MOSSOM CREEK 2017 BIOBLITZ REPORT

Prepared for:

Burrard Inlet Marine Enhancement Society

December 2017

Prepared by:

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Prepared for:
The Burrard Inlet Marine Enhancement Society (BIMES) / Mossom Creek Hatchery & Education Centre. The Burrard Inlet Marine Enhancement Society (BIMES), active since 1976, is a charitable organization committed to providing environmental education and stewardship activities in the Burrard Inlet area. This includes managing the Mossom Creek Hatchery & Education Centre located in Port Moody, BC. Programs focus on salmon enhancement activities and stream, watershed and marine educational opportunities in the Port Moody Arm of Burrard Inlet. http://www.mossomcreek.org/

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Pamela Zevit RPBio, Special Projects Coordinator for the South Coast Conservation Program (SCCP). Established in 2005, the SCCP is a multi-partner conservation program helping facilitate projects and activities to protect and restore species and ecological communities at risk on the South Coast of BC. http://www.sccp.ca/

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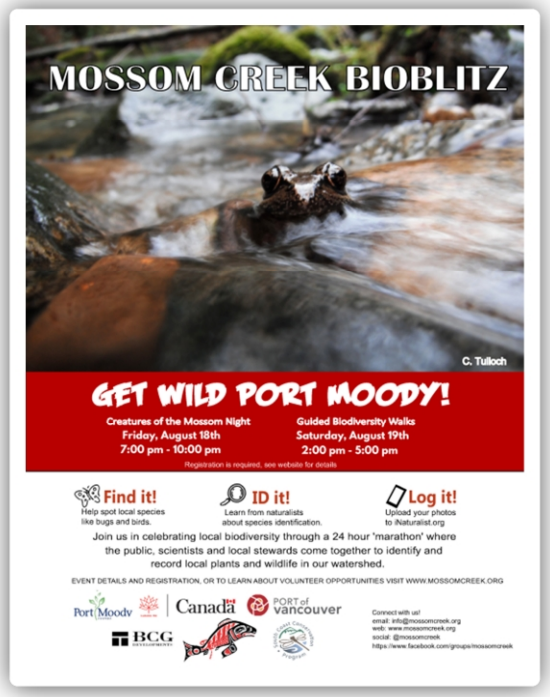

Throughout British Columbia, public and private lands play an important role in linking and protecting habitat for a range of species. Collaborative actions that enhance our understanding of the natural capital such areas support contributes to more effective, ecologically informed decision making. BioBlitzes or "Biodiversity Blitzes, are one of many tools for facilitating such collaborative efforts. Part contest, part festival, part educational event and scientific endeavor, the Mossom Creek BioBlitz of August 2017 was a first for the Burrard Inlet Marine Enhancement Society and the first such citizen science event in the City of Port Moody. The event offered a fresh, engaging approach to identifying species and ecosystem diversity throughout the landscape of the lower Mossom Creek watershed and the adjacent historic Ioco Townsite area.

As well as providing for updated information on pre-existing inventory data and species use, the event was an opportunity to further raise awareness about biodiversity and local conservation efforts to a range of public and local land use interests. Dozens of volunteers and specialists participated in the Mossom Creek BioBlitz, creating a unique opportunity for growing the citizen science expertise within BIMES, and the foundation for further citizen science partnerships and biodiversity monitoring.

In all, three hundred and seventy-seven (377) different species of flora and fauna, including hundreds of new species, species of conservation concern and introduced species were identified from the BioBlitz. This information will contribute to provincial resources such as the BC Conservation Data Center (CDC) as well as the local and regional knowledge base. In particular, species occurrence data will help inform land management for the area by the City of Port Moody and the Village of Anmore, as well as development interests for the historic Ioco Townsite. The results of the BioBlitz will also support the work of BIMES and the SCCP in their ongoing conservation efforts in the region. This is the fifth BioBlitz the SCCP has completed, and the first in which the international citizen science portal iNaturalist[1] was employed. It is hoped the experience, learning outcomes and information gathered provides BIMES and its partners further impetus to work collaboratively on efforts to inventory, monitor and conserve common and at risk species and ecosystems found within the watershed.

[1] iNaturalist is a citizen science project and online social network of naturalists, citizen scientists, and biologists built on the concept of mapping and sharing observations of biodiversity across the globe. See https://www.inaturalist.org/

"A BioBlitz is designed to increase the public's awareness of the variety of life in their immediate neighborhood and the services these various species provide to improve the quality of their lives.

What better way to address the topic than to invite people to share in 24-hours of discovery and to experience the vast array of species that can be find in their neighborhood park in just one cycle of the day?"

Source: Center for Conservation and Biodiversity and Connecticut State Museum of Natural History

Introduction

What exactly is a "BioBlitz"? The term was first coined by National Park Service naturalist Susan Rudy while assisting with the first BioBlitz at Kenilworth Aquatic Gardens, Washington D.C. in 1996. A BioBlitz has the dual aims of establishing the degree of biodiversity in an area and connecting local citizens, community groups and land use managers with concepts of conservation science. Often local parks are chosen for BioBlitz events as they have many of the key partnerships or stakeholders in place to facilitate the event.

Specialists in various disciplines like botany, entomology and ornithology all play a role. Some BioBlitzes[2] become an annual event, such as the one which has been occurring since 2006 in the Resort Municipality of Whistler[3]. Scientists establish a base at a point close to the area to be blitzed and provide expertise in identifying species found by the public as well as doing their own inspection of the area.

Ideally, a BioBlitz takes place over a full 24-hour period as different organisms are likely to be found at different times (e.g. bats, owls, night-flying insects etc.). While daytime-only blitzes over shorter periods are equally popular, the results may less accurately show the variety of life in the area. Regardless, BioBlitzes are an innovative way to link aspects of social and natural capital through re-establishing people's sense of wonder at exploring and being part of the natural world.

[2] https://en.wikipedia.org/wiki/BioBlitz
[3] http://www.whistlerBioBlitz.ca/

Why Conduct a BioBlitz?

Regions like BC's Lower Mainland are home to some of the highest levels of biodiversity and species at risk in BC[4].

This incredible natural capital is under a number of existing and potential threats including:

- Habitat loss
- Displacement and predation by introduced species
- Habitat degradation

The causes are numerous; human population growth, invasive species, and climate change are just a few of the sources of biodiversity loss.

The more we learn about our valuable natural capital, through efforts like BioBlitzes, the more we can do to protect and sustain it now and in the future.

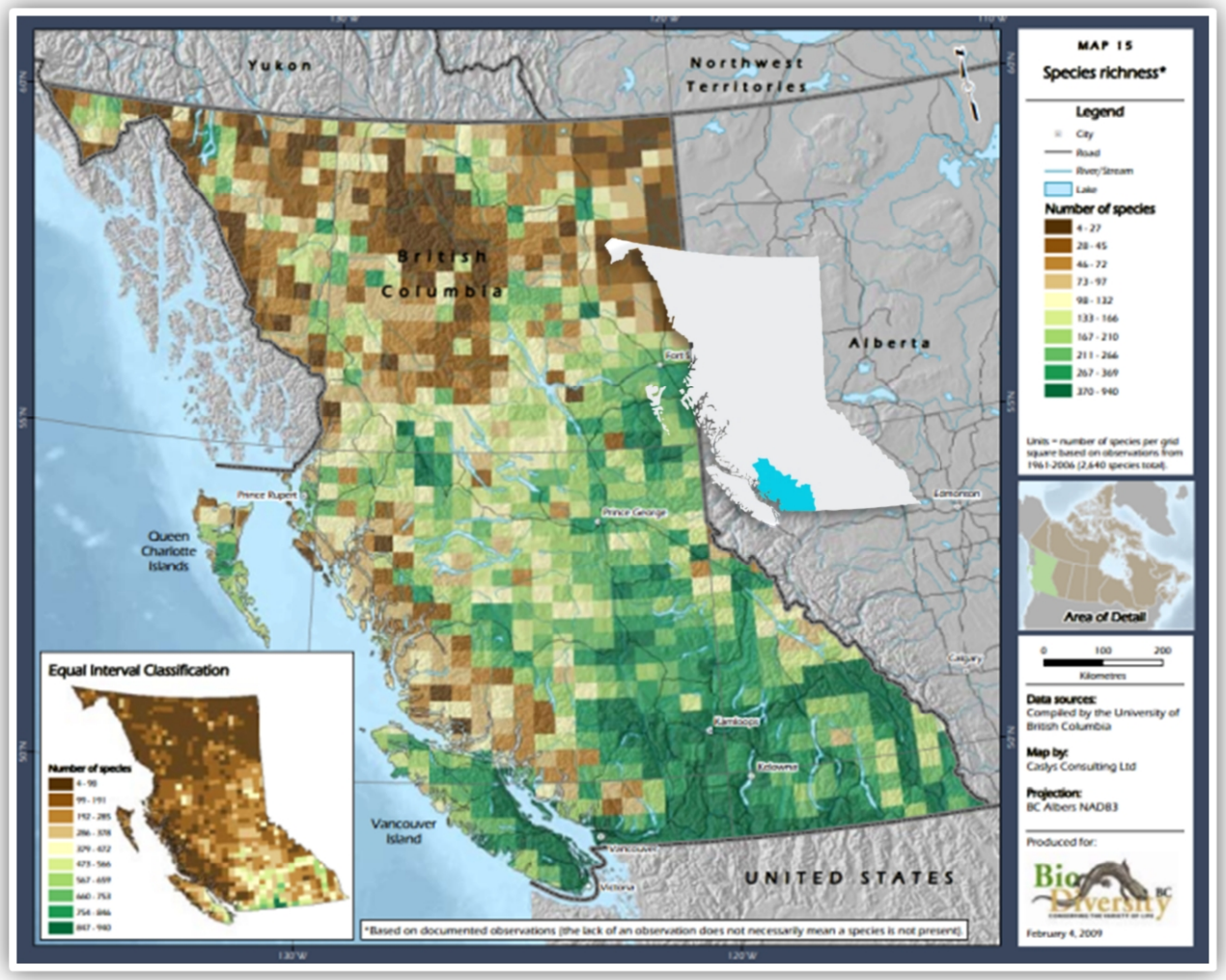

Figure 1 BC's Species Richness. Regions like BC's South Coast (teal area in upper right inset) where the Mossom watershed is located, supports some of the greatest levels of species richness (dark green) in BC. Source: Biodiversity Atlas of British Columbia 2009.

[4] Taking Nature's Pulse, The Status of Biodiversity in British Columbia. 2008 http://www.biodiversitybc.org/EN/main/where/133.html

BioBlitz events have experienced growing popularity in Canada, even becoming part of a recognized national event process as part of Canada's 150th birthday in 2017. In southwest BC, BioBlitzes have become annual events or have been undertaken by a number of organizations for a number of locations since at least 1998:

- Resort Municipality of Whistler
- Ruby Lake Lagoon Society, Sunshine Coast
- Burnaby Lake Regional Park, Burnaby
- UBC Botanical Gardens, Vancouver
- East Sector Lands, Harrison Hot Springs
- Stanley Park, Vancouver
- Cheam Wetlands, Popkum
- West Creek Wetlands, Township of Langley
- Musqueam Creek, Musqueam Reserve Vancouver

BioBlitz Goals

- Provide opportunities to improve skill sets in the identification of local species of conservation concern.
- Encourage BioBlitz team participants to consider similar survey activities at other potential biodiversity hotspots to add to the regional knowledge base.
- Report out and inform elected officials, landowners and land use managers of the biodiversity values present in their local areas.

BioBlitz Objectives

- Increase the capacity of local conservation interests as frontline "stewards" to protect and monitor biodiversity occurring within their local are of interest management.
- Engage municipal interests, specialist and the broader public in "citizen science" efforts to enhance conservation actions for biodiversity.
- Ensure information and adequate tools are available to maintain species and ecosystem diversity from the local to eco-regional landscape.

Metro Vancouver Regional Context

Adjacent to the Fraser Valley Regional District, the Metro Vancouver Regional District supports a diverse mosaic of wetlands, upland forests and one of the most significant estuaries in North America, the Fraser River Estuary. While hosting the most densely populated area in BC, Metro Vancouver is also home to a number of species of conservation concern, many at the northern end of their North American range.

Efforts have been evolving over the past decade to develop management priorities for conserving biodiversity across the region[5]. Integrating biodiversity into the land use decision making process is a critical step to understanding the role priority areas for conserving species and ecosystems at risk play across the regional landscape.

Relative Biodiversity Summary

Colour)	Map Legend Colour	Biodiversity Index	Area (ha)	% of Total Study Area
		Very High	50,859	13.8%
			60,175	16.3%
		To	107,475	29.1%
			16,243	4.4%
		Moderate	67,390	18.2%
				81.8%

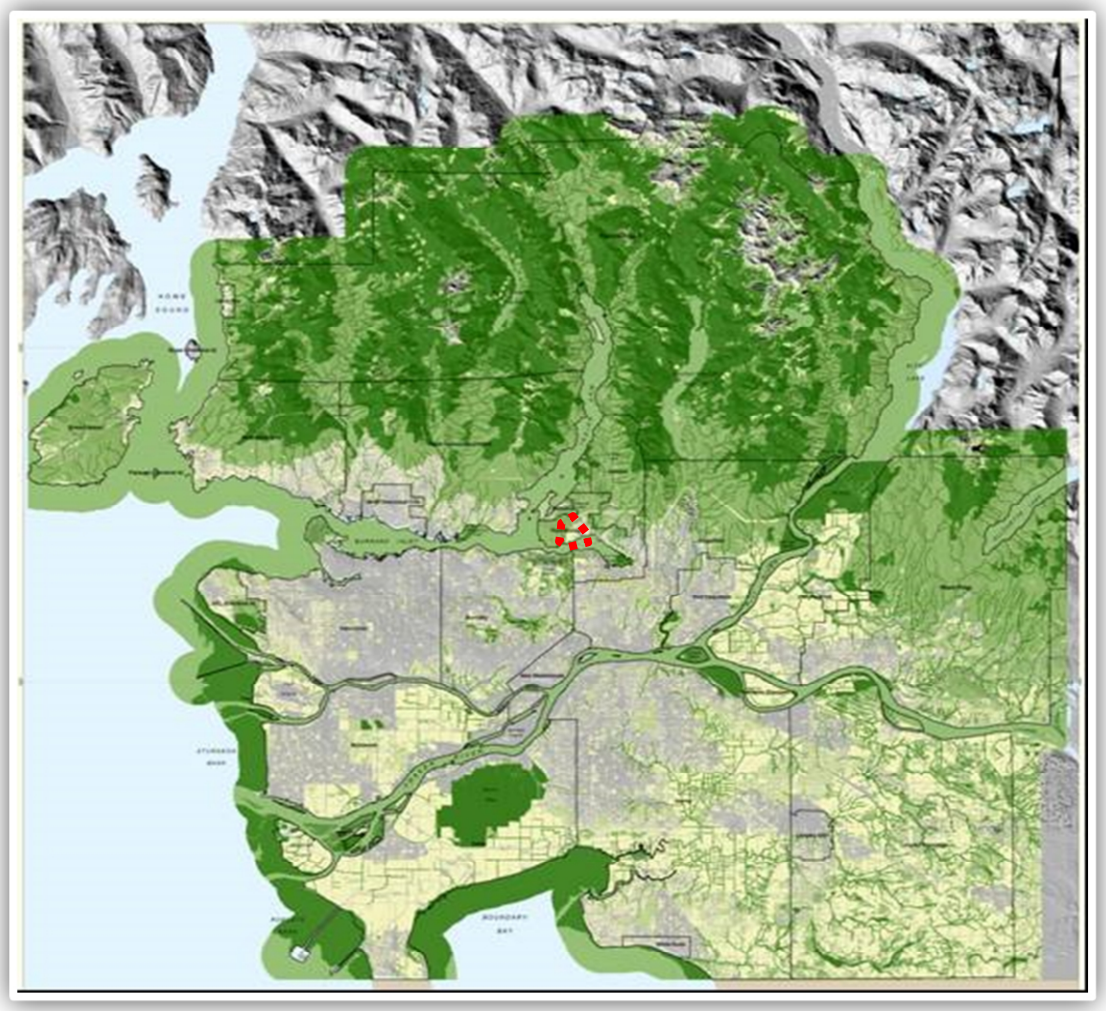

Figure 2 Relative biodiversity values across the Metro Vancouver Regional District. Mossom Creek watershed red-dotted line. Source: Axys Consultants, Biodiversity Conservation Strategy for Metro Vancouver (2006).

[5] Strategic Directions for Biodiversity Conservation in the Metro Vancouver Region | Forum Proceedings: Key Points and Potential Action Steps (2010), Ecological Health Action Plan for Metro Vancouver (Draft 2011). https://tinyurl.com/y8x9wrde | https://tinyurl.com/ybynyelw

The Mossom Watershed - Past and Present

Those outside of the salmon enhancement or environmental stewardship community in the Lower Mainland may not recognize the name Mossom Creek or its neighbour, North Schoolhouse Creek. Yet hundreds of thousands of visitors have passed by the "Mossom Creek Salmonid Habitat Please Protect Your Resource" sign on Ioco Road, just before heading north on 1st Avenue to make their way to Buntzen Lake, Sasamat Lake's White Pine Beach, or the hiking trails of Woodhaven Swamp or Belcarra Regional Park. While visitors on their way to those destinations may never visit the Mossom Creek Hatchery and Education Centre, or stop and enjoy a summer afternoon break in the nearby historic Ioco Townsite, the watershed and surrounding area represents a unique wildland interface between a rapidly developing marine foreshore and the densifying residential upland communities of Anmore, Port Moody and Coquitlam.

The Mossom Creek Hatchery (with visitors Nora Boekhout and Margaret Schulz and Mossom volunteer James Robertson). Source Ruth Foster

Local residents are not alone in their appreciation for the Mossom Creek watershed. In its Official Community Plan, the City of Port Moody "recognizes the ecological importance of the Mossom Creek and North Schoolhouse Creek watersheds and will strive to ensure their long term enhancement and protection e.g. through the development of integrated stormwater management plans (ISMPs)."[6]

Mossom and North Schoolhouse Creek are two of a number of tributaries to the transition area where Burrard Inlet meets Port Moody Arm, just east of the entrance to Indian Arm. This is an area with a "colonial" past as well as being part of the historic breadbasket for Tsleil Waututh, Squamish and Musqueam Nations. Recent archaeological studies by Simon Fraser University and the Tsleil Waututh have identified significant traditional use of the inlet for shellfish and red elderberry harvesting going back thousands of years (Carleen Thomas pers. comm. 2017). Since the 1800's, industry and now development pressures represent a continuum of stressors that have impacted the unique biodiversity and ecological values of the area. Shellfish harvesting has been closed since the early 1970's due to pollution, an issue that the Tsleil Waututh First Nation is seeking to resolve through a long-term vision of restoration and water quality enhancement[7]. Shellfish have not been the only resource that has suffered from human activities. Mossom and Noon's Creek to the east both experienced past extirpations of native chum, pink and coho salmon.

[6] City of Port Moody OCP Bylaw No. 2955 (Chapter 6 – The Natural Environment). [Accessed online November 2017] http://www.portmoody.ca/modules/showdocument.aspx?documentid=9096
[7] Burrard Inlet Action Plan. Kerr Wood Leidal 2014-2017. https://twnsacredtrust.ca/burrard-inlet-action-plan/

Watershed Features

Mossom Creek flows ~12.8 km from its headwaters on Eagle Mountain southwest through mainly contiguous second growth [coniferous dominated] mixed forest down to its estuary in Burrard Inlet below Ioco Road.

While the watershed supports dominant, maturing overstory species typical of the Coastal Western Hemlock biogeoclimatic zone of the South Coast (Douglas-fir, Western Redcedar, Western Hemlock and Bigleaf Maple)[8], visitors to the watershed may be surprised to know the area was logged extensively in the late 1800s, again in the early 1970s with a further 12% of the watershed (above East Road) logged during 1995-1996[9]. While still recovering from past disturbances, this forested landscape provides important connectivity for a number of large mammals such as Mule Deer, Cougar and American Black Bear. The watershed has even hosted rare visitors such as Wolverine, a rarely observed species typically found in undisturbed, high elevation wilderness habitats[10].

The creek is also crossed by two BC Hydro transmission line right of ways upstream of East Road.[11] The nearby Ioco Townsite to the east, including North Schoolhouse Creek and upslope portions of Mossom Creek as well as the abandoned gun range site along Sunnyside Road to the north, are lands slated to become part of a new urban village core for the area[12].

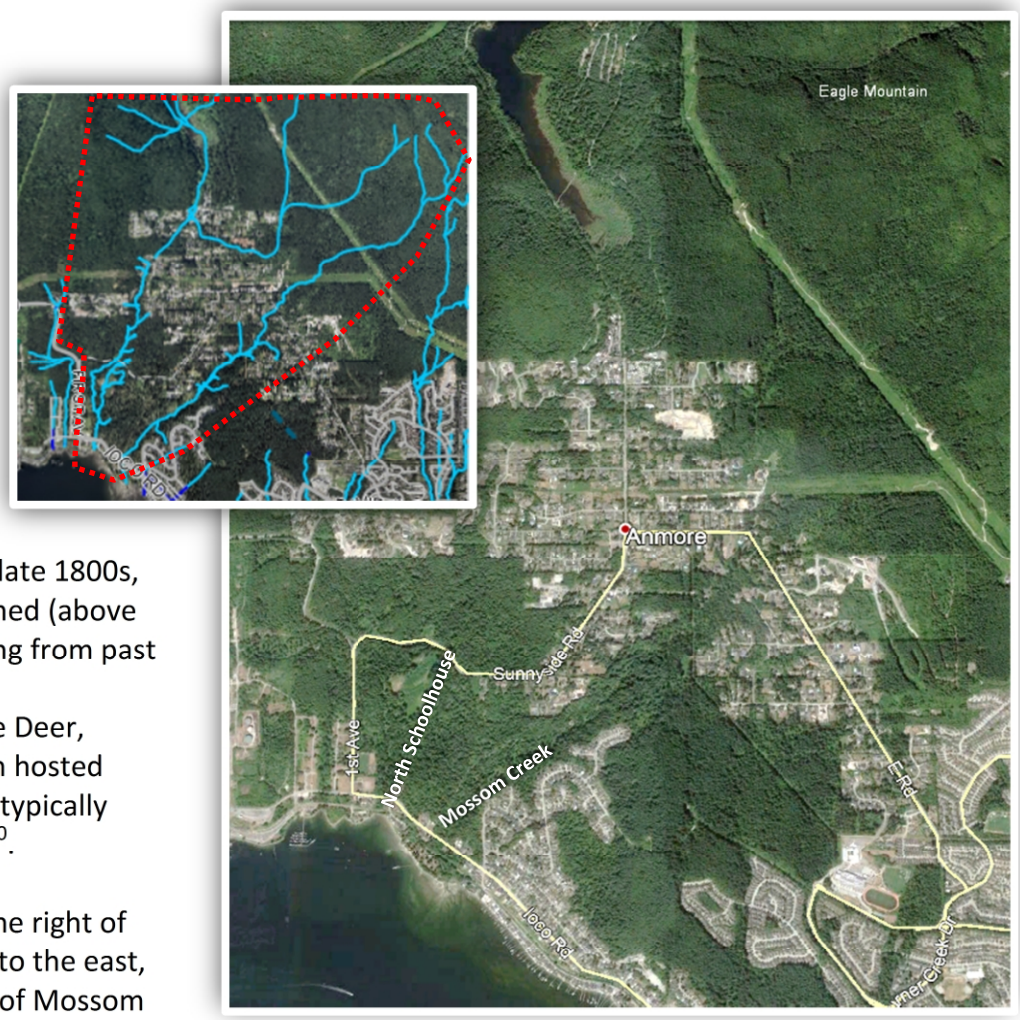

Figure 3 Mossom and North Schoolhouse Creek watersheds. Inset: Detailed morphology of both creeks. Source: Google Earth, inset City of Port Moody

[8] British Columbia is broken up into Biogeoclimatic Zones A biogeoclimatic zone is defined as "a geographic area having similar patterns of energy flow, vegetation and soils as a result of a broadly homogenous macroclimate." https://www.for.gov.bc.ca/hfd/library/documents/treebook/biogeo/biogeo.htm

[9] Source BIMES

[10] A young, injured male wolverine was captured in Port Moody in 2003 and successfully rehabbed at Wildlife Rescue in Burnaby. The animal was released north of the Coquitlam River watershed but was later found dead near the Mossom Creek Estuary, likely as a result of a Cougar attack. Source Wildlife Rescue Association.

[11] Pacific Streamkeeper Federation, Watershed Profiles, [accessed online November 2017]

[12] Ioco Lands Master Plan. Brilliant Circle Group Developments 2015-2017

Mossom Creek has been used as an indicator system since 1999 by Metro Vancouver Regional District (GVSDD) for monitoring watershed health (based primarily on parameters such as riparian forest integrity, percent of total impervious area, stream channel complexity and benthic diversity)[13]. Even with the increasing pressures of residential development (increased imperviousness, runoff, road densification and fragmentation) the watershed is still considered to be in relatively "excellent" health (compared to other urban watersheds in the region). A number of homes in the southeast portion of Anmore still have registered wells within the Mossom Creek watershed, though it is unknown how many still withdraw water from the creek for residential use[14].

Mossom Creek. Source BIMES

The Mossom BioBlitz

While the SCCP has a focus on species at risk, attempting an overall biodiversity "reading" through conducting a BioBlitz is a complementary goal in conservation efforts. Participants are asked to log and identify species they observe and note whether these species may be native, introduced or of conservation concern. Cataloguing less 'charismatic' species such as gastropods (e.g. snails and slugs), mosses and insects as well as more familiar species such as salmon and songbirds is equally important to understanding the Mossom watershed's natural capital.

In some BioBlitzes, specialists and experts are just 'let loose' to inventory as much area as they can cover in the time allowed. In others, "Blitz Teams" are created and each team is assigned various areas of the BioBlitz area to inventory. In the case of the Mossom BioBlitz it was a combination, with specialists, protégés, neophyte volunteers and seasoned naturalists heading out to cover many of the same areas in pairs or groups. Most surveyors went out with a specific taxon focus (e.g. birds versus bryophytes, or stream invertebrates versus fish) but were free to include all observations as species presented themselves (e.g. mammals and plants seen during the birding component). The exception was the marine component of the survey which had a dedicated team who spent the bulk of the BioBlitz focused on identifying organisms from beach seining or diving in and around the Mossom/North Schoolhouse Creek estuary in Burrard Inlet.

[13] Environmental Effects of Stormwater Discharges on Small Streams. Final Habitat and Benthic Assessment. EVS Environment Consultants. 2000 (hardcopy only)
[14] Government of BC groundwater well and aquifer records. Accessed online December 3 2017

The Mossom BioBlitz occurred in late August and applied a 24 hour approach to gathering observations. The areas to be blitzed were broken up into segments based on distinct landscape characteristics or habitat associations (i.e. Mossom mainstem, riparian area and estuary, upland northwest forest, Ioco Townsite, the abandoned gun range to the north including part of North Schoolhouse Creek). The event opened with an evening session on a Friday night hosting different specialists speaking about various topics related to the theme of "Creatures of the Mossom Creek Night" (e.g. owls, bats). Talks were open to the public as well as participating 'Blitzers'. Talks were followed by a walk along the creek to call for owls, bat detector monitoring along the road leading up to the Mossom Creek Hatchery and down at the Ioco Townsite, and a night flying insect light trap event in the playing field behind the Ioco School off of 1st Avenue. The evening event was well attended (40+) with standing room only at the Mossom Creek Hatchery's education centre.

Bright and early the next morning (Saturday), the birders were out to track the "dawn chorus" and volunteers began to set up for the day. The remaining Blitzers arrived around 8:30 am for a meet and greet and orientation about the area, which included a safety check, light breakfast and opportunity to network. Prior to heading out, participants were honoured with a welcoming from Tsleil Waututh Nation's Manager of Culture and Heritage, Carleen Thomas. It was through this session that participants learned of some of the recent archaeological findings about Tsleil Waututh Nation's historical relationship with Burrard Inlet, including the dependency on shellfish beds and red elderberry harvesting and processing.

After the welcome was completed, participants headed out to start the day-long component of the BioBlitz. To complement the event, BIMES hosted two guided public nature walks where participants could learn about the BioBlitz and the unique flora and fauna of the area. Local professional biologist Chris Lee provided a special interactive component by providing interpretation for a small mammal trap installation. Chris also spoke about some of the species at risk that occurred in the area, including the endangered Pacific Water Shrew, which was found in nearby North Schoolhouse Creek in 2008, and other species such as the Coastal Tailed Frog, a unique, primitive frog species of special concern found in and around Mossom Creek.

The BioBlitz wrapped up in the late afternoon with a celebratory barbeque to thank everyone who participated and provide some time to relax, network and share stories and finds from the day!

Faces of the Mossom BioBlitz!

Figure 4 Mossom BioBlitz map showing areas to be surveyed. Icons reflect the taxon focus (known, or expected to be observed) for respective participants.

Findings

The Mossom Creek 2017 BioBlitz was an important opportunity for BIMES to fill knowledge gaps in local biodiversity especially for taxa in the marine environment (i.e. the estuary), aquatic and terrestrial invertebrates and non-vascular plants (e.g. mosses and liverworts). Of the species identified, five are federally listed species at risk (Species at Risk Act or SARA) and seven are listed provincially as either red or blue listed[15]. Highlights included the discovery of Roell's Brotherella (a red-listed moss) and a species of Japanese Leafhopper (new to BC, though introduced and possibly invasive). Plants composed the largest group of organisms at 178 species (vascular=99 species, non-vascular=79 species), with invertebrates coming in second at 127 species (insects forming the most biodiverse group at 79 species). Of the vertebrates, birds dominated at 48 species, with passerines (perching birds) being the dominant Order. A number of amphibian species are known to occur in the watershed, including two SARA listed species of special concern, the Northern Red-legged Frog and Coastal Tailed Frog. The latter was the only amphibian observed during the BioBlitz.

Table 1. Taxonomic classifications recorded from the Mossom Creek 2017 BioBlitz

Taxonomic Groupings	Order	Family	Genera	Species
Woody and Herbaceous Plants	30	52	89	99
Mosses	13	19	39	51
Liverworts, Threadworts et al	4	15	19	23
Algae	3	4	5	5
Arthropods (crustacea)	3	8	8	9
Arthropods (insecta & Diplopoda)	12	52	71	80
Cnidaria (jellies, hydroids et al)	6	7	7	7
Miscellaneous (annelida, echinodermata et al)	10	8	10	11
Molluscs (marine)	9	9	9	13
Molluscs (terrestrial)	1	5	6	7
Fishes	5	7	9	11
Amphibians	1	1	1	1
Birds	12	29	39	47
Mammals	4	6	9	13
Totals	113	222	321	377

[15] Based on their conservation status rank, each species and ecosystem is assigned to the red, blue or yellow list in BC to help set conservation priorities and provide a simplified view of the status of B.C.'s species and ecosystems. These lists also help to identify species and ecosystems that can be considered for designation as "Endangered" or "Threatened." Species listed in this provincial classification system are not automatically afforded any special protection. Source: BC Conservation Data Centre.

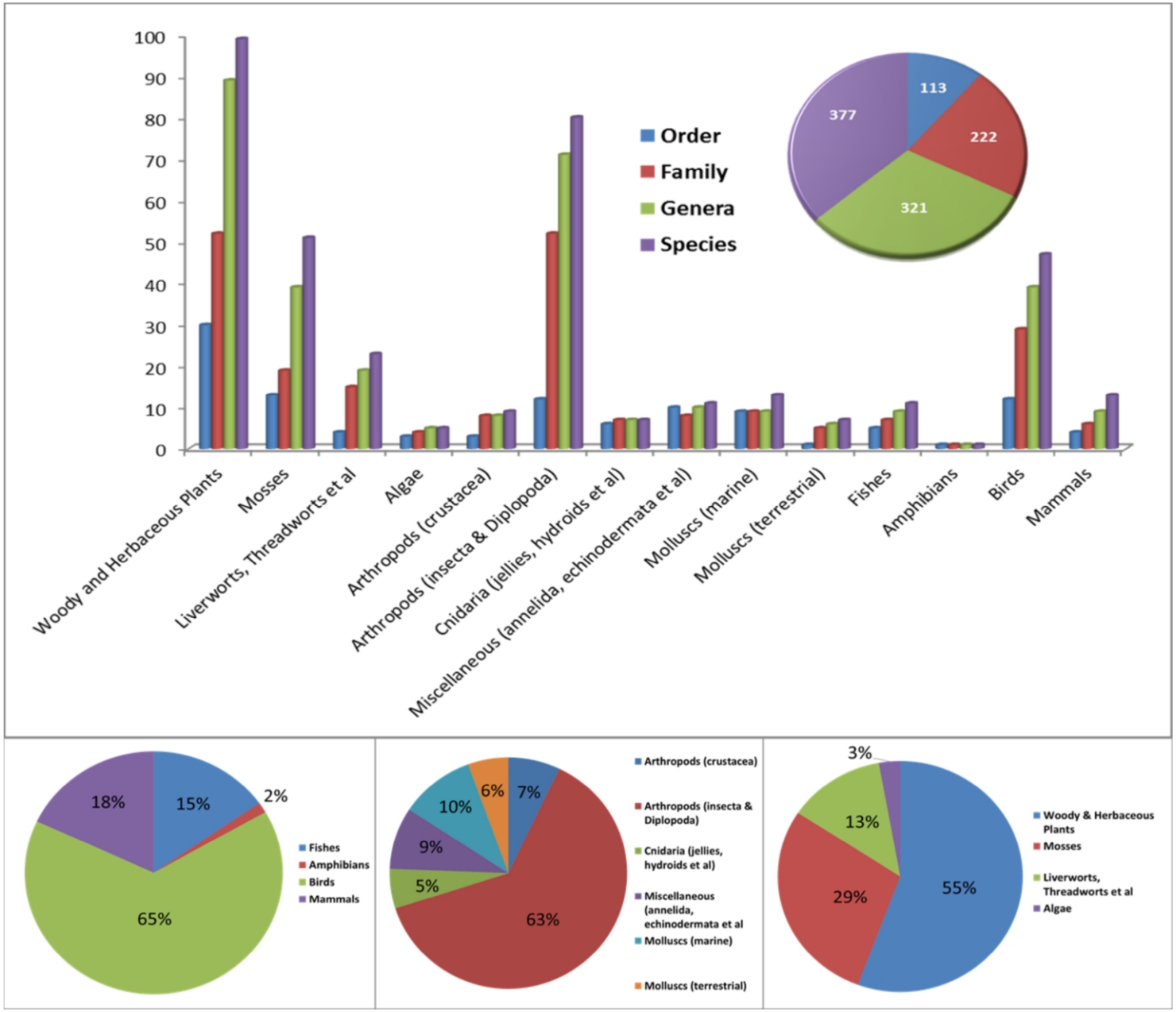

Figure 5 Comparison of all taxa observed during the Mossom BioBlitz by order, family, genera and species

Next Steps

While the seasonal timing of the BioBlitz and the associated drought conditions did create limitations to observations expected, the data collected will provide an important contribution to provincial resources such as the BC Conservation Data Center (CDC) as well as the local and regional knowledge base. Providing BIMES, Tsleil Waututh Nation, private land interests and land use authorities with critical information for land use planning and conservation efforts now and in the future.

The SCCP works to facilitate public engagement on conservation opportunities with local partners. This is done with the intent to provide those partners with the tools and ideas as to how to best invest their efforts. Should BIMES wish to make a BioBlitz a regular event for the Mossom watershed area, the following are some learning outcomes to consider:

Partnership Development Opportunities and Long-term Community Benefits

Present conditions in the Mossom watershed range from a relatively intact mosaic of second growth Coastal Western Hemlock upland and riparian forest, to successional meadow, young deciduous forest and homogenous landscaped areas. While the BioBlitz itself provides a valuable snapshot in time of species diversity, there are a number of ways that the 2017 and future BioBlitz data can be applied for the benefit of the watershed and broader community:

i. Utilize the data for working with private landowners, land use authorities and development interests to measure how close specific ecological indicators or species communities are to tipping points. Mossom Creek hovers at low percent of total impervious area (~5-<10%) and has relatively intact riparian forest integrity, conditions which have allowed the watershed to remain in relatively "excellent" health (see pg. 8). Many sensitive species, (e.g. Coastal Tailed Frog and Northern Red-legged Frog, and aquatic invertebrates like stoneflies) are extirpated from other watersheds in the Tri-cities. These species act like sentinels of aquatic ecosystem and upland forest health. Partnering with large-scale development interests and the City of Port Moody and Village of Anmore to monitor, protect, and even restore features where needed may help avoid degraded conditions in the future. This is especially relevant as the Mossom watershed and surrounding landscape faces increased fragmentation and runoff effects from development and road densification.

ii. Work together in the near-term to develop adaptation and mitigation strategies to protect the watershed's biodiversity for the best chance of remaining resilient against the increasing effects of climate change. Impacts are already being felt in Metro Vancouver. Consider how groundwater recharge and runoff can be managed to maintain base flows during drought periods and reduce the impacts of extreme runoff events during heavy rainfall. Can increasing wildfire risks be mitigated in such a way that does not result in loss to upland forest integrity?

iii. Utilize the Mossom Creek watershed as a benchmark system to measure local biodiversity in other Port Moody, Anmore and Belcarra watersheds. This could be expanded to watersheds with similar landscape attributes in other areas of Metro Vancouver (e.g. District and City of North Vancouver and West Vancouver).

iv. Work with local developers and municipal interests to mitigate and recover declining or lost habitat features, not just in the Mossom watershed, but more broadly in developed areas of Indian Arm and the Burrard-Port Moody Inlet area. This is already underway through activities like installing and maintaining Purple Martin boxes at Rocky Point Park, however many terrestrial species found in the area are showing marked declines across their North American and or global ranges and would benefit from attention as well. Species that would provide the best focus for this include: insect pollinators (e.g. native bees, flower flies, moths and butterflies) as well as birds (i.e. aerial insectivores like nightjars and swallows), and bats. The BioBlitz has shown that many of these species utilize diverse habitat associations in the Mossom watershed, including modified landscapes and disturbed places like the Ioco Townsite or old gun range. Disturbed or redeveloping areas often represent incredible opportunities to restore important habitat attributes. Restoration efforts can also be focal points for community engagement and stewardship. Activities such as building and installing "insect hotels", bat boxes (and condos) or understanding the importance of protecting wildlife trees, reducing noise and light pollution, reducing bird window strikes and wildlife vehicle mortality are just some of the opportunities that could be investigated.

v. Explore and build on partnerships with Tsleil Waututh Nation, and programs at institutions like Simon Fraser University (native bee conservation) and the Beaty Biodiversity Museum (aquatic invertebrates). Undertake more comprehensive surveys with organizations like Wild Research (butterflies), Burke Mountain Naturalists (birds, bats) and the South Coast Bat Conservation Society (for bat inventory and management practices). Not only will BIMES and the community benefit from expanded access to a diversity of expertise and traditional knowledge, but the society can give back through sharing of members' expertise and potential student project opportunities.

Future BioBlitz Planning Considerations: As well as looking outward to the land use interest and community partnership opportunities the Mossom Creek 2017 BioBlitz has created, there are a number of learning outcomes to consider for planning future events of this nature. Not only are these important for BIMES but they represent teachable moments to share with partners or other organizations looking to undertake a BioBlitz in their own watershed or community:

1. **Set project scope and resources needed:** Partners need to identify the extent and scope of a future BioBlitz and the social capital (people resources) and finances needed to support planning and implementation. This includes securing sufficient specialist expertise (quantity as well as quality) to cover off gaps in knowledge at the local level, as well as providing for wider coverage geographically. In respect to event location, are there other areas in the Mossom/North Schoolhouse watershed that may be worth expanding the BioBlitz

to (e.g. Bert Flinn Park and the associated gas pipeline ROW bog)? Should future events include a bigger public celebration component, none at all, or stay the same?

2. **Timing and setting deliverables:** Regardless of the certainty of funding, if the partners wish to undertake an event of this nature in the future, planning should occur at least six (6) months in advance. This will allow for optimal planning and notification of the event and advertising to specialists and experts who often have field season schedules planned well in advance. It will also allow for adequate time to build the event and market and disseminate information locally and regionally. Other considerations tied to planning are whether the BioBlitz timing should be moved earlier in the summer or to remain consistent with the original event timing in late August? As an example June can have uncertain weather but can capture local school participation. Ultimately timing, associated seasonality and weather conditions will all affect the potential number of species that can be identified. This needs to be taken into account when strategizing the best path forward to more accurately assess and monitor biodiversity and other environmental health indicators in the watershed.

3. **Employing iNaturalist as a citizen science tool:** The Use of iNaturalist for the Mossom BioBlitz was a pilot for the SCCP and BIMES. It is hoped that BIMES will create a main iNaturalist page where BioBlitz data can be merged with ongoing observations. The disadvantages of using this tool is that not all observations may get accurately captured and or verified, and archiving data requires uploading and downloading observations in a CSV file format which must follow specific syntax formatting. However with further use and practice iNaturalist could become a complementary tool for ongoing biodiversity monitoring for the watershed and further local citizen science projects.

BioBlitzes are designed to serve a dual purpose of engaging the public about biodiversity conservation and the natural world, as well as collecting valuable information about local species use. The 2017 Mossom BioBlitz should be considered a success by all involved. The event demonstrated BIMES has the capacity to pull together a large complex event in a short time that can engage a diversity of interests.

The Mossom Creek watershed is an important natural asset to the Tri-cities and of significant value to the local community and those who work to conserve it. Of the three hundred and seventy-seven (377) different species recorded at the BioBlitz, a majority represented new observations. The data collected is invaluable for recording local biodiversity conditions in public data repositories such as the BC Conservation Data Center (CDC) and natural history collections like the Beaty Biodiversity Museum. More importantly the information will contribute to a much needed baseline for local biodiversity conservation and stewardship efforts by BIMES and its' partners. In considering the bigger picture, the outcomes of the Mossom Creek 2017 BioBlitz will be essential in informing local land use decisions in the community to help ensure that watershed integrity is protected now and into the future.

Appendix 1: Species observed during the BioBlitz[16]

[16] Taxonomic information has been derived and cross-referenced from a number of recognized sources including: The Encyclopedia of Life, Algae Base, E-Flora and E-Fauna, Beaty Biodiversity Museum Collections Database and the BC Conservation Data Centre. Every effort has been made to ensure accurate and up-to-date nomenclature has been applied. All tables are ordered by scientific name (genus and species).

Table 2. Vascular Plants - Woody and herbaceous

Species Common Name	Scientific name	Family	Order	Comments
Pacific Silver Fir	*Abies amabilis*	Pinaceae	Pinales	common throughout
Vine Maple	*Acer circinatum*	Sapindaceae	Sapindales	common throughout
Bigleaf Maple	*Acer macrophyllum*	Sapindaceae	Sapindales	common throughout
Common Yarrow	*Achillea millefolium*	Asteraceae	Asterales	common throughout disturbed areas and roadsides
Red Alder	*Alnus rubra*	Betulaceae	Fagales	common throughout
Pearly Everlasting	*Anaphalis margaritacea*	Asteraceae	Asterales	common throughout disturbed areas and roadsides
Goatsbeard	*Aruncus dioicus*	Rosaceae	Rosales	
Cascade Oregon-grape	*Berberis nervosa*	Berberidaceae	Ranunculales	
Deer Fern	*Blechnum spicant*	Blechnaceae	Athyriales	common throughout forested zones
Hedge Bindweed	*Calystegia sepium sepium*	Convolvulaceae	Solanales	common throughout disturbed areas and roadsides, exotic
Harebell	*Campanula rotundifolia*	Campanulaceae	Asterales	
Bittercress	*Cardamine sp.*	Brassicaceae	Brassicales	possibly Hairy Bittercress, exotic
Spear Thistle	*Cirsium vulgare*	Asteraceae	Asterales	exotic
Siberian Miner's Lettuce	*Claytonia sibirica*	Montiaceae	Caryophyllales	found along riparian areass and moist zones
Canadian bunchberry	*Cornus canadensis*	Cornaceae	Cornales	common throughout forested zones
Pacific Dogwood	*Cornus nuttallii*	Cornaceae	Cornales	
Beaked Hazelnut	*Corylus cornuta*	Betulaceae	Fagales	
Pacific Bleeding Heart	*Dicentra formosa*	Papaveraceae	Ranunculales	common throughout forested zones
Purple Foxglove	*Digitalis purpurea*	Plantaginaceae	Lamiales	common throughout disturbed areas and roadsides, exotic, exotic
Coastal Woodfern	*Dryopteris arguta*	Dryopteridaceae	Polypodiales	
Common Horsetail	*Equisetum arvense*	Equisetaceae	Equisetales	common throughout disturbed areas and roadsides, exotic
Common Eyebright	*Euphrasia nemorosa*	Orobanchaceae	Lamiales	exotic

Species Common Name	Scientific name	Family	Order	Comments
Japanese Knotweed	*Fallopia japonica*	Polygonaceae	Caryophyllales	common throughout disturbed areas and roadsides, exotic
Hemp-nettle	*Galeopsis sp.*	lamiaceae	Lamiales	common throughout disturbed areas and roadsides, exotic
Salal	*Gaultheria shallon*	Ericaceae	Ericales	
Herb Robert	*Geranium robertianum*	Geraniaceae	Geraniales	exotic
Large-leaved Avens (macrophyllum ssp.)	*Geum macrophyllum ssp. macrophyllum*	Rosaceae	Rosales	now broken into two varieties/ssp. in BC
Common Ivy, English Ivy	*Hedera helix*	Araliaceae	Apiales	exotic
Oceanspray, Creambush	*Holodiscus discolor*	Rosaceae	Rosales	found along marine foreshore and marine upland forests and riparian areas
Common Hop	*Humulus lupulus*	Cannabaceae	Rosales	exotic
Common St. John's wort	*Hypericum perforatum*	Hypericaceae	Malpighiales	exotic
Common Cat's-ear	*Hypochaeris radicata*	Asteraceae	Asterales	exotic
European Holly	*Ilex aquifolium*	Aquifoliaceae	Aquifoliales	exotic
Common Jewelweed	*Impatiens capensis*	Balsaminaceae	Ericales	exotic
Policeman's Helmet	*Impatiens glandulifera*	Balsaminaceae	Ericales	exotic
Small Touch-me-not	*Impatiens parviflora*	Balsaminaceae	Ericales	riparian areass, exotic
Ragwort	*Jacobaea vulgaris*	Asteraceae	Asterales	exotic
Slender Rush	*Juncus tenuis*	Juncaceae	Poales	old gun range wet meadow micro site
Yellow Archangel, Lamium	*Lamium galeobdolon*	lamiaceae	Lamiales	common throughout disturbed areas and roadsides, exotic
Nipplewort	*Lapsana communis*	Asteraceae	Asterales	exotic
Sweet Peas and Vetchlings	*Lathyrus sp. 1*	Fabaceae	Fabales	common throughout disturbed areas and roadsides, exotic
Ox-eye Daisy	*Leucanthemum vulgare*	Asteraceae	Asterales	common throughout disturbed areas and roadsides, exotic
Common Toadflax	*Linaria vulgaris*	Plantaginaceae	Lamiales	common throughout disturbed areas and roadsides, exotic

Species Common Name	Scientific name	Family	Order	Comments
Bird's-foot-trefoils	*Lotus sp.*	Fabaceae	Fabales	exotic
Rose Campion	*Lychnis coronaria*	Caryophyllaceae	Caryophyllales	exotic
Western Skunk Cabbage	*Lysichiton americanus*	Araceae	Alismatales	riparian and instream, seepage zones
Starflower	*Lysimachia borealis*	Primulaceae	Ericales	
Wild Lily-of-the-valley	*Maianthemum canadense*	Asparagaceae	Asparagales	
Pineapple-weed	*Matricaria discoidea*	Asteraceae	Asterales	common throughout disturbed areas and roadsides, exotic
White Sweet-clover	*Melilotus albus*	Fabaceae	Fabales	disturbed areas and roadsides, exotic
Wall Lettuce	*Mycelis muralis*	Asteraceae	Asterales	
Indian-plum	*Oemleria cerasiformis*	rosaceae	Rosales	
Red-sepaled Evening-primrose	*Oenothera glazioviana*	Onagraceae	Myrtales	exotic
Virginia Creeper	*Parthenocissus quinquefolia*	Vitaceae	vitales	disturbed areas and roadsides, exotic
Sweet Coltsfoot	*Petasites frigidus var. palmatus*	Asteraceae	Asterales	
Reed Canarygrass	*Phalaris arundinacea*	Poaceae	Poales	disturbed areas roadsides, old gin range, exotic
Torrey's surf-grass	*Phyllospadix torreyi*	Zosteraceae	Alismatales	Mossom estuary and foreshore
Pacific Ninebark	*Physocarpus capitatus*	Rosaceae	Rosales	
Sitka Spruce	*Picea sitchensis*	Pinaceae	Pinales	
Ribwort Plantain	*Plantago lanceolata*	Plantaginaceae	Lamiales	common throughout disturbed areas and roadsides, exotic
Common Plantain	*Plantago major*	plantaginaceae	Lamiales	common throughout disturbed areas and roadsides, exotic
Common Knotweed	*Polygonum aviculare*	Polygonaceae	Caryophyllales	common throughout disturbed areas and roadsides, exotic
Licorice Fern	*Polypodium glycyrrhiza*	Polypodiaceae	Polypodiales	common in forested areas especially on Big-leaf Maple

Species Common Name	Scientific name	Family	Order	Comments
Western Sword Fern	*Polystichum munitum*	Dryopteridaceae	Polypodiales	common in forested areas
Black Cottonwood	*Populus trichocarpa*	Salicaceae	Malpighiales	upslope riparian areas
Common Silverweed	*Potentilla anserina*	Rosaceae	Rosales	Mossom estuary and foreshore
Coast Douglas-fir	*Pseudotsuga menziesii var. menziesii*	Pinaceae	Pinales	common throughout
Common Bracken	*Pteridium aquilinum*	Dennstaedtiaceae	Polypodiales	common throughout disturbed areas and roadsides, exotic
Creeping Buttercup	*Ranunculus repens*	Ranunculaceae	Ranunculales	wet meadows and disturbed areas
Cascara	*Rhamnus purshiana*	Rhamnaceae	Rosales	found along road up to the hatchery, synonym *Frangula purshianais* used in the US, *Frangula* is considered by some to be a subgenus of the Buckthorn genus, *Rhamnus*
Stink Currant	*Ribes bracteosum*	Grossulariaceae	Saxifragales	found along riparian areas and moist zones
Armenian Blackberry	*Rubus armeniacus*	Rosaceae	Rosales	common throughout disturbed areas and roadsides, riparian
Cutleaf Blackberry	*Rubus laciniatus*	Rosaceae	Rosales	common throughout disturbed areas and roadsides, ripiarian zones
Thimbleberry	*Rubus parviflorus*	Rosaceae	Rosales	along roadsides and forest openings, old gun range
Salmonberry	*Rubus spectabilis*	Rosaceae	Rosales	riprian openings and seepage areass
Trailing Blackberry	*Rubus ursinus*	Rosaceae	Rosales	
Bitter Dock	*Rumex obtusifolius*	Polygonaceae	Caryophyllales	common throughout disturbed areas and roadsides, ripiarian zones
Willows	*Salix sp. 1*	Salicaceae	Malpighiales	
Red Elderberry	*Sambucus racemosa*	Adoxaceae	Dipsacales	along roadsides and forest openings, old gun range
Stonecrops	*Sedum sp.1*	Crassulaceae	Saxifragales	exotic likely Sedum album or White Stonecrop
Heath Groundsel	*Senecio sylvaticus*	Asteraceae	Asterales	exotic

Species Common Name	Scientific name	Family	Order	Comments
European Bittersweet	*Solanum dulcamara var. dulcamara*	Solanaceae	Solanales	exotic
Canada Goldenrod	*Solidago canadensis*	Asteraceae	Asterales	common throughout disturbed areas and roadsides
Spiny Sow Thistle	*Sonchus asper*	Asteraceae	Asterales	common throughout disturbed areas and roadsides
Greene's Mountain Ash	*Sorbus scopulina*	Rosaceae	Rosales	possible but unusual typically not at lower elevations or west of Cascades
Heather sp.	*species 1*	Ericaceae	Ericales	exotic
Hardhack, Douglas' spirea	*Spiraea douglasii*	Rosaceae	Rosales	wet meadows and riparian openings
Common Tansy	*Tanacetum vulgare*	Asteraceae	Asterales	common throughout disturbed areas and roadsides
Common Dandelion	*Taraxacum officinale*	Asteraceae	Asterales	common throughout disturbed areas and roadsides
Western Redcedar	*Thuja plicata*	Cupressaceae	Pinales	
Threeleaf Foamflower	*Tiarella trifoliata*	Saxifragaceae	Saxifragales	
Piggy-Back Plant, Youth on Age	*Tolmiea menziessii*	Saxifragaceae	Saxifragales	riparian zones and seepage areass
Red Clover	*Trifolium pratense*	Fabaceae	Fabales	common throughout disturbed areas and roadsides
White Clover	*Trifolium repens*	Fabaceae	Fabales	common throughout disturbed areas and roadsides
Western Hemlock	*Tsuga heterophylla*	Pinaceae	Pinales	
Stinging Nettle	*Urtica dioica*	Urticaceae	Rosales	wet meadows, forest openings and roadsides
Red Huckleberry	*Vaccinium parvifolium*	Ericaceae	Ericales	
Great Mullein	*Verbascum thapsus*	Scrophulariaceae	Lamiales	common throughout disturbed areas and roadsides
Lesser Periwinkle	*Vinca minor*	Apocynaceae	Gentianales	exotic

Order	30	Family	52	Genera	89	Species	99

Table 3 Non-vascular Plants - Mosses

Species Common Name	Scientific name	Family	Order	Comments
no common name	*Antitrichia curtipendula*	Leucodontaceae	Hypnales	Mossom Creek, north of hatchery
Aloe Moss	*Atrichum selwynii*	Polytrichaceae	Polytrichales	Mossom Creek, north of hatchery
Apple Moss	*Bartramia pomiformis*	Bartramiaceae	Bartramiales	Mossom Creek, north of hatchery
no common name	*Brachythecium (Sciuro-hypnum) plumosum*	Brachytheciaceae	Hypnales	Mossom Creek, north of hatchery
no common name	*Brachythecium asperrimum*	Brachytheciaceae	Hypnales	Northwest Forest
Roell's brotherella	*Brotherella roellii*	Sematophyllaceae	Hypnales	red-listed; seen once, Mossom Creek, north of hatchery
Waved Silk Moss	*Buckiella undulata*	Hypnaceae	Hypnales	widely distributed
no common name	*Claopodium crispifolium*	Thuidiaceae	Hypnales	widely distributed
Dichodonium Moss	*Dichodontium pellucidum*	Dicranaceae	Dicranales	probably throughout creek
Curly Thatch Moss	*Dicranoweisia cirrata*	Dicranaceae	Dicranales	Mossom Creek, near hatchery
Dicranum Moss	*Dicranum fuscescens*	Dicranaceae	Dicranales	widely distributed
Broom Moss	*Dicranum scoparium*	Dicranaceae	Dicranales	widely distributed
no common name	*Didymodon sp.*	Pottiaceae	Pottiales	Mossom Creek, north of hatchery
Macoun's Heterocladium Moss	*Heterocladium macounii*	Thuidiaceae	Hypnales	probably throughout creek
Tree Mat Homalothecium Moss	*Homalothecium fulgescens*	Brachytheciaceae	Hypnales	Northwest Forest; Mossom creek, near hatchery
Nuttall's Homalothecium Moss	*Homalothecium nuttallii*	Brachytheciaceae	Hypnales	Mossom Creek, near hatchery
Claw Brook-moss	*Hygrohypnum ochraceum*	Amblystegiaceae	Hypnobryales	probably throughout creek
Stairstep Moss	*Hylocomium splendens*	Hylocomiaceae	Hypnales	widely distributed
no common name	*Hypnum circinale*	Hypnaceae	Hypnales	widely distributed
Dieck's Hypnum Moss	*Hypnum dieckii*	Hypnaceae	Hypnales	probably throughout creek
no common name	*Hypnum subimponens*	Hypnaceae	Hypnales	Mossom Creek, north of hatchery; Northwest Forest
no common name	*Isothecium cardotii*	Lembophyllaceae	Hypnales	Mossom Creek, north of hatchery
no common name	*Isothecium stoloniferum*	Lembophyllaceae	Hypnales	widely distributed

Species Common Name	Scientific name	Family	Order	Comments
Oregon Beaked Moss	*Kindbergia oregana*	Brachytheciaceae	Hypnales	widely distributed
Common Feather-moss	*Kindbergia praelonga*	Brachytheciaceae	Hypnales	widely distributed
Leucolepis Umbrella Moss	*Leucolepis acanthoneuron*	Mniaceae	Bryales	widely distributed
Menzies' Metaneckera Moss	*Metaneckera menziesii*	Neckeraceae	Leucodontales	Northwest Forest
Douglas' Neckera Moss	*Neckera douglasii*	Neckeraceae	Hypnales	widely distributed
no common name	*Orthortrichum pulchellum*	Orthotrichaceae	Orthotrichales	Northwest Forest
no common name	*Orthotrichum columbicum*	Orthotrichaceae	Orthotrichales	resurrected from synonymy with O. consimile in 2012
Lyell's Orthotrichum Moss	*Orthotrichum lyellii*	Orthotrichaceae	Orthotrichales	Northwest Forest
Plagiomnium Moss	*Plagiomnium insigne*	Mniaceae	Bryales	widely distributed Northwest Forest
no common name	*Plagiomnium venustum*	Mniaceae	Bryales	Northwest Forest
Toothed Plagiothecium Moss	*Plagiothecium denticulatum*	Plagiotheciaceae	Hypnobryales	Mossom Creek, north of hatchery
Haircap	*Pogonatum urnigerum*	Polytrichaceae	Polytrichinales	Mossom Creek, north of hatchery
Opal Nodding Moss	*Pohlia cruda*	bryaceae	Bryales	Mossom Creek, near hatchery
Alpine Polytrichastrum Moss	*Polytrichastrum alpinum*	Polytrichaceae	polytrichales	Mossom Creek, north of hatchery
Bank Haircap Moss	*Polytrichastrum formosum*	Polytrichaceae	polytrichales	Northwest Forest
Bigelow's Porotrichum Moss	*Porotrichum bigelovii*	Neckeraceae	Isobryales	Mossom Creek, north of hatchery
Elegant Pseudotaxiphyllum Moss	*Pseudotaxiphyllum elegans*	Plagiotheciaceae	Hypnales	widely distributed
no common name	*Racomitrium aciculare*	Grimmiaceae	Grimmiales	probably throughout creek
Yellow-green Rock Moss	*Racomitrium heterostichum s.l.*	Grimmiaceae	Grimmiales	Mossom Creek, north of hatchery
no common name	*Racomitrium varium*	Grimmiaceae	Grimmiales	Mossom Creek, north of hatchery
Fan Moss	*Rhizomnium glabrescens*	Mniaceae	Bryales	widely distributed
Loreus Goose Neck Moss	*Rhytidiadelphus loreus*	Hylocomiaceae	Hypnales	widely distributed
Square Gooseneck Moss	*Rhytidiadelphus squarrosus*	Hylocomiaceae	Hypnales	
Rough Goose Neck Moss	*Rhytidiadelphus triquetrus*	Hylocomiaceae	Hypnales	Mossom Creek, north of hatchery
Sanionia Moss	*Sanionia uncinata*	Amblystegiaceae	Hypnales	Mossom Creek, near hatchery
Obtuseleaf Scleropodium Moss	*Scleropodium obtusifolium*	Amblystegiaceae	Hypnobryales	probably throughout creek

Species Common Name	Scientific name	Family	Order	Comments
Tetraphis Moss	*Tetraphis pellucida*	Tetraphidaceae	Tetraphidales	Mossom Creek, near hatchery; Northwest Forest
Twisted Ulota Moss	*Ulota obtusiuscula*	Orthotrichaceae	Orthotrichales	Mossom Creek, north of hatchery

Order	13	Family	19	Genus	39	Species	51

Table 4 Non-vascular plants Liverworts et al

Species Common Name	Scientific name	Family	Order	Comments
Bazzania Lichen	*Bazzania denudata*	Lepidoziaceae	Jungermanniales	widely distributed
Hairy Threadwort	*Blepharostoma trichophyllum*	Lophocoleaceae	Jungermanniales	Mossom Creek, north of hatchery
no common name	*Calypogeia azurea*	Calypogeiaceae	Jungermanniales	Mossom Creek, north of hatchery
Twotoothed Cephalozia	*Cephalozia bicuspidata*	Cephaloziaceae	Jungermanniales	widely distributed
	Chiloscyphus polyanthos	Lophocoleaceae	Jungermanniales	probably throughout creek
Snakeskin Liverwort	*Conocephalum conicum s.l.*	Conocephalaceae	Marchantiales	Mossom Creek, north of hatchery
no common name	*Frullania tamarisci var. nisquallensis*	Frullaniaceae	Porellales	Mossom Creek, north of hatchery
no common name	*Jungermannia obovata*	Jungermanniaceae	Jungermanniales	Mossom Creek, north of hatchery
Creeping Fingerwort	*Lepidozia reptans*	Lepidoziaceae	Jungermanniales	widely distributed
no common name	*Lophocolea cuspidata*	Lophocoleaceae	Jungermanniales	Northwest Forest
Notched Rustwort	*Marsupella emarginata*	Gymnomitriaceae	Jungermanniales	Mossom Creek, north of hatchery
Rock Veilwort	*Metzgeria conjugata*	Metzgeriaceae	Jungermanniales	Mossom Creek, north of hatchery
Whiskered Veilwort	*Metzgeria temperata*	Metzgeriaceae	Jungermanniales	widely distributed

Species Common Name	Scientific name	Family	Order	Comments
Ring Pellia	*Pellia neesiana*	Metzgeriaceae	Jungermanniales	Mossom Creek, north of hatchery
no common name	*Plagiochila porelloides*	Plagiochilaceae	Jungermanniales	Mossom Creek, north of hatchery
no common name	*Porella cordeana*	Porellaceae	Jungermanniales	Mossom Creek, near hatchery
no common name	*Porella navicularis*	Porellaceae	Jungermanniales	Mossom Creek, north of hatchery
no common name	*Ptilidium californicum*	Ptilidiaceae	Jungermanniales	Mossom Creek, north of hatchery
no common name	*Radula bolanderi*	Radulaceae	Porellales	Mossom Creek, north of hatchery
Flat-leaved Scalewort	*Radula complanata*	Radulaceae	Porellales	Mossom Creek, north of hatchery
Bog Germanderwort	*Riccardia latifrons*	Aneuraceae	Metzgeriales	Mossom Creek, near hatchery
no common name	*Scapania bolanderi*	Scapaniaceae	Jungermanniales	widely distributed
no common name	*Scapania undulata*	Scapaniaceae	Jungermanniales	probably throughout creek

Order	4	Family	15	Genera	19	Species	23

Table 5. Non-vascular plants – algae (marine)

Species Common Name	Scientific name	Family	Order	Comments
Fucus	*Fucus gardneri*	Fucaceae	Fucales	beach seine
Sargassum	*Sargassum sp. 1*	Sargassaceae	Fucales	beach seine
Sarcodiotheca	*Sarcodiotheca sp. 1*	Solieriaceae	Gigartinales	red stag-like kelp, beach seine
Sea Lettuce sp.	*Ulva sp. 1*	Ulvaceae	Ulvales	beach seine, species not detailed, at least 13 species occur/potentially in southwest BC waters. Likely *Ulva lactuca*
Sea Lettuce (poss Sea Hair)	*Ulva sp. 2*	Ulvaceae	Ulvales	beach seine, species not detailed, at least 13 species occur/potentially in southwest BC waters. Likely *Ulva intestinalis*

Order	3	family	4	genera	5	Species	5

Table 6. Arthropods - crustaceans

Species Common Name	Scientific name	Family	Order	Comments
Acorn Barnacle	*Balanus glandula or Semibalanus balanoides*	Balanidae and or Archaeobalanidae	Sessilia	beach seine
Skeleton Shrimp	*Caprella sp.*	Caprellidae	Amphipoda	beach seine
Little Brown Barnacle	*Chthamalus dalli*	Chthamalidae	Sessilia	foreshore
Shore Crab	*Hemigrapsus sp.*	Portunidae	Decapoda	beach seine, likely *Hemigrapsus nudus* and or *H. oregonensis*
Graceful Rock Crab	*Metacarcinus gracilis*	Cancridae	Decapoda	net pen dive, beach seine
Dungeness Crab	*Metacarcinus magister*	Cancridae	Decapoda	Synonym genus *Cancer* , net pen dive, beach seine
Bering Hermit Crab	*Pagurus beringanus*	Paguridae	Decapoda	net pen dive, beach seine
Hairy Hermit Crab	*Pagurus hirsutiusculus*	Paguridae	Decapoda	net pen dive, beach seine
Dock Shrimp	*Pandalus danae*	Pandalidae	Decapoda	net pen dive
Krill	*species 1*	Euphausiidae and or Bentheuphausiidae	Decapoda and or Euphausiacea	beach seine

Order 3	Family 8	Genera 8	Species 9

Table 7. Arthropods – Insects & Diplopoda

Species Common Name	Scientific name	Family	Order	Comments
Midges	*Ablabesmyia sp.*	Chironomidae	Diptera	lower Mossom, larva
Predaceous Diving Beetles	*Agabinus sculpturellus*	Carabidae	Coleoptera	upper Mossom, nymphs
Combmouthed Minnow Mayflies	*Ameletus sp.*	Ameletidae	Ephemeroptera	in Mossom Creek
Small Minnow Mayflies	*Baetis sp.*	Baetidae	Ephemeroptera	lower Mossom, nymphs
Stink Bugs	*Banasa sordida*	Pentatomidae	Hemiptera	lower Mossom
Ground Beetles	*Bradycellus harpalinus*	Carabidae	Coleoptera	northwest forest, gun range
Common Stoneflies	*Calineuria californica*	Perlidae	Plecoptera	upper and lower Mossom, nymphs
Woodland Ground-beetle	*Carabus nemoralis*	Carabidae	Coleoptera	northwest forest, gun range
Oak-skeletonizer Moth	*Carcina quercana*	Depressariidae	Lepidoptera	introduced, light trap north of Ioco School
Gray Spruce Looper	*Caripeta divisata*	Geometridae	Lepidoptera	light trap north of Ioco School
Flatheaded Mayflies	*Cinygmula sp.*	Heptageniidae	Ephemeroptera	lower Mossom, nymphs
"Dancing or Dagger" Flies	*Clinocera sp.*	Empididae	Diptera	upper Mossom, light trap north of Ioco School
Pacific Spiketail	*Cordulegaster dorsalis*	Cordulegastridae	Odonata	Mossom Creek
Minute Brown Scavenger Beetles	*Cortinicara gibbosa*	Latridiidae	Coleoptera	upper Mossom, introduced
Pine Sawfly	*Diprion pini*	Diprionidae	Hymenoptera	light trap north of Ioco School, introduced
Common Stoneflies	*Doroneuria sp.*	Perlidae	Plecoptera	upper & lower Mossom, nymphs
"Sharpshooter Leafhopper"	*Draeculacephala crassicornis*	Cicadellidae	Hemiptera	old gun range
Early Western Mottled Sedge Caddisflies	*Ecclisomyia sp.*	Limnephilidae	Trichoptera	upper Mossom, larva & case

Species Common Name	Scientific name	Family	Order	Comments
Shield Bugs	*Elasmucha lateralis*	Acanthosomatidae	Hemiptera	lower Mossom
Syrphid (Flower) Flies	*Eupeodes fumipennis*	Syrphidae	Diptera	light trap north of Ioco School
Shield-backed Bugs	*Eurygaster amerinda*	Scutelleridae	Hemiptera	light trap north of Ioco School
Asian Ladybeetle	*Harmonia axyrides*	Coccinellidae	Coleoptera	light trap north of Ioco School, introduced
Cuckoo Wasps	*Hedychridium dimidiatum*	Chrysididae	Hymenoptera	old gun range
Flatheaded Mayflies	*Ironodes flavipennis*	Heptageniidae	Ephemeroptera	old gun range, nymph
Longhead Sallfly	*Kathroperla perdita*	Chloroperlidae	Plecoptera	lower Mossom, nymph
Birch Catkin Bug	*Kleidocerys resedae*	Lygaeidae	Hemiptera	old gun range
Riffle Beetles	*Lara avara avara*	Elmidae	Coleoptera	upper Schoolhouse Creek North, larvae
Sweat Bees	*Lasioglossum sp.*	Halictidae	Hymenoptera	old gun range
cornfield ants, citronella ants	*Lasius sp.*	Formicidae	Hymenoptera	upper a& lower Mossom, old gun range
water striders	*Limnoporus notabilis*	Gerridae	Hemiptera	upper & lower Mossom, nymphs & adults
Moth Flies and Sand Flies	*Maruina sp.*	Psychodidae	Diptera	upper Mossom
Red-legged Grasshopper	*Melanoplus femurrubrum*	Acrididae	Orthoptera	old gun range
Short-horned Grasshoppers	*Melanoplus sp.*	Acrididae	Orthoptera	old gun range
Damsel Bugs	*Nabis roseipennis*	Nabidae	Hemiptera	old gun range
Damsel Bugs	*Nabis rufusculus*	Nabidae	Hemiptera	old gun range
Lined Spittlebug	*Neophilaenus lineatus*	Aphrophoridae	Hemiptera	old gun range, introduced
Large Yellow Underwing	*Noctua pronuba*	Noctuidae	Lepidoptera	lower Mossom, introduced
Short-tailed Ichneumon Wasps	*Ophion*	Ichneumonidae	Hymenoptera	light trap north of Ioco School

Species Common Name	Scientific name	Family	Order	Comments
Predaceous Diving Beetles	*Oreodytes sp.*	Dytiscidae	Coleoptera	upper Mossom
Same genus as Japanese Leafhopper	*Orientus sp.*	Cicadellidae	Hemiptera	lower Mossom, Cicadellidae, introduced leaf hopper, new to BC
Pronggilled Mayflies	*Paraleptophlebia sp.*	Leptophlebiidae	Ephemeroptera	upper Mossom, nymphs
Crambid Snout Moths	*Pediasia sp.*	Crambidae	Lepidoptera	Ioco townsite
Ironclad Beetle	*Phellopsis porcata*	Carabidae	Coleoptera	Bog, Bert Flinn Park gasline Right of Way
Plant Bugs	*Phytocoris eurekae*	Miridae	Hemiptera	upper Mossom
Plant Bugs	*Phytocoris neglectus*	Miridae	Hemiptera	lower Mossom
Cabbage White	*Pieris rapae*	Pieridae	Lepidoptera	around hatchery
Hairy-winged Barklice	*Polypsocus corruptus*	Amphipsocidae	Psocodea	lower Mossom
Snow Sedge Caddisflies	*Psychoglypha sp.*	Limnephilidae	Trichoptera	upper & lower Mossom, larvae & cases
Twenty-spotted Lady beetle	*Psyllobora vigintimaculata*	Coccinellidae	Coleoptera	upper Mossom
Ebony Salmonfly	*Pteronarcys princeps*	Pteronarcyidae	Plecoptera	upper & lower Mossom, upper Schoolhouse Creek North
Woodland Ground Beetles	*Pterostichus algidus*	Carabidae	Coleoptera	northwest forest, gun range
Woodland Ground Beetles	*Pterostichus amethystinus*	Carabidae	Coleoptera	northwest forest, gun range
Woodland Ground Beetles	*Pterostichus crenicollis*	Carabidae	Coleoptera	northwest forest, gun range
Woodland Ground Beetles	*Pterostichus herculaneus*	Carabidae	Coleoptera	northwest forest, gun range
Woodland Ground Beetles	*Pterostichus herculeanus*	Carabidae	Coleoptera	northwest forest, gun range
Woodland Ground Beetles	*Pterostichus lama*	Carabidae	Coleoptera	northwest forest, gun range
Snipe Flies	*Rhagio tringarius*	Rhagionidae	Diptera	upper Mossom, introduced
Common Red Soldier Beetle	*Rhagonycha fulva*	Cantharidae	Coleoptera	old gun range, introduced
Green Sedge Caddisflies	*Rhyacophila sp.*	Rhyacophilidae	Trichoptera	lower Mossom, larva
acalyptrate flies	*Sapromyza rotundicornis*	Lauxaniidae	Diptera	lower Mossom
Snail-killer Carabid	*Scaphinotus angusticollis*	Carabidae	Coleoptera	northwest forest, gun range

Species Common Name	Scientific name	Family	Order	Comments
Spiny Crawler Mayflies	*Serratella sp1*	Ephemerellidae	Ephemeroptera	upper Mossom, nymphs
Spiny Crawler Mayflies	*Serratella sp2*	Ephemerellidae	Ephemeroptera	upper Mossom, nymphs
Braconid Wasps	*Spathius*	Braconidae	Hymenoptera	upper Mossom
no common name	*species 1*	Culicidae	Diptera	lower Mossom
no common name	*species 1*	Ephydridae	Diptera	lower Mossom
Lonchopterid Flies	*Species 1*	Lonchopteridae	Diptera	light trap north of Ioco School
no common name	*species 1*	Muscidae	Diptera	lower Mossom
no common name	*species 1*	Sarcophagidae	Diptera	light trap north of Ioco School
Large Crane Flies	*Species 1*	Tipulidae	Diptera	lower & upper Mossom
Crambid Snout Moths	*Species 1*	Crambidae	Lepidoptera	upper Mossom
Large Crane Flies	*Species 1*	Limnephilidae	Trichoptera	light trap north of Ioco School, possibly *limonia sp.*
Free-living caddisflies	*Species 1*	Rhyacophilidae	Trichoptera	light trap north of Ioco School
Large Crane Flies	*Species 2*	Tipulidae	Diptera	lower Mossom
Nut Leaf Weevil	*Strophosoma melanogrammum*	Curculionidae	Coleoptera	old gun range, introduced
Green Stonefly	*Sweltsa sp.*	Chloroperlidae	Plecoptera	lower Mossom, nymph
Pacific Coast Dampwood Termite	*Zootermopsis angusticollis*	Archotermopsidae	Isoptera	old gun range, immature
Ichneumon Wasps		Ichneumonidae	Hymenoptera	light trap north of Ioco School, sub-family Campopleginae

Order 11	Family 51	Genera 70	Species 79

Diplopoda:

Yellow Spotted Millipede	*Harpaphe haydeniana*	Xystodesmidae	Polydesmida	observed in northwest forest, common throughout area

Table 8. Miscellaneous marine invertebrates

Species Common Name	Scientific name	Family	Order	Comments (e.g., number observed)
Orange Sea Cucumber	*Cucumaria miniata*	Cucumariidae	Dendrochirotida	sea pen dive, phylum Echinodermata
Giant Feather Duster Worm	*Eudistylia polymorpha*	Sabellidae	Sabellida	sea pen dive, phylum Annelida
Northern Feather Duster Worm	*Eudistylia vancouveri*	Sabellidae	Canalipalpata	sea pen dive, phylum Annelida
Mottled Star	*Evasterias troschelii*	Asteriidae	Forcipulatida	sea pen dive, phylum Echinodermata
Sea Hedgehog, Sea Squirt	*Halocynthia igaboja*	Pyuridae	Pleurogona	sea pen dive, Phylum Chordata
Six-rayed Star	*Leptasterias hexactis*	Asteriidae	Forcipulatida	sea pen dive, phylum Echinodermata
Lacy Crust Bryozoans	*Membranipora sp. 1*	Membraniporidae	Cheilostomatida	sea pen dive, Phylum Bryozoa
Giant California Sea Cucumber	*Parastichopus californicus*	Stichopodidae	Aspidochirotida	sea pen dive, phylum Echinodermata
Ochre Sea Star	*Pisaster ochraceus*	Asteriidae	Forcipulatida	sea pen dive, phylum Echinodermata
Feather Duster Worm	*Schizobranchia insignis*	Sabellidae	Sabellida	sea pen dive, phylum Annelida
Yellow Sponge	not identified	not identified	not identified	beach seine, phylum Porifera

order 10	Family 8	genera 10	species 8

Table 9. Cnidaria – jellies and hydroids

Species Common Name	Scientific name	Family	Order	Comments (e.g., number observed)
Plumose Anemone	*Metridium senile*	Metridiidae	Actiniaria	sea pen dive,
Red Eye Medusa	*Polyorchis penicillatus*	Polyorchidae	Anthomedusae	sea pen dive, beach seine, aka Penicillate Jellyfish
Pacific Sea Gooseberry	*Pleurobrachia bachei*	Pleurobrachiidae	Cydippida	sea pen dive
Crystal Jelly	*Aequorea*	Aequoreidae	Hydroidolina	beach seine, poss Aequorea victoria
Wine-glass Hydroids	*Obelia sp. 1*	Campanulariidae	Leptomedusae	sea pen dive,
Lion's Mane Jelly	*Cyanea capillata*	Cyaneidae	Semaeostomeae	sea pen dive
Greater Moon Jelly	*Aurelia labiata*	Ulmaridae	Semaeostomeae	sea pen dive, beach seine

Order 6	Family 7	genera 7	species 7

Table 10. Molluscs (marine)

Species Common Name	Scientific name	Family	Order	Comments
Japanese Mud Snail	*Batillaria attramentaria*	Batillariidae	Neotaenioglossa	beach seine
Nuttall(s) Cockle, Heart or Basket Cockle	*Clinocardium nuttallii*	Cardiidae	Veneroida	beach seine, foreshore, exotic
Pacific Oyster, Japanese Oyster	*Crassostrea gigas*	Ostreidae	Ostreoida	beach seine, foreshore
Pacific Little-neck Clam	*Leukoma staminea*	Veneridae	Veneroida	beach seine, foreshore, synonym *Protothaca staminea*
Checkered Periwinkle	*Littorina scutulata*	Littorinidae	Littorinoidea	foreshore
Sitka Periwinkle	*Littorina sitkana*	Littorinidae	Littorinoidea	foreshore
Mossy Chiton	*Mopalia muscosa*	Mopaliidae	Chitonida	beach seine
Soft Shell Clam	*Mya arenaria*	Myidae	Myoida	beach seine, foreshore
Pacific Blue Mussel, Foolish Mussel	*Mytilus trossulus*	Mytilidae	Mytiloida	beach seine, foreshore, aka basket cockle
Varnish Clam, Purple or Dark Mahogany Clam	*Nuttallia obscurata*	Psammobiidae	Tellinoidea	beach seine, foreshore, exotic
Butter Clam	*Saxidomus gigantea*	Veneridae	Veneroida	beach seine, foreshore
Gaper Clam	*Tresus sp.*	Mactridae	Mactroidea	beach seine, also known as horse clam
Japanese Little-neck Clam, Manila Clam	*Venerupis philippinarum*	Veneridae	Veneroida	beach seine, foreshore, exotic

order	9	Family	9	genera	9	species	13

Table 11. Molluscs (terrestrial)

Species Common Name	Genus & Species	Family	*Order	Comments (e.g., number observed)
Banana Slug	*Ariolimax columbianus*	Ariolimacidae	Sigmurethra	northwest forest
Chocolate Arion	*Arion rufus*	Arionidae	Sigmurethra	northwest forest
Black Arion	*Arion ater*	Arionidae	Sigmurethra	northwest forest
Pacific Sideband	*Monadenia fidelis*	Bradybaenidae	Sigmurethra	northwest forest
Robust Lancetooth	*Haplotrema vancouverense*	Haplotrematidae	Sigmurethra	northwest forest
Oregon Lancetooth	*Ancotrema hybridum*	Haplotrematidae	Sigmurethra	northwest forest
Northwest Hesparian	*Vespericola columbianus*	Polygyridae	Sigmurethra	mossom creek riparian area

*Sigmurethra is an informal group which includes the majority of land snails and slugs, which are now broken down into numerous clades.

order	1	Family	5	genera	6	species	7

Table 12. Amphibians

Species Common Name	Genus & Species	Family	Order	Comments
Coastal Tailed Frog	*Ascaphus truei*	Leiopelmatidae	Anura	found throughout Mossom creek, Recently downlisted to yellow provincially, still SARA Special Concern

Table 13. Fishes

Species Common Name	Genus & Species	Family	Order	Comments (e.g., number observed)
Bay Goby	*Lepidogobius lepidus*	Gobiidae	Perciformes	Mossom estuary
Saddleback Gunnel	*Pholis ornata*	Pholidae	Perciformes	Mossom estuary
Shiner Perch	*Cymatogaster aggregata*	Embiotocidae	Perciformes	Mossom estuary
Starry Flounder	*Platichthys stellatus*	Pleuronectidae	Pleuronectiformes	Mossom estuary
Coho Salmon	*Oncorhynchus kisutch*	Salmonidae	Salmoniformes	fry of the year in Mossom Creek and possibly as smolts in Mossom estuary
Coastal Cutthroat Trout	*Oncorhynchus clarki clarki*	Salmonidae	Salmoniformes	both in Mossom Creek and anadromously, blue-listed
Pacific Staghorn Sculpin	*Leptocottus armatus*	Cottidae	Scorpaeniformes	Mossom estuary
Sharpnose Sculpin	*Clinocottus acuticeps*	Cottidae	Scorpaeniformes	Mossom estuary
Great Sculpin	*Myoxocephalus polyacanthocephalus*	Cottidae	Scorpaeniformes	Mossom estuary
Bay Pipefish	*Syngnathus leptorhynchus*	Syngnathidae	Syngnathiformes	Mossom estuary

order	5	Family	7	genera	9	species	11

Table 14. Birds

Species Common Name	Scientific name	Family	Order	Comments
Spotted Sandpiper	*Actitis macularius*	Scolopacidae	Charadriiformes	Mossom Ck Estuary
Mallard	*Anas platyrhynchos*	Anatidae	Anseriformes	Mossom Ck Estuary
Great Blue Heron faninni ssp.	*Ardea herodias fannini*	Ardeidae	Pelecaniformes	Ioco Boat Club, Mossom Ck Estuary
Cedar Waxwing	*Bombycilla cedrorum*	Bombycillidae	Passiformes	Ioco Townsite
Canada Goose, occidentalis ssp.	*Branta canadensis occidentalis*	Anatidae	Anseriformes	Mossom Ck Estuary
Anna's Hummingbird	*Calypte anna*	Trochilidae	Apodiformes	Ioco Townsite
Wilson's Warbler	*Cardellina pusilla*	Parulidae	Passiformes	near hatchery
American Goldfinch	*Carduelis tristis*	Fringillidae	Passiformes	Ioco Townsite
Turkey Vulture	*Cathartes aura*	Cathartidae	Accipitriformes	Mossom Ck Estuary
Swainson's Thrush	*Catharus ustulatus*	Turdidae	Passiformes	Ioco Townsite, Mossom Ck Hatchery
Pigeon Guillemot	*Cepphus columba*	Alcidae	Charadriiformes	Mossom Ck Estuary
Brown Creeper	*Certhia americana*	Certhiidae	Passiformes	Ioco Townsite, Old Gun Range
Killdeer	*Charadrius vociferus*	Charadriidae	Charadriiformes	Mossom Ck Estuary
Common Nighthawk	*Chordeiles minor*	Caprimulgidae	Caprimulgiformes	evening bat and owl event Ioco townsite August 18, blue-listed/SARA special concern
Northern Flicker	*Colaptes auratus*	Picidae	Piciformes	Ioco Townsite
Northwestern Crow	*Corvus caurinus*	Corvidae	Passiformes	Ioco Townsite, Old Gun Range, Mossom Ck Estuary
Common Raven	*Corvus corax*	Corvidae	Passiformes	Ioco Townsite

Species Common Name	Scientific name	Family	Order	Comments
Steller's Jay	*Cyanocitta stelleri*	Corvidae	Passiformes	Ioco Townsite, Old Gun Range
Hammond's Flycatcher	*Empidonax hammondii*	Tyrannidae	Passiformes	Ioco Townsite
Willow Flycatcher	*Empidonax traillii*	Tyrannidae	Passiformes	Ioco Townsite
House Finch	*Haemorhous mexicanus*	Fringillidae	Passiformes	Ioco Townsite
Bald Eagle	*Haliaeetus leucocephalus*	Accipitridae	Accipitriformes	Ioco Boat Club
Mew Gull	*Larus canus*	Laridae	Charadriiformes	Ioco Boat Club, Mossom Ck Estuary
Glaucous-winged Gull	*Larus glaucescens*	Laridae	Charadriiformes	Ioco Townsite
Hooded Merganser	*Lophodytes cucullatus*	Anatidae	Anseriformes	Mossom Ck Estuary
Belted Kingfisher	*Megaceryle alcyon*	Alcedinidae	Coraciiformes	Ioco Boat Club
Pacific-slope Flycatcher	*Melospiza melodia*	Tyrannidae	Passiformes	Ioco Townsite
Song Sparrow	*Melospiza melodia*	Passerellidae	Passiformes	Ioco Townsite
Common Merganser	*Mergus merganser*	Anatidae	Anseriformes	Mossom Ck Estuary
Osprey	*Pandion haliaetus*	Pandionidae	Accipitriformes	Ioco Boat Club
Band-tailed Pigeon	*Patagioenas fasciata*	Columbidae	Columbiformes	Ioco Townsite, blue-listed/SARA special concern
Double-crested Cormorant	*Phalacrocorax auritus*	Phalacrocoracidae	Suliformes	Ioco Boatclub, blue-listed
Pelagic Cormorant	*Phalacrocorax pelagicus*	Phalacrocoracidae	Suliformes	
Black-headed Grosbeak	*Pheucticus melanocephalus*	Cardinalidae	Passiformes	Ioco Townsite
Downy Woodpecker	*Picoides pubescens*	Picidae	Piciformes	Ioco Townsite
Spotted Towhee	*Pipilo maculatus*	Emberizidae	Passiformes	Ioco Townsite
Red-necked Grebe	*Podiceps grisegena*	Podicipedidae	Podicipediformes	Mossom Ck Estuary

Species Common Name	Scientific name	Family	Order	Comments
Black-capped Chickadee	*Poecile atricapillus*	Paridae	passiformes	Ioco Townsite, Old Gun Range
Chestnut-backed Chickadee	*Poecile rufescens*	Paridae	Passiformes	Ioco Townsite, Old Gun Range
Bushtit	*Psaltriparus minimus*	Aegithalidae	Passiformes	Mossom Ck Estuary
Rufous Hummingbird	*Selasphorus rufus*	Trochilidae	Apodiformes	Old Gun Range
Black-throated Gray Warbler	*Setophaga nigrescens*	Parulidae	Passiformes	Ioco Townsite, Old Gun Range
Townsend's Warbler	*Setophaga townsendi*	Parulidae	Passiformes	Ioco Townsite, Old Gun Range
Pacific Wren	*Troglodytes pacificus*	Troglodytidae	Passiformes	Hatchery
American Robin	*Turdus migratorius*	Turdidae	Passiformes	Ioco Townsite, Old Gun Range
Hutton's Vireo	*Vireo huttoni*	Vireonidae	Passiformes	Ioco Townsite, Old Gun Range
White-crowned Sparrow	*Zonotrichia leucophrys*	Passerellidae	Passiformes	Ioco Townsite, Old Gun Range

order	12	Family	29	genera	39	species	46

Table 15. Mammals

Species Common Name	Scientific name	Family	Order	Comments
Big Brown Bat	*Epetsicus fuscus*	Vespertilionidae	Chiroptera	Ioco Townsite and road to hatchery
Silver-haired Bat	*Lasionycteris noctivagans*	Vespertilionidae	Chiroptera	Ioco Townsite
Hoary Bat	*Lasiurus cinereus*	Vespertilionidae	Chiroptera	Ioco Townsite
California Myotis	*Myotis californicus*	Vespertilionidae	Chiroptera	Ioco Townsite
Little Brown Myotis	*Myotis lucifugus*	Vespertilionidae	Chiroptera	Ioco Townsite and road to hatchery, SARA Endangered
Long-legged Myotis	*Myotis volans*	Vespertilionidae	Chiroptera	Ioco Townsite
Yuma Myotis	*Myotis yumanensis*	Vespertilionidae	Chiroptera	Ioco Townsite and road to hatchery
American Mink	*Neovison vison*	Mustelidae	Carnivora	next to hatchery
Mule deer	*Odocoileus hemionus*	Cervidae	Artiodactyla	formerly known as Columbia Black-tailed Deer, observed at Ioco Townsite and along road to hatchery
Harbour Seal	*Phoca vitulina*	Phocidae	Carnivora	also referred to as Common Seal, observed at Mossom estuary
Douglas Squirrel	*Tamiasciurus douglasii*	Sciuridae	Rodentia	road to hatchery
Black Bear	*Ursus americanus*	Ursidae	Carnivora	Ioco Townsite

order	4	Family	6	genera	9	species	13

Appendix 2: Historic Wildlife Sightings[17]

[17] Based on records provided through the Mossom Creek Hatchery and Education Centre. Information is derived from sightings provided by residents in and around the watershed and volunteers of the Mossom Creek Hatchery, and from security video and wildlife cameras around the hatchery from 2014-2017

Table 16. Historic Wildlife Sightings from the Mossom Creek hatchery and watershed

*Highlighted rows represent species observed during the 2017 BioBlitz

Species Common Name	Scientific name	Family	Order	Comments
Cooper's Hawk	*Accipiter cooperii*	Accipitridae	Accipitriformes	hatchery parking lot; 2015
Northwestern Salamander	*Ambystoma gracile*	Ambystomatidae	Caudata	near hatchery, egg mass from Noons Creek pond placed in Mossom pond; yrs: 2014, 2016
Great Blue Heron *faninni* ssp.	*Ardea herodias faninni*	Ardeidae	Pelecaniformes	near hatchery; 2015, 2016 (SARA special concern)
Coastal Tailed Frog	*Ascaphus truei*	Leiopelmatidae	Anura	several, near hatchery, an adult, by pond, tadpole, above intake; yrs: 2014, 2016, 2017 (SARA special concern)
Red-tailed Hawk	*Buteo jamaicensis*	Accipitridae	Accipitriformes	at hatchery intake, 2014
Coyote	*Canis latrans*	Canidae	Carnivora	#8 Mossom Creek Drive, Mossom at Ioco Road, on hatchery cam system, lower end of gravel road; yrs: 2014, 2015
Swainson's Thrush	*Catharus ustulatus*	Turdidae	Passiformes	intake trail - heard, way up gravel road; yrs: 2014, 2017
American Dipper	*Cinclus mexicanus*	Cinclidae	Passiformes	Mossom Creek, Mossom Creek, base of stairs near hatchery, at pond beside hatchery; yrs: 2015, 2017
Pileated Woodpecker	*Dryocopus pileatus*	Picidae	Piciformes	seen from trail to intake above hatchery; 2017
Northern Alligator Lizard	*Elgaria coerulea*	Anguidae	Squamata	#8 Mossom Creek Drive; 2014
Pacific-slope Flycatcher	*Empidonax difficilis*	Tyrannidae	Passiformes	heard near hatchery, half way up gravel road; yrs: 2014, 2017
Ensatina Salamander	*Ensatina eschscholtzii*	Plethodontidae	Caudata	near hatchery; 2014

Species Common Name	Scientific name	Family	Order	Comments
Northern Flying Squirrel	*Glaucomys sabrinus*	Sciuridae	Rodentia	flying squirrel nesting box check, East Rd. residence on Mossom Cr., got into house, killed by cat; 2015, 2016 (possibly newly identified Humboldt's flying squirrel (*Glaucomys oregonensis*)
Bald Eagle	*Haliaeetus leucocephalus*	Accipitridae	Accipitriformes	beside hatchery pond, in tree near hatchery, high in large Douglas fir trees near bottom gate, start of gravel road, estuary; yrs: 2015, 2017
Varied Thrush	*Ixoreus naevius*	Turdidae	Passiformes	#8 Mossom Creek Drive; 2014
Dark-eyed Junco	*Junco hyemalis*	Emberizidae	Passiformes	half way up gravel road; 2017
Snowshoe Hare	*Lepus americanus*	Leporidae	Lagomorpha	20 m north of entry gate on west side of gravel road, just below entry gate - third time spotted; yrs: 2015, 2016 (possibly *washingtonii* ssp.)
North American River Otter	*Lontra canadensis*	Mustelidae	Carnivora	Mossom Creek, base of stairs near hatchery, pool, on hatchery cam system; 2015
Bobcat	*Lynx rufus*	Felidae	Carnivora	Heritage Mt. Boulevard, upper Mossom, Coutts/Hackinen yard, beside hatchery, road to hatchery, Sunnyside Properties, below Ioco Rd., beside Mossom Creek, a yearling at construction trailer, hatchery site, #8 Mossom Creek Drive; 2015
Striped Skunk	*Mephitis mephitis*	Mephitidae	Carnivora	dead on Ioco Road near Mossom Creek culvert; 2017
Pacific Sideband	*Monadenia fidelis*	Monadeniidae	Stylommatophora	also seen previously and often; 2015
American Mink	*Neovison vison*	Mustelidae	Carnivora	hatchery intake, hatchery pond, photo taken, pond beside hatchery; yrs: 2014, 2016, 2017

Species Common Name	Scientific name	Family	Order	Comments
Mule Deer	*Odocoileus hemionus*	Cervidae	Artiodactyla	Mossom Rd near Ioco Road, upper pull-out two deer, adult and two fawns at hatchery, on hatchery cam system, by welcome sign on gravel road below big parking lot - mom and 3 yearlings, lower pull-out young buck; yrs: 2014, 2015, 2016, 2017
Chum Salmon (approx. 200)	*Oncorhynchus keta*	Salmonidae	Salmoniformes	between estuary and hatchery, 2016
Coho Salmon	*Oncorynchus kisutch*	Salmonidae	Salmoniformes	between estuary and hatchery; 2016
Osprey	*Pandion haliaetus*	Pandionidae	Accipitriformes	flying low over Mossom gravel road; 2015
Spotted Towhee	*Pipilo maculatus*	Emberizidae	Passiformes	#8 Mossom Creek Drive, on fence, hatchery site; 2014
Western Tanager	*Piranga ludoviciana*	Thraupidae	Passiformes	half way up gravel road; 2017
Chestnut-backed Chickadee	*Poecile rufescens*	Paridae	Passiformes	intake trail - heard, half way up gravel road, between estuary and hatchery; yrs: 2014, 2015, 2017
Raccoon	*Procyon lotor*	Procyonidae	Carnivora	trail to intake, on hatchery cam system; yrs: 2014, 2015
Giant Stonefly	*Pteronarcys princeps*	Pteronarcyidae	Plecoptera	adults, flying near hatchery, exoskeletons on cedar tree beside creek; yrs: 2015, 2016 (likely Ebony Salmonfly
Cougar	*Puma concolor*	Felidae	Carnivora	path beside hatchery building, nature cam on trail, on hatchery cam system, Mel's backyard, Mossom forest - repeatedly over a week; yrs: 2014, 2015, 2017
Golden-crowned Kinglet	*Regulus satrapa*	Regulidae	Passiformes	by ear, near hatchery; 2015
Rufous Hummingbird	*Selasphorus rufus*	Trochilidae	Passiformes	on fence, hatchery site, near amphitheatre, beside hatchery, seen bathing in pond waterfall; yrs: 2014, 2015

Species Common Name	Scientific name	Family	Order	Comments
Red-breasted Sapsucker	*Sphyrapicus ruber*	Picidae	Piciformes	near hatchery; 2015
Barred Owl	*Strix varia*	Strigidae	Strigiformes	near hatchery, a quarter of the way up the gravel road, at hatchery pond on the ground, dead beside Ioco Road near Mossom Creek culvert; yrs: 2014, 2016, 2017
Douglas Squirrel	*Tamiasciurus douglasii*	Sciuridae	Rodentia	near hatchery, small parking lot, amphitheatre beside hatchery; yrs: 2014, 2015
Rough-skinned Newt	*Taricha granulosa*	Salamandridae	Caudata	between hatchery and parking lot on road, cold and slow moving; 2016
Pacific Wren	*Troglodytes pacificus*	Troglodytidae	Passiformes	intake trail, nest with chicks screeching, by ear, near hatchery; yrs: 2014, 2015
Black Bear	*Ursus americanus*	Ursidae	Carnivora	on hatchery cam system, on gravel road, on pathway beside hatchery, #8 Mossom Creek Drive, lower gate at base of gravel road - two bears, Adult and two cubs, on gravel road near bottom, eating unripe salmonberries, adult and cub near Ioco at Mossom Cr. Drive, hatchery parking lot, spawning pools, two cubs at hatchery; yrs: 2014, 2015, 2016, 2017
Warbling Vireo	*Vireo gilvus*	Vireonidae	Passiformes	intake trail - heard, half way up gravel road; yrs: 2014, 2017
Red Fox	*Vulpes vulpes*	Canidae	Carnivora	Lancaster Court, Anmore, Mossm watershed, ate a domestic duck; 2015
Wilson's Warbler	*Wilsonia pusilla*	Parulidae	Passiformes	intake trail - heard; 2014

Order	15	Genera	42	Family	33	Species	43