Mount Arrowsmith Biosphere Region BioBlitz

2023 Summary Report

United Nations Educational, Scientific and Cultural Organization

MOUNT ARROWSMITH BIOSPHERE REGION

MOUNT ARROWSMITH BIOSPHERE REGION Research Institute

VANCOUVER ISLAND UNIVERSITY

Table of Contents

The Mount Arrowsmith Biosphere Region 1

Introduction to a BioBlitz 1

MABR BioBlitz Events 2

The 2023 Biosphere-Wide Blitz 3

Goals and Objectives 3

Methods 4

Data Collection from the 2023 MABR BioBlitz 4

Image 1. Map of Observations Collected April 14, 15 and 16, 2023. 4

Table 1. Compiled Findings from April 14, 15 and 16, 2023 MABR BioBlitz Flora Species. 5

Table 2. Compiled Findings from April 14, 15 and 16, 2023 MABR BioBlitz Fauna Species. 12

Table 3. Comparison of Results Between 2021 - 2023 Flora and Fauna Observations. 20

Table 4. Comparison of Results Between 2016-2019 BioBlitzing at Milner Gardens. 20

Future Blitzing 21

References 22

Appendix: Map of the Mount Arrowsmith Biosphere Region Boundary for the 2023 BioBlitz 23

The MABR acknowledges and thanks the Qualicum, Snaw-naw-as, Snuneymuxw, K'ómox, Tseshaht, Hupacasath, and Ditidaht First Nations, on whose traditional lands the Mount Arrowsmith Biosphere Region is situated within.

We would also like to thank our partners, including the Nature Trust of BC, and the Brant Wildlife Festival, with which we have held this event in collaboration and partnership since 2016.

Last but not least, we would like to thank all those who participated in this year's BioBlitz and took time to record observations. Without you, this report would not have been possible. We greatly appreciate your help.

Cover image: Rufous Hummingbird by akradish

The Mount Arrowsmith Biosphere Region

The Mount Arrowsmith Biosphere Region (MABR) is a UNESCO designated Biosphere Reserve located on mid-eastern Vancouver Island. Biosphere Reserves are considered model regions where people live and work together in hopes of creating a sustainable future to thrive in harmony with nature. The MABR is situated within the traditional territories of seven First Nations communities and shares similar boundaries with the Regional District of Nanaimo. The vertical elevation spans just over 2,100 meters from the highest peak on Mt. Arrowsmith (1,817 meters) to 300 meters into the Salish Sea. This vertical range makes the MABR unique among Canadian Biospheres, containing many distinctive ecosystems ranging from high alpine and coastal forests to intertidal and marine habitats. Additionally, as the MABR spans a geographic area of 1,200 square kilometers, the region encompasses an ecologically diverse range of habitats and ecosystems within its watershed boundaries. These ecosystems hold cultural, environmental, and economical significance.

Further elevating local relationships between people and nature, is the Mount Arrowsmith Biosphere Region Research Institute (MABRRI). MABRRI strives to embrace and celebrate the diverse values of the MABR through research, education, and community outreach, promoting environmental conservation and awareness of this beautiful and extraordinary place by which we all live and share.

Introduction to a BioBlitz

A BioBlitz is a rapid biological survey of flora and fauna that embraces citizen science, connecting local community members, knowledge holders, naturalists, and scientists to identify as many species as possible within an allocated time frame. The data collected from these biological surveys is important for gaining sound baseline knowledge of existing biodiversity in the region. Annual biological monitoring allows researchers to monitor trends and changes over time that can indicate fluctuations in species at risk, invasive species, and overall species richness of a region. For instance, changes in habitat health from long-term climate trends and local weather patterns can significantly alter the state of the environment and can be detected over time with community monitoring initiatives. The main benefit of conducting a BioBlitz is that the data collected by participants provides a snapshot of biodiversity and species richness within the region. BioBlitz events also foster increased regional knowledge of changes to biodiversity over time, such as species abundance, habitat for species at risk, as well as invasive species distribution. The data collected during the annual event can help inform the management of sensitive habitats and ecosystems within the region.

MABR BioBlitz Events

The goal of the annual BioBlitz is to promote citizen science-based research while celebrating wildlife and biodiversity within the MABR. The data collected during this annual event helps inform the management of sensitive habitats and ecosystems within the region. BioBlitz events have been held by MABRRI within the MABR since 2016. The event supports the values of a UNESCO designated Biosphere Reserve as it is designed to connect people with nature through species identification and knowledge building. These events provide an engaging opportunity for community members to connect with local experts and peers while learning about their surrounding environment. The event has successfully worked toward increasing participants' knowledge of biodiversity while equipping individuals with basic stewardship field skills.

The MABR BioBlitz has the capability to expand local knowledge of biodiversity and wildlife habitat within the region, and contributes to a publicly available and transparent data set. This data set holds value and use for future generations and long-term species trend analysis. This research aims to promote the health and resilience of our natural systems, including the intricate and unique characteristics and relationships within these ecosystems. We wish to promote knowledge sharing, environmental stewardship, and critical thinking in communities beyond the academic environment to promote the longevity and relationships between people and nature. The aim of future BioBlitz events is to include a greater variety of ecosystems, habitats, and microclimates within the MABR year after year. This will provide an opportunity to observe and monitor trends in species inventory. Additionally, the MABR BioBlitz strives to increase citizen-science based participation each year.

The 2023 Biosphere-Wide Blitz

The 2023 MABR BioBlitz was the seventh annual event held in conjunction with the Brant Wildlife festival. Prior to 2021, the annual BioBlitz had been held at the Milner Gardens and Woodland site in Qualicum Beach. However, due to the COVID-19 pandemic, the event was extended to the boundaries of the MABR, ranging from Nanoose Bay to Qualicum Bay, to allow for social distancing and to collect a broader view of the biodiversity within the region.

This year's BioBlitz event encouraged MABR community members to identify as many species as possible within the MABR boundaries, which provided a snapshot of species richness in different locations throughout the region. The 2023 Biosphere-wide Blitz took place from April 14th through 16th and employed the iNaturalist mobile application (iNaturalist app) to record observations of flora and fauna. The data collected from the BioBlitz was compiled into a database (Table 1 and Table 2), and is useful in providing a snapshot of overall biodiversity within the MABR. The results of the participant data collected during the 2023 BioBlitz revealed 341 observations, including 236 distinct species.

Goals and Objectives

While the primary goal of the MABR's annual BioBlitz is to provide a snapshot of regional species richness, it is also a main focus of motivating a larger group of community participants to take part in the event year after year. By increasing engagement in the event, community members have opportunities to enhance their research skills, connect with their surrounding environment, learn about regional biodiversity, all while being part of a regional community initiative.

The objectives of the 2023 MABR BioBlitz are as follows:

1. To gain a broader view of biodiversity within our region;
2. Contribute to long-term monitoring of flora and fauna in the MABR;
3. Promote citizen science-based research while celebrating wildlife and biodiversity within the MABR;
4. Promote the health and resilience of our natural systems; and
5. Provide participants and the public with a finalized flora and fauna collection report, including species identified during the event.

Methods

The event took place over three days (April 14, 15, and 16, 2023) within the MABR's boundaries, ranging from Nanoose Bay to Qualicum Bay. Over the three days, participants recorded observations in their own time using the iNaturalist app. Observations were recorded through photos uploaded to the iNaturalist app, which were then identified by citizen scientists and volunteers using supporting identification materials, such as nature guides. Prizes were awarded to those who recorded the highest number of observations on each of the three days.

Data Collection from the 2023 MABR BioBlitz

The data collected in 2023 provides information on the biodiversity across the Biosphere Region (Image 1). Participant observations from across the MABR are compiled into Tables 1 and 2 below. Table 1 includes a complete list of the flora recorded and identified from April 14 to April 16, and Table 2 includes a complete list of fauna recorded and identified from April 14 to 16. Note that invasive species are highlighted in RED, exotic species are highlighted in GREEN, and species at risk in BC are highlighted in BLUE.

Image 1. Map of Observations Collected April 14, 15 and 16, 2023.

Western Red Cedar by david_dyck

Pacific madrone (Arbutus) by ebredberg

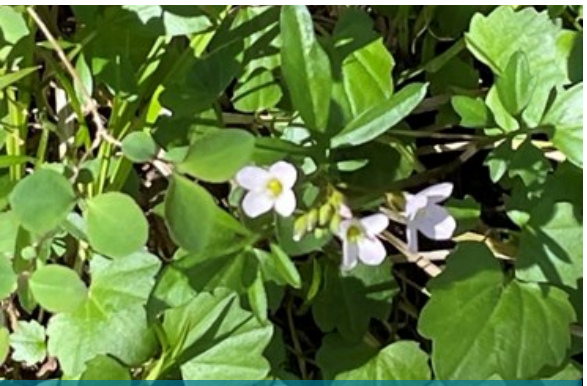
Table 1. Compiled Findings from April 14, 15 and 16, 2023 MABR BioBlitz Flora Species.

Trees		
Common Name	**Scientific Name**	**Number of Observations**
Arbutus	*Arbutus menziesii*	3
Balsam Poplar	*Populus balsamifera*	1
Bigleaf Maple	*Acer macrophyllum*	5
Bitter Cherry	*Prunus emarginata*	2
Cherry Laurel	*Prunus laurocerasus*	1
Common Alder	*Alnus glutinosa*	1
Douglas Fir	*Pseudotsuga menziesii*	6
Grand Fir	*Abies grandis*	5
Lodgepole Pine	*Pinus contorta*	1
Pacific Crab Apple	*Malus fusca*	3
Pacific Yew	*Taxus brevifolia*	1
Paper Birch Tree	*Betula papyrifera*	1
Red Alder	*Alnus rubra*	5
Sitka Spruce	*Picea sitchensis*	1
Sitka Willow	*Salix sitchensis*	3
Trembling Aspen	*Populus tremuloides*	1
Western Hemlock	*Tsuga heterophylla*	4
Western Red Cedar	*Thuja plicata*	8
Total Number of Species	18	
Total Observations		52

Oregon Grape by ebredberg

Baldhip Rose by jessified

Shrubs		
Common Name	**Scientific Name**	**Number of Observations**
Armenian Blackberry	*Rubus armeniacus*	2
Baldhip Rose	*Rosa gymnocarpa*	1
Bull Thistle	*Cirsium vulgare*	1
Cascade Oregon-grape	*Berberis nervosa*	6
Cascara	*Frangula purshiana*	1
European Holly	*Ilex aquifolium*	1
Evergreen Huckleberry	*Vaccinium ovatum*	2
Morrow's Honeysuckle	*Lonicera morrowii*	1
Nootka Rose	*Rosa nutkana*	3
Ocean Spray	*Holodiscus discolor*	4
Orange Honeysuckle	*Lonicera ciliosa*	1
Red Elderberry	*Sambucus racemosa*	2
Red Huckleberry	*Vaccinium parvifolium*	4
Red Osier Dogwood	*Cornus sericea*	1
Red-flowering Currant	*Ribes sanguineum*	3
Rose Spirea	*Spiraea douglasii*	1
Salal	*Gaultheria shallon*	5
Salmonberry	*Rubus spectabilis*	5
Scotch Broom	*Cytisus scoparius*	1
Spreading Gooseberry	*Ribes divaricatum*	1
Spurge-laurel	*Daphne laureola*	2
Thimbleberry	*Rubus parviflorus*	1
Trailing Blackcurrant	*Ribes laxiflorum*	1
Total Number of Species	23	
Total Observations		50



Nuttal's Toothwort by ebredberg

Pacific Trillium by accipiter56

Twinflower by ceridwenp

Herbs and Wildflowers		
Common Name	**Scientific Name**	**Number of Observations**
Catchweed Bedstraw	*Galium aparine*	3
Common Stinging Nettle	*Urtica dioica*	1
Common Yarrow	*Achillea millefolium*	1
Common Dandelion	*Taraxacum officinale*	1
Creeping Thistle	*Cirsium arvense*	1
Crevice Alumroot	*Ranunculus occidentalis*	1
Crisp Starwort	*Stellaria crispa*	2
Fringe Cups	*Tellima grandiflora*	1
Fringed Willowherb	*Epilobium ciliatum*	1
Giant White Fawn Lily	*Erythronium oregonum*	1
Herb Robert	*Geranium robertianum*	3
Lawn Daisy	*Bellis perennis*	1
Lesser Periwinkle	*Vinca minor*	1
Little Western Bittercress	*Cardamine oligosperma*	1
Marsh Marigold	*Caltha palustris*	2
Nipplewort	*Lapsana communis*	1
Nuttall's Toothwort	*Cardamine nuttallii*	3
Pacific Bleeding Heart	*Dicentra formosa*	2
Pacific Trillium	*Trillium ovatum*	6
Pacific Water Parsley	*Oenanthe sarmentosa*	1
Purple Foxglove	*Digitalis purpurea*	1
Shepherd's Cress	*Teesdalia nudicaulis*	2

Western Sword Fern by yana113

Giant Horsetail by ebredberg

Soft Rush	*Juncus effectus*	1
Stinging Nettle	*Urtica dioica*	2
Twinflower	*Linnaea borealis*	2
Vanilla Leaf	*Achlys triphylla*	3
Western Dock	*Rumex occidentalis*	1
Western Lily of the Valley	*Maianthemum dilatatum*	1
Western Skunk Cabbage	*Lysichiton americanus*	6
Western Starflower	*Lysimachia latifolia*	1
Western Sweet Coltsfoot	*Petasites frigidus palmatus*	1
White Clover	*Trifolium repens*	1
Wild Daffodil	*Narcissus pseudonarcissus*	1
Wild Carrot	*Daucus carota*	1
Wild Radish	*Raphanus raphanistrum*	1
Yellow archangel	*Lamium galeobdolon*	1
Total Number of Species	37	
Total Observations		62
Ferns		
Common Name	**Scientific Name**	**Number of Observations**
Bracken Fern	*Pteridium aquilinum*	1
Lady Fern	*Athyrium filix-femina*	1
Licorice fern	*Polypodium glycyrrhiza*	1
Western Sword Fern	*Polystichum munitum*	5
Total Number of Species	4	
Total Observations		8

Methuselah's Beard Lichen by david-dyck

Fishbone Beard Lichen by david-dyck

Sedges		
Common Name	**Scientific Name**	**Number of Observations**
Giant Horsetail	*Equisetum telmateia*	2
Slough Sedge	*Carex Obnupta*	1
Total Number of Species	2	
Total Observations		3

Grasses		
Common Name	**Scientific Name**	**Number of Observations**
Eelgrass	*Zostera marina*	1
Total Number of Species	1	
Total Observations		1

Lichens		
Common Name	**Scientific Name**	**Number of Observations**
Common Witch's Hair	*Alectoria sarmentosa*	1
Fishbone Beard Lichen	*Usnea dasopoga*	1
Lichen Agaric	*Lichenomphalia umbellifera*	1
Methuselah's Beard Lichen	*Usnea longissima*	1
Montenalia Sorediata	*Montenalia Sorediata*	1
Tree Lungwort	*Lobaria pulmonaria*	2
Total Number of Species	6	
Total Observations		7

Common Jelly Spot by cathymgillespie

Badge Moss by Sewardk

Fungi		
Common Name	**Scientific Name**	**Number of Observations**
Artists Conk	*Ganoderma applanatum*	1
Huckleberry Broom Rust Fungus	*Calyptospora columnaris*	1
Jelly Spot Fungus	*Dacrymyces stillatus*	2
Red-Belted Conk	*Fomitopsis pinicola*	1
Total Number of Species	4	
Total Observations		5

Mosses		
Common Name	**Scientific Name**	**Number of Observations**
Badge Moss	*Plagiomnium insigne*	1
Cat-tail Moss	*Isothecium stoloniferum*	2
Fan Moss	*Rhizomnium glabrescens*	1
Oregon Beaked Moss	*Kindbergia oregana*	2
Rough Goose Neck Moss	*Rhytidiadelphus triquetrus*	1
Total Number of Species	5	
Total Observations		7

Algae		
Common Name	**Scientific Name**	**Number of Observations**
Blue-green Algae	*Cyanobacteria*	1
Fringed Sieve Kelp	*Agarum fimbriatum*	1
Japanese Wireweed	*Sargassum muticum*	1
Mazaella Californica	*Mazaella Californica*	1
Mazzaella Japonica	*Mazzaella japonica*	1

Red Sea Spaghetti by vickiegould

Red Sea Grapes by leftcoaster

Purple Encrusting Hydrocoral	*Stylantheca papillosa*	1
Red Opuntia	*Opuntiella californica*	1
Red Sea Grapes	*Botryocladia pseudodichotoma*	1
Red Sea Spaghetti	*Gracilariopsis andersonii*	1
Red Seaweed	*Gracilaria gracilis*	2
Ribbon Kelp	*Alaria marginata*	1
Rockweed	*Fucus distichus*	2
Turkish Towel	*Chondracanthus exasperatus*	1
Total Number of Species	13	
Total Observations		15
Total Flora Species Observed	**113**	
Total Number of Observations		**210**

Barred Owl by ebredberg

Orange-crowned Warbler by akradish

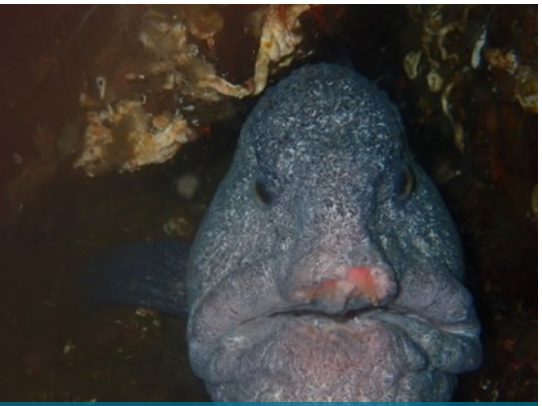
American Bullfrog by emrenpen

Table 2. Compiled Findings from April 14, 15 and 16, 2023 MABR BioBlitz Fauna Species.

Birds		
Common Name	**Scientific Name**	**Number of Observations**
American Robin	*Turdus migratorius*	1
Bald Eagle	*Haliaeetus leucocephalus*	1
Barred Owl	*Strix varia*	1
Bewick's Wren	*Thryomanes bewickii*	1
Canada Goose	*Branta canadensis*	1
Gadwall	*Mareca strepera*	1
Greater Yellowlegs	*Tringa melanoleuca*	1
Orange-crowned Warbler	*Leiothlypis celata*	1
Pileated Woodpecker	*Dryocopus pileatus*	1
Red Crossbill	*Loxia curvirostra*	1
Red-breasted Sapsucker	*Sphyrapicus ruber*	1
Rufous Hummingbird	*Selasphorus rufus*	1
Spotted Towhee	*Pipilo maculatus*	2
Townsend's Solitaire	*Myadestes townsendi*	1
Total Number of Species	15	
Total Observations		17
Amphibians		
Common Name	**Scientific Name**	**Number of Observations**
American Bullfrog	*Lithobates catesbeianus*	1
Total Number of Species	1	
Total Observations		1

Eastern Gray Squirrel by yana113

Blackeye Goby by leftcoaster

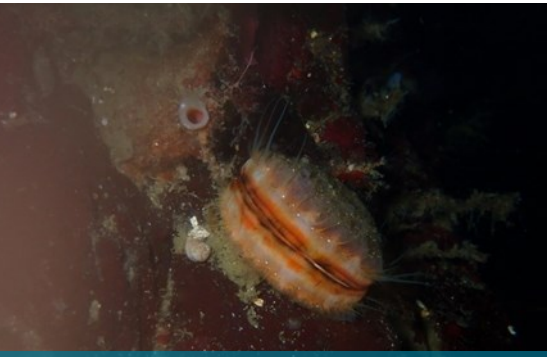


Wolf Eel by leftcoaster

Mammals		
Common Name	**Scientific Name**	**Number of Observations**
Eastern Grey Squirrel	*Sciurus carolinensis*	1
North American Beaver	*Castor canadensis*	2
Total Number of Species	2	
Total Observations		3

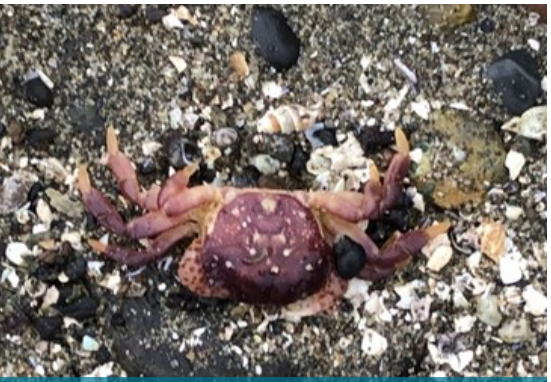
Insects		
Common Name	**Scientific Name**	**Number of Observations**
Cicada	*Okanagana occidentalis*	1
Western Thatching Ant	*Formica obscuripes*	2
Total Number of Species	2	
Total Observations		3

Fish		
Common Name	**Scientific Name**	**Number of Observations**
Blackeye Goby	*Rhinogobiops nicholsii*	1
Copper Rockfish	*Sebastes caurinus*	1
Decorated Warbonnet	*Chirolophis decoratus*	1
Kelp Greenling	*Hexagrammos decagrammus*	1
Lingcod	*Ophiodon elongatus*	2
Longfin Sculpin	*Jordania zonope*	1
Pacific Herring	*Clupea pallasii*	1
Quillback Rockfish	*Sebastes maliger*	1
Rock Sole	*Lepidopsetta bilineata*	1



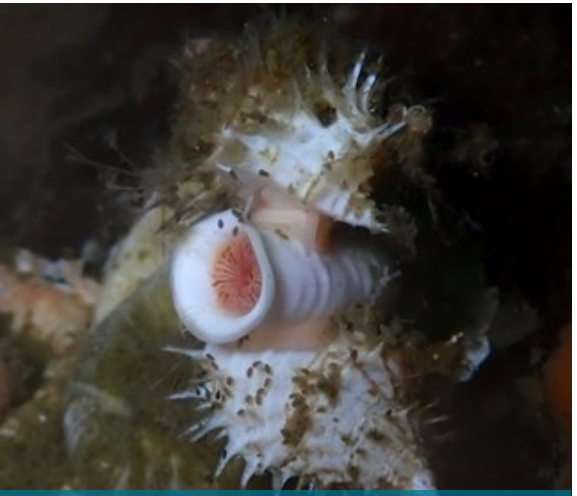
Spiny Scallop by leftcoaster

Acorn Barnacle by leftcoaster



Purple Shore Crab by left coaster

Tiger Rockfish	*Sebastes nigrocinctus*	1
Wolf Eel	*Anarrhichthys ocellatus*	1
Total Number of Species	11	
Total Observations		13
Bivalves		
Common Name	**Scientific Name**	**Number of Observations**
Giant Rock Scallop	*Crassadoma gigantea*	1
Nuttall's Cockle	*Clinocardium nutallii*	1
North Pacific Lampshell	*Terebratalia transversa*	1
Pacific Oyster	*Magallana gigas*	1
Purple Mahogany Clam	*Nuttallia obscurata*	1
Spiny Scallop	*Chlamys hastata*	2
Total Number of Species	6	
Total Observations		8
Crustaceans and Arthropods		
Common Name	**Scientific Name**	**Number of Observations**
Acorn Barnacle	*Balanus glandula*	1
Armed Hermit Crab	*Pagurus armatus*	1
Bering Hermit Crab	*Pagurus beringanus*	3
Butterfly King Crab	*Cryptolithodes typicus*	1
Coonstriped Shrimps	*Pandalus hypsinotus*	1
Dungeness Crab	*Metacarcinus magister*	2
Giant Acorn Barnacle	*Balanus nubilus*	1



Cancellate Hairysnail by leftcoaster

White-and-Orange-Tipped Nudibranch by leftcoaster

Washington Sea Slug by leftcoaster

Purple Shore Crab	*Hemigrapsus nudus*	1
Pygmy Rock Crab	*Glebocarcinus oregonensis*	1
Red Rock Crab	*Cancer Productus*	1
Total Number of Species	10	
Total Observations		13
Mollusks		
Common Name	**Scientific Name**	**Number of Observations**
Cancellate Hairysnail	Trichotropis cancellata	1
Carinate Dove Snails	*Alia carinata*	1
Giant Nudibranch	*Dendronotus iris*	1
Gumboot Chiton	*Cryptochiton stelleri*	1
Leafy Hornmouth	*Ceratostoma foliatum*	1
Lewis's Moon Snail	*Neverita lewisii*	1
Merten's Chiton	*Lepidozona mertensii*	1
Monterey Dorid	*Doris montereyensis*	1
Mossy Chiton	*Mopalia muscosa*	1
Plate Limpet	*Lottia scutum*	1
Puppet Margarite	*Margarite pupilus*	1
Red-fingered Coryphella	*Coryphella verrucosa*	1
Red-lined Chiton	*Tonicella lineata*	1
Rough Keyhole Limpet	*Diodora aspera*	1
Washington Sea Slug	*Predaceous Aeolis*	1
White-and-Orange-Tipped Nudibranch	*Antiopella fusca*	1

Armoured Sea Cucumber by leftcoaster

Pacific Blood Star by leftcoaster

Vermilion Star by leftcoaster

White-lined Dirona	*Dirona albolineata*	1
Wrinkled Purple	*Nucella lamellosa*	1
Yellow-edged Cadlina	*Cadlina luteomarginata*	1
Total Number of Species	20	
Total Observations		20

Sea Cucumbers, Sea Stars and Urchins		
Common Name	**Scientific Name**	**Number of Observations**
Armored Sea Cucumber	Psolus chitonoides	1
Common Feather Star	*Florometra serratissima*	2
Daisy Brittle Star	*Ophiopholis aculeata*	1
Giant California Sea Cucumber	*Apostichopus californicus*	1
Giant Plumose Anemone	*Metridium farcimen*	1
Grey Brittle Star	*Ophiura luetkenii*	1
Leather Star	*Dermasterias imbricata*	1
Long-stalked Sea Squirt	*Styela montereyensis*	1
Mottled Star	*Evasterias troschelii*	3
Orange Sea Cucumber	*Cucumaria miniata*	1
Pacific Blood Star	*Henricia leviuscula*	4
Rainbow Star	*Orthasterias koehleri*	1
Red Sea Urchin	*Mesocentrotus franciscanus*	1
Rose Sun Star	*Crossaster papposus*	1
Stiff-footed Sea Cucumber	*Eupentacta quinquesemita*	1

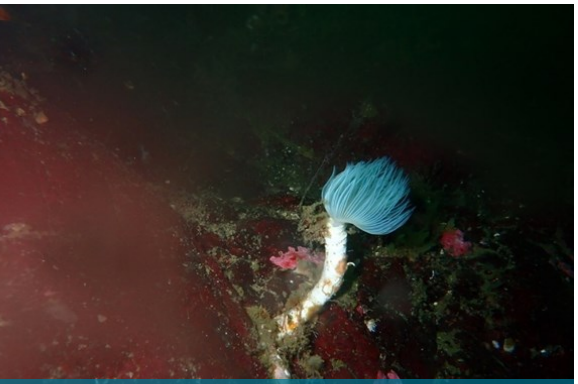
Hydroid Jelly

Crimson Anemone by leftcoaster

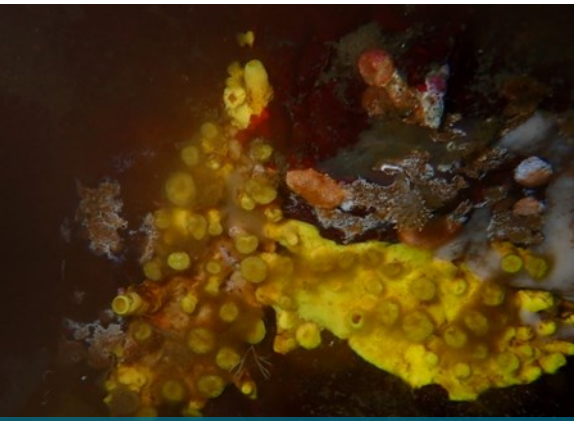
Lobate Comb Jelly

Velcro Star	*Stylasterias forreri*	1
Vermilion Star	*Mediaster aequalis*	1
Total Number of Species	18	
Total Observations		24
Anemones, Tunicates and Jellies		
Common Name	**Scientific Name**	**Number of Observations**
Bristly Tunicate	*Boltenia villosa*	1
Compound Sea Squirt	*Didemnum vexillum*	1
Crimson Anenome	*Cribrinopsis fernaldi*	1
Fringed Cerianthid	*Pachycerianthus plicatus*	1
Hydroid Jelly	*Tiaropsis multicirrata*	1
Icy Tunicate	*Corella willmeriana*	1
Lightbulb Tunicate	*Clavelina huntsmani*	1
Lobate Comb Jelly	*Bolinopsis microptera*	2
Orange Sea Pen	*Ptilosarcus gurneyi*	1
Pacific Sea Peach	*Halocynthia aurantium*	1
Pacific Stubby Rose Anemone	*Urticina clandestina*	1
Plumose Anemone	*Metridium senile*	1
Sea Hedgehog	*Halocynthia igaboja*	1
Small Planktonic Medusa	*Sarsia princeps*	1
Taylor's Social Tunicate	*Metandrocarpa taylori*	1
Total Number of Species	16	
Total Observations		17

Lacy Crust Bryozoan by leftcoaster



Serpulid Tubeworm by leftcoaster



California Boring Sponge by leftcoaster

Bryozoa and Worms		
Common Name	**Scientific Name**	**Number of Observations**
Glassy Tubeworm	*Spiochaetopterus costarum*	1
Lacy Crust Bryozoan	*Membranipora villosa*	1
Lattice-Work Bryozoan	*Phidolopora pacifica*	1
Northern Feather Duster Worm	*Eudistylia vancouveri*	3
Purple Encrusting Bryozan	*Disporella separata*	1
Red-trumpet Calcareous Tubeworm	*Serpula columbiana*	1
Sand Fan Worm	*Myxicola infundibulum*	1
Serpulid Tubeworm	*Protula pacifica*	1
Spaghetti Worms	*Eupolymnia crassicornis*	1
Spiral Bryozan	*Bugula californica*	1
Total Number of Species	11	
Total Observations		13

Hydroids and Sea Sponges		
Common Name	**Scientific Name**	**Number of Observations**
Bugulina Stolonifera	*Bugulina stolonifera*	1
California Boring Sponge	*Cliona californiana*	1
Glass Sponge	*Rhabdocalyptus dawsoni*	1
Glassy Plume Hydroid	*Plumularia setacea*	1
Hermit Horny Sponge	*Suberites latus*	1
Husked Horny Sponge	*Penares cortius*	1

Hermit Horny Sponge by leftcoaster

Oaten Pipes Hydroid	*Tubularia indivisa*	1
Orange Finger Horny Sponge	*Isodictya rigida*	1
Orange Puffball Sponge	*Tethya californiana*	1
Rough Scallop Horny Sponge	*Myxilla incrustans*	1
Total Number of Species	11	
Total Observations		11
Total Fauna Species Observed	**123**	
Total Number of Observations		**143**

Note that the above tables refer to species as threatened, invasive, or introduced only in the context of BC. Species may have a different status elsewhere in North America or globally, even if they are not listed as such here.

Table 3. Comparison of Results Between 2021 - 2023 Flora and Fauna Observations.

Year	Number of Flora Observations	Number of Flora Species	Number of Fauna Observations	Number of Fauna Species	Total Observations
2023	210	113	143	123	**341**
2022	964	324	143	83	**1,107**
2021	290	167	455	222	**745**

As shown in Table 3, the total number of observations recorded from the 2023 BioBlitz decreased from 745 in 2021 and 1,107 in 2022, indicating an increase in participant engagement during 2021 and 2022 but a decrease in 2023.

Although there was a decrease in observations overall, this year's BioBlitz proved unique in that a great number of marine Fauna observations were recorded. These observations have helped to provide a better understanding of species diversity, both native and exotic that inhabit the Biosphere Region.

Table 4. Comparison of Results Between 2016-2019 BioBlitzing at Milner Gardens.

Year	Number of Flora Species	Number of Fauna Species	Total Observations
2019	84	64	**148**
2018	96	49	**145**
2017	171	62	**233**
2016	108	36	**144**

As shown in Table 4, the number of observations of both Flora and Fauna species greatly increased after the adoption of both the iNaturalist app and Blitzing Biosphere wide.

Utilizing iNaturalist has allowed for more observations to be recorded, as well as a far greater amount of data to be captured. While the Blitzing events from 2016-2019 were conducted solely at Milner Gardens, within a much shorter window of one day, the opportunities for participants

to collect data were limited. However, the 2021, 2022 and 2023 Blitzing spanned over three days, providing participants with more time to collect observations and Blitz at their leisure. This format helped to greatly increase participation over the past three years', contributing to a greater and more holistic dataset which encompasses the entire Biosphere.

Another benefit of using the iNaturalist app has been the ability to record both the number of species found and the total number of observations. While Blitzing from 2016-2019 only included the total number of species and not the total number of observations. This has been a great advantage, as it has provided insight into species abundance, i.e. if there are multiple numbers of one species recorded. This key data will help provide insight into the populations, abundance and distribution of species throughout the MABR, while providing great background knowledge surrounding the health and prosperity of our ecosystems.

Future Blitzing

Our future goals are to continue to Blitz the entire Biosphere region, while highlighting core areas such as Wildlife Management Areas, and Provincial, Regional and Municipal parks. These areas maintain some level of protection and may be able to be consistently surveyed year after year to allow for an accurate comparison between species data. Using the iNaturalist app to record observations has proven to be successful and will be implemented again in future BioBlitz events.

The Mount Arrowsmith Biosphere Region is a stunningly beautiful and diverse region with a myriad of species to discover and steward. Our team is inspired and eager to explore, engage, and educate one another about these important ecosystems and habitats that we all live in and share. We look forward to continuing this event throughout the MABR for years to come.

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Appendix A: Map of the Mount Arrowsmith Biosphere Region Boundary for the 2023 BioBlitz