

Mount Arrowsmith Biosphere Region BioBlitz 2018: Summary Report



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Executive Summary

The Mount Arrowsmith Biosphere Region (MABR), located on the eastern coast of Vancouver Island, encompasses an ecologically diverse range of habitats and ecosystems within its watershed boundaries. These ecosystems hold special importance to the region culturally, environmentally, and economically. Our team at the Mount Arrowsmith Biosphere Region Research Institute (MABRRI) strives to embrace and celebrate these diverse values through research, education, and community outreach, promoting environmental conservation and awareness of this beautiful and extraordinary place that we all live and share.

A BioBlitz is a rapid biological survey of flora and fauna that embraces citizen science, connecting local community members, students, faculty, knowledge holders, naturalists, and scientists to identify as many species as possible within the allocated time frame. One benefit of conducting a BioBlitz is that the data collected by participants can provide a snapshot of biodiversity and species richness within the region. Other benefits associated with a BioBlitz includes an increased regional knowledge of changes to species abundance, habitat for Species at Risk, as well as changes in invasive species distribution over time. The data collected during the annual event helps inform the management of sensitive habitats and ecosystems within the region.

The results of the participant data collected during the third annual BioBlitz at Milner Gardens & Woodland in Qualicum Beach include eleven different tree species, eighteen shrub species, twenty five species of herbs and wildflowers, six fern species, four sedge species, twenty one moss species, eight species of lichen, two fungi species, and one slime mold species. Participants observed three species of invasive flora at Milner Gardens, identifying one endangered (red-listed) Species at Risk. Furthermore, fauna species that were observed at Milner Gardens included two birds of prey, one shore bird, sixteen different waterfowl species, twenty-six forest bird species, and four other



fauna species. Of the fauna species at Milner Gardens, three were listed under the Provincial Species at Risk: one threatened, one endangered, and one of special concern.

Participants collecting data at the Englishman River Regional Park (ERRP)/Top Bridge Trail Head in Parksville observed 119 different flora and fauna species within the park boundaries. The flora species included thirteen tree species, twenty four shrub species, sixty seven herb and wildflower species, eight ferns and allies, four mosses, one lichen, one rush, and one grass species. Additionally, participants observed one bird of prey, seven species of forest bird, and three other fauna species. Eight invasive flora species were observed at ERRP and one endangered flora species was identified.

The data collected from conducting biogeographic flora and fauna surveys is important for gaining sound baseline knowledge of existing biodiversity in the region. Annual biological monitoring will allow researchers to observe trends and changes over time that can indicate the fluctuations in species at risk, invasive species, and overall species richness of a region (MABRRI, 2016). Changes in habitat health from long-term climate trends and local weather patterns can have a significant impact on the state of the environment, and these changes can be detected over time with community monitoring initiatives (MABRRI, 2016). The data collected at the first annual MABR BioBlitz at Milner Gardens on April 17, 2016 has been compared to the data collected at Milner Gardens during the second annual MABR BioBlitz on April 22, 2017, as well as the most recent event, which occurred on April 21, 2018. The data was compared in order to observe changes and counts of different flora and fauna species that were identified (Table 1).

Events such as the MABR BioBlitz have the capability to expand local knowledge of biodiversity and wildlife habitat within the region while contributing to a publically available and transparent data set that will be valuable and useful for future generations and long-term species trend analysis. This research aims to promote the health and resilience of our natural systems and all the intricate and unique characteristics and relationships within these ecosystems (MABRRI, 2016). 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. With future BioBlitz events, the aim is to expand its boundaries of the event year after year to include a greater variety of ecosystems, habitats and microclimates within the MABR. This expansion will provide an opportunity to observe and monitor trends in species inventory over a greater geographic range on Vancouver Island. Additionally, the MABR BioBlitz strives to increase student research and participation in the event coordination and grow the citizen-science based participation each year (MABRRI, 2016).

Introduction

The 2018 MABR BioBlitz was developed entirely by student researchers at Vancouver Island University's (VIU) through the biosphere reserves research institute, MABRRI. The 2018 BioBlitz event is the third annual event held in collaboration with the Brant Wildlife Festival, the Nature's Trust of BC, the Regional District of Nanaimo, and Milner Gardens & Woodland; the goal is to promote citizen science-based research while celebrating wildlife and biodiversity within the MABR.

The MABR is a UNESCO designated biosphere reserve located on mid-eastern Vancouver Island. The MABR spans a geographic area of 1,200 km² and is known as a place where people live and work together in hopes of creating a sustainable future where they can live in harmony with nature (MABRRI, 2016). The MABR BioBlitz event supports these values and is designed to connect people with nature through species identification and knowledge building. The last three years of blitzing have been successful, accomplishing the goals of providing an engaging platform for community members to connect with local experts and peers while learning about their local environment. The event has successfully worked toward increasing participant's knowledge of biodiversity while equipping these individuals with basic stewardship field skills.

The 2018 BioBlitz was successful in expanding the event, relative to previous, years by including a new location within the MABR for the event that was different from previous years. The geographic expansion of the project allowed for species identification in different microclimates within the region. The new location, at Englishman River Regional Park (ERRP)/Top Bridge Trail Head, created an opportunity for expert biologists, botanists, ornithologists, naturalists, and experienced BioBlitzers to participate in a terrestrial biological survey of flora and fauna species. The Milner Gardens & Woodland BioBlitz site continued for its third year, hosting BioBlitz training for those individuals that are new to species identification and require



some guidance from local experts. The data collected annually at the Milner Gardens BioBlitz is compiled into a database for comparison over time (Table 1). The data collected is useful in analyzing trends and changes in our natural environment as well as evaluating human influences over time.

Milner Gardens & Woodland

Milner Gardens and Woodland consists of 60 acres of coastal and upland forests, as well as, 10 acres of developed gardens. In 1996, VIU obtained the lands from Ray and Veronica Milner and thus was given the name “Milner Gardens”; VIU must preserve the garden for education and communal purposes (About Milner Gardens, n.d.). The Milner Woodland is comprised of Coastal Douglas-fir old-growth forests with an understory of Western red cedar, Grand fir, and Red alder; it is perceived as a relatively productive ecosystem (MABRRI, 2016). Due to the geographic location of the Milner Woodland, it is considered to be a “rain shadow” forest, which consists of warm, dry summers and mild, wet winters (MacKinnon, 2013). This relatively rare, yet extremely productive ecosystem accounts for 0.2% of the province of British Columbia and contains the lowest volume of old growth trees, which raises considerable concern for conservation of these forests (About Milner Gardens, n.d.). Milner Gardens & Woodland staff and volunteers are dedicated to preserving these ecosystems and the species at risk that are found within them (MABRRI, 2016).

Milner Gardens consists of meadow lawns and many varieties of rhododendrons, as well as, trees and shrubs brought home from Ray and Veronica Milner’s Travels from around the world (About Milner Gardens, n.d.) Exotic species include the Red Japanese Maple (*Acer palmatum*), Spanish chestnut (*Castanea saliva*), a Golden chain tree (*Laburnum x watereri ‘Vossii’*), Chinese dogwood (*Corpus kousavar. Chinensis*), and a Dove tree (*Davidia involucrate*) (About Milner Gardens, n.d.; MABRRI, 2016). Additionally, due to Milner Gardens possessing such rare species from around the globe, it is considered to be a place with important educational resources for research opportunities, as well as public outreach and enjoyment.

Why a BioBlitz at Milner Gardens?

Milner Gardens & Woodland has proven to be an excellent venue for the MABR BioBlitz over the past three years. There are many benefits to hosting the event at Milner Gardens, including the amazing staff and volunteers whom have been very helpful and accommodating with assisting in the organization and logistics of the event. The 2016 BioBlitz was the first ever pilot event and it was determined that Milner Gardens would be the perfect location for the MABRRI team of research assistants, experts, and volunteers to train community members to collect flora and fauna identification data. Accessibility, parking, washrooms, and other facilities that Milner Gardens make the location an ideal choice for community members to learn in a safe and comfortable environment. Milner

Gardens is a VIU entity and has a strong relationship with the MABR and MABRRI through various collaborative student research projects. Milner Gardens will continue to be the designated training site for future MABR BioBlitz events.

Englishman River Regional Park/Top Bridge

Englishman River Regional Park is located in Parksville, bordering along the Englishman River conservation corridor (Regional District of Nanaimo (RDN), 2008). The Park boasts a lush terrestrial ecosystem and important habitat for fish and wildlife. The Park consists of two parcels in the northern boundary of the Englishman River that are owned by the Nature Trust of British Columbia, Ducks Unlimited Canada, and the Nature Conservancy of Canada. The RDN manages the Regional Park through lease agreements in order to ensure the responsible use of the park by recreational users, minimizing impacts to sensitive ecosystem habitats within the area (RDN, 2008). The park includes 207 hectares of floodplain and forests, nearly five kilometers of riverbanks, two side channels, and a community salmon hatchery (RDN, 2008). Top Bridge Regional Trail connects three parks and conservation areas along the Englishman River through a network of trails, including ERRP (See Appendix D for a map of the ERRP boundaries).



Why a BioBlitz at Englishman River Regional Park/Top Bridge?

Englishman River Regional Park/Top Bridge was expressed by several members within the MABR community as an area of interest for a BioBlitz. Additionally, Top Bridge is one of the 10 Amazing Places within the MABR, which are special locations that are well-loved, publically accessible outdoor spaces (MABR, 2018). The BioBlitz data collected during the event will assist the RDN in managing environmentally sensitive areas of the park that experience high levels of foot traffic. A five-year management plan of the park was established in 2008 to outline the long-term vision, as well as management and stewardship strategy for the property (RDN, 2008).

This biologically rich site was an excellent choice for a second BioBlitz location due to its natural characteristics, habitat, and diverse recreational values. The location also importantly had an on-site washroom, as well as accessible parking and trails. The data collected during the 2018 MABR BioBlitz included location information for the species identified, allowing MABRRI to map the inventoried species for further management of the Park.

Goals and Objectives

There were several key deliverables and objectives associated with the 2018 MABR BioBlitz, which built on the success of previous biological surveys. The goal is to continue to grow the event year after year and extend the geographic boundaries, selecting different sites within the MABR. The goals and objectives of the 2018 MABR BioBlitz are as follows:



1. Have MABRRI student researchers plan and host a BioBlitz at both Milner Gardens and Woodland and a secondary site within the MABR.
2. Promote VIU student research through outreach in the local community and spark interest in environmental stewardship while also increasing knowledge and understanding of the MABR.
3. Contribute to long-term monitoring of flora and fauna in the MABR while expanding the event from the previous year.

4. Maintain Milner Gardens & Woodland as a training site for beginner BioBlitzers and introduce a second site for more experienced and/or advanced BioBlitzers that require little or no guidance to identify flora and fauna species.
5. Provide the RDN with the data collected during species inventories at Englishman River Regional Park to aid in further management of the Park and future conservation efforts.
6. Provide participants and the public with a finalized flora and fauna collection form, in report form, for species identified during the event.

Overall, the annual BioBlitz event aims to engage VIU students with the community, enhancing their research skills by bringing them together with VIU faculty, local experts, citizen scientists, and local participants to collaborate on a regional research project. While VIU students benefit from learning through teaching and engaging with the members of the community and local knowledge holders, there is a positive benefit to all participants through connections made with each other and the environment. Additionally, those participants that conducted an individual biological survey are able to contribute to the research and be part of a regional community initiative.

Methods, Tools, and Equipment Used

Local participants were self-selected by signing up for this event on the online BioBlitz Eventbrite registration page for either of the two study sites. Expert team leaders were contacted prior to the event by the MABRRI team based on their area of expertise (flora and fauna). On the day of the event participants joined the MABRRI team of volunteers at either Milner Gardens & Woodland or Englishman River Regional Park to participate in the event. At Milner Gardens the day's events were separated into two sessions, one in the morning and another in the afternoon. All participants were provided with clipboards and field forms for data collection of both plant and bird species. The groups at Milner Gardens were separated into groups that were interested in birding or plant identification. The birding groups were provided use of spotting scopes and data collection forms. Those that were participating in the plant surveys were provided with *Plants of Coastal British Columbia* by Jim Pojar and Andy MacKinnon, along with magnifying glasses and data collection forms. BioBlitz participants were initially sent to separate starting stations throughout Milner Gardens but were encouraged to branch out and navigate throughout the stations to identify a greater variety of species than one station could provide. This method appeared to work well as participants were able to Blitz in several different ecosystems around the property, increasing the number of species identified on site.

BioBlitz participants at Englishman River Regional Park were provided with species identification books, a map with location grid, a handheld Global Positioning System (GPS), and data collection forms for the terrestrial flora and fauna survey of the Park. Participants

were encouraged to use whichever method they preferred for species identification based on their background of expertise and field experience.

Findings

The data collected during the 2018 BioBlitz at Milner Gardens & Woodland contributes to baseline data that can be compared to data from the previous MABR BioBlitz events. The species data collected at Englishman River Regional Park is provided to the RDN for use in management of the park and is made publically available for researchers to use. The MABR BioBlitz event is a platform that allows participants to gain hands on experience and knowledge in species identification. The event aims to encourage these participants to continue to be environmental stewards in their own lives or at the very least connect them with nature within the MABR.



Comparison of Data between 2016, 2017, and 2018 Milner Gardens BioBlitzes

The collection of the following data allows Milner Gardens to update their current species inventory and contributes to long-term monitoring for the flora and fauna within the MABR, which is one of the projects main objectives. Table 1 is a complete list of flora identified within Milner Gardens & Woodland on April 17, 2016, April 22, 2017, and April 21, 2018 during the MABR BioBlitz. The data was compiled into one table for ease of comparison between the three years. NOTE: invasive species are highlighted in **RED**, exotic species are highlighted in **GREEN**, and Species at Risk are highlighted in **BLUE**. The flora Species at Risk that was identified during the 2018 MABR BioBlitz was the endangered American Bulrush (*Schoenoplectus americanus*). Exotic flora species that were identified during the 2018 MABR BioBlitz were English Holly (*Ilex aquifolium*), Himalayan Blackberry (*Rubus armeniacus*), and English Ivy (*Hedera helix*). Exotic Species identified included Common Foxglove (*Digitalis purpurea*), Creeping Buttercup (*Ranunculus repens*),

Herb Robert (*Geranium robertianum*), Stinging Nettle (*Urtica dioica*), Wall Lettuce (*Lactuca muralis*), and Wall Speedwell (*Veronica arvensis*).

Table 1. Compiled Findings from 2016, 2017, and 2018 MABR BioBlitz Flora Species (both morning and afternoon sessions) at Milner Gardens & Woodland.

Trees				
Species Common Name	Species Scientific Name	2016	2017	2018
Arbutus	<i>Arbutus menziesii</i>		X	
Big-Leaf Maple	<i>Acer macrophyllum</i>	X	X	X
Bitter Cherry	<i>Prunus emarginata</i>	X		X
Douglas-fir	<i>Pseudotsuga menziesii</i>	X	X	
Grand Fir	<i>Abies grandis</i>	X	X	X
Holly, English	<i>Ilex aquifolium</i>	X	X	X
Lodgepole Pine	<i>Pinus contorta</i>	X		
European Mountain Ash	<i>Sorbus aucuparia</i>		X	X
Pacific Crab Apple	<i>Malus fusca</i>	X		X
Pacific Dogwood	<i>Cornus nuttallii</i>	X		
Pacific Willow	<i>Salix lasiandra</i>	X		
Red Alder	<i>Alnus rubra</i>	X	X	X
Sitka Willow	<i>Salix sitchensis</i>	X		
Western Hemlock	<i>Tsuga heterophylla</i>	X	X	X
Western Red Cedar	<i>Thuja plicata</i>	X	X	X
Western Yew	<i>Taxus brevifolia</i>		X	X
Willow	<i>Salix spp.</i>			X
Total Number of Species		13	10	11
Shrubs				
Species Common Name	Species Scientific Name	2016	2017	2018

Baldhip Rose	<i>Rosa gymnocarpa</i>	X	X	X
Cascara	<i>Rhamnus purshiana</i>	X	X	X
Devils Club	<i>Oplopanax horridus</i>	X		
Dull Oregon Grape	<i>Mahonia nervosa</i>	X	X	X
Evergreen Huckleberry	<i>Vaccinium ovatum</i>	X		X
Falsebox	<i>Pachistima myrsinites</i>		X	X
Hardhack	<i>Spiraea douglasii ssp. douglasii</i>	X	X	X
Himalayan Blackberry	<i>Rubus armeniacus</i>	X	X	X
Nootka Rose	<i>Rosa nutkana</i>	X		X
Ocean Spray	<i>Holodiscus discolor</i>	X	X	X
Red Elderberry	<i>Sambucus racemosa</i>	X	X	X
Red Huckleberry	<i>Vaccinium parvifolium</i>	X	X	X
Red-Osier Dogwood	<i>Cornus stolonifera</i>	X	X	X
Salal	<i>Gaultheria shallon</i>	X	X	X
Salmonberry	<i>Rubus spectabilis</i>	X	X	X
Scoulers Willow	<i>Salix scouleriana</i>		X	X
Sitka Mountain-ash	<i>Sorbus sitchensis</i>			X
Tall Oregon Grape	<i>Mahonia aquifolium</i>		X	
Thimbleberry	<i>Rubus parviflorus</i>	X	X	X
Trailing Blackberry	<i>Rubus ursinus</i>	X	X	X
Western Trumpet Honeysuckle	<i>Lonicera ciliosa</i>		X	
Total Number of Species		16	17	18
Herbs & Wildflowers				
Species Common Name	Species Scientific Name	2016	2017	2018
Aniseed	<i>Apiaceae spp.</i>	X		
Arrow-Leaved Groundsel	<i>Senecio triangularis</i>		X	
Bittercress	<i>Cardamine spp.</i>	X	X	

Broad-Leaf Shooting Star	<i>Dodecatheon hendersonii</i>		X	
Broad-Leaved Starflower	<i>Trientalis latifolia</i>		X	X
Buttercups	<i>Ranunculus spp.</i>		X	X
Canadian Bunchberry	<i>Cornus Canadensis</i>		X	
Chickweed	<i>Stellaria spp.</i>		X	X
Cleavers	<i>Gallium aparine</i>	X	X	X
Common Foxglove	<i>Digitalis purpurea</i>	X	X	X
Creeping Buttercup	<i>Ranunculus repens</i>	X	X	X
Crisp Sandwort	<i>Stellaria crispa</i>	X		X
Daffodil	<i>Narcissus spp.</i>		X	
Duckweed	<i>Lemnoideae spp.</i>		X	
English Daisy	<i>Bellis perennis</i>	X	X	
English Ivy	<i>Hedera helix</i>	X		X
Few-Seeded Bitter-cress	<i>Cardamine oligosperma</i>			X
Forget-Me-Not	<i>Myosotis spp.</i>	X		X
Geranium	<i>Geranium spp.</i>		X	
Herb Robert	<i>Geranium robertianum</i>	X	X	X
Horsetail, Common	<i>Equisetum arvense</i>		X	
Miner's Lettuce	<i>Claytonia perfoliata</i>	X	X	X
Northern Starwort	<i>Cerastium arvense</i>			X
One-Sided Wintergreen	<i>Orthilia secunda</i>	X		
Ox-Eye Daisy	<i>Leucanthemum vulgare</i>		X	
Pacific Bleeding Heart	<i>Dicentra formosa</i>	X	X	
Pacific Coralroot	<i>Corallorhiza maculata sp. Mertensiana</i>	X		
Pacific Trillium	<i>Trillium ovatum</i>	X	X	X
Pinedrops	<i>Pterospora andromedea</i>	X		
Pinesap	<i>Monotropa hypopitys</i>	X		

Pink Fawn Lily	<i>Erythronium revolutum</i>		X	
Prunella	<i>Lamiaceae spp.</i>		X	
Purple Dead Nettle	<i>Lamium purpureum</i>		X	
Parsley-piert	<i>Aphanes spp.</i>	X	X	
Sitka Columbine	<i>Aquilegia formosa</i>	X		
Skunk Cabbage	<i>Lysichiton americanus</i>	X	X	X
Small Bedstraw	<i>Galium trifidum</i>			X
Snowberry	<i>Symphoricarpos albus</i>	X		
Stinging Nettle	<i>Urtica dioica</i>	X	X	X
Sweet-Scented Bedstraw	<i>Galium triflorum</i>	X	X	X
Three-Leafed Foamflower	<i>Tiarella trifoliata</i>	X		
Trailing Yellow Violet	<i>Viola sempervirens</i>		X	
Twin Flower	<i>Linnaea borealis</i>		X	X
Vancouver Groundcone	<i>Boschniakia hookeri</i>		X	
Vanilla Leaf	<i>Achlys triphylla</i>	X	X	X
Wall Lettuce	<i>Lactuca muralis</i>	X	X	X
Wall Speedwell	<i>Veronica arvensis</i>			X
Water Parsley	<i>Oenanthe sarmentosa</i>	X	X	X
Western Bitter-Cress	<i>Cardamine occidentalis</i>			X
Western Coralroot	<i>Corallorhiza maculata ssp. Mertensiana</i>		X	
Western Dock	<i>Rumex spp.</i>	X		
Wood Sorrel	<i>Oxalis spp.</i>		X	
Yellow Flag Iris	<i>Iris pseudacorus</i>		X	
Total Number of Species		28	36	25
Ferns				
Species Common Name	Species Scientific Name	2016	2017	2018
Bracken Fern	<i>Pteridium aquilinum</i>	X	X	X

Deer Fern	<i>Blechnum spicant</i>	X	X	
Green Spleenwort	<i>Asplenium viride</i>		X	X
Lady Fern	<i>Athyrium filix-femina</i>	X	X	X
Licorice Fern	<i>Polypodium glycyrrhiza</i>	X		
Oak Fern	<i>Gymnocarpium dryopteris</i>	X		X
Spiny Wood Fern	<i>Dryopteris expansa</i>	X	X	X
Sword Fern	<i>Polystichum munitum</i>	X	X	X
Total Number of Species		7	6	6
Sedges				
Species Common Name	Species Scientific Name	2016	2017	2018
American Bulrush	<i>Schoenoplectus americanus</i>			X
Pale Sedge	<i>Carex livida</i>			X
Sedges	<i>Cyperaceae spp.</i>		X	X
Slough Sedge	<i>Carex obnupta</i>	X	X	X
Small-Flowered Sedge	<i>Lipocarpa micrantha</i>		X	
Total Number of Species		1	3	4
Grasses				
Species Common Name	Species Scientific Name	2016	2017	2018
Bitter Grass	<i>Calea ternifolia</i>	X		
Reed Canary Grass	<i>Phalaris arundinacea</i>	X	X	
Sweet Vernal Grass	<i>Anthoxanthum odoratum</i>	X		
Total Number of Species		3	1	0
Mosses				
Species Common Name	Species Scientific Name	2016	2017	2018
Badge Moss	<i>Plagiomnium insigne</i>	X	X	X
Bent Leaf Moss	<i>Rhytidiadelphus squarrosus</i>	X	X	
Broom Moss	<i>Dicranum scoparium</i>	X	X	

Capillary Thread-Moss	<i>Bryum capillare</i>		X	
Cat Tail Moss	<i>Isoetecium myosuroides</i>	X	X	X
Clear Moss	<i>Hookeria lucens</i>			X
Coastal Leafy Moss	<i>Plagiomnium insigne</i>	X	X	
Coiled Leaf Moss	<i>Hypnum circinale</i>		X	
Common Witch's Hair	<i>Alectona sarmentosa</i>	X		
Cord Moss	<i>Leptobryum pyriforme</i>		X	
Crane's Bill Moss	<i>Atrichum selwynii</i>		X	
Curly Thatch Moss	<i>Dicranoweisia cirrata</i>	X		X
Cylindric Beard-Moss	<i>Didymodon insulanus</i>		X	
Douglas' Neckera Moss	<i>Neckera douglasii</i>	X		
Dusky Fork-Moss	<i>Dicranum fuscescens</i>	X	X	X
Electrified Cats-Tail Moss	<i>Rhytidiadelphus triquetrus</i>	X	X	X
Fan Moss	<i>Rhizomnium glabrescens</i>	X	X	X
Flat Moss	<i>Pseudotaxiphyllum elegans (buckiella)</i>	X		
Fragile Fork Moss	<i>Dicranum tauricum</i>		X	
Golden Short-Capsuled Moss	<i>Brachythecium frigidum</i>			X
Green/Herzog's Pocket Moss	<i>Fissidens viridulus/limbatus</i>		X	
Hairy Screw Moss	<i>Tortula ruralis</i>		X	
Hanging Moss	<i>Antitrichia curtipendula</i>		X	
Juniper Haircap Moss	<i>Polytrichum juniperinum</i>		X	
Lanky Moss	<i>Rhytidiadelphus loreus</i>	X	X	
Large Hair Moss	<i>Oligotrichum parallelum</i>			X
Lovers Moss	<i>Aulacomnium androgynum</i>	X		
Lyell's Bristle Moss	<i>Orthotrichum lyellii</i>		X	
Magnificent Moss	<i>Plagiomnium venustum</i>	X		

Menzies' Neckera	<i>Metaneckera menziesii</i>			X
Menzies' Tree Moss	<i>Leucolepis acanthoneuron</i>	X	X	X
Moss	<i>Dicranum spp.</i>	X		X
Nocktooth Leafy Moss	<i>Mnium spinulosum</i>	X		
Nuttall's Homalothecium Moss	<i>Homalothecium nuttallii</i>		X	
Oregon Beaked Moss	<i>Kindbergia oregana</i>	X	X	X
Pale-Fruited Thread Moss	<i>Pohlia annotina</i>		X	
Palm Tree Moss	<i>Leucolepis acanthoneuron</i>	X	X	
Park Moss	<i>Zygodon rupestris</i>		X	
Pipe Cleaner Moss	<i>Rhytidiopsis robusta</i>		X	X
Plume Moss	<i>Dendroalsia Abientina</i>	X		
Red Mouthed Mnium	<i>Mnium spinulosum</i>		X	X
Red Roof Moss	<i>Ceratodon purpureus</i>		X	
Rough Moss	<i>Claopodium crispifolium</i>		X	
Shaggy Moss	<i>Rhytidiadelphus triquetrus</i>		X	
Silky Forklet-Moss	<i>Dicranella heteromalla</i>		X	
Slender Beaked Moss	<i>Kindbergia praelonga</i>	X	X	X
Small Leaf Moss	<i>Pseudotaxiphyllum elegans</i>		X	
Soft-Tufted Beard-Moss	<i>Didymodon vinealis</i>		X	
Spear Moss	<i>Calliergonella cuspidata</i>		X	
Step Moss	<i>Hylocomium splendens</i>	X	X	X
Tall Clustered Thread Moss	<i>Bryum pallescens</i>			X
Tangled Moss	<i>Heterocladium procurrens</i>	X		
Tree Moss	<i>Climacium dendroides</i>	X		X
Wavy Leaved Cotton Moss	<i>Plagiothecium undulatum</i>	X	X	X
Wet Rock Moss	<i>Dichodontium pellucidum</i>		X	X
Yellow Moss	<i>Homalothecium fulgescens</i>		X	

Total Number of Species		26	40	21
Liverworts				
Species Common Name	Species Scientific Name	2016	2017	2018
Blue Pouchwort	<i>Calypogeia azurea</i>		X	
Crescent-Cup Liverwort	<i>Lunularia cruciate</i>		X	
Hanging Millipede Liverwort	<i>Frullania nisquallensis</i>		X	
Hard Scale Liverwort	<i>Mylia taylorii</i>		X	
Ladle Liverwort	<i>Scapania bolanderi</i>		X	
Lesser Featherwort	<i>Plagiochila porelloides</i>		X	
Little Hands Liverwort	<i>Lepidozia reptans</i>		X	
<i>Lophocolea cuspidate</i>	<i>Lophocolea cuspidate</i>		X	
Snake Liverwort	<i>Conocephalum conicum</i>	X		
Tree Ruffle Liverwort	<i>Porella navicularis</i>	X	X	
Two-Horned Pincerwort	<i>Cephalozia bicuspidate</i>		X	
Yellow-Ladle Liverwort	<i>Scapania bolanderi</i>	X	X	
Total Number of Species		3	11	0
Lichens				
Species Common Name	Species Scientific Name	2016	2017	2018
Antlered Perfume	<i>Evernia prunastri</i>	X	X	
Bark Barnacle Lichen	<i>Thelotrema lepadinum</i>		X	
Beaded Bone	<i>Hynogymia enteromorpha</i>			X
Bitter Wart Lichen	<i>Pertusaria amara</i>		X	
Camouflage Lichen	<i>Melanelia spp.</i>		X	
Cumberland Rock-Shield	<i>Xanthoparmelia cumberlandia</i>		X	
Dotted Bush Lichen	<i>Ramalina farinacea</i>		X	
Dust Lichens	<i>Lepraria spp.</i>	X	X	X
Forking Bone	<i>Hypogymnia inactiva</i>			X

Frog Pelt	<i>Peltigera neopolydactyla</i>	X		X
Gold Dust Lichens	<i>Chrysothrix spp.</i>		X	
Herringbone Beard	<i>Usnea filipendula</i>		X	
Lichen	<i>Cladina spp.</i>	X		
Lichen	<i>Cladonia spp.</i>	X		
Lichen	<i>Usnea spp.</i>	X		
Lipstick pixie	<i>Cladonia macilenta</i>		X	
Lungwort Lichen	<i>Lobaria pulmonaria</i>	X	X	
Membranous Dog Lichen	<i>Peltigera membranacea</i>		X	
Methuselah's Beard	<i>Usnea longissima</i>			X
Nit Beard	<i>Usnea subfloridana</i>		X	
Oak Moss Lichen	<i>Evernia prunastri</i>		X	
Rag Bag Lichen	<i>Platismatia glauca</i>	X	X	X
Rose-Bud Pert	<i>Pertusaria subambigens</i>		X	
Sarea resinae	<i>Sarea resinae</i>		X	
Saucer Lichen	<i>Ochrolechia laevigata</i>		X	
Shield Lichen	<i>Parmelia sulcate</i>		X	
Script Lichen	<i>Graphis scripta</i>		X	
Speckled Horsehair	<i>Bryoria fuscescens</i>			X
Tattered Rag Lichen	<i>Platismatia herrei</i>	X	X	X
Tree Lungwort	<i>Lobaria pulmonaria</i>		X	
Tree Pelt	<i>Peltigera collina</i>		X	
Trumpet Lichen	<i>Cladonia fimbriata</i>		X	
Total Number of Species		9	24	8
Fungi				
Species Common Name	Species Scientific Name	2016	2017	2018
Artist Conk	<i>Ganoderma applanatum</i>		X	

Bird's Nest Fungus	<i>Nidulariaceae spp.</i>		X	
Bitter Iodine Polypore	<i>Albatrellus hirtus</i>		X	
Cedar Needle Blight	<i>Didymascella thujina</i>		X	
Coccomyces dentatus	<i>Coccomyces dentatus</i>		X	
Dasyscyphus bicolor	<i>Dasyscyphus bicolor</i>		X	
Deer Mushroom	<i>Pluteus cervinus s.l.</i>		X	
Dye Polypore	<i>Phaeolus schweinitzii</i>		X	
Heterotextus luteus	<i>Heterotextus luteus</i>		X	
Jelly fungus	<i>Dacrymyces spp.</i>		X	
Leaf Fungus	<i>Stereum spp.</i>		X	
Lichen Agaric	<i>Lichenomphalia umbellifera</i>		X	
Needle Rust	<i>Pucciniastrum goeppertianum</i>		X	
Ochre Spreading Tooth	<i>Steccherinum ochraceum</i>		X	
Panther Cap Mushroom	<i>Amanita pantherina</i>	X		
Red Belt Conk	<i>Fomitopsis pinicola</i>		X	
Red Edge Bonnet	<i>Mycena rubromarginata</i>		X	
Ringed Conocybe	<i>Conocybe filaris</i>		X	
Saprotrophic Mushrooms	<i>Mycena spp.</i>		X	
Turkey Tail	<i>Trametes versicolor</i>		X	
Western Varnished Conk	<i>Ganoderma oregonense</i>		X	X
Witch's Butter	<i>Tremella mesenterica</i>			X
White Green-Algae Coral	<i>Multiclavula mucida</i>		X	
White Marasmius	<i>Marasmiellus candidus</i>		X	
Total Number of Species		1	22	2
Slime Molds				
Species Common Name	Species Scientific Name	2016	2017	2018
Scrambled Egg Slime Mold	<i>Fuligo septica</i>		X	

Tapioca Slime	<i>Brefeldia maxima</i>			X
Total Number of Species		0	1	1
Total Number of Flora Species at Milner Gardens		107	171	96

Table 2 is a complete list of fauna identified within Milner Gardens & Woodland on April 17, 2016, April 22, 2017, and April 21, 2018 during the MABR BioBlitz. The data was compiled into one table for ease of comparison between the two years. NOTE: invasive species are highlighted in **RED**, exotic species are highlighted in **GREEN**, and Species at Risk are highlighted in **BLUE**. Fauna Species at Risk that were identified during the 2018 MABR BioBlitz include the Horned Grebe (*Podiceps auritus*) and three species that are considered to be of special concern, which include the Band-Tailed Pigeon (*Patagioenas fasciata*) and the Yellow-Billed Loon (*Gavia adamsii*) that are of special concern, and the threatened Western Grebe (*Aechmophorus occidentalis*). No invasive fauna species were identified during the 2018 MABR BioBlitz.

Table 2. Compiled Findings from 2016, 2017, and 2018 MABR BioBlitz Fauna Species (both morning and afternoon sessions) at Milner Gardens & Woodland.

Birds of Prey				
Species Common Name	Species Scientific Name	2016	2017	2018
Bald Eagle	<i>Haliaeetus leucocephalus</i>	X	X	X
Barred Owl	<i>Strix varia</i>		X	X
Sharp-Shinned Hawk	<i>Accipiter striatus</i>		X	
Total Number of Species		1	3	2
Shore Birds				
Species Common Name	Species Scientific Name	2016	2017	2018
Belted Kingfisher	<i>Megaceryle alcyon</i>	X	X	
Black-Bellied Plover	<i>Pluvialis squatarola</i>	X	X	X
Black Turnstone	<i>Arenaria melanocephala</i>	X	X	
Dunlin	<i>Calidris alpina</i>	X	X	
Greater Yellow Legs	<i>Tringa melanoleuca</i>	X		
Total Number of Species		5	4	1

Waterfowl				
Species Common Name	Species Scientific Name	2016	2017	2018
Bonaparte's Gull	<i>Chroicocephalus philadelphia</i>	X	X	X
Brant	<i>Branta bernicla</i>		X	X
California Gull	<i>Larus californicus</i>	X		X
Common Loon	<i>Gavia immer</i>	X	X	X
Common Merganser	<i>Mergus merganser</i>	X	X	X
Common Murre	<i>Uria aaige</i>		X	
Glaucous-Winged Gull	<i>Larus glaucescens</i>	X	X	X
Greater Scaup	<i>Aythya marila</i>		X	
Horned Grebe	<i>Podiceps auritus</i>	X	X	X
Mallard	<i>Anas platyrhynchos</i>		X	X
Marbled Murrelet	<i>Brachyramphus marmoratus</i>	X	X	
Mew Gull	<i>Larus canus</i>	X	X	
Pacific Loon	<i>Gavia pacifica</i>	X	X	X
Pelagic Cormorant	<i>Phalacrocorax pelagicus</i>		X	X
Pidgeon Guillemot	<i>Cepphus columba</i>	X	X	X
Red-Breasted Merganser	<i>Mergus serrator</i>	X	X	
Red-Necked Grebe	<i>Podiceps grisegena</i>	X	X	X
Rhinoceros Auklet	<i>Cerorhinca monocerata</i>		X	
Surf Scoter	<i>Melanitta perspicillata</i>	X	X	X
Western Grebe	<i>Aechmophorus occidentalis</i>	X	X	X
Western Gull	<i>Larus occidentalis</i>			X
White-Winged Scoter	<i>Melanitta fusca</i>		X	X
Yellow-Billed Loon	<i>Gavia adamsii</i>			X
Total Number of Species		14	20	16

Forest Birds				
Species Common Name	Species Scientific Name	2016	2017	2018
American Robin	<i>Turdus migratorius</i>	X	X	X
Anna's Hummingbird	<i>Calypte anna</i>	X	X	X
Band-Tailed Pigeon	<i>Patagioenas fasciata</i>		X	
Bewick's Wren	<i>Thryomanes bewickii</i>			X
Black-Capped Chickadee	<i>Poecile atricapillus</i>	X		
Black-Throated Blue Warbler	<i>Setophaga caerulescens</i>		X	
Black-Throated Gray Warbler	<i>Setophaga nigrescens</i>	X	X	
Brown Creeper	<i>Certhia americana</i>		X	
Bushtit	<i>Psaltriparus minimus</i>		X	X
Chestnut-Backed Chickadee	<i>Poecile rufescens</i>		X	X
Common Raven	<i>Corvus corax</i>	X	X	X
Common Yellowthroat	<i>Geothlypis trichas</i>			
Dark-Eyed Junco	<i>Junco hyemalis</i>	X	X	X
Downy Woodpecker	<i>Picoides pubescens</i>	X		
European Starling	<i>Sturnus vulgaris</i>		X	X
Golden-Crowned Kinglet	<i>Regulus satrapa</i>		X	X
Golden-Crowned Sparrow	<i>Zonotrichia atricapilla</i>		X	X
Hammond's Flycatcher	<i>Empidonax hammondii</i>		X	
Hutton's Vireo	<i>Vireo huttoni</i>	X	X	X
Northern Flicker	<i>Colaptes auratus</i>	X	X	X
Northwestern Crow	<i>Corvus caurinus</i>	X	X	X
Nuthatch	<i>Sittidae spp.</i>	X		
Orange-Crowned Kinglet	<i>Regulus satrapa</i>		X	
Orange-Crowned Warbler	<i>Oreothlypis celata</i>		X	X

Pacific-Slope Flycatcher	<i>Empidonax difficilis</i>		X	
Pacific Wren	<i>Troglodytes pacificus</i>	X	X	X
Pileated Woodpecker	<i>Dryocopus pileatus</i>		X	X
Pine Siskin	<i>Spinus pinus</i>		X	X
Purple Finch	<i>Haemorhous purpureus</i>		X	X
Red-Breasted Nuthatch	<i>Sitta Canadensis</i>		X	X
Red-Breasted Sapsucker	<i>Sphyrapicus ruber</i>		X	X
Ruby-Crowned Kinglet	<i>Regulus calendula</i>			X
Rufous Hummingbird	<i>Selasphorus rufus</i>	X	X	X
Rufous-Sided Towhee	<i>Pipilo erythrophthalmus</i>	X	X	
Song Sparrow	<i>Melospiza melodia</i>		X	
Spotted Towhee	<i>Pipilo maculatus</i>	X		X
Townsend's Warbler	<i>Setophaga townsendi</i>		X	
Tree Swallow	<i>Tachycineta bicolor</i>			X
Varied Thrush	<i>Ixoreus naevius</i>			X
Western Tanager	<i>Piranga ludoviciana</i>		X	
Winter Wren	<i>Troglodytes hiemalis</i>	X		
Yellow Warbler	<i>Setophaga petechial</i>		X	
Yellow Rumped Warbler	<i>Setophaga coronata</i>		X	X
Total Number of Species		16	33	26
Other Species				
Species Common Name	Species Scientific Name	2016	2017	2018
Banana Slug	<i>Ariolimax spp.</i>		X	X
Black-Tailed Deer	<i>Odocoileus hemionug columbianus</i>			X
Harbour Seal	<i>Phoca vitulina</i>			X
Red-Backed Salamander	<i>Plethodon cinereus</i>		X	

Red Squirrel	<i>Tamiasciurus hudsonicus</i>			X
Total Number of Species		0	2	4
Total Number of Fauna Species at Milner Gardens		36	62	49

2018 MABR BioBlitz Data for Englishman River Regional Park

The collection of species data has been compiled into the following tables from the findings of Englishman River Regional Park. The data collected at this site is baseline data that will contribute to biological species inventory for the MABR and the RDN that meets the main objectives of the project. The baseline species inventory data will be provided to the RDN to add to their existing knowledge of the area. NOTE: invasive species are highlighted in **RED**, exotic species are highlighted in **GREEN**, and Species at Risk are highlighted in **BLUE**. One endangered flora species was identified at this site during the biological survey, which was Angled Bittercress (*Cardamine angulate*). There were eight invasive flora species identified, including: English Holly (*Ilex aquifolium*), Daphne (*Daphne laureola*), Himalayan Blackberry (*Rubus armeniacus*), English Ivy (*Hedera helix*), Giant knotweed (*Polygonum sachalinense*), Hairy Cat’s Ear (*Hypochaeris radicata*), Ox-Eye Daisy (*Leucanthemum vulgare*), and Yellow Archangel (*Lamiastrum galeobdolon*). Exotic species identified include the Common Dandelion (*Taraxacum officinale*), Creeping Buttercup (*Ranunculus repens*), Self-Heals (*Prunella vulgaris*), Wall Lettuce (*Lactuca muralis*), Wall Speedwell (*Veronica arvensis*), and White Clover (*Trifolium repens*) as is shown in Table 3.

Table 3. Compiled Findings from 2018 MABR BioBlitz of Flora Species at Englishman River Regional Park on April 21, 2018

Trees		
Species Common Name	Species Scientific Name	Observed
Arbutus	<i>Arbutus menziesii</i>	X
Big-leaf Maple	<i>Acer macrophyllum</i>	X
Bitter Cherry	<i>Prunus emarginata</i>	X
Black Cottonwood	<i>Populus balsamifera</i> spp. <i>Trichocarpa</i>	X
Douglas-fir	<i>Psuedotsuga menziesii</i>	X
Grand Fir	<i>Abies grandis</i>	X
Holly, English	<i>Ilex aquifolium</i>	X

Red Alder	<i>Alnus rubra</i>	X
Shore Pine	<i>Pinus contorta</i>	X
Sitka Spruce	<i>Picea sitchensis</i>	X
Sitka Willow	<i>Salix sitchensis</i>	X
Western Hemlock	<i>Tsuga heterophylla</i>	X
Western Red Cedar	<i>Thuja plicata</i>	X
Total Number of species		13
Shrubs		
Species Common Name	Species Scientific Name	Observed
Baldhip Rose	<i>Rosa gymnocarpa</i>	X
Black Gooseberry	<i>Ribes divaricatum</i>	X
Black Twinberry	<i>Lonicera involucrata</i>	X
Cascara	<i>Rhamnus purshiana</i>	X
Common Snowberry	<i>Symphoricarpos albus</i>	X
Daphne	<i>Daphne laureola</i>	X
Dull-Oregon Grape	<i>Mahonia nervosa</i>	X
Evergreen Huckleberry	<i>Vaccinium ovatum</i>	X
Himalayan Blackberry	<i>Rubus armeniacus</i>	X
Nootka Rose	<i>Rosa nutkana</i>	X
Ocean Spray	<i>Holoduscus discolor</i>	X
Pacific Ninebark	<i>Physocarpus capitatus</i>	X
Red Elderberry	<i>Sambucus racemose</i>	X
Red-flowering Currant	<i>Ribes ganguineum</i>	X
Red Huckleberry	<i>Vaccinium parviflorum</i>	X
Salal	<i>Gaultheria shallon</i>	X
Salmonberry	<i>Rubus spectabilis</i>	X
Saskatoon	<i>Amelanchier alnifolia</i>	X
Scotch Broom	<i>Cytisus scoparius</i>	X

Scoulers Willow	<i>Salix scouleriana</i>	X
Thimbleberry	<i>Rubus parviflorus</i>	X
Trailing Blackberry	<i>Rubus ursunus</i>	X
Twinflower	<i>Linnaea borealis</i>	X
Western Trumpet Honeysuckle	<i>Lonicera ciliosa</i>	X
Total Number of species		24
Ferns & Allies		
Species Common Name	Species Scientific Name	Observed
Bracken Fern	<i>Pteridium aquilinum</i>	X
Common Horsetail	<i>Equisetum arvense</i>	X
Fragile Fern	<i>Cystopteris fragilis</i>	X
Giant Horsetail	<i>Equisetum telmateia</i>	X
Lady Fern	<i>Athyrium filix-femina</i>	X
Licorice Fern	<i>Polypodium glycyrrhiza</i>	X
Swamp Horsetail	<i>Equisetum fluviatile</i>	X
Sword Fern	<i>Polystichum minitum</i>	X
Total Number of species		8
Herbs & Wildflowers		
Species Common Name	Species Scientific Name	Observed
Alaska Rein-orchid	<i>Platanthera unalascensis</i>	X
American Vetch	<i>Vicia americana</i>	X
Angled Bitter-cress	<i>Cardamine angulata</i>	X
Big-leaved sandwort	<i>Moehringia macrophylla</i>	X
Chickweed	<i>Stellaria spp.</i>	X
Cleavers	<i>Gallium aparine</i>	X
Coastal Strawberry	<i>Fragaria chiloensis</i>	X
Columbine	<i>Aquilegia Formosa</i>	X

Cooley's Hedge-nettle	<i>Stachys cooleyae</i>	X
Common Dandelion	<i>Taraxacum officinale</i>	X
Creeping Buttercup	<i>Ranunculus repens</i>	X
Enchanter's Nightshade	<i>Ciccaea alpina</i>	X
English Ivy	<i>Hedera helix</i>	X
False Lily-of-the-valley	<i>Maianthemum dilatatum</i>	X
Fireweed	<i>Epilobium angustifolium</i>	X
Five-Stamened Mitrewort	<i>Mitella pentandra</i>	X
Fringecup	<i>Tellima grandiflora</i>	X
Giant Knotweed	<i>Polygonum sachalinense</i>	X
Goat'sbeard	<i>Arnuncus dioicus</i>	X
Grassland Saxifrage	<i>S. integrifolia</i>	X
Harry Cat's-ear	<i>Hypochaeris radicata</i>	X
Herb Robert	<i>Geranium robertianum</i>	X
Hooker's Fairybells	<i>Disporum hookeri</i>	X
Large-leaved Avens	<i>Geum macrophyllum willd.</i>	X
Lyall's Anemone	<i>Anemone spp.</i>	X
Meadow Buttercup	<i>Ranunculus acris</i>	X
Miner's Lettuce	<i>Claytonia perfoliata</i>	X
Narrow-leaved Montia	<i>Montia linearis</i>	X
Nemophila	<i>Nemophila menziesii</i>	X
Nipplewort	<i>Lapsana communis</i>	X
Oregon anemone	<i>Anemone oregana</i>	X
Ox-Eye Daisy	<i>Leucanthemum vulgare</i>	X
Pacific Bleeding Heart	<i>Dicentra formosa</i>	X
Pacific Sanicle	<i>Sanicula crassicaulis</i>	X
Pacific Trillium	<i>Trillium ovatum</i>	X
Pacific Water-parsley	<i>Oenanthe sarmentosa</i>	X

Palmate Coltsfoot	<i>Petasites palmatus</i>	X
Pathfinder	<i>Adenocaulon bicolor</i>	X
Pearly Everlasting	<i>Anaphalis margaritacea</i>	X
Phlox spp.	<i>Collomia spp.</i>	X
Pink Fawn Lily	<i>Erythronium revolutum</i>	X
Purple Sweet-cicely	<i>Osmorphiza purpurae</i>	X
Ribwort	<i>Plantago lanceolata</i>	X
Sea Blush	<i>Plectritis congesta</i>	X
Self-Heals	<i>Prunella vulgaris</i>	X
Skunk Cabbage	<i>Lysichiton americanus</i>	X
Small-flowered Alumroot	<i>Heuchera micrantha</i>	X
Small-flowered Forget-me-not	<i>Myosotis laxa</i>	X
Small-leaved Montia	<i>Montia parvifolia</i>	X
Snow Berry	<i>Symphoricarpos albus</i>	X
Starflower	<i>Trientalis spp.</i>	X
Stream Violet	<i>Viola glabella</i>	X
Sweet-Scented Bedstraw	<i>Galium triflorum</i>	X
Tiger Lily	<i>Lilium columbianum</i>	X
Trailing Yellow Violet	<i>Viola sempervirens</i>	X
Vanilla Leaf	<i>Achyls triphylla</i>	X
Wall Lettuce	<i>Lactuca muralis</i>	X
Wall Speedwell	<i>Veronica arvensis</i>	X
Western Bittercress	<i>Cardamine occidentalis</i>	X
Western Dock	<i>Rumex occidenetalis</i>	X
Western Meadowrue	<i>Thalictrum occidentale</i>	X
Western St. John's-wort	<i>Hypericum formosum</i>	X
White Clover	<i>Trifolium repens</i>	X
White Fawn Lily	<i>Erythronium oregonum</i>	X

Wild Ginger	<i>Asarum caudatum</i>	X
Yellow Archangel	<i>Lamiastrum galeobdolon</i>	X
Yellow Monkey-flower	<i>Mimulus guttatus</i>	X
Total Number of species		67
Mosses		
Species Common Name	Species Scientific Name	Observed
Large Hair Moss	<i>Oligotrichum parallelum</i>	X
Lovers Moss	<i>Aulacomnium androgynum</i>	X
Menzies' Tree Moss	<i>Leucolepis acanthoneuron</i>	X
Step Moss	<i>Hylocomium splendens</i>	X
Total Number of species		4
Lichens		
Species Common Name	Species Scientific Name	Observed
Tattered Rag Lichen	<i>Platismatia herrei</i>	X
Total Number of species		1
Rushes		
Species Common Name	Species Scientific Name	Observed
Common Rush	<i>Juncus effusus</i>	X
Total Number of species		1
Grasses		
Species Common Name	Species Scientific Name	Observed
Bulbus Bluegrass	<i>Poa bulbosa</i>	X
Total Number of species		1
Total Number of Flora Species Top Bridge Park		119

Table 4 shows a complete list of all fauna species that were identified during the biological survey at Englishman River Regional Park on April 21, 2018. NOTE: invasive species are highlighted in RED, exotic species are highlighted in GREEN, and Species at Risk are highlighted in BLUE. No invasive, exotic, or species or Species at Risk fauna were identified during the biological survey at this site.

Table 4. Compiled Findings from 2018 MABR BioBlitz of Fauna Species at Englishman River Regional Park on April 21, 2018

Birds of Prey		
Species Common Name	Species Scientific Name	Observed
Bald Eagle	<i>Haliaeetus leucocephalus</i>	X
Total Number of Species		1
Forest Birds		
Species Common Name	Species Scientific Name	Observed
American Robin	<i>Turdus migratorius</i>	X
Chestnut-Backed Chickadee	<i>Poecile rufescens</i>	X
Common Raven	<i>Corvus corax</i>	X
Dark-Eyed Junco	<i>Junco hyemalis</i>	X
Orange-Crowned Warbler	<i>Oreothlypis celata</i>	X
Pacific Wren	<i>Troglodytes pacificus</i>	X
Yellow Rumped Warbler	<i>Setophaga coronata</i>	X
Total Number of Species		7
Other Species		
Species Common Name	Species Scientific Name	Observed
Banana Slug	<i>Ariolimax columbianus</i>	X
Western Terrestrial Garter Snake	<i>Thamnophis elegans vagrans</i>	X
Northern Red-Legged Frog	<i>Rana aurora</i>	X
Total Number of Species		3
Total Number of Fauna Species at Milner Gardens		11

Participant Feedback and Recommendations

Without the assistance, participation, and support of VIU students, local experts, citizen scientists and community members, the MABR BioBlitz would not have been such a great success. Through participant feedback and recommendations, the event and coordination is able to improve each year. With continual improvement and increased interest, the event is able to expand its geographic boundaries, as well as welcome and support more public participation and knowledge sharing within the MABR. Feedback from participants at Milner Gardens & Woodland showed that the event was unanimously a positive experience. Some stated that they enjoyed the tranquility of the outdoor forested environment, while others enjoyed learning from the knowledgeable experts. Several participants felt that the event was well organized. Further, many found it very



engaging because of the small group sizes. There were some participants that stated having a volunteer whose expertise is in fungi species would have been a good addition. Certainly for future BioBlitz events at Milner Gardens partnering with a local fungi expert is a possibility. Some feedback for improvement for future BioBlitz events includes having name tags for all volunteer staff, some more reference material such as check lists, and increased advertisement, specifically in schools. There were some comments regarding the noise from garden activity in the morning due to project work underway during the event. Overall, the feedback from the 2018 MABR BioBlitz was positive and constructive.

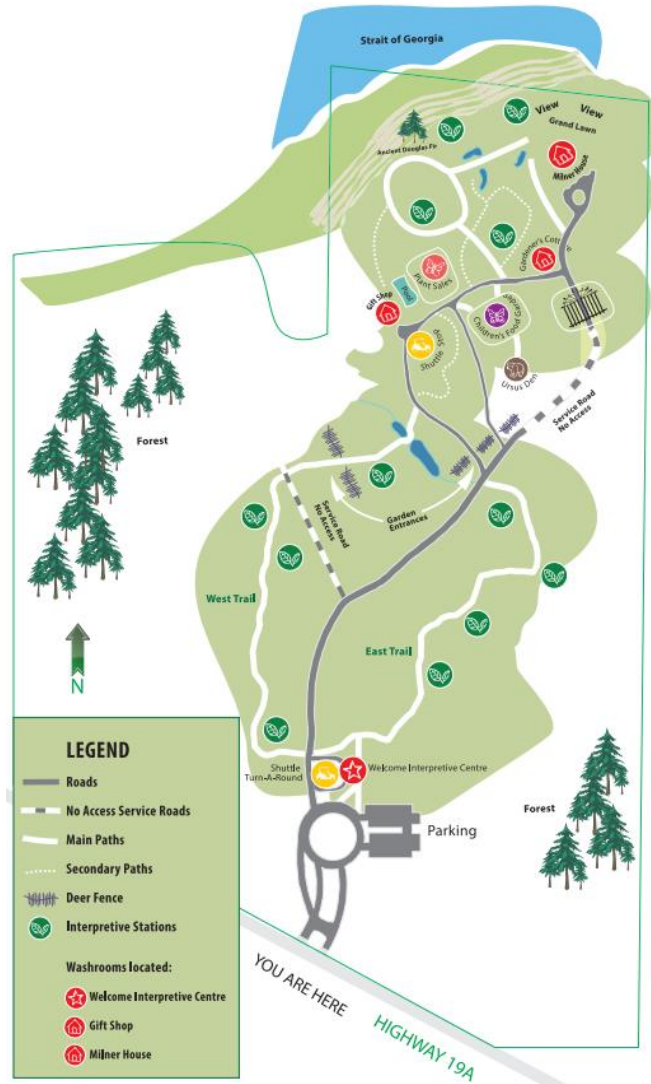
Future Blitzing

The 2018 MABR BioBlitz achieved its goals in expanding to another site at Englishman River Regional Park/Top Bridge while maintaining Milner Gardens & Woodland as a training site for beginner BioBlitzers to learn about species identification from local experts and citizen scientists in the region. Our future goals are to expand the MABR BioBlitz further across the MABR to include 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 a proper comparison between species data. The marine survey that was conducted during the 2017 MABR BioBlitz at Oak Leaf Drive Park was a success and could be implemented again for future BioBlitz














The MABR is a stunningly beautiful and diverse region with countless species to discover and steward. The incredible vertical range of the MABR allows for 2100 meters of discovery from the highest peak of Mount Arrowsmith to the depths of the Salish Sea. The MABRRI team is inspired and eager to explore, engage, and educate one another and the community about these important ecosystems and habitats that we all live in and share. The MABR BioBlitz has proven to be a success within the community and our team at MABRRI looks forward to expanding the event throughout the MABR for future years to come.

Appendix A: Map of BioBlitz Sites for the Milner Gardens BioBlitz



Appendix B: Common Species-BioBlitz Handout

Some species you may find during the MABR BioBlitz...

Trees		Ferns		Shrubs	
1	 Douglas fir <i>Pseudotsuga menziesii</i>	6	 Bracken Fern – <i>Pteridium aquilinum</i>	9	 Dull Oregon Grape <i>Mahonia nervosa</i>
2	 Western Red Cedar <i>Thuja plicata</i>	7	 Sword Fern <i>Polystichum munitum</i>	10	 Salmon Berry <i>Rubus spectabilis</i>
3	 Arbutus <i>Arbutus menziesii</i>	8 Moss  Step Moss <i>Hylocomium splendens</i>		11	 Oceanspray <i>Holodiscus discolor</i>
4	 Western Hemlock <i>Tsuga heterophylla</i>	14	 Pink Fawn Lily <i>Erythronium revolutum</i>	Flowers	
5	 Bigleaf Maple <i>Acer macrophyllum</i>	15	 Pacific Bleeding Heart <i>Dicentra formosa</i>	16	 Pacific Trillium <i>Trillium ovatum</i>
				17	 Vanilla Leaf <i>Achlys triphylla</i>
				12	 Trailing Blackberry <i>Rubus ursinus</i>
				13	 Salal <i>Gaultheria shallon</i>
				18	 Skunk Cabbage <i>Lysichiton americanum</i>

Appendix C: Birds You May Expect to Find at Milner Gardens



Most Likely Birds Seen and Heard at Milner Gardens and Woodland

by Sandra Gray

Listed below are predominantly forest dwelling birds that can be seen or heard during your visit to Milner Gardens and Woodland throughout the seasons. In addition, many species of ducks, shorebirds, and gulls visit the shoreline of MGW during migration or may winter over along the East Coast of Vancouver Island. With binoculars or spotting scope you may be able to add quite a few to 'your list' while on site. Over 250 species of birds have been recorded in the Parksville Qualicum Beach Checklist Area.

S Usually a seasonal visitor; may be seen during migration; may nest locally or on site.

C Common visitor or resident; can be seen most of the year but may be migratory; may nest locally or on site.



The following list is in the scientific order used by most field guides.

<input type="checkbox"/> Mallard	S	<input type="checkbox"/> Rufous Hummingbird	S
<input type="checkbox"/> California Quail	C	<input type="checkbox"/> Belted Kingfisher	C
<input type="checkbox"/> Great Blue Heron	C	<input type="checkbox"/> Red-breasted Sapsucker	C
<input type="checkbox"/> Turkey Vulture	S	<input type="checkbox"/> Downy Woodpecker	C
<input type="checkbox"/> Bald Eagle	C	<input type="checkbox"/> Hairy Woodpecker	C
<input type="checkbox"/> Sharp-shinned Hawk	C	<input type="checkbox"/> Northern Flicker	C
<input type="checkbox"/> Cooper's Hawk	C	<input type="checkbox"/> Pileated Woodpecker	C
<input type="checkbox"/> Red-tailed Hawk	S	<input type="checkbox"/> Pacific-slope Flycatcher	S
<input type="checkbox"/> Merlin	C	<input type="checkbox"/> Hutton's Vireo	C
<input type="checkbox"/> Peregrine Falcon	S	<input type="checkbox"/> Warbling Vireo	S
<input type="checkbox"/> Killdeer	C	<input type="checkbox"/> Steller's Jay	C
<input type="checkbox"/> Band-tailed Pigeon	C	<input type="checkbox"/> Northwestern Crow	C
<input type="checkbox"/> Great Horned Owl	C	<input type="checkbox"/> Common Raven	C
<input type="checkbox"/> Barred Owl	C	<input type="checkbox"/> Tree Swallow	S



2179 West Island Highway, Qualicum Beach
For more information call 250-752-6153 or email milnergardens@shaw.ca.



Most Likely Birds Seen and Heard at Milner Gardens and Woodland

by Sandra Gray

S Usually a seasonal visitor; may be seen during migration; may nest locally or on site.

C Common visitor or resident; can be seen most of the year but may be migratory; may nest locally or on site.

The following list is in the scientific order used by most field guides.

<input type="checkbox"/> Violet-green Swallow	S	<input type="checkbox"/> Black-throated Gray Warbler	S
<input type="checkbox"/> Northern Rough-winged Swallow	S	<input type="checkbox"/> Townsend's Warbler	S
<input type="checkbox"/> Chestnut-backed Chickadee	C	<input type="checkbox"/> Western Tanager	S
<input type="checkbox"/> Bushtit	C	<input type="checkbox"/> Spotted Towhee	C
<input type="checkbox"/> Red-breasted Nuthatch	C	<input type="checkbox"/> Chipping Sparrow	S
<input type="checkbox"/> Brown Creeper	C	<input type="checkbox"/> Fox Sparrow	C
<input type="checkbox"/> Bewick's Wren	C	<input type="checkbox"/> Song Sparrow	C
<input type="checkbox"/> Pacific (Winter) Wren	C	<input type="checkbox"/> White-crowned Sparrow	C
<input type="checkbox"/> Golden-crowned Kinglet	C	<input type="checkbox"/> Dark-eyed Junco	C
<input type="checkbox"/> Ruby-crowned Kinglet	C	<input type="checkbox"/> Black-headed Grosbeak	S
<input type="checkbox"/> Swainson's Thrush	S	<input type="checkbox"/> Red-winged Blackbird	C
<input type="checkbox"/> Hermit Thrush	C	<input type="checkbox"/> Brown-headed Cowbird	S
<input type="checkbox"/> American Robin	C	<input type="checkbox"/> Purple Finch	C
<input type="checkbox"/> Varied Thrush	C	<input type="checkbox"/> House Finch	C
<input type="checkbox"/> European Starling	C	<input type="checkbox"/> Red Crossbill	S
<input type="checkbox"/> Cedar Waxwing	S	<input type="checkbox"/> Pine Siskin	S
<input type="checkbox"/> Orange-crowned Warbler	S	<input type="checkbox"/> American Goldfinch	S
<input type="checkbox"/> Yellow-rumped Warbler	S		

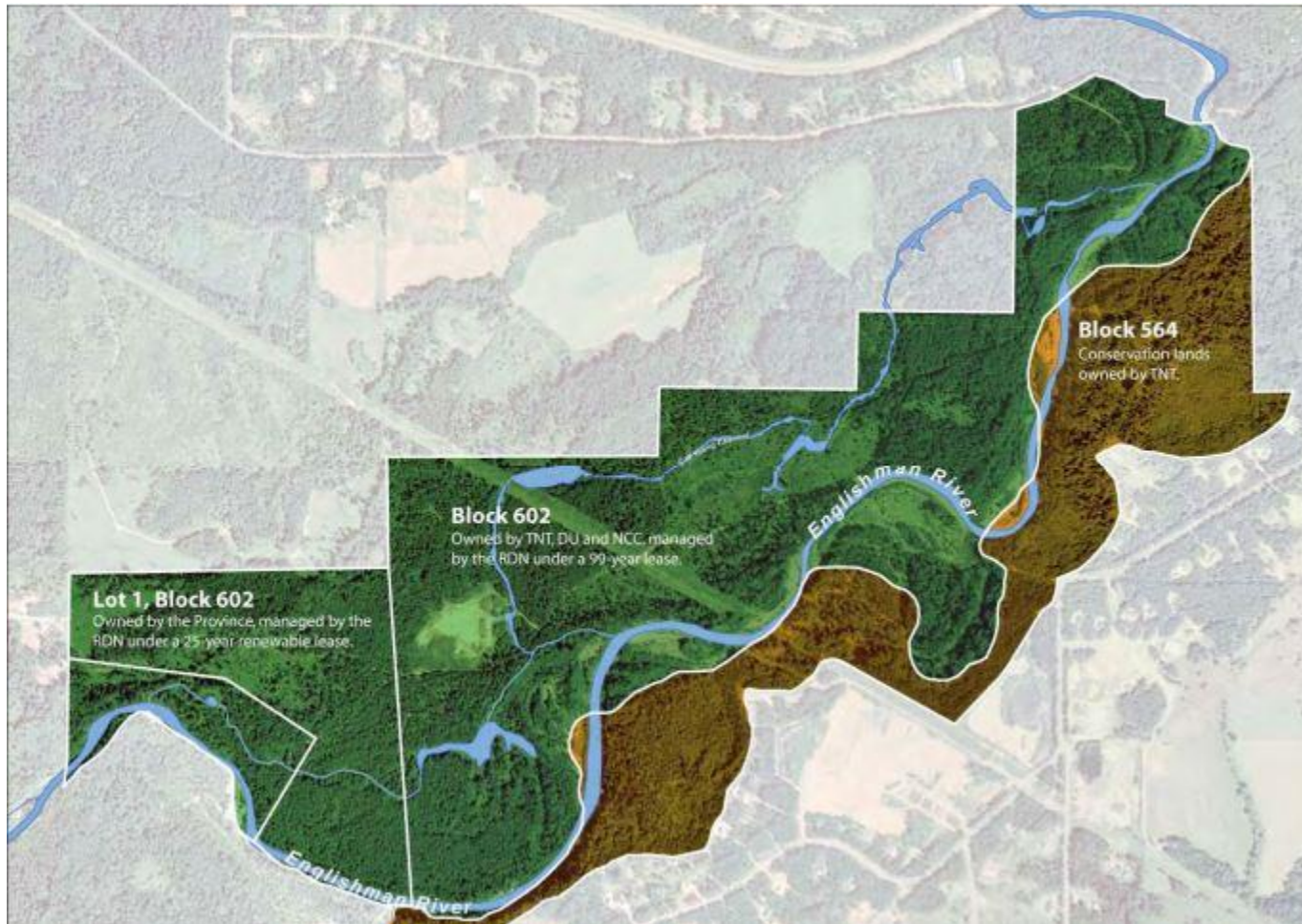


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Appendix D: Map of Englishman River Regional Park Boundaries

ERRP boundary shown in green

Source: RDN, 2008



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