvae float with coastal currents. In this way, many of our marine species are distributed over long ranges. Fortunately, there were invertebrates surviving in areas away from our heat dome death zone, and their gametes and/or larvae found their way to our shores, settled and are supporting species recovery after the heat dome.

In our most recent study on Valdes Island, we noted that the mussels were all young and of the same year class – likely settling out from the water column last year, in 2022. Barnacles appeared to have settled out last year and again this year. So these ubiquitous species are back. But many others are not – the usual plethora of under rock sea cucumbers, chitons, limpets, egg-laying fish called midshipman, barnacle-eating nudibranchs and the rock-boring clam, the rough piddock, were not noted in their usual numbers.



The currents noted in the diagram help explain the widespread distribution of many invertebrate animal species which broadcast either their gametes or fertilized eggs into the sea to have them go on a floating adventure of a lifetime. The larvae of a mussel or a barnacle starting its life in Alaska might just end up settling along the coast of BC.
Credit: OceanTracks, EDC, Oceans of Data Institute, 2017

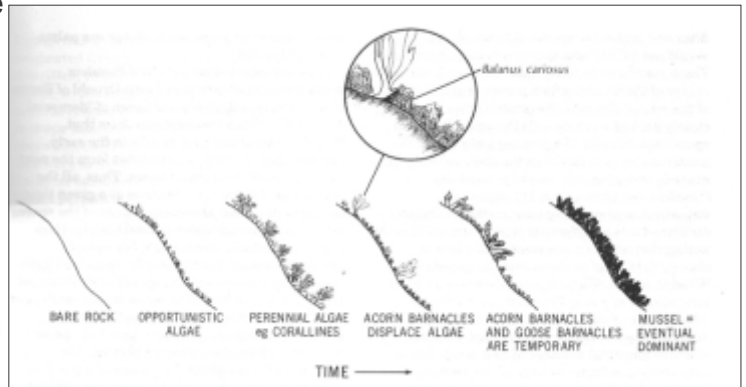
Fortunately, the massive die-off of 2021 must have provided our intertidal keystone species, the common seastar *Pisaster ochraceus*, with a glutinous smorgasbord. This seastar has had its own challenges over the last 10 years trying to survive seastar wasting disease. Although many likely died along with their preferred mussel prey during the heat dome, recent seastar counts indicate many juveniles and young must have survived. The ability to move may have been a factor. This species tends to migrate down the seashore with the outgoing tide and up with the incoming. Yes, some seastars tend to get caught between the tides and seek refuge under rocks and in other damp shading spaces while waiting for the tide to come back in.

Had we lost the common seastar as we did years ago, our intertidal ecosystems may have been further challenged in their recovery from the heat dome. The seastar *Pisaster ochraceus* is a keystone species - one which influences not only which species live in an ecosystem but also the

abundance of each of those species. Think of the wolves in Yellowstone. I know it is hard to compare the grandeur of a wolf to a purple seastar, but they are equal in their influence in an ecosystem.

In year's past, the decline of the purple star due to wasting disease, saw the intertidal becoming a monoculture of mussels with many other species being out competed. The survival of the common seastar through the heat dome and its general recovery is ensuring that its preferential feeding on the highly space-competitive blue mussel, is keeping its numbers in check and creating patches and opportunities for other species to occupy the intertidal. Overall, species diversity is boosted.

We noted some of the expected stages in succession recovery along our shores since the heat dome of 2021 and it will be interesting to continue to observe the pattern that develops over the next few years. Of course, having a team of eager observers will be essential.



This illustration shows the succession of species in a mussel-bed community. In many ways these are the stages our shorelines are undergoing since the summer heat dome of 2021. The massive die off of species left the rocks bare and overtime species are returning. You will note the seaweeds and barnacles tend to return first but once the mussels are in place they become the dominant species.

Credit: Pacific Seashores, Thomas Carefoot, 1977

Natural History Notes: Jumping Spiders & Thrashing Caterpillars

Rob McGregor



Photo: Andrew Simon

Lasiocampidae, *Malacosoma californicum*) (Maddison 1986, Hill 2008). Closer inspection of the tent revealed that all the caterpillars within were engaged in “thrashing” behaviour. This involves performing rhythmic undulations of the body while holding onto the substrate by the abdominal end.

On a walk from Blackberry Point to the east side of the island, I was amazed to see this jumping spider (Araneae: Salticidae, *Eris militaris*) emerge from a Western Tent Caterpillar tent (Lepidoptera:

Thrashing behaviour occurs in many social caterpillar species and can function to deter predation by stinkbugs and spiders (McClure & Despland 2011). The effectiveness of this defensive behaviour is presumably enhanced when all the larvae in a tent thrash at the same time. Clearly, the jumping spider we observed didn't feel welcome in the tent and decided to leave before feeding. So, it looks like this coordinated defensive behaviour works.

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Ground beetles are members of the family Carabidae with approximately 40,000 species globally and over 3,000 species occurring in North America alone (Bland & Jaques 1978). In British Columbia (BC), human-disturbed environments like cities harbor a mixture of native species and species introduced from Europe (McGregor & Wahl 2020). At least 55 introduced ground beetle species occur in Canada, with over 20 of these well established in BC (Klimaszewski et al 2012). The presence of European beetle species can be used to indicate human disturbance of environments. So, when we find only native BC species in a particular location, that indicates an intact environment, relatively unaffected by our presence (McGregor & Wahl 2020).

Scaphinotus angusticollis also known as the narrow-collared snail-eating beetle is a very common native ground beetle in coastal BC forests (Lavallee & Richardson 2010). The narrow head of this beetle allows insertion of the head and mouthparts directly into snail shells for feeding. This beetle also feeds on small arthropods and slugs on the forest floor. We found one *Scaphinotus angusticollis* by flashlight, foraging at night on a forest trail near Starvation Bay. We also captured one specimen in a pitfall trap nearby along with another native BC beetle, *Pterostichus algidus*. With this small survey, there was no sign of introduced European beetles on Valdes Island. So, that is good news, so far, for the integrity of beetle communities on the island.

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Rob McGregor is Faculty Emeritus at Douglas College where he was Executive Director of the Institute of Urban Ecology for 17 years. Rob has broad interests in insect biology including ecology, evolution, conservation and biological control of pest species. His most recent work has focused on the community ecology of ground beetles (Carabidae) in urban forests and the habitat requirements of a threatened tiger beetle species (Omus audouini) in coastal salt marshes.



Narrow-collared snail-eating beetle
Scaphinotus angusticollis

Photo: Henri Goulet, Agriculture & Agri-Food Canada



While walking near Starvation Bay, my dad and I spotted a rough-skinned newt *Taricha granulosa* sitting perfectly still in the middle of the trail. These newts are part of the Salamandridae family, which is made up of more than 60 different species of true salamanders and newts. Rough-skinned newts can be identified by their rough, grainy skin which can range from light brown to dark brown to olive green. They also have a distinct orange or yellow underbelly. Compared to other salamanders, their skin is relatively dry. Rough-skinned newts breed in aquatic habitats such as ponds and streams, but usually spend most of their adult lives in forested areas nearby. We happened to find this newt in the forest near a stream. Some adult rough-skinned newts spend their whole lives in the water, where they can stay active through the winter. Terrestrial newts, however, find shelter underground and hibernate through the coldest months.

Some - but not all - garter snakes have evolved resistance to tetrodotoxin, the neurotoxin that rough-skinned newts produce in their skin glands. Because of this adaptation, only the newts with the highest toxin levels can survive toxin-resistant garter snakes, which means that only the most resistant snakes can survive eating the newts. Garter snakes evolved to be even more toxin-resistant, and rough-skinned newts evolved to be even more toxic. This fascinating cycle of coevolution is one example of the endless, complex connections between species that shape the world around us.



Rough-skinned newt *Taricha granulosa*

Photo: Rob McGregor

Like other species in the Salamandridae family, rough-skinned newts are highly toxic. In fact, they are the most poisonous amphibians found in BC. When threatened, these newts make their bright orange-yellow bellies more visible in order to warn and deter predators. One predator, however, is capable of surviving their poison: the garter snake.



Rough-skinned newt in its defense posture.

Photo: Gary Nafis

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Nia Davis-McGregor is a 2nd year student at Simon Fraser University where she intends to major in Biology with a minor in Indigenous Studies. She is interested in biodiversity and ecology, and hopes to help conserve and restore ecosystems in BC.



As we wandered through the coastal Douglas fir *Pseudotsuga menziesii* forests of Valdes Island, we saw many tall Douglas fir trees, with some cedar *Thuja plicata* trees scattered about as well. However, what stood out most to me were the large number of bigleaf maple trees *Acer macrophyllum*. These trees were not overly tall, however, because the forest is second growth. Bigleaf maples *Acer macrophyllum* are pioneer species, so they will be of the first trees to grow after logging occurs. They tend to seek out gaps, and find unique ways to grow, often having 3-5 stands growing from one stump (*Bigleaf maple - Province of British Columbia. (2019)*). Their roots are shallow, but are extensively wide creating large networks underground. These extensive and shallow roots become paired with mycorrhizal fungi networks that are very important in assisting with communication, and exchange of nutrients in the soil. Also, these mycorrhizal networks play a role in establishing the new understory as the forests regrow after logging occurs.

Where these bigleaf maples *Acer macrophyllum* are present, there are soils with high nutrient concentration, and high cation exchange capacities. As these trees grow they require a large amount of organic nutrients; however, as they shed their leaves, the elements that remain decompose into the soil, assisting the nutrient cycle (*The Ecology and Silviculture of Bigleaf Maple. (1999)*). Even though there is a large need for nutrients, the high nutrient content creates bark rich in calcium which allows calciphytic bryophytes to set up, and grow on the bark (*Bigleaf maple - Province of British Columbia. (2019)*). Having many species of moss, ferns, lichens and more growing on the bark creates a stronger forest that encompasses many more species, and further enhances the cycling of nutrients via leaf litter into the soil. Bigleaf maples *Acer macrophyllum* may be found at the base of Colluvial slopes, though this was not always the case on Valdes Island. This is a strategy employed based off of their pioneer tree status, allowing the exploitation of certain niches that other trees cannot attain. In

part, this is because of their seed dissemination. At 10 years of growth, these trees begin to disseminate, and will produce seeds every year after that. Carried by the wind, seeds can be dispersed up to 100 meters (*Bigleaf maple - Province of British Columbia. (2019)*). This capacity allows them to have a large distribution, and colonize more areas.



Bigleaf maple *Acer macrophyllum*

Photo: David Lisle

As I wandered through the forest on Valdes Island, I saw many of these second growth bigleaf maple trees. I was fascinated to say the least and my interest drove me to find out more about why these trees exist in the Coastal Douglas Fir biogeoclimactic zone. It was cool to see how it could support itself, while also providing a niche for certain mosses, and maybe some ferns to live on them.

Overall, the role that bigleaf maple trees play in their ecosystems should not be overlooked. Their roots associated with mycorrhizal networks play large roles in creating underground networks, and completing the nutrient cycle as the leaf litter decomposes. These trees are also valuable in forest regeneration sites for short, and long-term periods since they improve soil health, and provide areas for certain epiphytes to live and grow (*Bigleaf maple - Province of British Columbia. (2019)*). Bigleaf maples *Acer macrophyllum* are very unresponsive to environmental factors, and are not affected very much by damaging agents such as wind or snow (*Bigleaf maple - Province of British Columbia. (2019)*). This shows how bigleaf maples *Acer macrophyllum* are a tolerant tree species that can help other species grow, while

still growing themselves. As they live in the forest, these trees add to the productivity of the ecosystem, maintaining these forests as some of the world's most biodiverse, and adaptable ecosystems in the world. In an ever-changing world where logging occurs frequently, bigleaf maples *Acer macrophyllum* will be crucial in the rebuilding processes of many forest ecosystems.

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Personal comments re: the BioBlitz

I had the great pleasure of attending the 2023 BioBlitz on the island. Prior, I had not seen a place with the unimaginable amount of undisturbed nature that was home to Leey'qsun (Valdes) Island. Being there had a profound impact upon me; through the tall trees and, luscious plant life, together with many marine and terrestrial vertebrates and invertebrates, my love for nature grew. I want to extend my great appreciation to Marja de Jong Westman for inviting me and my other classmates along on this trip. We all agreed that we would do whatever it takes to come back next year for the 2024 Blitz, just to have another chance to be in a place with such biological integrity. I would like to also thank the Lyackson First Nation for sharing this beautiful island with me and my classmates.

David Lisle is a student at Capilano University working toward the completion of a Bachelor's degree in Environmental Science, with a focus in biology.

2023 Kelp Survey Mark Bonar



The 2023 kelp survey was performed on the morning of August 12th as part of the Mayne Island Conservancy initiative to monitor kelp beds in the Southern Gulf Islands. Islanders, Mark Bonar and Ella Hillbrecht, were in attendance, assisted by "friends of the island" Max Lattimer,

Aaron Lattimer and Madison Markey. The annual survey has been focused on a large kelp bed between Th'áxel / Cardale Point and Porlier Pass. You can find more information on the Kelp Bed Monitoring program at <https://mayneconservancy.ca/bull-kelp-monitoring-program-expands/>

As a foundational species, this algae is critical for establishing and sustaining a unique marine ecosystem.

https://kelpforestalliance.com/?gad=1&gclid=EAlaQobChMI2aTqtOPzgQMVKtLCBB3LeQxJEAAYASAAEgILRvD_BwE



This orange sea cucumber *Cucumaria miniata* was found near Blackberry Point during our annual BioBlitz. While submerged in a tide pool or under a rock, they often take on a U-shape with their feeding tentacles opened and extended to feed on suspended detritus and their anal end turned up to access seawater pumped in the anal opening for respiration! While not really obvious on a first quick look, sea cucumbers are closely related to seastars and sea urchins. All are members of the Phylum Echinodermata (from the Greek ekhinos meaning spiny and derma meaning skin). Some physical evidence of their relationship remains: the dark lines running along the length of the sea cucumber, known as ambulacral grooves, contain rows of tube feet, similar to a sea star's; on close study, one can see these grooves come in a set of five, linking them further to seastars through their iconic pentaradial symmetry. They also have bone-like ossicles embedded in the body wall these are smaller than those found in most seastars and much smaller than the large bony plates of a sea urchin.



Orange sea cucumber *Cucumaria miniata*

Photo: Larry Taylor

This burrowing cucumber, is found across our Pacific coast in low intertidal and subtidal zones from Alaska to Mexico. They typically will not be found much higher on the seashore, as their soft, membranous bodies are susceptible to desiccation. Beside seeking refuge and shade in under rock habitat, they will retract their feeding tentacles and their tube feet as a way to reduce surface area and exposure to air. If bothered by a predator or when handled by curious beachcombers,

they employ a strategy of engaging a special tissue type, called catch collagen, and will be able to convert from limp bag of tissue to a tough solid cucumber. The body wall becomes tight and pressure is applied to water contained within the body cavity. It's also a strategy to become firmly fixed in place and make it impossible for a predator or you to extract the animal out from its under rock habitat.

Despite these helpful strategies, daily changes in the rocky intertidal make life difficult. We were relieved to see a few individuals appeared to have survived the heat dome of June 2021.

Orange sea cucumbers are quite small compared to the giant California sea cucumbers that you might see at the Vancouver Aquarium. They typically only reach sizes of up to 25 cm when their feeding tentacles are extended, with up to an 8 cm diameter, though the specimen pictured is significantly smaller. This small size might seem disadvantageous, but in many ways, it is quite the opposite! They can fit into smaller crevices amongst the rocky beaches to hide from the sun, and being smaller actually helps them retain moisture. It does, however, leave them more at the mercy of predators, such as the leather star *Dermasterias imbricata* and the morning sunstar, *Solaster stimpsoni*



Orange sea cucumber *Cucumaria miniata*

Photo: Larry Taylor

Relevant websites/links:

[https://inverts.wallawalla.edu/Echinodermata/Class%20](https://inverts.wallawalla.edu/Echinodermata/Class%20Holothuroidea/Cucumaria_miniata.html)

[Holothuroidea/Cucumaria_miniata.html](https://www.centralcoastbiodiversity.org/orange-sea-cucumber-bull-cucumaria-miniata.html)

<https://www.centralcoastbiodiversity.org/orange-sea-cucumber-bull-cucumaria-miniata.html>

https://www.inaturalist.org/guide_taxa/650515

<https://www.eopugetsound.org/species/cucumaria-miniata>

Jak is a Biology student at Capilano University. He particularly loves field work and is looking forward to finishing his Bachelor of Science degree soon.



The sunflower star *Pycnopodia helianthoides* is to sea urchins like wolves are to deer, a critical piece of the ecosystem that is the all too familiar story of species at risk that maintain the biodiversity of their environments. A modest invertebrate, reaching about a meter in size, but do not be fooled by their large size and the typical sedentary seastar lifestyle because, with twenty or so arms at their disposal, the sunflower star is one of the fastest seastars in the world.



Sunflower star *Pycnopodia helianthoides*
Photo: Larry Taylor.

Sunflower stars typically hang out in the subtidal zones of the Pacific Northeast, a mighty range that encompasses the northern part of Baja California and Southern Alaska. Even more impressive is their ability to maintain the sea urchins that love to eat kelp forests. In this relationship, sunflower stars are crucial to the biodiversity of the marine environment.

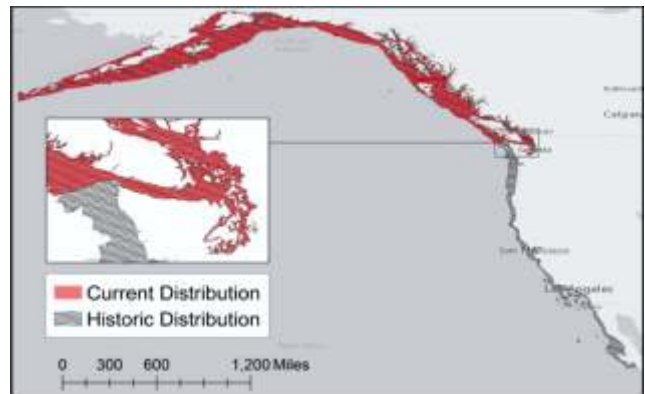
However, in recent years the species has been hit hard by the emergence of a seastar wasting disease which has obliterated seastar populations, and the sunflower stars are no exception. Some sunflower star populations are estimated to be reduced by about ninety percent in some parts of their habitat, particularly the warmer waters of the Californian Pacific Coast. Seastar wasting disease is more widespread in these warmer waters, and with the warming of the waters due to climate change, seastar wasting disease threatens even the most Northern end of the sunflower star's habitat.

In response to the drastic reduction in population, the National Oceanic and Atmospheric Administration (NOAA) of the United States of

America has recently proposed that sunflower stars be classified as threatened under the Endangered Species Act. Despite the dire situation the sunflower star faces, Andy Lamb located a juvenile on his dive for the Blitz this year.

Finding this juvenile, implies that gametes are being released and juveniles are surviving to reproductive maturity. This was a special moment for me, as I plan to further my education in oceanic science. Questions remain about the future of the sunflower star: the conservation status of the animal, the ecological implications of the reduction of the species, and how seastar wasting disease will resolve. In any case, the most effective measure the average person can take is to advocate for the conservation status to change through civil participation and discussion with all levels of government.

<https://www.fisheries.noaa.gov/species/sunflower-sea-star#overview>



The effective range of the sunflower sea star, once reaching into Mexico, is now limited to areas north of Puget Sound. Ref. Puget Sound Institute, 2020.

Map: Sara Hamilton, OSU.

Jordan Virgl is a second year student at Capilano University who is pursuing a Bachelor of Science in Biology. Jordan is deeply fascinated by the natural world and how it shaped life today.

Jordan hopes to continue his studies and pursue a career in oceanic sciences to not only learn how the ocean gives life, but also protect it so future generations can see similar stories.

Larry Taylor was drawn to scuba diving 25 years ago after this prairie boy went for a snorkel in the warm Mexican waters of the Sea of Cortez. Diving has been an integral part of this life since then. Adding to his love of diving are his exceptional underwater photography skills! Larry has generously provided images of fish and marine invertebrates for several articles in this year's newsletter.



Our North Pacific marine waters boast the highest number of seastar species in the world!



L to R, Leather star *Dermasterias imbricata*, Northern sun star *Solaster endeca* and Rainbow star *Orthasterias koehleri*

Photo: Larry Taylor

This makes it particularly tragic that seastar populations were decimated along our entire coast from 2013 to 2017 by a wasting syndrome. The National Marine Fisheries Service (NMFS) in the States called it “the largest marine wildlife disease outbreak on record”. There is still discussion in the scientific community as to whether the disease was caused by a virus or a disruption in the seastars’ microbiome which make them susceptible to bacterial infections. It might be that an overabundance of bacteria on the seastar’s skin was the cause of death as they use little tissue pockets called skin gills to breathe and this bacterial coating could cause suffocation.

While all species of seastars were affected, the sunflower seastar *Pycnopodia helianthoides* was particularly hard hit. It is thought that 90% of all sunflower stars died.

In March 2023, the NMFS proposed to have the sunflower seastar listed under the Endangered Species Act. It was already considered critically endangered. You don’t get your name on this list unless your extinction is considered eminent.

<https://www.washingtonpost.com/climate-environment/2023/03/15/sunflower-sea-star-endangered-threatened/>

The loss of the sunflower star while critical in itself is threatening to trigger changes in the larger

marine ecosystem. This species preferentially feeds on sea urchins and keeps their numbers in check. In the absence of the predatory seastars, urchin populations increase and feast in high numbers preferentially on kelp. Kelp as a foundation species creates its own unique ecosystem and is home to species which live near exclusively in these underwater forests. The loss of the seastar can even be traced forward to add to issues of climate change as these large algal forests are known to capture and use a great deal of carbon dioxide.



Sunflower star *Pycnopodia helianthoides*

Photo: Larry Taylor.

So it is with heartfelt joy that when seeking pictures for this newsletter’s intertidal fish tale and the seastar nature notes, I found out from diver and photographer Larry Taylor that he has very recently seen indications of the recovery of the sunflower star. On dives around Henderson Point, Saanich Inlet he came across a plentiful patch of very young sunflower stars. They look to be about the size one would expect of a one-year-old so last year’s reproductive moments must have been very successful in this spot.



Healthy seastars along the west coast. Photo: NOAA

As a biologist-lecturer-writer at Capilano University, Marja thrives on sharing her knowledge and stories of nature with both her students and islanders - many of her stories have grown up from years of observations made on Leey’qsun (Valdes) Island.



BioBlitz Valdes Island 2023

Bay-by-Bay Seastar Count

16

| <u>Island Bay & Counters</u> | <u>Seastar Species</u> | <u>Numbers of each</u> | <u>Numbers showing</u> |
|---|---|------------------------|------------------------|
| STARVATION BAY Marja de Jong Westman, Jak Doidge-Harrison, Christopher Gann, Ella Hillbrecht, Margo Dennis, Jordan Virgl, David Lisle | | | |
| | Leather Seastar <i>Dermasterias imbricata</i> | 20 | 3 |
| | Mottled Seastar <i>Evasterias troschelii</i> | 26 | 2 |
| | Ochre Seastar <i>Pisaster ochraceus</i> | 198 | 3 |
| DETWILLER POINT (NORTH) Mika Livingston, Archer Livingston, Marin Livingston | | | |
| | Ochre Seastar <i>Pisaster ochraceus</i> | 55 | 2 |
| | Leather Seastar <i>Dermasterias imbricata</i> | 7 | 1 |
| NOEL BAY Christina Doolittle, Georgia Campbell, Norah Doolittle, Emma Doolittle, Mat Evans and Kate Campbell | | | |
| | Ochre Seastar <i>Pisaster ochraceus</i> | 256 | 2 |
| | Mottled Seastar <i>Evasterias troschelii</i> | 4 | |
| | Bat Star <i>Asterina miniata</i> (Bat Stars are rare in the Gulf of Georgia) | 6 | |
| | Leather Seastar <i>Dermasterias imbricata</i> | 20 | |

| TOTALS | Ochre Seastar <i>Pisaster ochraceus</i> | Leather Seastar <i>Dermasterias</i> | Mottled Seastar <i>Evasterias troschelii</i> | Bat Star <i>Asterina miniata</i> |
|-----------------|--|--|---|-------------------------------------|
| | 809 | 47 | 30 | 6 |
| Diseased | 7 | 4 | 2 | 0 |



Bat Star *Asterina miniata*

Photo: Larry Taylor

This omnivorous seastar everts its stomach through its mouth and simply covers its algal foods to feed. They can digest cellulose! A commensal segmented worm lives in their tube foot grooves.



Ochre Seastar *Pisaster ochraceus*

Photo: Tony Westman

Our most abundant seastar loves the island's eastern shores with its beds of blue mussels. Tube feet pull the mussel's shells apart and a jelly-like stomach squeezes through the gap to eat the animal inside.



Leather Seastar *Dermasterias imbricata*

Photo: Marja de Jong Westman

Sea anemones are its preferred food and when not available a sea cucumber will do. This species swallows prey whole.



Mottled Seastar *Evasterias troschelii* Photo: L. Taylor

Sometimes confused with the Ochre Seastar they can be identified by the smaller disc and more tapered arms. Colours vary from brown, to orange to blue grey. Found on rocky cobbly beaches where snails, limpets and barnacles are available for food.





During the 2023 BioBlitz, the rock wall of the clam garden was visible as the tide receded. Photo: Tyler James

Stone by stone. Rock by rock. Thousands of years ago, the ancestors lined the lowest tide line with the intention of feeding their family. Over time, these rocks collected sediment and created a habitat that greatly benefits the life within and reshaped the land we call home.

As the sediment collects, it causes the beach to become more level, creating a long shelf that is perfect for clams to flourish. Too much time in the sun or too much time submerged in the tide, neither is favourable. The elevated beach provides the balance they seek.

You will often hear in the culture that all things will return to nature. This is the nature of Nature. From weapons and tools, to totem poles, and entire villages, much of the past is nearly invisible because it was meant to return to the earth. The beauty is, this very living feature will also be invisible to most people. A human-made geological feature in harmony with nature, benefiting the bivalves and in turn, nurturing the people. You can

look right at it or walk right over it without even realizing what is beneath your feet. It is a structure that has truly stood the test of time, standing in place for thousands of years. Today, we call it a clam garden, or a sea food garden. This earth-work feature is so favourable for clams, in fact, that beaches with a rock wall produce up to four times more clams than a beach without.

Beyond creating a habitable environment, harvesting is also an important part of caring for the land. When you dig a clam from the beach, you are turning over the sand, aerating it and allowing the flow of oxygen and nitrogen to enrich the layers of the beach while also preventing the sand from becoming too densely packed. When you take a clam from the beach, you are making room for new clams to flourish while also preventing overcrowding. Returning the shells to the beach after your meal gives growing clams the calcium they need to develop their shell. Each step in harvesting, when done with the right intentions, cares for the land and the life you are

harvesting. You not only take what you need, but you give back. It leaves only a footprint that washes away with the tide.

In the past, all of our neighbouring nations from Nanaimo to Saanich would stop at Leey'qsun en route to the Fraser River for the summer season of fishing for sockeye and sturgeon, among other activities. The gatherings on Leey'qsun could number in the thousands. These large gatherings meant large feasts, and there was enough to go around. Not only that, but there was abundance enough for dried clams to be a popular trade item to bring over to the nations on the Fraser.

In modern times, we must face many external factors. From climate change and rising sea levels, to reckless over-harvesting, and invasive species out-competing the native species. Even the modern idea of borders is a challenge. We used to have our own areas, yes, but we had protocols that were lost with the introduction of lines on a map. These maps brought with them the idea of exclusive territory. These are things to which we must learn to adapt and apply the old ways. And one day, we can gather with our

neighbours for a grand feast on our beach as the old people did.

Many things were taken from us, but the teachings of our ancestors have persisted through time with no words at all. When we walk the beach, it is in their footsteps we follow. When we hold a rock in our hands, it is the same rock they handled. And with the right intentions, these ancient practices will guide us in caring for the land for the generations yet to come. In many ways, the ancestors have made sure that their family was cared for, that we were fed.

Tyler James is the Cultural Records Coordinator for the Lyackson First Nation. The Nation began work restoring their clam gardens, a multi-generational undertaking, this summer.

As this incredible cultural work continues, the Conservancy asks its membership to respect sensitive intertidal areas, especially along the shorelines of the island. As we are made more aware of the cultural and historical significance of the lands and waters here on Lyackson's homelands, let us strive to be mindful and respectful of how we conduct ourselves on their territory.



Manila clam *Lajonkairia lajonkairii* that was eaten by a moon snail. Photo: Tyler James



The moon snail *Neverita lewisii* is a natural predator to clams. They secrete an enzyme that softens the shell of their prey which the moon snail then "drills" with its sharp-toothed radula, digesting the clam from within its own shell. Their presence is an indicator that the clam garden is healthy.

Photo: Tyler James



Andy Lamb

During this year's BioBlitz I brought along an odd gelatinous, oblong cylindrical mass! Most of the other marine specimens passed around had been easily identified but puzzled looks met my question – "What do you think this thing is?"

It was the egg capsule of one of the Salish Seas', cephalopods – the opalescent squid *Doryteuthis opalescens*. While our marine waters are well known for having the world's largest octopus, other head-footed molluscs are not as well known. The opalescent squid is considered a pelagic species and seen by beach goers only when they come into muddy bays to spawn. Islander, Mika Livingston, recalls seeing a school of opalescent squid one summer in a bay on nearby Wallace Island.

Animals and algae that wash ashore can be used as evidence of the existence of species found beneath the waves and offshore. An optimal time to find such subtidal or pelagic species is at a low tide – particularly after our now more commonly occurring wind events. For example, beachcomber friend Linda Schroeder found this squid egg case along a seashore in Puget Sound. She too was puzzled by what she had found.



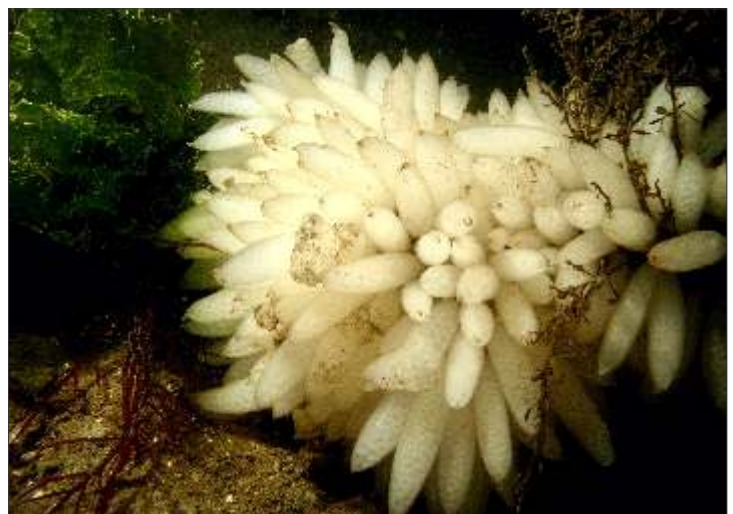
Egg case of the opalescent squid *Doryteuthis opalescens* Photo: Linda Schroeder

The capsules result from the elaborate mating process of *Doryteuthis opalescens*. Within each, you will see circular, marble sized structures. These are individual eggs. A capsule could contain up to 300 eggs. Eggs develop directly into juveniles and hatching occurs 3-5 weeks after capsules are laid. Adults die after spawning.

While a shore find of these squid egg clusters is unusual, they are frequently seen by snorkelers and divers in shallow Salish Sea waters including around Valdes Island. They are most often anchored to seaweeds. Such clusters are more likely to be cantaloupe or small watermelon size as shown in the following photo. Recently spawned batches are white but with time, may become brown due to diatom growth.



Egg case of the opalescent squid *Doryteuthis opalescens* Photo: Linda Schroeder



Egg cluster of the opalescent squid *Doryteuthis opalescens* Photo: Jim Hester

Underwater photographer Marc Chamberlain was at the right place at the right time and with the camera skills to capture surprise. A female opalescent squid is dragging an individual egg “sausage” to add to a nearby cluster. The first capsules are usually attached directly to the bottom and subsequent ones are then attached to existing clusters.



A female opalescent squid is dragging an individual egg “sausage” to add to a nearby cluster.

Photo: Marc Chamberlain

Very rarely seen is another cephalopod jewel - the stubby squid *Rossia pacifica*. It is a benthic species, living in the subtidal zone upon and in sandy-muddy substrates. It grows to about 15 cm in length (includes tentacles) and when seen, it is often at night swimming along just off the bottom. A charming feature is their tendency to crawl using their arms and when resting, roll the arms under their heads!



Stubby squid *Rossia pacifica*

Photo: Marc Chamberlain

Underwater photographer Bruce Kerwin had what he called a “miraculous encounter” with this little squid. His photo shows a female with a cluster of spherical, marble-sized eggs deposited on a rock. Interestingly, I was told one was found alive washed ashore in Starvation Bay over 20 years ago and given their preference for shrimp it is a pity that the bountiful supply of ghost shrimp creating the quicksand mud conditions now present in several bays on the east side of island, burrow too deeply for this little squid to catch them. They tend to prefer Crangonid shrimp.



Stubby squid *Rossia pacifica* with eggs

Photo: Bruce Kerwin



Ghost shrimp *Neotrypaea californiensis*

Photo: Dave Cowles.



Apparently, the term BioBlitz was the idea of a US Park Naturalist and grew out of a species survey conducted in Kenilworth Aquatic Gardens in Washington DC in 1996! It took a few years for the idea to catch on in Canada. Naturalist and artist Robert Bateman served as its catalyst here by initiating the Robert Bateman Get to Know BioBlitz in 2010 in cooperation with Parks Canada. Our Conservancy joined the BioBlitz bandwagon in 2014. Over the years, these scientifically-driven community participation intensives have proven to not only be popular but also are recognized as being successful tools in building a solid body of biodiversity data both in natural and urban areas. And as we have seen during our own events, they importantly help inspire authentic connections and appreciation of the natural wealth of a biologically rich island - unique among its island cousins by having so many intact ecosystems of conservation concern in BC and in Canada.

So once again this past May, we did our bit for nature and had a lot of fun while at it! Over 50 people, including Conservancy members, Lyackson Community members and biologists were together at the community dinner on Saturday, May 20 after a 17 km plus "trek and truck" meander from Starvation Bay to Blackberry Point, the south Beaver Pond and finishing through the forests of the Blue Trail back to Starvation Bay.



Marja with a group of BioBlitzers at Blackberry Point.
Photo: Tony Westman

The weekend held so many memorable moments. Some of mine were the morning welcoming words of Lyackson Nation member and past councilor

Jennifer Jones; sharing a meal and stories with Lyackson Nation member author and artist, Andrea Fritz and her family while picnicking at Blackberry Point; realizing the day would not have gone along as smoothly without the generous Uber services of islander Graham Hill; joining in the excitement of the discoveries of guest biologists; observing Lyackson Nation member Tyler James generously sharing his stories of work on the ancient clam garden; seeing the enduring excitement of all participants with the finding of life under seashore rocks; seeing the happy faces of bird count participants as they realized they were recognizing different species by their calls and finally, being astonished at the energy in the walking legs of some of the children who accompanied us all on our near 17 km island trek!



Broad-leaved Stonecrop *Sedum spathulifolium*
Photo: MDJW

And then as always, being reminded that an honouring of the natural world serves as a catalyst to bring people together and why the Conservancy organizes this signature event each year.



Ella Hillbrecht showing kids a specimen.
Photo: Tony Westman



Enraptured children observe creatures and listen to Andy Lamb's tales of the deep.

Photo: Mika Livingston

Biological highlights included:

- getting the long-term intertidal survey started at Blackberry Point to assess the recovery of inshore marine life from the effects of the heat dome of June 2021;
- recording two first time purple martin nests in boxes at the South Beaver Pond;
- the positive indications of seastar recovery via the Bay-by-Bay seastar counts. Massive die offs of seastars were first noted in 2013/2014 due to seastar wasting disease. It is estimated that billions of seastars disappeared from BC's marine waters and we are holding our breath for hints of their come back;
- observations of 5 bat species – Yuma myotis, California myotis, Hoary, Big Brown and Silver-haired all in the meadows of Starvation Bay! . <https://bcbats.ca/bat-basics/bat-species-in-bc/>
- Communal concern for the presence and spreading of Scotch Broom *Cytisus scoparius* on the logging roads near Blackberry Point. This invasive has destroyed so much habitat on Vancouver Island.



Marja and Andy point out details of the specimens to curious kids and adults.

Photo: Mika Livingston



Children participate in art and craft activities...

Photo: Mika Livingston



The Campbell's Valdes Story

Doug and Shirley Campbell

Due to limited space, this is a precis of the Campbell's Island Story. For the full story, please go to the VIC website www.valdesconservancy.org

Alberta was both the birthplace of Doug and Shirley Campbell and the place where they met. They remained in Alberta until their early twenties when their shared urge for change saw them looking west and moving to Vancouver in 1970. Good jobs were found, and poodles and boats added to their coastal nest. As is often the case, life takes unexpected turns and one which triggered a fundamental shift both their work and personal worlds was when Doug was asked to take on the Children's Aid Society as a client. After a couple of years of this rewarding challenge he served as a consultant for some needed reforms of the Provincial court and was then, at age 29, appointed a judge assigned to the Victoria Family Court. Looking back, they both realized these work commitments provided them with their first step toward Valdes Island.

In Victoria, they met a couple who would become such important anchors in their lives and inform so many aspects of the Campbell's future. That couple was Barbara Mullin and Gordon Detwiller. Barbara was a social worker for the Victoria Family Court and Gordon, a legal aid lawyer. These two people, assisted and guided many young people and many of those young people ended up in Doug Campbell's courtroom! As two couples, they shared lives outside of work which included a few tad infamous and memorable parties and saw them also spending many wonderful days together on board Campbell's 40 foot converted troller - the Pacific Crown, pictured below.



L to R, Barbara Mullin, Gordon Detwiller, Shirley and Doug Campbell
Jervis Inlet BC 1979

Ah, memories! While aboard and as committed boaters, Doug and Shirley tried to be patient and listen to Barbara and Gordon's stories of their special place – Valdes Island. As previously landlocked Albertans, Campbells were dreaming of years of boating along the coast and had no intention of becoming land bound. But alas, Barbara and Gordon stubbornly and lovingly continued to try to lure them to Valdes Island. That arm twisting took on a new level when a lease became available through Gordon's brother, Doug. And what was that lease for? A pristine beach front property in Noel Bay. By this time Doug and Shirley (now pregnant with first- born) were back in Vancouver. The decision to honour Detwiller's invitation came on a summer's day in 1981 as they headed across the Gulf in a smaller and faster vessel and landed in an unknown spot with no tour guide and Shirley with a broken ankle. This trip, however, proved to be the turning point for them and the Campbell family's future.

First impressions mean so much, eh? They meandered about and found this south facing arbutus grove on a beautiful point of land with a 180 degree view of the Gulf, with a quiet protected beach, and a lovely neighbour, Liz Rivers swimming in the bay. Little arm twisting was needed as they were overcome with the island's remoteness and beauty and the clarity of thinking about the benefits of a land-based spot for a growing family. And so their island story began...



The original cabin proved too small for a growing family...



Campbell daughters, Georgia and Christina, July 1988



Granddaughters, Norah and Emma, July 2022



The new cabin, designed and built by Paul Hamson 2001/02



Shirley, Doug, Norah, Allan, Emma, Christina & Georgia

Valdes is a very special place for all three generations of the Campbell family.

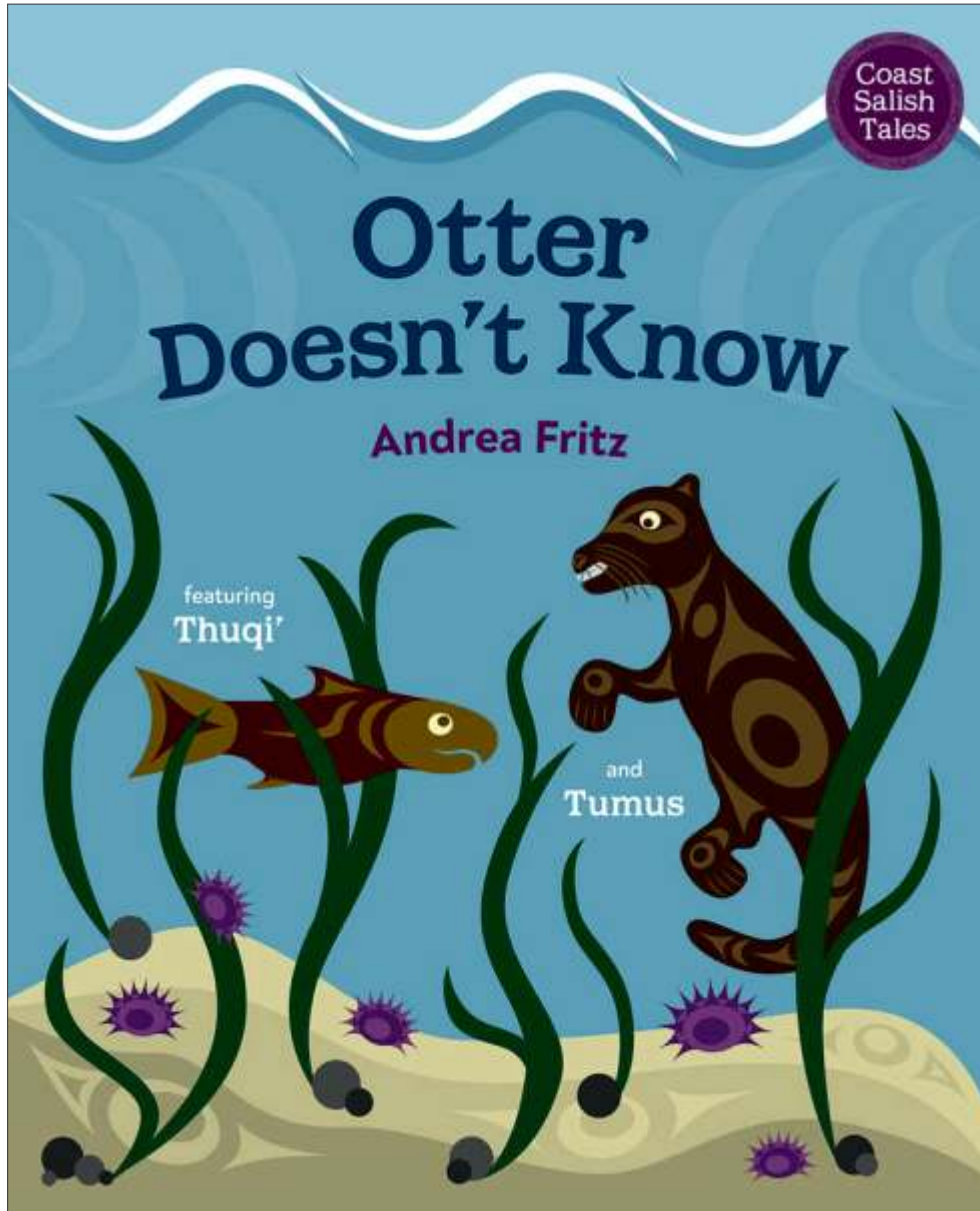
Dedication

The Story is about adventure and friendship. It is dedicated to our dear friends Gordon Detwiller and Barbara Mullin. Gordon passed away on March 14, 2020. He was a pioneer of the cabin community on Valdes and is missed by all.
Doug & Shirley



Otter Doesn't Know by Andrea Fritz. Published by Orca Book Publishers, 2023. (Children and adults of all ages).

Perhaps for those of us who have our cabins in Lyackson territory, to know the flowers and animals by their Hul'q'umi'num names will similarly gladden hearts along unfamiliar paths too. As Fritz writes in the epilogue of her newest book, *Otter Doesn't Know*, Hul'q'umi'num is a language "meant to be spoken, shared and experienced as part of a broader cultural journey — a journey that brings you closer to those who came before you, those who discovered what there was on our land and how to talk about it." Within this book's covers she provides the tools, instruction and encouragement to try on the "new-to-you" sounds of the Hul'q'umi'num language. For example, I have learned through her book, that the word for the children in our community is smun'eem (pronounced smun-EM) and each time I say it I think it's the most perfect word for a treasure that we nurture across all the communities connected to us: smun'eem. She writes: "In reading and sharing these stories with the smun'eem in your life, you are making an important step toward reconciliation by valuing Indigenous ways of knowing and teaching". Thus, Fritz provides the reader with not just a beautifully illustrated and meaningful children's story, but a gift to those of us navigating the work of reconciliation. So yes, this is a children's book, but the layers that Fritz has wrapped around it enrich it immensely and generously.

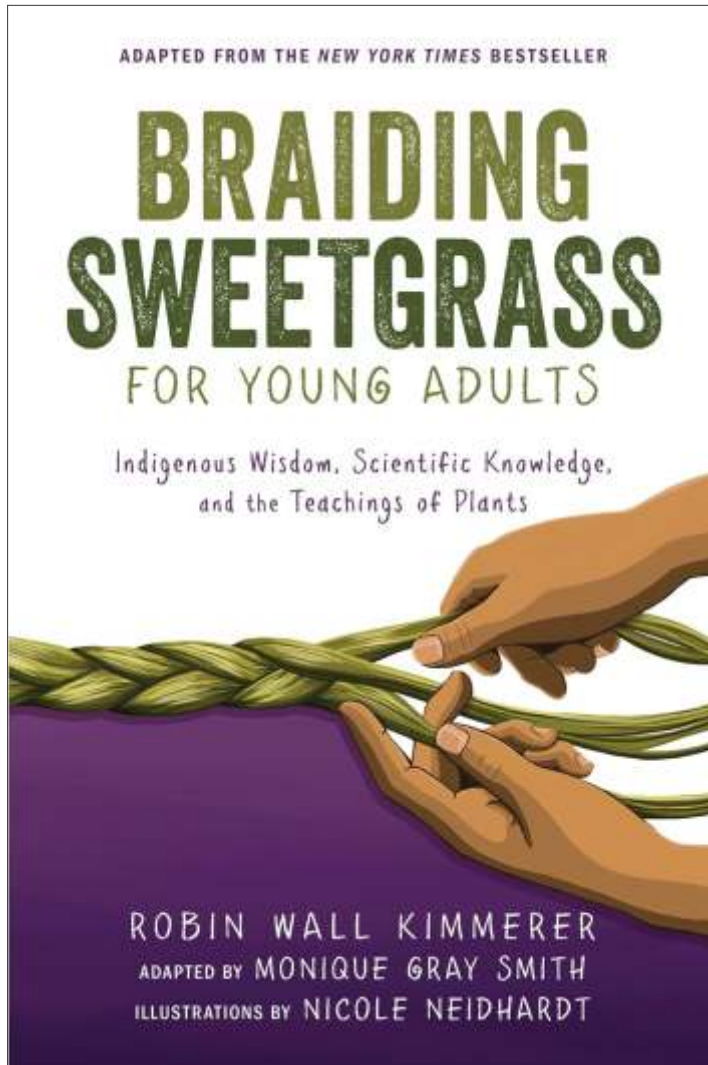


Andrea Fritz is a Coast Salish artist, storyteller and member of the Lyackson First Nation. The Conservancy was so fortunate to have her and her family (as well as other Lyackson community members) join our BioBlitz this year. There was a moment out on the beach at Blackberry Point where a giant, glossy feathered Eagle soared overhead and she looked up and said, "Oh! Yuxwule'!", just as one would greet a dear friend. It was the first time I'd heard a Bald Eagle called by its Hul'q'umi'num name and hearing it, I thought of the words of the late Botanist Lewis J. Clark: "Happy the man who is able to greet by name the flowers that brighten his way, for they become known friends that gladden his heart no matter how unfamiliar the path."

The story itself features a brave, courageous and generous Thuqi' (sockeye salmon) who teaches a self-involved Tumus (sea otter) the value in kindness, patience and generosity, and these are important lessons unto themselves. But it is set in the waters around Leey'qsun and what a gift to see the island drawn in Fritz' beautiful Coast Salish style and read about the Shining Point, Tth'hwumqsun, known on our charts as Porlier Pass.

The next instalment in Andrea Fritz's Coast Salish Tales series: *Crow Helps a Friend* will be published April 2024!

Braiding Sweetgrass for Young Adults: Indigenous Wisdom, Scientific Knowledge, and the Teachings of Plants by Robin Wall Kimmerer, Monique Gray Smith and Nicole Neidhardt. 2022.

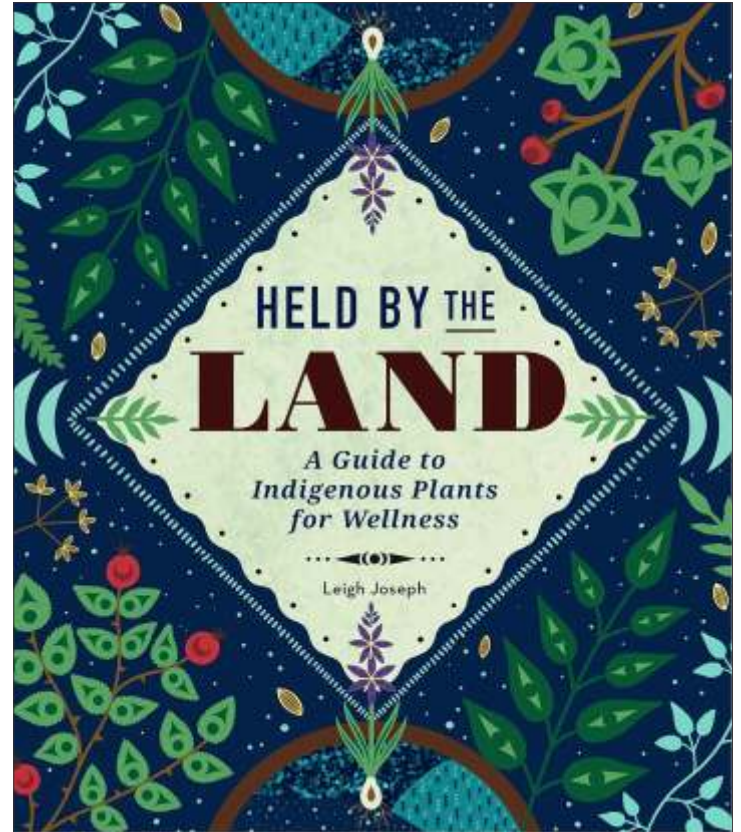


Braiding Sweetgrass now has a young adult version! Monique Gray Smith has adapted Robin Wall Kimmerer's game-changing blockbuster of a book and she has done such a fantastic job. The YA version features new illustrations, photos and sidebars as well as definitions to de-jargon the original and the result is undeniably engaging.

Held by the Land: A Guide to Indigenous Plants for Wellness by Leigh Joseph. 2023.

Skwálwen Botanicals founder Leigh Joseph's new book is beautifully illustrated by Sarah Jim and across its 192 pages it educates, informs, challenges and rewards readers. Not only does she share gifts from the 44 plants she explores in depth (which include recipes that use these gifts) but she includes a treatise on "The

Mindful Harvest" (chapter 4) and "Botanical or Land-Based Mindfulness Practices" (Chapter 5). This is a deep, intentional and thoughtful piece of work from Joseph, a brilliant indigenous ethnobotanist and entrepreneur.



The Science and Superpowers of Seaweed: A Guide for Kids by Amanda Swinimer. 2023.

This summer a very marine-savvy friend told our daughter that you can eat every kind of seaweed in the ocean and given the diverse array of seaweed I have seen her munch on since then, I sure wish I had this activity and factoid-packed book on hand to harness her curiosity!





The ever popular balloon toss



Above: Julian, Ally, Jocelyn and Gordy
Left: Ian, Phyllis, Linda and Brent

