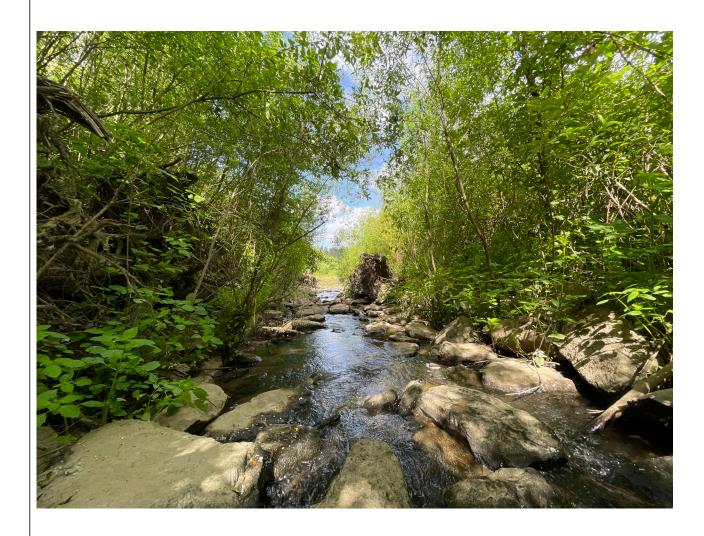
# RINEARSON NATURAL AREA RESTORATION YEAR 5 (2023) MONITORING REPORT



prepared for Columbia Restoration Group, LLC

prepared by



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June, 2024



# Rinearson Natural Area Restoration Monitoring - Cover Sheet

Owner/Permittee: Columbia Restoration Group Report Prepared By: Waterways Consulting, Inc. and

**Pacific Habitat Services** 

City/County: Gladstone/Clackamas County Report Date: June 14, 2024

Monitoring Year: 5

Date(s) of Data Collection: March through August 2023

	Performance Standards (required by the HDP)	Fully Met?	Comments/Reason for Shortfall
1	<b>Geomorphic:</b> 100% of installed large wood pieces will be retained downstream of the remnant pond outlet.	Yes	100% of structures were recorded in August 2023. This standard is met.
2	<b>Geomorphic:</b> 80% of placed large wood pieces and structures will be retained upstream of the remnant pond outlet.	Yes	> 80% of structures were recorded in August 2023. This standard is met.
3	Riparian/Upland: 80% of placed terrestrial habitat structures will be retained within upland and riparian areas.	Yes	> 80% of structures were recorded in August 2023. This standard is met.
4	Active Channel Margin: ACM acreage will not decrease by more than 10% compared to as-built drawings.	Yes	ACM acreage has remained within 10% of asbuilt drawings. This standard is met.
5	Fish Passage: Roughened channel gradient does not exceed 4%; Jump height will not exceed 6 inches.	Yes	The roughened channel slope was surveyed as 2.8% and therefore meets the performance standard of needing to be <4%; No drops in the low flow channel water surface were observed during the monitoring period. Localized flow obstructions do occur at three beaver dams located throughout the project site but ODFW does not consider beaver dams to be barriers to fish movement. This standard is met.
6	Fish Passage: Remnant pond outlet discharged continuously during Year 5 monitoring.	Yes	During the monitoring period Rinearson Creek was perennial and flowed continuously on the surface through the entire project area. This standard is met. This conclusion is based on site observations conducted during each time Waterways staff was on site during the low flow period.
7	Fish Passage: Thalweg downstream of the remnant pond outlet will remain wetted during low water conditions.	Yes	Water flow was low, but water flowed continuously on the surface, downstream of the remnant pond to the Willamette River. Standard met.



8	Hydrology and Hydraulics: Remnant pond outlet will be overtopped by the Willamette River when stage height >14 feet NGVD29 (17.5 feet NAVD88).	Yes	The crest of the beaver dam at the top of the roughened channel (16.85 feet NAVD88) was surveyed in 2023 to be at elevation of 18.06 feet NAVD88. A high-water event was recorded at the Oregon City gage on December 29, 2022 that resulted in a Willamette River water surface elevation of 19.8 feet. Although this event was not recorded at the site because the water level loggers were not installed until April 2023, the as-built surface, which is consistent with the cross-sections measured in 2023, was used to calculate the area of inundation from that event. The results suggest that the remnant pond outlet was overtopped by 1.74 feet and inundated approximately 6.8 acres of the site upstream of the roughened channel.
9	Hydrology and Hydraulics: No less than 8.6 acres of the site will be inundated when stage height on the Willamette River >21.76 feet NGVD29 (25.25 feet, NAVD88).	TBD	No storm event in the 2022-2023 season resulted in the Willamette River reaching 21.76 feet NGVD29 at the USGS gauge. However, we assume that a larger storm event producing an equivalent Willamette River stage near 22 feet NAVD88 at the site would inundate approximately 9.8-acres of the site (which is well above the 8.6-acre minimum) based on the as-built contours that are consistent with the 2023 surveyed cross-section elevations.
10	Emergent Marsh – Native Species Cover: 30% or greater cover by native herbaceous species Y2–5. 50% or greater in Y7; 70% in Y10.	No	Mean native herbaceous cover was 15%; the site is not meeting native cover standards.
11	Emergent Marsh – Invasive Species Cover: Less than or equal to 20% cover by invasive herbaceous species Y2–10.	No	Mean invasive herb cover was 42%, largely due to high cover of reed canarygrass. This standard is not met.
12	<b>Emergent Marsh - Diversity:</b> At least 5 species of herbaceous plants that provide at least 5% cover and are present in at least 10% of the plots.	No	Only 1 native species, soft rush, met the abundance and frequency thresholds.
13	<b>Riparian Forest Restoration – Woody Species Density:</b> At least 1,200 living native stems/ac in Y2–5.	Yes	Density of woody vegetation was 2,037 living native stems per acre and meets the performance standard but is significantly lower than the count in 2019.
14	Riparian Forest Restoration – Invasive Cover: 30% or less cover by invasive herbaceous species Y2–5.	Yes	Mean invasive herb cover was 20%. This standard is met.
15	Riparian Forest Restoration – Shrub Species Richness: At least 5 native shrub species present in Y2–5.	Yes	11 native shrub species were present. This standard is met.
16	Riparian Forest Restoration – Tree Species Richness: At least 3 native tree species present in Y2–5.	Yes	7 native tree species were present, where the most abundant species was black cottonwood. This standard is met.



17	Riparian Forest Enhancement – Invasive Cover:	Yes	Mean invasive herb was 19%, within the
	30% or less cover by invasive herbaceous species		maximum threshold. This standard is met.
	Y2-5.		
18	Unland / Discussion Forest Investige Investige	Vac	8.4 i i   -                         -     -     -   -     -     -   -   -   -   -   -   -   -   -   -   -   -
10	Upland/Riparian Forest Invasive – Invasive	Yes	Mean invasive herb was 25%, so the standard
10	Cover: 30% or less cover by invasive herbaceous	Yes	is met.



# **Remedial Work Recommended**

Yes	$\square$	
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No 🗌

Refer to the Adaptive Management Section in this report.

	Monitoring Questions	Comments/Conclusions
1.	Are native fish using the restored site? What size salmon and/or lamprey are using the site?	No future seining will be approved by NOAA Fisheries based on concerns about seining ESA-listed species. Environmental eDNA sampling will be conducted by PHS starting in mid-June 2024. A formal scope of work is being approved for review by the Trustees. Time limitations resulted in an initial sampling effort to be conducted the week of June 11 <sup>th</sup> .
2.	What birds are using the site? Do changes in the bird diversity and abundance indicate habitat improvement?	33 bird species were detected in the 2023 monitoring, as compared to the 32 bird species in 2021 and 27 species observed in 2014. The top five most commonly detected species in 2023, in decreasing order of abundance, were song sparrow, mallard, American crow, American robin, house finch, and Bewick's wren.
3	How much time are eagles spending on-site and vicinity and for which activities (perching, nesting)? Which features (riparian, upland)?	Bald eagles nested on the west bank of the Willamette River across from the site. The project area is part of their territory, and they perch and hunt on site. Perches consist of mature black cottonwood trees located in riparian habitat adjacent to the river. Adult eagles spent a total of 7 hours perching in trees in the northwest corner of the site adjacent to the mouth of Meldrum Bar Channel, 7 minutes flying over the site, and 10 minutes foraging unsuccessfully for ducks and fish in Meldrum Bay. They flew over the site but were not observed perching in the interior of the site. Juvenile / sub-adult eagles spent 4 hours and 53 minutes on site perched in cottonwood trees along the riverbank and 6 minutes foraging unsuccessfully in Meldrum Bay. Bald eagles were observed on site during 26% of the observation time while they were observed in the site vicinity 53% of the observation time. The nesting attempt was a failure, but the adults remained in the vicinity of the nest through the final August survey.



4	Are mink using the site	Mink were not documented on-site during the 2023 monitoring
4	(presence/absence)? Has	period, and therefore mink abundance has decreased as
	mink abundance at the site	compared to 2021. While no mink were detected during the
	increased?	
	increasedr	monitoring period, three related mesocarnivores in the mustelid
		family were observed: skunk (Mephitis mephitis), long-tailed
		weasel (Mustela frenata), and river otter (Lontra canadensis). The
		presence of mustelids and aquatic mammals indicates that the
		area is suitable for animals that occupy similar niches and
		habitats. Prey diversity and availability appears to be the primary
		factor influencing mink presence, followed by invasive vegetation,
		as it can degrade available denning and foraging habitat. An
		adaptive management approach that focuses efforts on native
		woody vegetation establishment in the emergent wetland habitat
		area may improve conditions for mink as well as other species
		including beaver and songbirds.
5	Is water quality (temp, DO,	Water quality data collected in mid-July 2023 are difficult to
	pH, cond.) improving over	compare to the April 2021 monitoring, based on the time of year
	time?	of sampling. The 2023 data show that conditions for water
		temperature, DO, pH, and conductivity were relatively similar to
		those measured at the site in previous efforts. The July 2023 data
		for temperature and pH at some of the monitoring stations do
		not meet Oregon water quality standards for those parameters,
		but all stations met the DO standards. DO levels at the Rinearson
		Creek stations exceed the Oregon standard of a minimum of 6.0
		mg/L for cold water aquatic life, except at WQ-9 which may have
		been an errant measurement.
6	Has the benthic	Total taxa richness dropped in both the emergent marsh and
-	macroinvertebrate	upper control site in 2020 and 2021 but increased in 2023 and
	community improved	upper control site. Total richness declined for 2023 in the
	(species abundance and	engineered riffle and rose slightly compared to 2021 in the
	diversity/richness)	remnant pond. Total abundance (relative) increased threefold in
	uiversity/fichiness/	2023 compared to 2021 in the remnant pond. Total abundance
		· · · · · · · · · · · · · · · · · · ·
		increased for 2023 in the emergent marsh and upper control after
		declining 2020–21. After a marked decline 2020-21 in the
		engineered riffle, total abundance declined slightly again in 2023.
		These results may indicate that the project site must be
		considered within the context of the overall Rinearson Creek
		watershed, which is highly impacted by an urbanized watershed
		and a myriad of water quality issues that ultimate limit conditions
		at the project site.



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## 1.0 INTRODUCTION – MONITORING OVERVIEW

At the request of the Columbia Restoration Group, Waterways Consulting, Inc. (Waterways) and Pacific Habitat Services (PHS) conducted the Year 5 (2023) monitoring at the Rinearson Natural Area Restoration Project. This monitoring is the third iteration of the efforts included in a 10-year adaptive management and monitoring project. The Rinearson Natural Area Restoration Project construction activities were completed in 2018. The restoration project encompassed aquatic, riparian, wetland, and floodplain enhancement elements. The Portland Harbor Natural Resource Trustee Council developed this project as part of their regional restoration effort in the Lower Willamette River to mitigate industrial contamination of Portland Harbor.

The goal of the following report is to document the monitoring performed, as well as relate the collected data to the as-built conditions and performance standards outlined in the Rinearson Natural Area Habitat Development Plan (HDP) from 2018, and is intended to evaluate restoration success over the 10-year period using benchmark metrics, specific monitoring protocols, and qualitative questions. Years 1 and 2 monitoring in 2019 and 2020, respectively, were completed by Cardno, and Year 3 monitoring was performed by Environmental Science Associates (ESA) in 2021.

#### 1.1 PROJECT AREA

The 33-acre project area is within the Rinearson Natural Area, adjacent to Meldrum Bar Park, in Gladstone, Oregon and consists of Rinearson Creek (a tributary to the Willamette River), a restored floodplain with emergent wetlands and a meandering channel, a remnant pond with an outlet to a roughened channel, Meldrum Bar Channel (which serves as the current primary Rinearson Creek outlet), the historical Rinearson Creek outlet, habitat structures, and upland areas. The site is surrounded by high-density residential development and the developed Meldrum Bar Park which is operated by the City of Gladstone. Rinearson Creek starts at Boardman Wetlands and flows through the highly developed City of Gladtsone before reaching the project site; it reaches the Willamette River at river mile 24, downstream of the mouth of the Clackamas River, and flows into Meldrum Bay. **Figure 1-1** shows the project area and the site features.

# 1.2 PHOTO MONITORING

Permanent photo monitoring points were established during the baseline surveys in 2019, and additional points were included in the Year 3 (2021) monitoring. For Year 5 (2023, the Year 3 points were used with no additional points. The locations of the Year 5 monitoring points are shown in **Figure 1-1**.

**Appendix A** contains the compilation of the photo monitoring efforts from April 2023 – August 2023. **Figures 1-2 through 1-9** show example comparison photos between monitoring Years 3 and 5.







**Figure 1-2**: PP20 (April 20, 2021) looking east into emergent wetland area.



**Figure 1-3**: PP20 (May 4, 2023) looking east into emergent wetland with meander channel.



**Figure 1-4**: PP15 (August 11, 2021) looking east into the emergent wetland area.



**Figure 1-5**: PP15 (July 12, 2023) looking east.



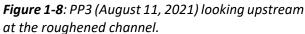
**Figure 1-6**: PP5 (July 16, 2021) looking east and upstream into the lagoon/historic creek outlet.



Figure 1-7: PP5 (July 12, 2023).









**Figure 1-9**: PP3 (August 21, 2023) looking south and upstream at the roughened channel.

# 2.0 GEOMORPHIC AND STRUCTURAL HABITAT MONITORING

#### 2.1 HABITAT STRUCTURES AND LARGE WOODY DEBRIS

In-stream and upland habitat structures and large wood structures were installed as part of the restoration project at Rinearson Natural Area to improve fish and wildlife habitat and natural functions. On August 21, 2023, Waterways biologist John Dvorsky assessed the project site to determine the status of each habitat structure. Each structure was located using GPS points that were established during the as-built survey and recorded on the Avenza mapping application. The structures were also characterized based on condition. **Figure 2-1** shows all documented structure locations, and **Table 2-1** in **Appendix B** describes the condition of each structure for Year 5. Due to the growth of vegetation, especially blackberry, several of the habitat structures within the upland area were not accessible at the time of the assessment. It is likely that those structures still exist, are intact, and are functioning properly, given their location in an infrequently inundated area. They were just not accessible without a significant amount of effort to create a pathway through large stands of blackberry. Photos for all structures are also presented in **Appendix B**.

#### 2.1.1 Structures below the Remnant Pond Outlet

The habitat structures below the remnant pond include four large wood structures within the roughened channel. All four structures were still present and functioning at the time of the Year 5 (2023) monitoring effort (structure numbers 20-23 in **Figure 2-1**), and therefore fulfill the HDP requirement that 100% of as-built structures within the roughened channel remain intact.

#### 2.1.2 Structures and Large Woody Debris within the Active Channel Margin (ACM)

The HDP performance standard for structures within the ACM is that 80% of the total pieces placed in aquatic and terrestrial areas upstream of the remnant pond be intact, and 100% of the installed instream large wood pieces downstream of the remnant pond be retained and present or naturally recruited. A total of 28 structures are shown in the as-built drawings: 13 floodplain structures, 12 meander channel structures as well as 3 trees tipped into the remnant pond. All structures except one floodplain log structure were identified in the August 2023 assessment, which indicates that more than 80% of the structures were intact and therefore the HDP standard was met.



**Habitat Structures Monitoring Map** 

Rinearson Natural Area **Restoration Project** 





#### 2.1.3 Upland Structures

The upland structures throughout the site, based on the as-built plans, include 43 features: 13 debris piles, 11 upland log structures, 8 snags, 7 small rock piles, and 4 large rock piles. Four of the structures in upland areas were inaccessible due to dense vegetation growth (such as blackberry). Therefore, they were labeled as "not accessible" and considered absent for this monitoring effort. However, the total of 39 located upland structures meets the HDP requirement of 80% retention. If blackberry is removed during future vegetation management efforts adjacent to those structures, future monitoring efforts may identify those structures as intact.

#### 2.1.4 Other Features

Three beaver dams were identified during the monitoring efforts for Year 5 (2023). These features are considered temporary, but it is valuable to locate them and gather information for recording any changes in the next monitoring efforts. The first has been established at the upstream end of Meldrum Channel, where it intersects with the flooded lagoon area at the downstream end of the roughened channel. This beaver dam holds approximately 2.5 feet of grade and is about 33 feet long. The second beaver dam (also recorded in Year 3 (2021)) is located at the remnant pond outlet, at the upstream end of the roughened channel, and has a crest elevation of 18.06 feet (NAVD88). This means that, based on the known as-built elevation for the roughened channel of 16.85 feet (NAVD88), the dam is about 15 inches in height, and was observed to hold approximately 1.5 feet of grade. Lastly, the third observed beaver dam is situated near the Rinearson Creek inlet into the project site, at the upstream end of the restored floodplain area. This dam holds approximately 1 foot of grade. Photos of all three beaver dams can be found in **Appendix D**.

Two instances of recruited logs were recorded (noted on Figure 2-1) and appeared to be associated with logs that had fallen from dead trees. These two logs are examples of on-site recruited wood that will continue to enhance the function and ecological integrity of the site.

#### 2.2 ACTIVE CHANNEL MARGIN (ACM)

The baseline ACM for the project is 10.09 acres, which includes area under the OHW elevation of 24.0 feet (NAVD88). In 2019 (the first year of monitoring after the project completion), the ACM consisted of a total of 9.8 acres of the site, and in Year 3 (2021) the ACM was recorded as 9.7 acres. The HDP performance standard requires that the ACM acreage remains within 10% of the as-built drawings. The HDP stipulates that ACM be measured by professional topographical survey in Year 10, with Years 1, 3, 5, and 7 consisting of surveying the permanent channel cross-sections to assess visually and qualitatively if there is evidence of sedimentation or erosion.

On August 21 and 22, 2023, Waterways surveyed 12 cross-sections in approximately the same locations established in 2019, which were also used in the Year 3 monitoring efforts by ESA. Two additional cross-sections (cross-sections 11 and 12 on **Figure 2-2**) were monitored in Year 5 based on the cross-section locations established by the HDP (shown in Figure 8 of the HDP). **Figure 2-2** shows the locations of the monitoring cross-sections and displays all survey points taken for this Year 5 effort. Due to dense vegetation (such as blackberry and willow), several of the established cross-section end point stakes were not found. Therefore, Waterways used known GPS locations to approximate the ends of those cross-sections. Furthermore, some of the sections were not marked in the field with permanent stakes during the as-built survey, and so no end points were present (**Figure 2-2**). Vegetation growth, along with deep water or silt depth, made gathering survey points exactly along the cross-sections difficult.



**Cross-Section Monitoring Map** 

Rinearson Natural Area Restoration Project



**2-2** 



Consequently, some of the survey points were not always precisely on the cross-section line, as shown on **Figure 2-2**. These variations do not limit the ability to qualitatively understand the degree to which sedimentation or erosion has affected the site or the ability to calculate the acreage below ACM.

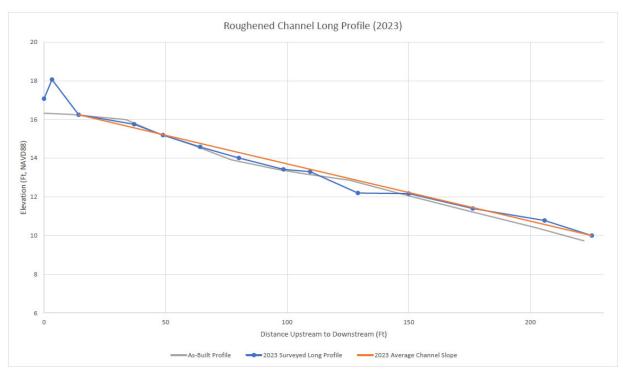
Based on the survey data collected, the total area within the ACM experienced a minor amount of aggradation along the ACM margin, as compared to the baseline ACM of 10.09 acres. The total ACM acreage for Year 5 (2023) is 9.96 acres, which is a change of approximately 1.3% from the baseline ACM, which meets the HDP standard. This difference is likely within the measurement error of the survey and interpolation between cross-sections.

**Appendix C** presents the cross-section data obtained during the survey and compares them to the asbuilt ground surface from the record survey performed in 2018.

#### 2.3 FISH PASSAGE

The measurement criteria used for fish passage in this monitoring effort, as outlined in the Habitat Development Plan (HDP), includes the slope of the roughened channel, water availability, and depth in relation to the pond outlet. The overall intent is to ensure that there is little to no change in the condition of the roughened channel and that there is continuous surface flow from the remnant pond to the Willamette River.

**Figure 2-3** shows the long profile of the roughened channel that was surveyed by Waterways on August 22, 2023. The surveyed grades, as well as field observations, reveal that there have not been any significant changes, migration, or erosion of the roughened channel. The upstream-most point at the top of the roughened channel (below the beaver dam) was 16.24 feet (NAVD88) and the downstream-most point was measured to be 10.00 feet (NAVD88). The total length of the roughened channel was surveyed to be 222 feet, and therefore the slope of the channel was calculated to be 0.028 or 2.8%. The performance standards identifies that the gradient of the roughened channel must remain less than 4%.





**Figure 2-3:** Roughened Channel Long Profile for Year 5 (2023)

Three (3) beaver dams have been constructed within the project site since project construction (see **Figure 1-1** for locations). Fish passage professionals, including Oregon Department of Fish and Wildlife staff, do not typically consider beaver dams as impassable barriers to fish, except in extreme circumstances. The HDP requires that continuous surface flow be visually observed in the wetted channel and that a minimum amount of flow is discharged from the remnant pond outlet. During the survey performed by Waterways biologist John Dvorsky on August 21, 2023, the roughened channel was stable with depths at low flow that were adequate to facilitate juvenile fish movement with continuous flow through the entire project area from where Rinearson Creek enters at the upstream end through to the Meldrum Bar alcove. The channel was experiencing flow through and beneath the beaver dam, with visible surface flow along the entire length of the thalweg.

#### 2.4 HYDROLOGY AND HYDRAULICS

The HDP sets a performance standard that no fewer than 8.5 acres of the project site be inundated when the Willamette River exceeds 21.76 feet NGVD29 (25.25 feet NAVD88) at USGS gauge 1420770 at Willamette River Below Falls at Oregon City. This elevation corresponds to a water surface elevation (WSE) in the Willamette River of 22.0 feet NAVD88 at the Rinearson site.

To monitor the water surface elevations at the project site, Waterways deployed two water level loggers on April 4, 2023. These loggers remained on site through the peak snowmelt season and were removed on July 12, 2023. The loggers were located at the remnant pond outlet and at the entrance of Rinearson Creek into the project site (see **Figure 1-1** for the mapped logger positions and **Figure 2-4** for images of the installed loggers).



Figure 2-4: Waterways water level loggers installed on site.



Per the as-built records, the top of the engineered channel was constructed at an elevation of 16.85 feet. Based on the Year 5 (2023) surveyed long profile (**Figure 2-3**) for the roughened channel, and field observations, the roughened channel grade has remained stable. The water surface elevation upstream of the roughened channel is controlled by the roughened channel crest and the beaver dam at the pond outlet, which was surveyed in 2023 to have a crest elevation of 18.06 feet (NAVD88). However, once the Willamette River stage exceeds the elevation of the roughened channel crest, the water surface elevations above the pond outlet are responsive to changes in the Willamette River. This response can be observed in the water surface elevation measurements collected by the loggers and shown in **Figure 2-5**.

The Waterways logger in the upper reach of the project site on Rinearson Creek is also shown in **Figure 2-5**. This logger reported higher water surface elevations than the pond outlet logger, with an average water surface elevation of approximately 21.8 feet (NAVD88). This difference is partially due to the slight slope of the channel, but primarily because of the beaver dam that has formed at the upper portion of the meander channel (see **Figure 2-1**).

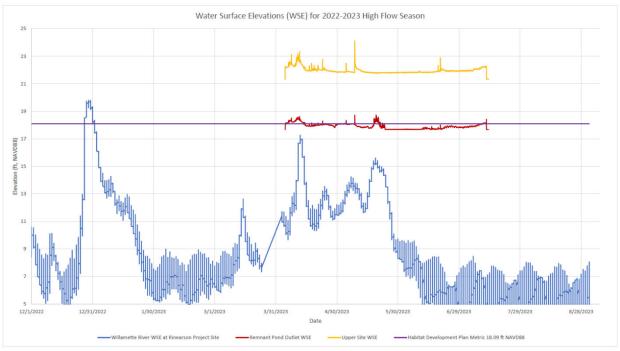


Figure 2-5: Water Surface Elevations for 2022-2023 (Year 5) High Flow Season

A high Willamette River stage on December 29, 2022 (based on the USGS gauge 14207770 for the Willamette River Below Falls at Oregon City) resulted in a maximum water surface elevation of 19.8 feet (NAVD88) in the Willamette River at the Rinearson Site. The elevation of the roughened channel crest is 16.85 feet (NAVD88), and therefore the remnant pond sill was overtopped by 2.95 feet, which inundated approximately 6.8 acres of the site (**Figure 2-6**). Per the performance standards set in the HDP, a minimum of 8.6 acres should be inundated when the Willamette River exceeds 22.0 feet (NAVD88) at the project site. Even though no storm event in the 2022-2023 season resulted in the Willamette River reaching 22 feet (NAVD88), we assume that a larger storm event producing a river stage near 22 feet would inundate approximately 9.8-acres of the site (which is well above the 8.6-acre minimum) based on the as-built contours that are consistent with the 2023 surveyed cross-section elevations. Given the



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**Maximum Inundation Map for 2023** 

Rinearson Natural Area **Restoration Project** 





fact that the cross-sections surveyed in 2023 closely matched the as-built condition, and the fact that a complete, updated topographic survey of the site will not be conducted until Year 10, the as-built survey represents the best available data for use in calculating acreages at different reference elevations. Therefore, to calculate the acreage at 19.8 feet NAVD88 (highest Year 5 Willamette stage) and 22 feet NAVD88, planar surfaces representing those elevations were used to intersect the area above the roughened channel, using AutoCAD, and the resulting acreage was computed, producing 6.8 acres and 9.8 acres, respectively.

# 3.0 VEGETATION MONITORING

The following details the findings of 2023 vegetation monitoring and how these findings meet or do not meet the performance standards of the Rinearson Natural Area Habitat Development Plan (HDP) (Proutt 2018). Vegetation monitoring was conducted by Natural Resource Specialists from Pacific Habitat Services on July 18-19 and August 8-9, 2023.

A total of 65 1-m<sup>2</sup> quadrat plots were sampled across four different habitat categories: emergent marsh, riparian forest restoration, riparian forest enhancement, and upland/riparian forest invasive. Table 3-1 shows a detailed count of the plots within each habitat, and Figure 3-1 shows the locations of all these plots. The criteria for these categories are outlined in the HDP, along with detailed protocol and statistical analysis background. Aside from riparian forest restoration (RFR) sample plots, Quadrat placement was not outlined in detail in previous monitoring reports, nor in the HDP. To attempt to standardize plot placement for subsequent sampling efforts, the following protocol was used for quadrat placement: facing north (or at a bearing of approximately 0°) from the sample point, the "lower left" corner of the quadrat is placed on the plot center. This ensures that the area being monitored will generally remain the same over time. See Figure 3-2 for an example of this alignment. Following placement, the absolute percent cover of all herbaceous/woody plant and bare ground within the sample plot was estimated and recorded. Bare ground includes bare mineral soil, thatch, and unvegetated water surfaces. RFR plots also include an expanded 2 x 10-m<sup>2</sup> plot, in which all living woody plants were identified and counted to determine woody plant density. For these specific plots, quadrats will be centered along the sampling sub-transects; quadrat length will be measured with a measuring tape; quadrat length will be measured with a measuring tape facing by facing north (0°) and measuring 10 meters in this direction; quadrat width will be measured by holding a 1-meter dowel along the



**FIGURE** 

**3**-1

Vegetation Monitoring Plot Map

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transect tape. All living woody native and non-native stems occurring within the quadrat will be identified to species level and counted.



Figure 3-2: Example of plot placement in an RFR plot

Data collected was separated into native, non-native, and invasive categories for both herbaceous and woody plants and analyzed using methods outlined in the HDP and based on DSL's Routine Monitoring Guidance (DSL 2009), Elzinga et al. (1998), the Trustee Council's monitoring guidance. Analysis results were then used to determine whether or not performance standards outlined in the HDP were met. The sample mean and 80% confidence interval are presented for each standard. Detailed data of all sample plots can be found in Appendix E. The Year 3 Monitoring Report (ESA 2021) notes that additional sampling points were added for that year. These were added using a randomized grid with the intent to raise the confidence of results from 2020. This change in sample design was indicated to remain permanent, as outlined in an April 5, 2022, note from the Board of Trustees. Additional updates to locations for emergent marsh, riparian forest restoration, and riparian forest enhancement sample points may be beneficial for future sampling, they are outlined in their respective discussions below.

**TABLE 3-1 VEGETATION SAMPLE PLOT SUMMARY** 

Habitat Type	Number of Plots in 2023
Emergent Marsh (EmMa)	17
Riparian Forest Restoration (RFR)	18
Riparian Forest Enhancement (RFE)	18
Upland/Riparian Forest Invasive (URFI)	12



## 3.1 EMERGENT MARSH (EMMA)

#### Performance Standard #10

Native Species: The cover of native species in the herbaceous stratum is 30% or greater for Year 5. In Year 7, the standard increases to 50% or greater and to 70% or greater in Year 10.

**Result:** The mean herbaceous cover across the Emergent Marsh plots was calculated to be approximately 15% (CI80 = 4-23%; CI = +7.2). The performance standard requiring at least 50% native herbaceous cover is not met. Native vegetation was limited to cleavers (Galium aparine), small-fruited bulrush (Scirpus microcarpus), cattail (Typha latifolia), and soft rush (Juncus effusus). Soft rush was the dominant native herbaceous plant observed, averaging nearly 8% across the 17 plots.

If the area is to meet the performance standard for ≥70% by year 10, then management will need to be radically more aggressive. The most abundant invasive vegetation within the Emergent Marsh plots is reed canarygrass (Phalaris arundinacea), impatiens (Impatiens capensis), and Himalayan blackberry (Rubus armeniacus). Control of reed canarygrass often requires a multifaceted approach. Firstly, mechanical removal, such as mowing or cutting, can be effective, especially if repeated before the grass sets seed. Herbicide applications can also be used, but year-round ponding conditions in the Emergent Marsh area do present some barriers to safe use. Imazapyr is a non-selective herbicide that is often recommended for use in aquatic or semi-aquatic environments, concentration typically ranges from 0.5% to 1.5% of the total spray solution, depending on the specific target species and environmental conditions. Other herbicides can be used safely in semi-aquatic areas as well; however, a licensed herbicide application professional should be consulted for the best plans for chemical control. Additional seeding of native grasses observed to be growing well in the plots (cattail (Typha latifolia), slough sedge (Carex obnupta), and soft rush (Juncus effusus)) can compete with the aggressive reed canarygrass and may serve to colonize bare patches in the area after control takes place. Finally, reed canarygrass is known to prefer shallower water and less-inundated conditions. Maintaining water levels sufficiently to submerge the grass can hinder its growth but could also have negative impacts on native plants in the ponded areas over time. One or a combination of these treatments would also serve to control impatiens and Himalayan blackberry as well; however, it should be noted that control of Himalayan blackberry should receive multiple mowings with a single season. Some patches, particularly along the south boundary of the pond, were nearly impenetrable and well over 15 feet tall. Prior to any chemical control of these patches, mechanical control via mowing will be the best way to get a foothold in the area and allow for any trees and shrubs within the thicket to have a chance at competition.

#### Performance Standard #11

Invasive Species: Less than or equal to 20% cover by invasive herbaceous species in Years 2 through 10. *Result:* The mean invasive herbaceous cover across the Emergent Marsh plots was found to be approximately 42% (CI80 = 29-56%; CI = +10). This is largely due to the high cover of reed canarygrass, which was determined to cover almost 28% of the area. This aggressively colonizing grass will need to be more heavily managed if performance standards for invasive vegetation are to be met in the future. Additionally, reducing the cover of reed canarygrass and other invasives will increase available habitat for native herbaceous vegetation, which will likely be unable to meet performance standards without increased habitat availability and reduced competition from invasive vegetation. Other invasives present included Canadian thistle (Cirsium arvense), teasel (Dipsacus fullonum), and impatiens. Impatiens was a distant second to reed canarygrass with around 10% cover, having been found in similar densities across fewer plots.



Himalayan blackberry and butterfly bush (Buddleja davidii) are both invasive shrubs observed with Emergent Marsh plots. Together, they were found to have a mean cover of 16% in Emergent Marsh plots. If Himalayan blackberry was excluded from invasive herbaceous vegetation, then the mean invasive vegetation cover would decrease to 29%. Future efforts to aggressively manage the area for invasive shrubs in particular will also be a crucial component of increasing the average cover of native vegetation in these plots.

#### Performance Standard #12

Diversity: Plant species will include at least five native species of herbaceous plants with 5% cover present in at least 10% of the monitored plots.

**Result:** This performance standard is not fully met. A total of four native herbaceous plants were sampled in the plots, as outlined under results for Performance Standard #10, falling short of the five required. Of these four, only soft rush met the standard with approximately 8% cover. Of the 17 Emergent Marsh plots, about 40% had native vegetation.

As at least two of the Emergent Marsh plots (12 & 13) were located in areas that are submerged for periods too great to allow for any colonization of vegetation, it is recommended that these plots be relocated elsewhere within the Emergent Marsh area. Plots with vegetation approaching zero do not provide useful data for understanding the composition and community of plants in the area and artificially distort any subsequent analysis. By excluding the ponded area and randomly selecting new plot locations, future analysis is likely to be more accurate to real conditions on site; therefore, it is recommended that these plots be relocated to a new location within this area for all future monitoring.

#### 3.2 RIPARIAN FOREST RESTORATION AREA (RFR)

#### Performance Standard #13

Woody Vegetation Density: The density of woody vegetation is at least 1,200 living native stems per acre for Years 2–5.

Result: Woody stem density averaged 1,889 living native stems per acre. While this average meets the performance standard requirement of a minimum of 1,200 stems per acre, it is significantly lower than the 5,432 living native stems counted during 2021 (Year 3) monitoring. It is worth nothing that this may be inaccurate due to two plots (#14-15) requiring estimation due to thick Himalayan blackberry thickets blocking access to precise plots and subsequent estimation. As discussed in the following performance standard for invasive species cover, Himalayan blackberry is a significant presence in the area and may be a factor in the reduced count for native woody species. Another plot, #16, was also found to have zero living woody stems, likely due to poor placement. This plot is currently in the floodplain of the channel flowing from the project area and experiences significantly high water during much of the fall/winter season. Upslope of this plot and still within the Riparian Forest Restoration area is a dense area of willow and cottonwood. Moving plot #16 toward this area may help to represent the stem count more accurately for future sampling; therefore, it is recommended that this plot be relocated to a new location within this area for all future monitoring.

#### Performance Standard #14

Invasive Species: The cover of invasive herbaceous species is 30% or less in Years 2 through 5.

**Result:** During Year 5, the mean invasive cover of the area was 22% (CI80 = 13-30%, CI = +7.5), meeting the performance standard. Mean invasive shrub cover for Year 5 is not required to meet performance



standards, however it is important to note that mean shrub cover is now approximately 20%. Keeping invasive vegetation under control will be crucial in maintaining adequate habitat for native woody and herbaceous species. Invasive herbaceous species present were dominated by impatiens and reed canarygrass, as well as some patches of Canada thistle and tansy ragwort (Jacobaea vulgaris). Invasive woody species included one plot with English holly (Ilex aquifolium), but was dominated by Himalayan blackberry, which accounted for an average of 10% cover in all RFR plots. As detailed in the above Performance Standard #13, accurate counts of woody stems in RFR plots were severely hindered in two plots due to dense thickets of Himalayan blackberry. Aggressive management of blackberry for the following three years before Year 10 monitoring will be crucial to ensure native woody and herbaceous plants can survive.

# Performance Standard #15

Shrub Species Richness: At least five native shrub species present in Years 2 through 5.

**Result:** Between the 1-m<sup>2</sup> herbaceous and 20-m<sup>2</sup> woody plots, eleven shrub species were observed, resulting in the performance standard being met. The most abundant of any species was Douglas' spirea (Spiraea douglasii), with an average cover of nearly 5%. Detailed data of other species sampled in the RFR plots can be found in **Appendix E**.

#### Performance Standard #16

Tree Species Richness: At least three native species present in Years 2 through 5.

**Result:** Between the 1-m<sup>2</sup> herbaceous and 20-m<sup>2</sup> woody plots, at least seven tree species were observed, resulting in the performance standard being met. The most abundant of any species was black cottonwood (Populus balsamifera var. trichocarpa), with an average cover of nearly 7%.

 Native cover: Cover by native woody species is ≥55% by Year 7. By year 10, there should be ≥80% cover by native woody species, ≥10% cover by native herbaceous species, and ≤20% cover invasive vegetation.

Detailed data of other species sampled in the RFR plots can be found in **Appendix E**.

# 3.3 RIPARIAN FOREST ENHANCEMENT AREA (RFE)

#### Performance Standard #17

Invasive Species: The cover of invasive herbaceous species is 30% or less in Years 2 through 5.

**Result:** While this performance standard does not apply to Year 5, analysis was conducted to determine cover of invasive herbaceous species in case the results provided insight to management or overall site health. The mean invasive herbaceous cover was 21% (CI80 = 13-30%; CI = +6.6), down from 20% in Year 3 (2019). Invasive species found in the greatest abundance here include reed canarygrass and impatiens. Detailed data of other species sampled in the RFE plots can be found in **Appendix E**.

Native Cover: Cover by invasive herbaceous species is  $\leq$ 20% and  $\leq$ 10% cover by invasive woody species by Year 7. By year 10, there should be  $\leq$ 20% cover by invasive woody and herbaceous species combined,  $\geq$ 80% cover by native woody species,  $\geq$ 10% cover by native herbaceous species.

**Result:** While these standards are not required by Year 5, understanding current trends may be helpful for providing adaptive management to ensure these standards can be reached by their respective years. The current native woody species cover is 4%, native herbaceous cover is 3%, and invasive vegetation cover is 31%. It is worth noting that bare ground cover is also nearly 50% in these areas, likely due to control of invasive species. To reach the respective covers required to meet or exceed these



performance standards, management in the form of continued invasive control throughout the growing season, followed by replanting and reseeding between October and February.

As previously mentioned, there is potential for some of these plots to be moved to locations that are more representative of riparian forest conditions—currently, RFE plots 9, 14, and 15 are located in areas may not represent current or future forested areas. Updating these plots may help to provide more accurate data for actual conditions for future monitoring.

The following performance standards A, B, and C for species diversity in the RFE area are not explicitly required, however the results can be helpful in understanding the overall function and health of the area. They are as follows:

## Performance Standard A

Herbaceous cover will include at least five native species of herbaceous plants with 5% cover present in at least 10% of the monitored plots.

**Result:** While 6 native herbaceous species were found in 50% of the plots sampled, average cover was approximately 0.5%, resulting in the performance standard being unmet. Two species were observed in one plot each to have cover greater than 10%--California brome (Bromus carinatus) at 13%, and fringecup (Tellima grandiflora) with 16%. As mentioned in the results for performance standard #17, invasive species coverage averaged 19%, which likely presents some competition for native species habitat. Furthermore, bare ground and thatch had an average of 50% cover in all RFE plots sampled. The performance standard is only partially met in this case.

#### Performance Standard B

Shrub cover will include at least five native species with 5% cover present in at least 10% of monitored plots.

**Result:** The performance standard is partially met, since native shrubs accounted for 7 species in 61% of plots sampled. However, average cover was approximately 3.7%, which does not meet the 5% minimum cover required. Of the 7 species observed, 6 were observed to have at least one plot in which their cover exceeded 10%. Similar to the above findings with native herbaceous cover, this low cover of shrubs is likely partially explained by the high coverage of invasive herbaceous species and bare ground/thatch.

## Performance Standard C

Tree cover will include at least three native species with 10% cover present in at least 10% of monitored plots.

Result: The performance standard is partially met with 5 species of trees sampled in 50% of the plots. The average cover was 3.6% however, falling short of the 5% minimum and resulting in the standard not being met. It is worth noting that 4 of the 5 tree species observed each had at least one plot in which their cover exceeded 10%. Most notably, black cottonwood was observed in three separate plots to have cover ranging from 20-90%. Despite this, overall average cover remained low. While the goal of this performance standard, along with the previous shrub diversity standard outlined above, is diversity rather than abundance, it is worth noting that using a total of 18-m2 of sampling for tree and shrub cover is not an ideal measure. A greater sample size or larger plot for tree and shrub cover would likely produce a more representative measure that more accurately represents the cover within the RFE area, which was observed to be greater than 5% for both measures.



## 3.4 UPLAND/RIPARIAN FOREST INVASIVE MANAGEMENT AREA (URFI)

#### Performance Standard #18

Invasive Species: The cover of invasive herbaceous species is 30% or less in Years 2 through 5.

**Result:** While this performance standard does not apply to Year 5, analysis was conducted to determine cover of invasive herbaceous species in case the results provided insight to management or overall site health. The mean invasive herbaceous cover was 26% (CI80 = 16-35%; CI = +6.6), slightly up from 24% in Year 3 (2021). Invasive species found in the greatest abundance here included English ivy (Hedera helix) and reed canarygrass.

Native cover: Cover by invasive herbaceous species is  $\leq 20\%$  and  $\leq 10\%$  cover by invasive woody species by Year 7. By year 10, there should be  $\leq 20\%$  cover by invasive woody and herbaceous species combined,  $\geq 80\%$  cover by native woody species,  $\geq 10\%$  cover by native herbaceous species.

**Result:** While these standards are not required by Year 5, understanding current trends may be helpful for providing adaptive management to ensure these standards can be reached by their respective years. The current native woody species cover is 59%, native herbaceous cover is 6%, and invasive vegetation cover is 42%. Bare ground represents approximately 36% of the groundcover, likely due to control of invasive species. While woody species cover is on track to meet 80% cover by Year 10, native herbaceous species and all invasives will require continued management. To bring up native herbaceous cover and decrease invasive cover, mechanical and chemical control should be used to control invasives during the growing season, followed by reseeding of a native seed mix for a shaded understory between October and February on any bare patches.

No relocation of URFI plots is recommended at this time. Detailed data of other species sampled in the URFI plots can be found in **Appendix E**.

Although the following performance standards D, E, and F for species diversity for the URFI habitat are not identified explicitly in the HDP for the upland/riparian invasive management area, performance standards for native herbaceous species, native shrub species and native tree species. They are as follows:

#### Performance Standard D

Herbaceous cover will include at least five native species of herbaceous plants with 5% cover present in at least 10% of the monitored plots.

**Result:** The performance standard is partially met, since native herbaceous plants were observed in 61% of plots sampled. However, only 4 species with an average cover was approximately 3.7% were found, which does not meet the 5 species with 5% minimum cover required. The only herbaceous plant with greater than 5% cover observed in any single plot was manroot (Marah oregana), which was observed twice with cover of 20-30%. This is likely due to the high cover of invasive herbaceous plants of approximately 25% and is dominated by reed canarygrass. Non-native herbaceous vegetation on the other hand, only averaged about 1% and does not appear to be out-competing native vegetation.

#### Performance Standard E

Shrub cover will include at least five native species with 5% cover present in at least 10% of monitored plots.

**Result:** The performance standard is partially met, since native shrubs accounted for 7 species in 67% of plots sampled. The average cover was approximately 4.1%, which is close but does not meet the 5% minimum cover required. Of the 7 species observed, 6 were observed to have at least one plot in which



their cover exceeded 10%. Most notably, trailing blackberry (Rubus ursinus) was observed in three different plots to have cover ranging from 35-76%. While no non-native or invasive trees were sampled, non-native and invasive shrub cover averaged just over 13%, much of it accounted for by Himalayan blackberry. Like elsewhere in Rinearson Natural Area, aggressive control of Himalayan blackberry will be a crucial component to meeting the criteria of the performance standards, as native plants will typically be outcompeted by blackberry if it is allowed to completely colonize the area.

## Performance Standard F

Tree cover will include at least three native species with 10% cover present in at least 10% of monitored plots.

**Result:** The performance standard is not met but comes very close. Three tree species average 9.9% cover and account for 83% of the plots sampled. This is likely due to the abundance of mature trees within the sample area.

# 4.0 FISH AND WILDLIFE MONITORING

#### 4.1 FISH MONITORING

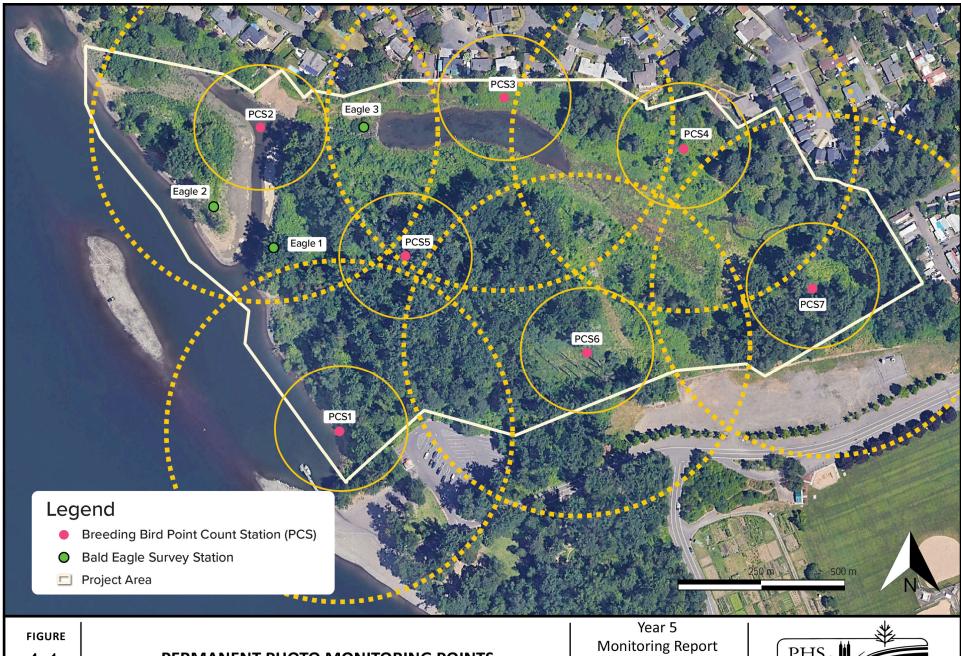
Past monitoring to document fish presence and abundance was conducted using beach seine and direct observation snorkel methods. In 2020, seining resulted in the capture of 208 fish (eleven different species) with approximately half of all fish captured being juvenile Chinook salmon. One juvenile coho salmon was captured in the remnant pond during the monitoring period. In 2021, seining was not permitted because juvenile salmonids were caught in seine nets during the 2020 surveys, and noncontact methods were recommended. Snorkeling was concluded to be the best non-contact method for sampling native fish; however, no fish species were observed in 2021 during the snorkel surveys due to poor visibility.

In 2023, snorkel surveys were abandoned due to continued poor visibility and seining was again proposed. An application to conduct seining was submitted to NOAA Fisheries but was rejected due to continued concerns about seining ESA-listed species. Lauren Senkyr, Habitat Restoration Specialist with the NOAA Restoration Center, informed the project team that Section 10 permits to conduct seining in the Lower Willamette River are not being issued by NMFS unless the purpose for seining is for robust research. The original ESA authorization for the Rinearson restoration project was under the Army Corps of Engineers' programmatic consultation (SLOPES) and included approval of seining until a single ESA listed fish was handled. As that occurred in 2020, no future seining will be approved.

Environmental DNA (eDNA) sampling will be conducted by Pacific Habitat Services (PHS) in the spring 2024 monitoring effort and for future monitoring years.

## 4.2 BREEDING BIRDS

Breeding bird surveys were conducted at seven point count stations based on methods outlined in Huff et al. (2000). Seven survey stations were visited in 2023, as in 2021. Refer to **Figure 4-1** for a depiction of the survey station locations. To compare results, detections are presented as birds per station within 50 feet and include adults and juveniles as well as birds flushed between stations and observed as associated flyovers. Auditory or visual detections beyond 50 feet from a point count station were recorded on the data sheets, but not included in the results. Only seven of the 15 baseline stations closest to the revised point count stations were re-analyzed and are used for comparison with current data.



4.1

PERMANENT PHOTO MONITORING POINTS

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A summary table comparing the relative abundance of birds detected in 2023 and 2021 versus 2014 is included in **Appendix F**. A total of forty-two bird species have been recorded during the three years. Thirty-three bird species were detected in 2023, compared to thirty-two in 2021, and twenty-seven in 2014. The top five most commonly detected species in 2023, in decreasing order of abundance, were song sparrow, mallard, American crow, American robin, house finch, and Bewick's wren. In 2021the top five most commonly detected species were mallard, song sparrow, American crow, spotted tohwee, and European starling and cedar waxwing (the latter two tied for fifth most commonly detected), and in 2014, the top five most commonly detected species were song sparrow, spotted towhee, mallard, black-capped chickadee, and Bewick's wren.

Comparison of the number of birds per station between the 2014 baseline and the two monitoring trends shows varying trends, depending on species. Thirteen species showed a continuous increasing trend in the number of birds per station from 2014 to 2021 and 2023. One species, western woodpewee, was detected in 2023 but not in either of the previous monitoring years. Three species were observed in the initial baseline surveys but not during the subsequent monitoring surveys. It's possible that all three of these species (rufous hummingbird, black-throated gray warbler, and Wilson's warbler) were migrants rather than locally nesting species. The same is likely also Townsend's warbler, which was detected in 2021 but not during the baseline survey or the 2023 monitoring effort, as appropriate nesting habitat for this species is not present within the study area. The 2021 monitoring effort report decreases in black-capped chickadees and Bewick's wrens; however, the results of the 2023 monitoring effort showed increases in both species compared to the 2021 results. Species typically associated with ponds, emergent wetlands, and scrub-shrub wetlands (habitats present within the restoration area) that were detected during the 2023 monitoring effort include common yellowthroat, red-winged blackbird, and violet green swallow.

#### 4.3 BALD EAGLES

# 4.3.1 Methodology

PHS conducted bald eagle surveys at the Rinearson Restoration site from mid-March through August 2023. Initially, surveys were taken from three vantage points in order to cover the entire site. However, once it was determined that the best viewpoint was near the boat ramp, it was used the majority of the time with shorter walks through the site. Surveys were scheduled weekly and alternated between two hours after dawn or two hours before dusk. Inclement weather or other circumstances interfered with scheduling resulting in one missed survey in April and one survey that was interrupted for 10 minutes due to torrential rain and lack of visibility.

PHS ornithologist, Christie Galen, listened, and scanned the area with 8x32 binoculars and 25X-60X zoom spotting scope to detect bald eagles. Bald eagle presence/absence, abundance, behavior, age class, habitat element use, and time of use were recorded. Refer to **Appendix G** for a summary table and bald eagle observation data sheets.





Figure 4-2: Nesting bald eagle in study area

# 4.3.2 Results

# 4.3.2.1 *Nesting Bald Eagles*

Bald eagles have nested on the west bank of the Willamette River across from the site since before the project began. In 2023 they nested approximately 0.33 miles west-northwest of the site in the upper crotch of a black cottonwood tree, see **Figure 4-3**. In mid-March at the beginning of the surveys the female bald eagle was already sitting tall in the nest, and it appeared that the eggs had hatched. For the next few weeks, the adults appeared to be feeding young but due to the distance and lighting it could not be confirmed. Although the adults continued to perch on or near the nest, no fledglings were observed. The nesting attempt failed but the eagles remained in the vicinity through the final August survey.



4.3

 $\mathbf{M} \text{ink Monitoring Map}$ 

Rinearson Natural Area **Restoration Project** 







Figure 4-3: Bald eagle nest on west side of Willamette River, outside of the study area

#### 4.3.2.2 Presence/Absence/Abundance

Twenty-three bald eagle surveys were conducted between mid-March and August 2023. Sixty one percent of surveys (14) resulted in one or more on-site bald eagle sightings. Additionally, bald eagles were observed in the vicinity of the site during 91 percent of surveys (21). Bald eagles were observed on site during 26% of the observation time while they were observed in the site vicinity during 53% of the observation time. A minimum of 3-4 sub-adults and 2 adults were observed on site during surveys.

#### 4.3.2.3 Site Habitat Elements Used

Bald eagles were observed perched in the riparian zone or flying over the site and Meldrum Bay. The most frequently used site feature (9 times) was a mature black cottonwood tree with a scraggly dead top located on the south end of the island in the northwest corner of the site. They also showed preference for perching in another mature cottonwood tree (3 times) located opposite the mouth of Meldrum Bar Channel. Adult eagles spent a total of 7 hours perching in trees in the northwest corner of the site adjacent to the mouth of Meldrum Bar Channel, 7 minutes flying over the site, and 10 minutes foraging unsuccessfully for ducks in Meldrum Bay. They flew over the site but were not observed perching in the interior of the site. Juvenile (~2-year-old) eagles spent 4 hours and 53 minutes on site perched in cottonwood trees along the riverbank and 6 minutes foraging unsuccessfully in Meldrum Bay. The adult bald eagles flew between these perches and the off-site nest across the river, as well as other hunting perches on both banks of the river. Both adults and sub-adults hunted from these perches.



## 4.3.2.4 Timing and Seasonality

Of the 14 surveys with on-site bald eagle sightings, approximately half were morning surveys and half were evening surveys. Adult and sub-adult sightings occurred on and off-site throughout the survey period from mid-March through August.

## 4.3.2.5 *Summary*

Bald eagles nested on the west bank of the Willamette River across from the site. The project area is part of their territory, and they perch and hunt on site. Perches consist of mature black cottonwood trees located in riparian habitat adjacent to the river. Adult eagles spent a total of 7 hours perching in trees in the northwest corner of the site adjacent to the mouth of Meldrum Bar Channel, 7 minutes flying over the site, and 10 minutes foraging unsuccessfully for ducks and fish in Meldrum Bay. They flew over the site but were not observed perching in the interior of the site. Juvenile / sub-adult eagles spent 4 hours and 53 minutes on site perched in cottonwood trees along the riverbank and 6 minutes foraging unsuccessfully in Meldrum Bay. Bald eagles were observed on site during 26% of the observation time while they were observed in the site vicinity 53% of the observation time. The nesting attempt was a failure, but the adults remained in the vicinity of the nest through the final August survey.

#### 4.3.2.6 Other Species

#### American Beaver

On two occasions an American beaver was observed in Meldrum Bay; at dusk on April 21, 2023, it slapped its tail a couple of times while swimming in the bay and at dawn on June 19, 2023, it carried a cottonwood branch and swam to the bank near the boat ramp to eat the leaves off and then walked north along the bank and crawled into some brush.

#### Birds in Meldrum Bay and Willamette River

Peregrine falcon (4/21), osprey, belted kingfisher, barn swallow, tree swallow, Vaux's swift, mallard, Canada goose, spotted sandpiper, killdeer, Caspian tern, glaucous-winged gull, California gull, purple martin (8/10), common mergansers, hooded merganser (3/15), American crow, turkey vulture, double-crested cormorant, great blue heron, and song sparrow. On July 4, a 3-foot-long dead salmon on Meldrum Bar attracted over 20 turkey vultures, numerous American crows, 1 great blue heron, 1 juvenile bald eagle, and 1 mallard.

On July 4, 2023, a 3-foot dead salmon on bar attracted great blue heron, turkey vulture (~20) and American crow, and a juvenile bald eagle.

#### **4.4** MINK

Mink were selected as target species for wetland monitoring due to their correlation with high quality aquatic environments, as cited in the Rinearson Natural Area Baseline Monitoring Report (Cascade Environmental, 2016). As mesocarnivores that hunt within continuous aquatic habitat, they are typically associated with heterogenous bank canopy and structure, moderate to low bank slopes, and availability of aquatic prey.

PHS monitored Mink from June-August via three monitoring stations, each with a motion-detection camera and fur snare, and visual searches for mink sign in the general area of the monitoring stations. Monitoring stations were visited bi-monthly within the monitoring period to check camera and fur snare conditions, and to reapply attractants to stations. Attractants used included Three Rivers mink scent



applied to the inside of fur snares and anchovy paste applied near the cameras. Previous mink monitoring deployed three camera and snare sites, along with another separate snare site unassociated with a camera. The single snare site was not deployed for 2023 monitoring, as any fur sample captured in the snare would've required lab testing to prove species. This area was still included during searches for signs of mink.

No mink were detected or captured by the camera traps or fur snares during the monitoring period. Camera 1 was placed downslope of the previous monitoring year location, as it was adjacent to a large, embedded root wad and represented high quality aquatic habitat. This camera was later moved upslope to the original monitoring location after high precipitation and spring freshet raised the water levels and temporarily submerged the camera. The upslope location contained large woody structures typically associated with mink habitat, however as the water level dropped throughout the monitoring season this site became quite dry and was less suitable for mink. It is recommended that the camera be mounted elsewhere for the next monitoring year, in a location that is less likely to be impacted by seasonal water levels. Please see **Figure 4-4** for locations of snares and cameras.

While no mink were detected during the monitoring period, three related mesocarnivores in the mustelid family were observed: skunk (Mephitis mephitis), long-tailed weasel (Mustela frenata), and river otter (Lontra canadensis). Figures 4-5 through 4-9 show images of these observed species. Aquatic mammals such as beaver (Castor canadensis) and nutria (Myocastor coypus) were also observed. The presence of mustelids and aquatic mammals indicates that the area is suitable for animals that occupy similar niches and habitats. Prey diversity and availability appears to be the primary factor influencing mink presence (Holland et al. 2019), followed by invasive vegetation, as it can degrade available denning and foraging habitat (Cascade Environmental, 2016). Improvements to water quality and aggressive management of invasive vegetation are likely to increase the quality of habitat for mink and increase the probability of mink observation in the future.





Figure 4-5: long tailed weasels investigating fur snare.



Figure 4-6: River otter emerging from waters with a fish.



**Figure 4-7:** Skunk investigating fur snare.





Figure 4-8: Beaver smiling for the camera.



Figure 4-9: Nutria

#### 5.0 WATER QUALITY MONITORING

Water quality monitoring was conducted on July 12, 2023, at 11 locations within the project area. Data collected at each station included water temperature, dissolved oxygen, pH, and conductivity. The stations for the 2023 monitoring were approximated based on the monitoring map and station descriptions provided in the Year 3 (2021) monitoring report by ESA. Two additional readings were taken in this effort due to lower water depths in the upper reaches on the day of measuring. **Table 5-1** describes the 2023 water quality monitoring locations that are shown in **Figure 5-1**. Additionally, continuous temperature data was collected by the water level logger instruments from April through July.

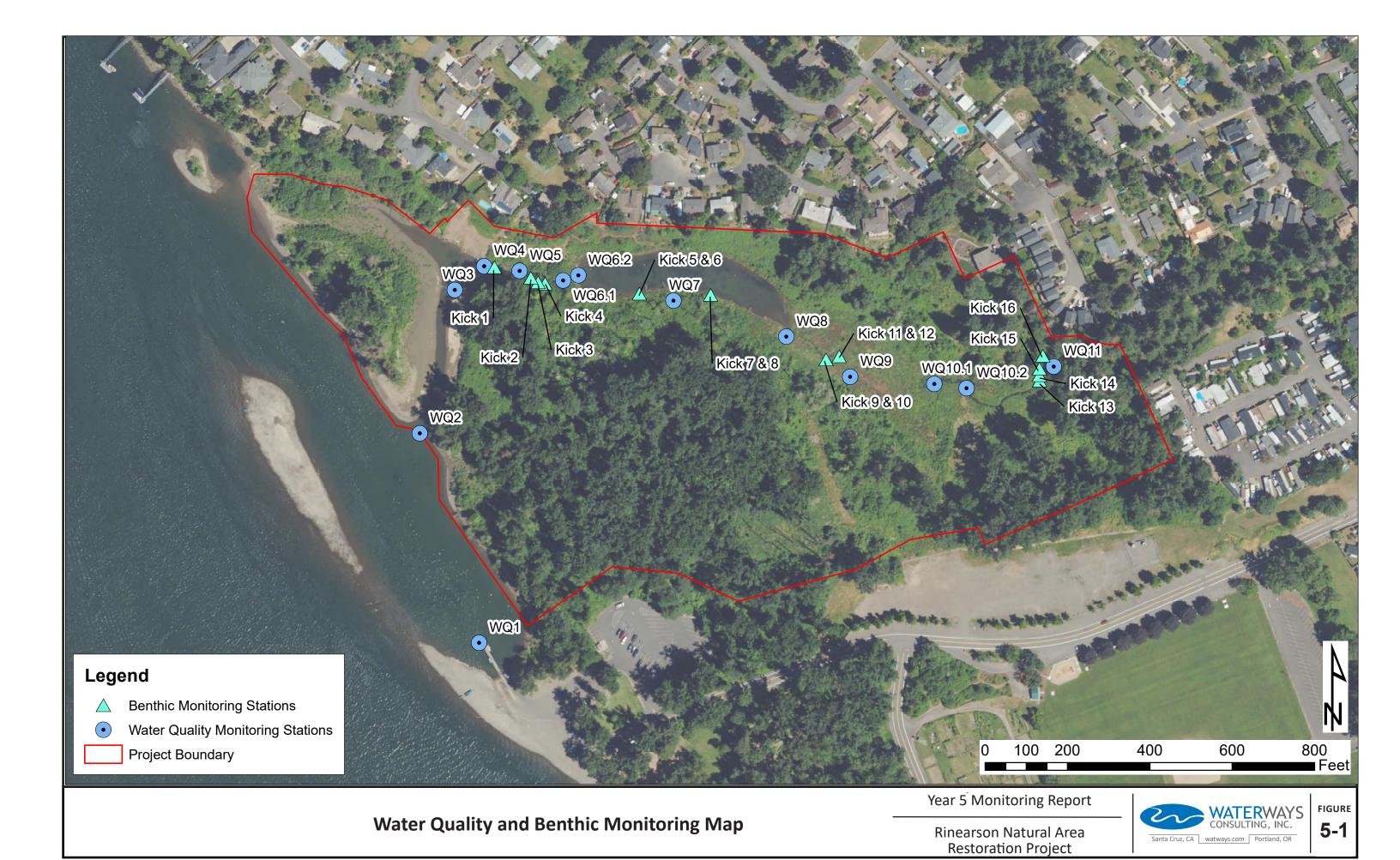




TABLE 5-1 WATER QUALITY MONITORING LOCATIONS

Monitoring Station ID	Location Description			
WQ-1	Willamette River/Meldrum Bay: End of Boat Ramp Dock at Meldrum Bar Park			
WQ-2	Willamette River/Meldrum Bay: Confluence of Meldrum Bar Channel and Meldrum Bar Bay			
WQ-3	Meldrum Bar Channel – Upper Section, above beaver dam			
WQ-4	Engineered Riffle – Lower Section			
WQ-5	Engineered Riffle – Middle Section			
WQ-6.1	Engineered Riffle – Upper Section, below beaver dam			
WQ-6.2	Remnant Pond – Outlet, above beaver dam			
WQ-7	Remnant Pond – Middle Section, South Side			
WQ-8	Remnant Pond – East End, South Side of channel into pond			
WQ-9	Emergent Marsh Channel – Lower Section			
WQ-10.1	Emergent Marsh Channel – Upper Section			
WQ-10.2	Emergent Marsh Channel – Upper Section, downstream of beaver dam			
WQ-11	Upper Rinearson Creek – Downstream of rock cascade, upstream of footbridge			

A YSI 556 multi-parameter sonde with handheld display was used to collect the water quality parameters. The water quality meter was calibrated by Pine Equipment, Inc. (from whom the YSI multiparameter was rented, and a certification of calibration is provided in **Appendix I**) within 24 hours of the field data collection using standards of known values for pH and conductivity, and with known percent saturation for DO. Like the previous Year 1 and Year 3 monitoring efforts, the data were collected beginning with WQ-1 in the Willamette River at the beginning of the day (around 9:30am) and moving upstream to end with WQ-11 in Upper Rinearson Creek by early afternoon (12:40pm). Data collection was aimed for mid-depth in the water column at each monitoring station, where feasible. However, since data was collected in early July, as compared to previous monitoring efforts in April, this was more difficult in some areas due to lower water levels.

The water quality monitoring, per the HDP, is meant to be performed during April of each year. However, during the Spring months of 2023, water levels in the Willamette River were relatively high, limiting access to much of the lower project area. Therefore, monitoring was not performed until early July. Comparisons between certain water quality metrics to previous years are not beneficial in some instances, and these are discussed in the following sections. In future monitoring years if water levels at a particular sampling point are too high, the closest dry ground location adjacent to the sampling point will be used, to the extent feasible.

#### 5.1 RESULTS

Data was collected on July 12, 2023 for water temperature, pH, dissolved oxygen, and conductivity. On the day on the monitoring, the weather conditions were sunny with air temperatures of 57-84 degrees Fahrenheit, or 13.89-28.89 degrees Celsius. The results are shown in **Table 5-2**.



TABLE 5-2
SUMMARY OF WATER QUALITY RESULTS

Station ID	Sample Time	Temperature	pH (S.U.)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)
WQ-1	9:41 AM	22.9 °C 73.22 °F	7.59	8.02	91.8
WQ-2	10:00 AM	23 °C 73.4 °F	7.57	8.4	93.4
WQ-3	10:19 AM	22.2 °C 71.96 °F	8.73	8.04	188
WQ-4	10:30 AM	22.5 °C 72.5 °F	9.06	9.62	184
WQ-5	10:39 AM	22.6 °C 72.68 °F	9.15	9.03	183.3
WQ-6.1	10:49 AM	23.2 °C 73.76 °F	9.25	14.11	184
WQ-6.2	10:52 AM	22.8 °C 73.04 °F	9.52	18.38	181.7
WQ-7	11:36 AM	23 °C 73.4 °F	9.14	15.34	182
WQ-8	11:54 AM	17.7 °C 63.86 °F	7.42	9.52	186.8
WQ-9	12:06 PM	17.1 °C 62.78 °F	6.97	2.6	186.3
WQ-10.1	12:20 PM	17.4 °C 63.32 °F	7.26	9.19	187
WQ-10.2	12:27 PM	17.2 °C 62.96 °F	7.24	9.24	186.5
WQ-11	12:37 PM	17 °C 62.6 °F	7.58	9.28	184.3

#### **5.2 TEMPERATURE**

The data collected for temperature indicate that the monitoring locations located nearest the inlet of Rinearson Creek into the project site and into the emergent marsh area upstream of the remnant pond experience the lowest temperatures (around 17-18 °C), whereas the highest temperatures (approximately 23 °C) were recorded in the remnant pond, upstream of the roughened channel, and in the Willamette River.

In general, the water temperature showed a decreasing trend as the measurements moved upstream of the remnant pond and into Rinearson Creek, as well as a decreasing trend from the remnant pond downstream through the roughened channel before nearing the Willamette River. Since the samples were recorded in July rather than in April, the flows within the project site were lower and the ambient air temperatures were higher. Therefore, no comparison between the sample water temperature can be drawn between Year 5 and Years 1 and 3.



The water level loggers utilized by Waterways for water surface elevation monitoring also record water temperature. The Waterways loggers recorded from April 14, 2023 through July 12, 2023. The recorded water temperatures are displayed in **Figure 5-2**. The Oregon water quality standard for temperature is defined in OAR 340-041-0028 and stipulates that the 7-day-average maximum temperature of a stream identified for salmon and trout rearing and migration use may not exceed 18.0 °C (64.4 °F). The water temperature for the upper site logger (where Rinearson Creek enters the project site) remained well under the 64.4 °F standard. However, the Waterways logger located near the remnant pond outlet had more variable high and low temperatures, with averages above the OAR standard beginning in late April and continuing through the remainder of the period of record.

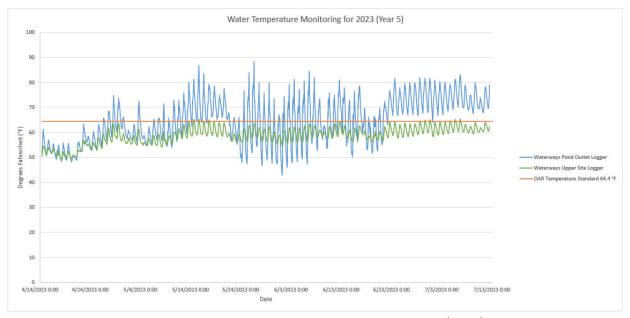


Figure 5-2: Water Temperature Monitoring Year 5 (2023)

#### 5.3 DISSOLVED OXYGEN (DO)

The Oregon water quality standards for dissolved oxygen are outlined in OAR 340-041-0016 and require that DO should not be less than 6.0 mg/L in waters designated for cold water aquatic life. Higher DO standards have been established for waters that are being used by salmon for spawning but it is likely that the Rinearson site is only being utilized by juvenile salmonids for rearing. The DO values measured on July 12, 2023 were well above the minimum needed to meet the water quality standard except for WQ-9, which is located in the lower section of the emergent marsh. Since this value of 2.6 mg/L is significantly lower than the remainder of the data, we assume that this is an errant data point and non-indicative of low oxygen levels in the system.

The DO data collected in this monitoring effort displayed measurements with a minimum, outside of the errant measurement of 2.6 mg/L, of 8.02 mg/L at WQ-1 (at the boat launch in Meldrum Bay) and a maximum of 18.38 mg/L at WQ-6.2 (at the remnant pond outlet above the beaver dam). Readings at the remaining stations ranged from 8.04 mg/L to 15.34 mg/L. The Year 3 monitoring efforts also recorded a high dissolved oxygen level in the remnant pond and determined that this was likely due to photosynthetic activity resulting from algae growth and aquatic plants in the pond. Algae and plant life can produce more oxygen than the system can consume. The measurement in the pond in Year 5 was also taken at midday, a time at which photosynthetic activity is likely at its highest. **Figure 5-3** shows a



photo of the remnant pond on the day of monitoring (July 12, 2023), which demonstrates the extent of algae growth in the remnant pond during the warmer months of the year.

In general, the measurements for Year 5 (2023) show similar patterns as Years 1 and 3, other than the values being slightly higher overall due to the date of collection being in the summer rather than spring. As in Years 1 and 3, the DO readings increased moving upstream in the site, and hit their peak in the remnant pond, and then decreased in the emergent marsh and Rinearson Creek inlet to the site.



Figure 5-3: Algae growth in the remnant pond on July 12, 2023

#### 5.4 PH

The pH measurements for Year 5 (2023) indicated values from a low of 7.24 Standard Units (S.U.) at station WQ-10.1 to a high of 9.52 at station WQ-6.2. The pH measurements at the remaining stations were recorded within the range of 7.26 to 9.25 S.U.

These data were slightly elevated as compared to the pH measurements recorded for Year 3, which ranged from  $6.8-8.3\,$  S.U. This difference is likely caused by the time of year. The ambient air temperature in July is higher than in April, and the water level in Rinearson Creek and the Willamette River are also lower. Both factors cause an increased water temperature, which decreased the solubility of carbon dioxide. Lower levels of carbon dioxide reflect a lower concentration of hydrogen, which can increase pH. Additionally, the larger number of photosynthesizing aquatic plants and algae observed during monitoring release oxygen, which also increased pH in water. Outliers in the data, especially Sites WQ4 through WQ7, may be a result of sediment being stirred up during the sampling, which can be especially acute during low flow summer conditions, or the fact that the water was very shallow, which may impact the sampling equipment.

The Oregon water quality standards for pH in the Willamette Basin are outlined in OAR 340-041-0345 and state that pH values should remain within 6.5 to 8.5 S.U. Six of the 13 pH values measured for Year 5 on July 12, 2023 were above 8.5 S.U. and therefore do not meet the standards. These six



measurements consisted of all stations located between Meldrum Channel (above the lower beaver dam) and the remnant pond (WQ-3 to WQ-7). As discussed, the temperatures due to the timing of the water quality monitoring, paired with aquatic vegetation growth, likely affected the recorded values.

#### 5.5 CONDUCTIVITY

There are no water quality standards for conductivity in Oregon. However, conductivity is valuable to measure for an overall indicator of stream quality. Tracking this variable allows us to note any change in pollution sources either within or entering the project site.

The Year 5 (2023) measurements of conductivity ranged from a low of 91.8  $\mu$ S/cm at station WQ-1 to a high of 188 at WQ-3  $\mu$ S/cm. The readings at the two stations nearest the Willamette River (WQ-1 and WQ-2) shows the lowest values throughout the project site, while the conductivity values were higher and steady throughout the rest of the site (182-188  $\mu$ S/cm). These data and the patterns they indicate are consistent with those recorded for Years 1 and 3, which ranged from about 100 to 200  $\mu$ S/cm (ESA 2022 and Cardno 2020).

#### 6.0 BENTHOS MONITORING

Benthic macroinvertebrates were sampled at four sites in the project area according to methods outlined in the HDP (Figure 5-1). Samples were sieved and bottled on site and delivered to Aquatic Biology Associates for analysis. A summary of some of the benthic macroinvertebrate metrics with the most interpretive value are provided below. However, trends from 2020 to 2023 should be approached with caution, as the benthic macroinvertebrate samples were collected in the spring in 2020 and 2021 and at the height of summer in 2023. Refer to Appendix H for benthic invertebrate data and results. Future macroinvertebrate sampling will be conducted in spring so that results are standardized and comparable with the 2020 and 2021 data.

<u>Total taxa richness</u> dropped in both the emergent marsh and upper control site in 2020 and 2021 but increased at both sites in 2023. Total richness declined in the engineered riffle and rose slightly compared to 2021 in the remnant pond.

<u>Total abundance (relative)</u> increased threefold compared to 2021 in the remnant pond. Total abundance increased in the emergent marsh and upper control after declining 2020–21. After a marked decline 2020-21 in the engineered riffle, total abundance declined slightly again in 2023.

<u>EPT taxa richness</u> (mayflies, stoneflies, and caddisflies) is a commonly tracked metric for assessing stream samples. EPT taxa richness was very low in all years, with two or fewer taxa in each of the four habitat types.

<u>Life cycle duration</u>: Multivoltine taxa comprise 59–98% of the community at the four habitat types, which is considered high, similar to the results observed in 2020 and 2021. Semivoltine (long-lived) taxa richness is a commonly tracked metric for stream BIBI indices. It varied from 1–5 taxa across all habitats and years. That is comparatively low for both marshes and streams in the Pacific Northwest. Semivoltine taxa richness dropped significantly 2020–21 at the emergent marsh and upper control sites, with drought impacts thought to be the likely cause; the metric increased to scores similar to or exceeding the 2020 scores in 2023.

<u>Taxonomic group composition</u>: Non-insects and the insect order Diptera dominate the four habitat types. Dominance by these two groups is generally considered to reflect low biotic integrity. Percent



mollusks declined significantly in three habitat types in 2021 but increased in 2023. Crustacea are extremely dominated by highly tolerant Caecidotea, Lirceus, and Crangonyx. Crustacea increased in dominance 2020–21 in three habitat types but declined in the engineered riffle in 2023. Chironomidae (midges) were the dominant dipterans present, and many of the midges present were tolerant taxa in the subfamily Chironominae.

<u>Feeding groups</u>: A high percentage of predators is considered desirable in benthic communities. For midorder streams in the Pacific Northwest, 0–9% predators is low, 10–19% is moderate, and >20% is high. Both the engineered riffle and upper control stream sites show low % predator scores in all three years. The % predator metric decreased from moderate to low between 2020-21 and 2023. Collector dominance was high (>60%) at the engineered riffle in 2020-21 but decreased to 33.5 in 2023. High collector dominance is regarded as a negative sign for biotic integrity in streams. Shredder % is very low in all habitat types and years, which is also a negative sign. Scraper % at the stream sites is generally low (<10%) across all habitats and years, another negative sign.

<u>Biological Condition Gradient (BCG)</u>: A team of invertebrate specialists is working with the EPA to develop BCG models for the maritime Pacific Northwest (Stamp et al., 2022, in progress). This will include a model for low gradient, valley streams. Final classification of maritime Pacific Northwest taxa into their attribute type may differ slightly from this analysis, but not by much. Version 1 of the low gradient stream model was applied to the Rinearson Creek data.

<u>Tolerant taxa</u> (IV, V, and VI) make up 78.4–100% of the taxa present across all habitat types/years, and comprise 95.2–100% by abundance. This is extremely high for stream communities, but perhaps not unexpected for the marsh and pond habitats.

Using Version 1 of the low gradient stream BCG model, the engineered riffle and upper control sites are classified as level 5 and 6 (highly disturbed). Note that this model is calibrated on mid-order, perennial, low gradient streams. The stream sites at Rinearson Creek are small streams, and possibly seasonal or intermittent during drought years.

#### 7.0 ADAPTIVE MANAGEMENT

#### 7.1 EMERGENT WETLAND

As designed, the emergent wetland, located upstream of the remnant pond, constitutes an important habitat element in the overall Rinearson Natural Area Restoration. Based on the monitoring results, it is also an area that has consistently fallen short of the required metrics, especially those associated with the development of a native vegetation community, and the associated deficiencies has likely contributed to the absence of indicator mammals such as mink. In addition, the lower section of the emergent wetland, adjacent to the remnant pond, has experienced localized channel erosion and incision.

From an adaptive management perspective, focusing resources in this portion of the project area might be warranted. Based on our observations, the prevalence of reed canary grass and the lack of a native assemblage of woody species within this bottomland floodplain has resulted in a range of ecological limitations. If woody species, such as willow, dogwood, and other shrub-scrub species can get established it is likely that beaver would expand to this area and construct a dam. This would benefit the site by limiting creating channel incision through construction of a series of grade controls (beaver dams) that would backwater the entire emergent wetland area, increase the hydroperiod for



areas outside the channel, and improve conditions for native wetland species. Currently, the conditions are more favorable for reed canary grass establishment because of the more pronounced wetting and drying cycle that occurs due to the localized channel incision. Beaver have constructed dams and ponded water elsewhere on the site where the native woody species have become established. This vegetation provides a source of food, but also cover from predators, for the beaver, which will not use areas that require them to move across open terrain.

Following construction of the project, native woody saplings did recruit to this area and beaver were active in the lower portion of the emergent wetland but reed canary grass outcompeted those species which may have led to abandonment of the beaver dams in those areas due to a lack of building materials and food. The beavers are now restricted to the upper portion of the emergent wetland, the roughened channel, and the lower lagoon area where native woody species have established and are doing well.

**Appendix J** outlines all treatment completed in 2023 (Year 5) for the project area, and includes spray logs, the Ash Creek Forest Management Statement of Work for vegetation management, and treatment logs divided by month.



#### 8.0 REFERENCES

Cardno. 2020. Rinearson Monitoring Annual Report. Dated December 2020. Prepared for: Columbia Restoration Group, LLC.

Cascade Environmental Working Group. January 2016. Rinearson Natural Area Habitat Development Plan (HDP).

DSL (Department of State Lands). 2009. Routine Monitoring Guidance for Vegetation. September 23, 2009. Interim Review Draft version 1.0.URL:

https://www.oregon.gov/dsl/WW/Documents/dsl\_routine\_monitoring\_guidance.pdf

Holland, A.M., Schauber, E.M., Nielsen, C.K. and Hellgren, E.C. (2019), River otter and mink occupancy dynamics in riparian systems. Jour. Wild. Mgmt., 83: 1552 1564. https://doi.org/10.1002/jwmg.21745

Proutt, B. 2018. Rinearson Natural Area Habitat Development Plan. Dated October 5, 2017, updated December 2018. Portland, OR. Rinearson Natural Area, LLC.

Environmental Science Associates. Rinearson Natural Area Restoration Monitoring Report Year 3 (2021). Dated September 2022. Prepared for: Columbia Restoration Group. LLC.



# Appendix A

**Photo Monitoring** 

### PHOTO MONITORING DOCUMENTATION

All photo monitoring was performed by Waterways from April through August 2023 and documented using the Avenza mapping application.

<u>PP1-C</u>



**Date**: August 21, 2023



PP2-C







**Date**: May 4, 2023





**Date**: July 12, 2023



**Date**: August 21, 2023





**PP3-C** 



**Date**: May 4, 2023

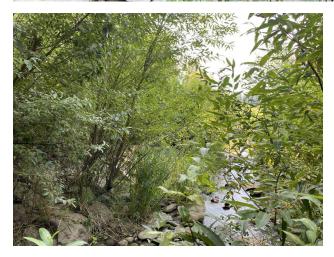






**Date**: August 21, 2023





<u>PP4-C</u>







**Date**: May 4, 2023















<u>PP5-C</u>





**Date**: May 4, 2023









<u>PP7-C</u>





**Date**: May 4, 2023





PP8-C







**Date**: May 4, 2023





**Date**: August 21, 2023







PP9-C







**Date**: May 4, 2023









**Date**: August 21, 2023







# PP10-C

**Date**: April 3, 2023



**Date**: May 4, 2023





**Date**: August 21, 2023



# PP11-C

**Date**: April 3, 2023





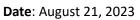
**Date**: May 4, 2023













# PP12-C

**Date**: April 3, 2023



**Date**: May 4, 2023





PP13-C



**Date**: May 4, 2023







**Date**: August 21, 2023



# PP14-C

**Date**: April 3, 2023



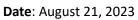














## PP15-C

**Date**: April 3, 2023











**Date**: August 21, 2023







# PP16-C

**Date**: April 3, 2023













**Date**: August 21, 2023







## PP17-320

**Date**: April 3, 2023















**Date**: August 21, 2023







<u>PP18</u>

**Date**: April 3, 2023













**Date**: August 21, 2023



## PP19-260-90

**Date**: April 3, 2023















**Date**: August 21, 2023







## PP20-131





**Date**: May 4, 2023





**Date**: July 12, 2023







**Date**: August 21, 2023









# Appendix B

Habitat Structures and Large Woody Debris Monitoring

#### HABITAT STRUCTURE PHOTO AND NOTES DOCUMENTATION

Habitat Structure 1: Debris Pile (Intact)



**Habitat Structure 2:** Floodplain Log Structure (Intact) Notes: Consists of a log and a few boulders.



Habitat Structure 3: Log Pile (Intact)

Notes: Consists of multiple large cottonwood logs and is covered in native trailing blackberry.



**Habitat Structure 4:** Debris Pile (Intact) Notes: Covered in native trailing blackberry.



Habitat Structure 5: Single Log Structure (Intact)

Notes: Appears to be cottonwood and is covered in ivy and some native vines.



Habitat Structure 6: Single Log Structure (Intact)

Notes: Covered in ivy and other vines.



Habitat Structure 7: Debris Pile (Intact)

Notes: Wood debris pile covered in a mix of native and non-native vines.



Habitat Structure 8: Boulder Pile (Intact)

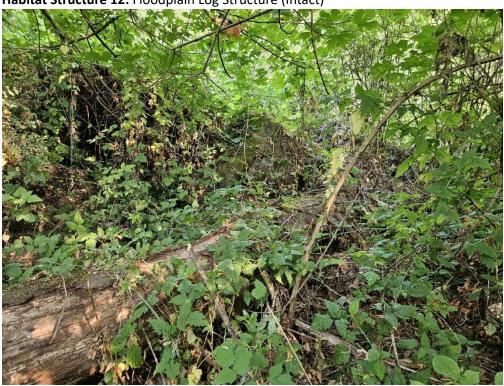
Notes: Small rock pile.



#### Habitat Structure 11: Not Accessible (Unknown)

Notes: At site but completely overgrown so could not observe the structure.

Habitat Structure 12: Floodplain Log Structure (Intact)



Habitat Structure 13: Snag (Still Standing)



Habitat Structure 14: Boulder Cluster (Intact)



Habitat Structure 15: Snag (Still Standing)



Habitat Structure 16: Log Pile (Intact)



Habitat Structure 17: Boulder Cluster (Intact)



Habitat Structure 18: Log Pile (Intact)



Habitat Structure 19: Boulder Pile (Intact)



Habitat Structure 20: Roughened Channel (RC) Log Structure (Intact)



Habitat Structure 21: Roughened Channel (RC) Log Structure (Intact)



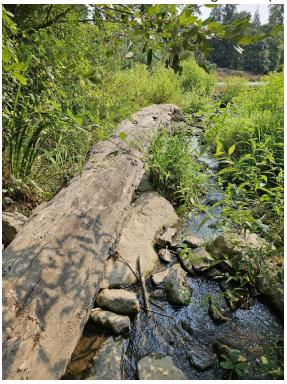
Habitat Structure 22: Roughened Channel (RC) Log Structure (Intact)



Habitat Structure 23: Roughened Channel (RC) Log Structure (Intact)



Habitat Structure 24: Recruited Large Wood (Intact)



Habitat Structure 24: Recruited Large Wood (Intact)



Habitat Structure 25: Boulder and Log Pile (Intact)



Habitat Structure 26: Log Pile (Intact)



Habitat Structure 27: Log Pile (Intact)



Habitat Structure 28: Snag (Still Standing)

Notes: Large cottonwood that is not completely dead



Habitat Structure 29: Log Pile (Intact)



**Habitat Structure 30:** Boulder Pile (Intact) Notes: Includes one floodplain log



## Habitat Structure 31: Snag (Still standing)

Notes: Three volunteer snags







Habitat Structure 34: Log Pile (Intact)



Habitat Structure 35: Floodplain Log (Intact)



Habitat Structure 36: Floodplain Log (Intact)



Habitat Structure 37: Log Pile (Intact)



Habitat Structure 38: Log Pile (Intact)



**Habitat Structure 39:** Not Accessible (Unknown) Notes: Site found but hidden under vegetation



Habitat Structure 40: Floodplain Log Structure (Intact)



Habitat Structure 41: Recruited Large Wood (Intact)



Habitat Structure 42: Floodplain Log Structure (Intact)



**Habitat Structure 43:** Floodplain Log Structure (Intact)



Habitat Structure 44: Floodplain Log Structure (Intact)



Habitat Structure 45: Log Pile (Intact)



Habitat Structure 46: Floodplain Log Structure (Intact)



Habitat Structure 47: Floodplain Log Structure (Intact)



Habitat Structure 48: Floodplain Log Structure (Intact)



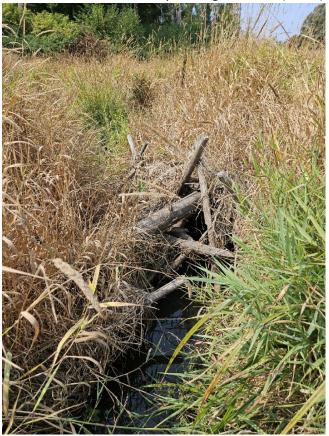
Habitat Structure 49: Floodplain Log Structure (Intact)



Habitat Structure 50: Floodplain Log Structure (Intact)



**Habitat Structure 51:** Floodplain Log Structure (Intact)



Habitat Structure 52: Floodplain Log Structure (Intact)



**Habitat Structure 53:** Floodplain Log Structure (Intact)



Habitat Structure 54: Floodplain Log Structure (Intact)



**Habitat Structure 55:** Floodplain Log Structure (Not Intact)

Notes: Logs mobilized.



Habitat Structure 56: Floodplain Log Structure (Intact)

Notes: only one log.



**Habitat Structure 57:** Floodplain Log Structure (Intact)



Habitat Structure 58: Floodplain Log Structure (Intact)



Habitat Structure 59: Floodplain Log Structure (Intact)



Habitat Structure 60: Floodplain Log Structure (Intact)



Habitat Structure 61: Floodplain Log Structure (Intact)



**Habitat Structure 62:** Floodplain Log Structure (Intact)



Habitat Structure 63: Floodplain Log Structure (Intact)



Habitat Structures 70-72: Tree Tipped into Pond (all three Intact)



Table 2-1
Summary of Habitat Structure Monitoring for Year 5 (2023)

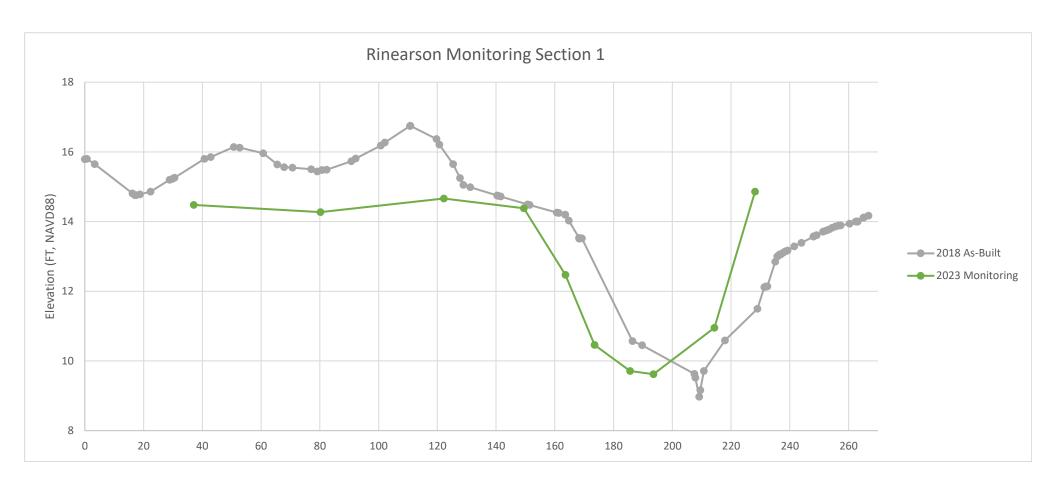
Year 5 Structure ID	Feature Type	Year 5 Condition
1	Debris Pile	Intact
2	Floodplain Log Structure	Intact
3	Log Pile	Intact
4	Debris Pile	Intact
5	Single Log Structure	Intact
6	Single Log Structure	Intact
7	Debris Pile	Intact
8	Boulder Pile	Intact
9	Not Accessible	Unknown
10	Not Accessible	Unknown
11	Not Accessible	Unknown
12	Floodplain Log Structure	Intact
13	Snag	Standing
14	Boulder Cluster	Intact
15	Snag	Standing
16	Log Pile	Intact
17	Boulder Cluster	Intact
18	Log Pile	Intact
19	Boulder Pile	Intact
20	RC Log Structure	Intact
21	RC Log Structure	Intact
22	RC Log Structure	Intact
23	RC Log Structure	Intact
24	Recruited Large Wood	Intact
25	Boulder and Log Pile	Intact
26	Log Pile	Intact
27	Log Pile	Intact
28	Snag	Standing
29	Log Pile	Intact
30	Boulder Pile	Intact
31	Snag	Intact
32	Log Pile	Intact
33	Log Pile	Intact
34	Log Pile	Intact
35	Floodplain Log Structure	Intact
36	Floodplain Log Structure	Intact
37	Log Pile	Intact
38	Log Pile	Intact
39	Not Accessible	Unknown
40	Floodplain Log Structure	Intact
41	Recruited Large Wood	Intact

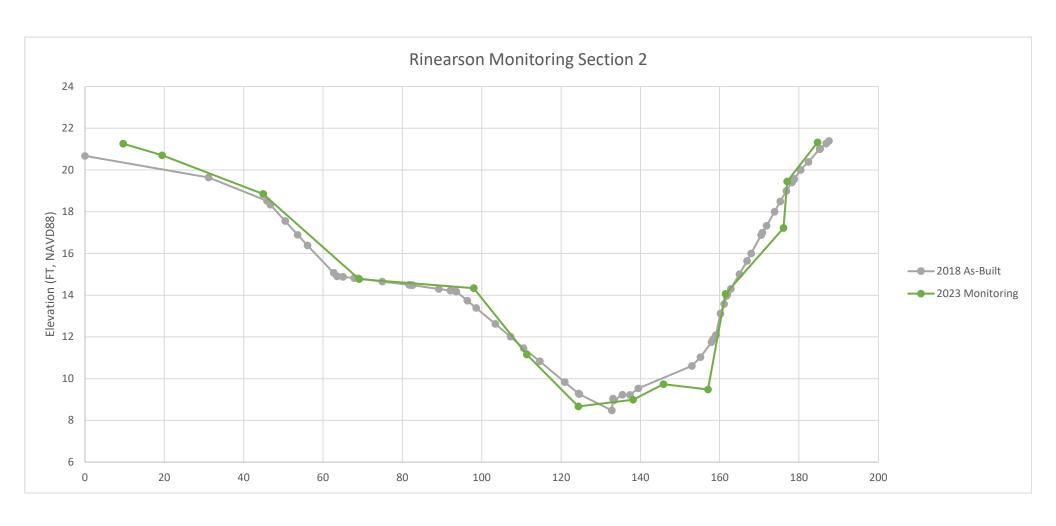
42	Floodplain Log Structure	Intact
43	Floodplain Log Structure	Intact
44	Floodplain Log Structure	Intact
45	Log Pile	Intact
46	Floodplain Log Structure	Intact
47	Floodplain Log Structure	Intact
48	Floodplain Log Structure	Intact
49	Floodplain Log Structure	Intact
50	Floodplain Log Structure	Intact
51	Floodplain Log Structure	Intact
52	Floodplain Log Structure	Intact
53	Floodplain Log Structure	Intact
54	Floodplain Log Structure	Intact
55	Floodplain Log Structure	Not Intact
56	Floodplain Log Structure	Intact
57	Floodplain Log Structure	Intact
58	Floodplain Log Structure	Intact
59	Floodplain Log Structure	Intact
60	Floodplain Log Structure	Intact
61	Floodplain Log Structure	Intact
62	Floodplain Log Structure	Intact
63	Floodplain Log Structure	Intact
64	Floodplain Log Structure	Not Present
65	Not Accessible	Unknown
66	Not Accessible	Unknown
70	Tree Tipped into Pond	Intact
71	Tree Tipped into Pond	Intact
72	Tree Tipped into Pond	Intact

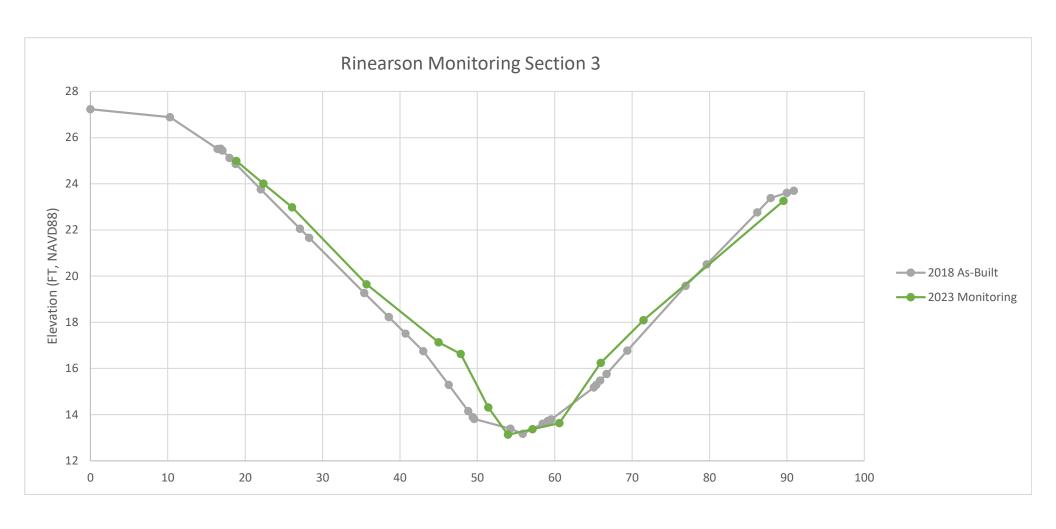


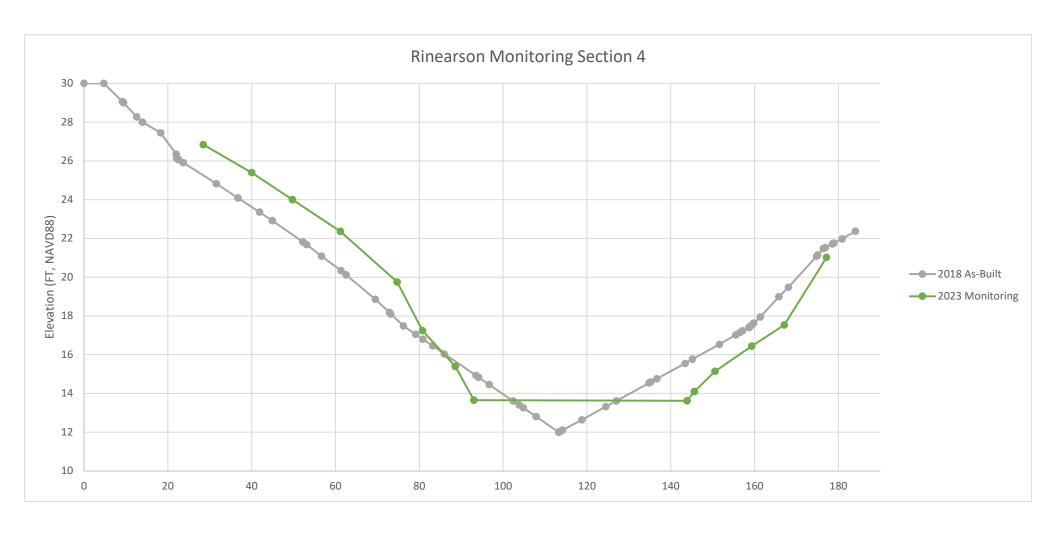
## Appendix C

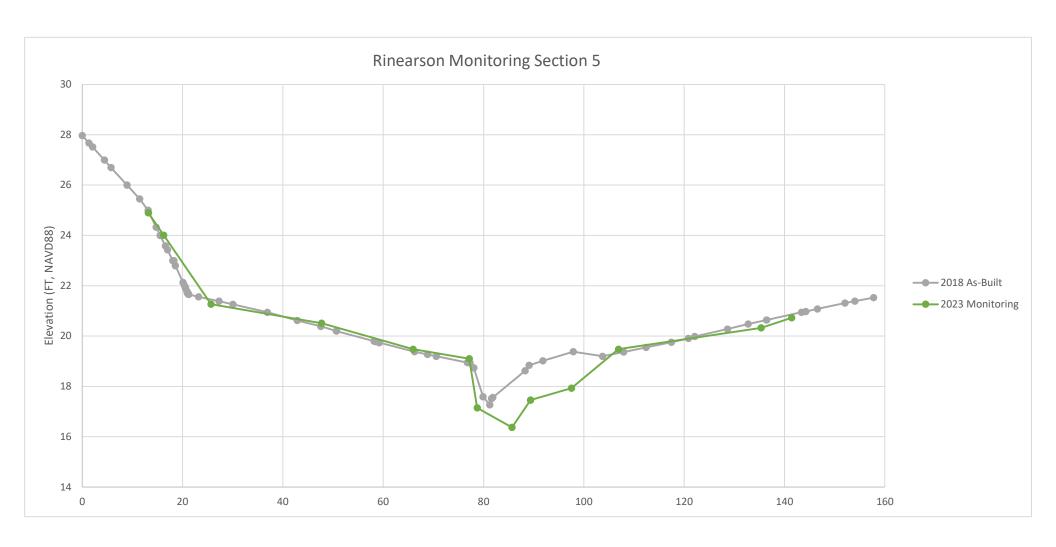
**Survey Cross Sections** 

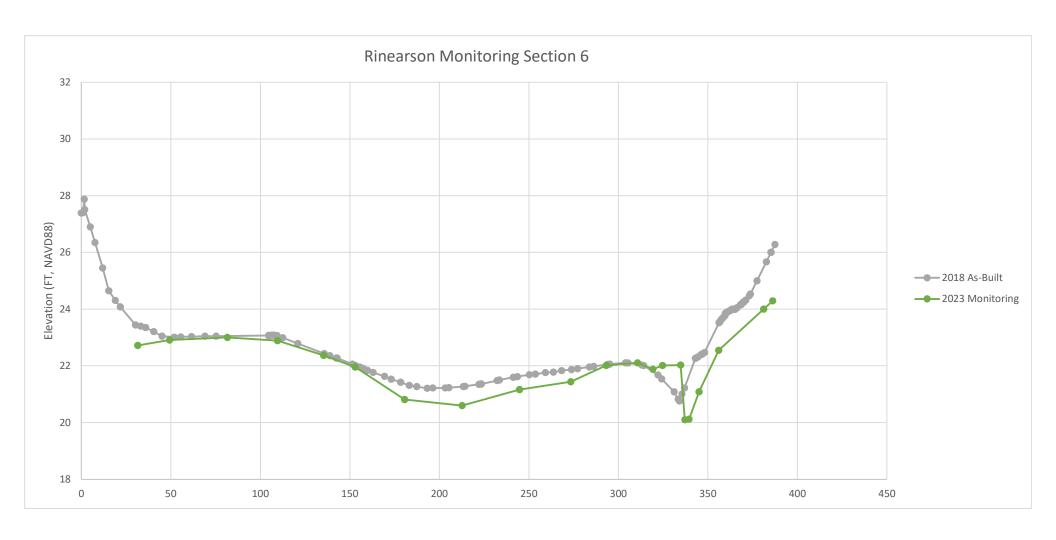


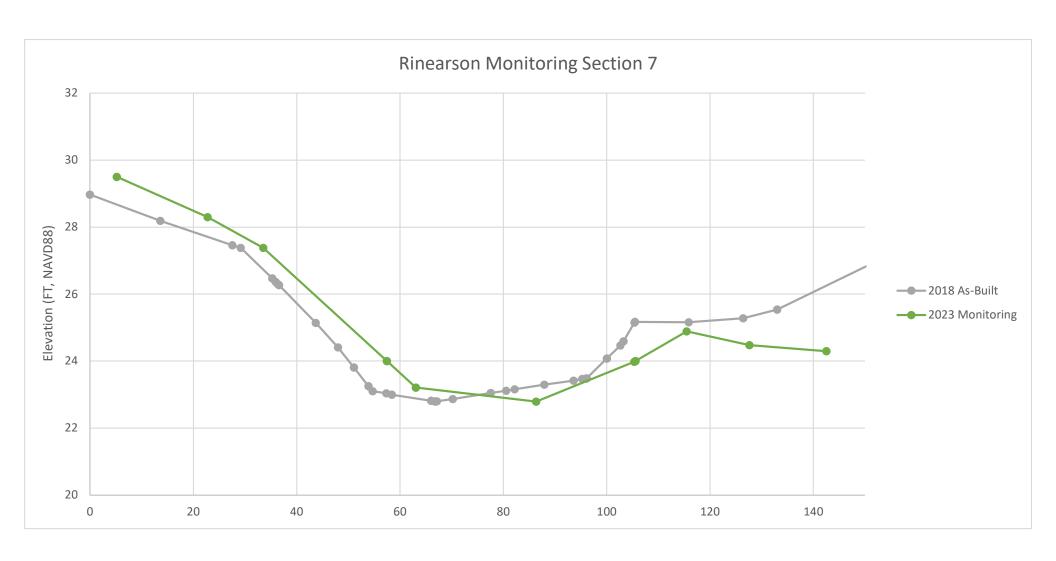


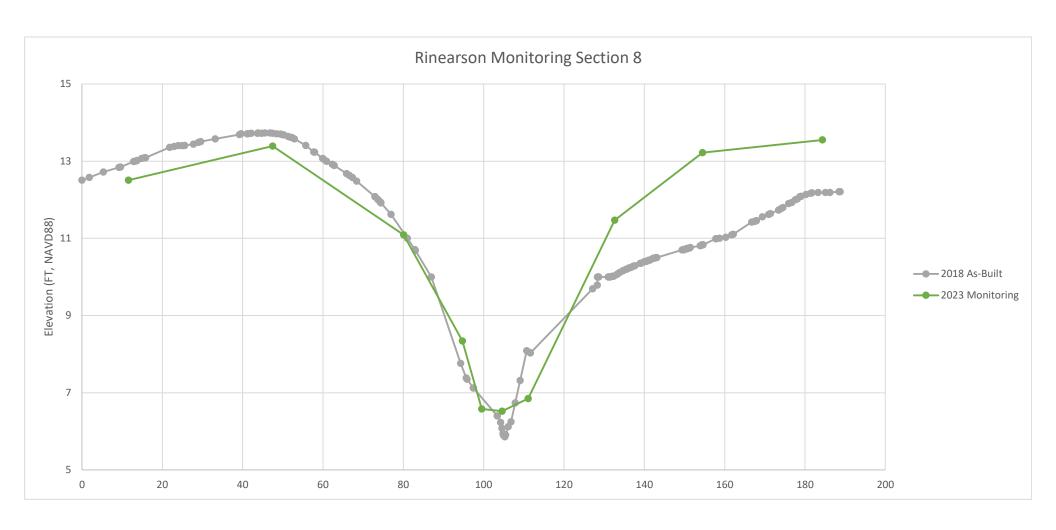


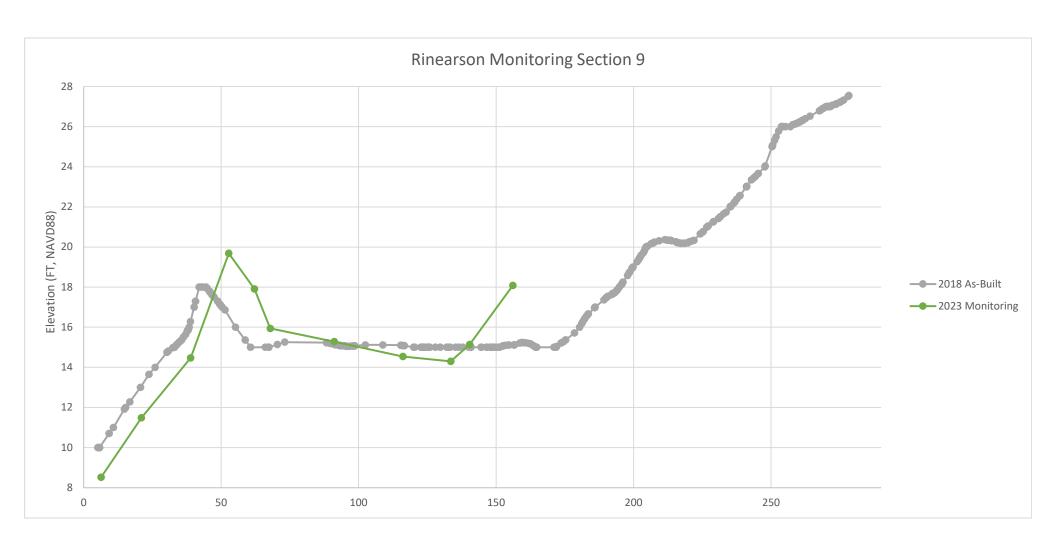


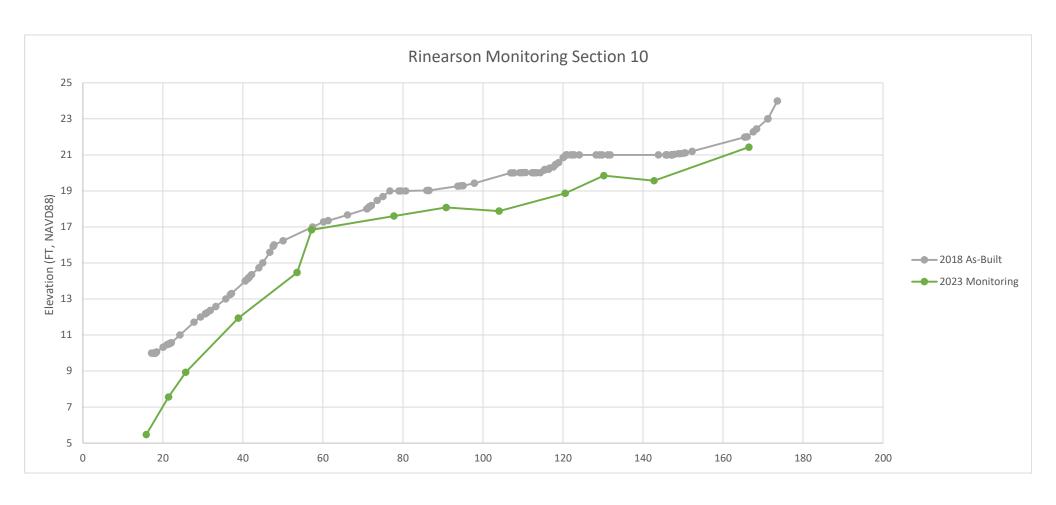


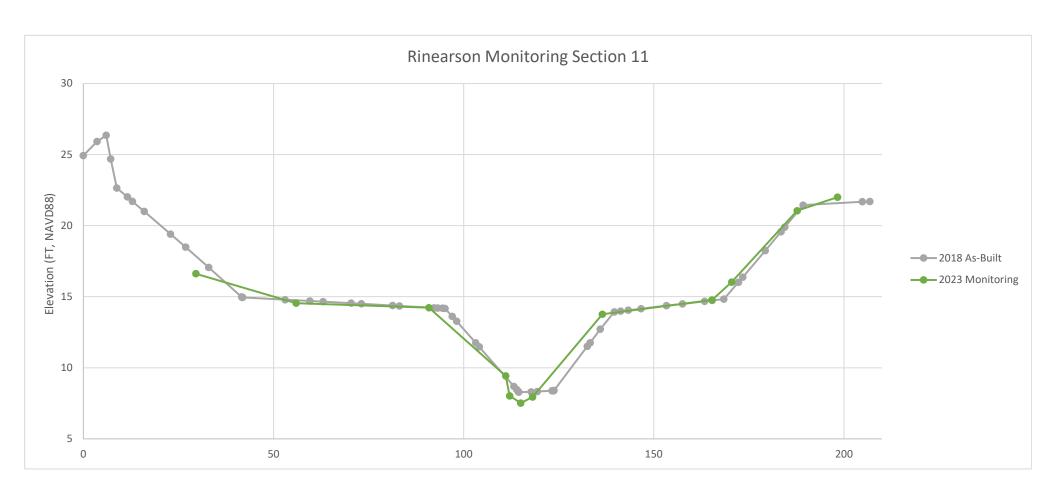


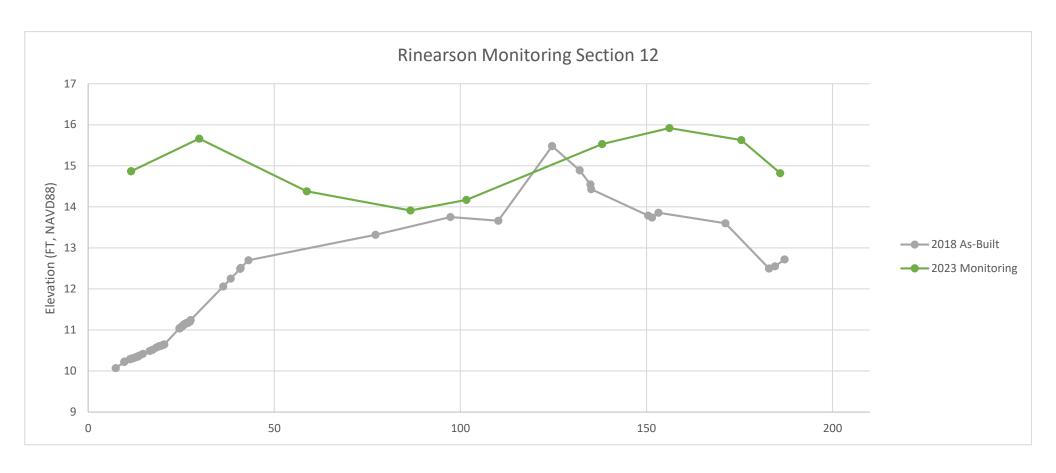














## Appendix D

Fish Passage Photos

## FISH PASSAGE PHOTO AND NOTES DOCUMENTATION

**Meldrum Channel Beaver Dam**: Holds approximately 2.5 feet of grade, maintains flooded lagoon upstream, is mostly inundated at summer high tide, and is not considered a fish barrier.



**Roughened Channel (RC)**: RC is stable with depths at low flow adequate to facilitate fish movement. There are no stability issues observed. The reach is vegetating well with a canopy of primarily willow with some cottonwood growth. There are very little to no nonnatives.



**Remnant Pond Outlet Beaver Dam**: Located at the top of the RC. Holds approximately 1.5 feet of grade. The formation of this beaver dam was anticipated at the design phase, and the dam is not considered a fish barrier.



**Emergent Wetland and Upper Creek Beaver Dam**: Holds approximately 1foot of grade. The dam is not considered a fish barrier.





## Appendix E

Vegetation Monitoring Data (Digital Appendix)

	Origin (N, NN, I)	Status El	IN1 EMM2	EMM3 EMM4	EMMS EMMS	EMM7 EMMS EI	MNO EMMIO EMI	M11 EMW12 EM	MM13 EMM14 EX	MN15 EMM16 EI	MIN17 RFR1 RI	FR2 RFR3	RFR4 RFRS	RFR6 RFR	7 RFRS S	RFR9 RFR10 RI	FR11 RFR12	RFR13 RFR14	RFR15 RFR16	RFR17 RFR10	RFE1 RI	FE2 RFE3	RFE4 RFES	RFE6 RFE7 RFE	a RFE9 RF	FE10 RFE11 RF	12 RFE13 RFE	E14 RFE15 RF	FE16 RFE17	RFE18 URFH	URFI2 URFI3	URFM URFIS	URFIG URFIG	URFID URF9 U	URF10 URF11	JRF12	
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	N	2	0 0	0 0	0 85	45 0	0 1	1 0	0 0	2 0	0 1	1 0	0 0	0 0	0	0 0	0 0		10 0	0 0		0 0	0 0	0 0 0	0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 23	20
	N N		0 0	0 0	0 0	0 0	0 0 1	0 0	0 0	0 0	0 0	0 0	0 0	0 2	2	9 9	0 25	9 9	0 0	0 0	0	0 0	0 0	0 0 0	0	9 9 1	0 0	0 0	0 0	0 20	0 20	0 0	0 0		0 2	0 14	14
	N N	2	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0		0 0		0 0		0	0 0	0 0	0 0 0	0		0 0	0 4	0 0	0 0	0 0				0 0	0 00	œ.
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	N.	2	0 0	0 0	0 0	0 0	70 0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0	0 0	0 0	0 0	0 0	0 0	0	0 0	0 0	0 0 0	0	0 0 1	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 10	30
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heaptis/			0 0	0 0	0 0	0 0	0 0 1	0 0	0 0	0 0	0 0	0 0	0 0	5 0	0	0 0	0 0	0 0	0 0	0 0	0	0 0	0 8	0 0 0					0 0	0 0	0 0	0 0	0 0		0 0	0 01	2
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	-	4	0 0	0 0	0 0	95 0	0 0 1	0 0	0 0	6 0	0 0	0 0	0 0	0 0	0	1 0	0 0	0 0	0 0	0 0	0	0 0	0 0	0 0 0	2	0 0 1	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	50 45	36 04
		2	0 0	6 0	90 8	40 0	15 95 9	9 0	0 5	92 10	10 0	0 0	0 35	0 10	10	0 0	82 0	4 0	5 0	0 0	0	0 0	1 0	5 0 30		0 0 2	0 0	0 0	0 0	90 2	0 0	0 0	0 25	0 25	80 0	0 14	40
	-	-2	0 0	0 0	0 0	3 8	0 0	0 0	0 0	0 0	0 0	28 0	0 0	0 0	1 0	0 0	0 0	0 0	0 0	0 0	1 0	0 0	0 0	0 0 0	- 0	0 0	1 0 1	0 0	0 0	0 0	0 0	8 8	0 0	0 25 0 0	0 0	0 04	<i>D</i>
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	NN.	3	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0	0 0	0 0	0 0	0 0	0 1	0	0 0	0 0	0 0 0		0 0			0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 00	32
	NN NN					0 0										0 0		0 0	0 0	0 0	1 0	0 0	0 0	35 0 0		0 0			0 0	0 0				0 0			/2 72
	NN.	3	0 0	0 0	0 0	0 0	0 0 1	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0	0 0	0 0	0 0	0 0	0 1	2	0 0	0 0	0 0 0		0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0		0 0	0 00	×5
	NN NN	- 1	0 0			0 0								1 0	1 0	2 0	0 0	0 0	0 0	0 0	8	0 0	0 0	0 0 0	- 0	0 0	1 0 1	0 0	0 0	0 0	0 0	1 8 1 8 1	0 0	0 0	0 0	0 00	.5 02
	NN.	4	0 0	0 0	0 0	0 0	0 0 1	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0	1 0	0 0	4 0	0 0	20 0	0	0 0	0 0	0 0 0		0 0		0 0	1 5	0 10	0 0	0 0	0 0	6 0	0 0	0 03	72
	NN.	- 2	0 0	0 0	0 0	0 0	0 0 1	0 0	0 0	0 0						0 0		50 0	0 0	0 0	0	0 0	0 0	0 0 0	0	0 0	0 0	0 0	0 0	0 0		0 0			0 0	0 01	12
	NN	3	0 0	0 0	0 0	0 8	0 0 1	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0	0 0	0 0	0 0	0 0	0 10	0	0 0	0 0	0 0 0	0	0 0 1	0 0	0 0	3 0	0 0	0 0	0 0	0 0	0 0	0 0	0 03	33
	NN NN	1	0 0	0 0	0 0	0 0	0 0 1	0 5	0 0	0 0	0 0	0 0	0 0	0 0	1 0	20 0	0 0	0 0	0 0	0 0	1 0	0 0	0 0	0 0 0	0	0 0	1 0 1	0 0	0 0	0 0	0 0	1 8 1 8 1	0 0	0 0	0 0	0 00	50
	NN	4	0 0	0 0	0 0	0 0	0 0 1	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0	8 0	0 0	0 0	0 0	0 0	0	0 0	0 0	0 0 0	0	0 0 1	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0.1	13
	NN NN		0 0	0 0	0 0	0 0	0 0 1	0 0	0 0	0 0	0 0	0 0	0 0	1 0	5	0 0	0 0	0 0	0 0	3 0	1	0 0	0 0	0 7 0	0	0 0 2	1 0 1	0 0	25 5	0 0	0 0	1 8 1 8 1	0 0	2 0	0 0	0 01	66
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	NN NN	3	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0	2 0	0 0	0 0	0 0	0 0	0	0 0	0 0	0 0 0		0 0				0 0	0 0	0 0	0 0	0 0	0 0	0 01	30
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	NN.		0 0	0 0	0 0	0 5	0 0	0 0	0 0	0 0		0 0	0 0		- 0	0 0	0 0	0 0	0 0	0 5	0	0 0		0 1 0					0 0	0 0	0 0	0 0	0 0		0 0	0 0.1	17
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	N N															0 0		0 0	0 0		0		0 0	0 0 0	0	0 2	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 00	20
	N.	4	0 0	0 0	6 0	0 0	0 0 1	0 0	0 0	0 40	0 0	0 0	0 0	0 0	0	0 0	0 0	0 0	0 0	1 0 1 0	1 0	0 0	0 0	0 0 0	0 .	40 0 1	0 0		0 65					8 0	0 0	0 45	97
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		-	- 1 -	y /6	- 1 0	7 0	- 0 1	20	v   30	v 50	v   0		- 0	0 20		- 0	30	v   ml	J 0		0	~   "	v   0	V 40 0	- 0	~   20	1 9 1 0	73	10	v   d	J   0	J 15	- 35		v   1	ra 11.	**
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		=	100	0 0	0 0	1 25	5 0	0 0	0 0	0 0	0 50	25 50	95 0	60 50	50	60 100	2 35	40 0	65 70	20 55	80	20 100	90 90	10 50 73	55	0 40 5	10 10	00 25	60 20	5 55	55 45	24 0	65 15	50 75	3 32	20 36	6)
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			IN1 EMM2	EMM3 EMM4	EMMS EMM	EMM7 EMMP E	ma EMM10 CM	M11 EMM12 EM	MM12 EMM14 EN	MN15 EMM16 E	MM17 RFR1 0	FR2 RFP1	RFR4 RFD4	RERG PED	7 RFRs s	RFR9 RFR10 00	FR11 BFR42	RER12 RER14	RFR15 RFR14	RER17 REP4	RFE1 DI	FE2 RFE2	RFE4 RFE5	BFE6 RFE7 DEE	a RFE9 OF	FE10 RFE11 DE	12 RFE13 DE1	E14 RFE15 OF	FE16 RFE17	RFE18 URFH	URFIZ URFIN	URFM URFS	URDS URDS	URFID URFS U	URF10 URF11	JRF12 Hab	nesie rage
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s Species	4*10%	_	8 0	14 30	94 0	65 0	16 100 9	15	0 13	90 10	95 0	22 0	0 37	11 40	10	2 0	82 12	22 10	15 0	70 0	2	@1 O	0 0	20 0 30	27	13 11 3	0 0	0 60	0 0	90 2	1 15	0 0	6 25	30 66	90 60	10 32	32
Lower Chill(%) Upper Chill(%)							$\perp$			$\perp$	$\perp$			$\perp$	$\perp$	$\perp$		$\rightarrow$			$\perp$		$\perp$	$\rightarrow$	$\perp$		$\perp$							=		23. 41.	.17
	e450%		4 4	0 25	0 0	0 0	0 0	0 95	A 64	0 50	0 0	0 0	A 0	5 20	95	3 0	45 50	0 88	0 0	0 0	0	0 0	A A	0 40 0		« ×	5 4	0 90	45	0 0	0 40	0 15	E 15	20 0	0 4	75 44	9K
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	<2.0		0.0	0.0	0 0	0 0	0 0 1	0	0 0	0 0	0 0	0 0	0 0	0 0	0		0 0	0 0	0 0	0 0	0	0 0	0 0	0 0 0	0	0 0 FR	EL S	0 0	0 0	MREFT 0	0 0	0 0	0 0	0 0	0 0	0.0	
and Characherson In																																					

Species	URFI1	URFI2	URFI3	URFI4	URFI5	URFI6	URFI7	URFI8	URF9	URF10	URF11	URF12					
Native Herbaceous Species																	
species-latin name											-						
Epilobium ciliatum (=E. watsonii)	0	0	2	0	0	0	0	0	0	0	0	0	0.17				
Galium aparine	0	0	0	0	1	0	0	0	0	4	2	1	0.67				
Marah oregana	20	0	30	0	0	0	0	0	0	0	2	0	4.33				
Polystichum munitum	0	9	0	0	0	0	0	0	0	0	0	0	0.75				
Invasive Herbaceous Species																	
species-latin name																	
Buddleja davidii	0	0	0	0	0	0	0	0	40	0	0	0	3.33				
Cirsium arvense	0	0	12	0	0	0	0	0	1	10	0	0	1.92				
Hedera helix	0	1	0	0	0	6	0	30	0	0	60	0	8.08				
Impatiens capensis	0	0	4	0	0	0	0	0	0	0	0	10	1.17				
Phalaris arundinacea	2	0	0	0	0	0	25	0	25	80	0	0	11.00				
Non-Native Herbaceous Species																	
species-latin name	12	0	0	0	0	0	0	0	0	0	0	0	1.00				
Clematis ligusticifolia Geranium robertianum	1	0	0	0	0	0	0	6	0	0	0	0	1.00	-			
Geranium robertianum Geum urbanum	10	0	0	0	0	0	0	2	0	0	0	0	0.17				
Lapsana communis	5	0	0	0	0	0	0	2	0	0	3	0	0.17				
Solanum dulcamara	0	0	0	0	0	12	0	0	0	10	0	0	1.83				
Solunum uuleamara	U		0	0	0	12	0	U	U	10	0	0	1.03				
Native Tree Species																	
species-latin name																	
Acer macrophyllum	20	0	25	95	0	0	0	0	0	0	0	30	14.17				
Fraxinus latifolia	0	0	0	0	0	0	30	0	0	0	0	0	2.50				
Populus balsamifera trichocarpa	0	15	0	55	0	5	0	18	0	15	50	0	13.17				
Native Shrub Species																	
species-latin name																	
Cornus sericea	0	0	0	0	0	0	0	8	0	0	0	0	0.67				
Corylus cornuta	0	55	0	0	10	0	0	8	0	0	8	0	6.75				
Holodiscus discolor	0	0	0	0	0	0	0	0	0	0	10	0	0.83				
Physocarpus capitatus	0	0	0	0	0	0	0	0	40	0	0	0	3.33				
Rubus parviflorus	0	0	0	0	0	0	28	0	0	0	0	0	2.33				
Rubus ursinus	0	48	0	76	0	35	0	8	0	0	0	0	13.92				
Symphoricarpos albus	0	0	0	0	0	5	0	0	0	0	5	0	0.83				
Invasive Shrub Species																	
species-latin name																	
Ilex aquifolium	0	0	0	0	0	0	0	20	0	0	0	0	1.67				
Rubus armeniacus	0	0	10	0	15	5	35	0	0	0	1	75	11.75				
Bare Substrate																	
thatch/bare ground	55	55	45	24	0	65	15	50	75	3	32	20	36.58				
Routine Performance Standards	URFI1	URFI2	URFI3	URFI4	URFI5	URFI6	URFI7	URFI8	URF9	URF10	URF11	URF12	Habitat Average	Standard Error	Standard Met?	Percentage with Native	Number of Native Sp.
Cover of Invasive Herbaceous Species	2	1	16	0	0	6	25	30	66	90	60	10	25.50	8.8	YES	Veg	
Lower CI (80%)													14.24				
Upper CI (80%) Cover of Non-Native Herbaceous Species	5	0	0	0	0	2	0	2	0	2	1	0	36.76 1.03	0.5	N/A		
Lower CI (80%)	Ĭ								_					5.0	,, .		
Upper CI (80%)						_		-					40 :-	<u> </u>			
Cover of Invasive Shrubs and Trees	0	0	10	0	15	5	35	20	0	0	1	75	13.42	6	N/A		
Lower CI (80%) Upper CI (80%)	1												5.19 21.65				
Native Herb. Sp. Diversity																	
(>5 sp, >=5% cover, >=10% plots) Native Shrub Sp. Diversity	5	2	8	0	0	0	0	0	0	1	1	0	1.48	0.7	NO	58%	4
(>5 sp, >=5% cover, >=10% plots)	0	15	0	11	_1	6	4	3	6	0	3	0	4.10	1.3	NO	67%	7
Native Tree Sp. Diversity																	
(>5 sp, >=5% cover, >=10% plots)	7	5	8	50	0	2	10	6	0	5	17	10	9.94	3.9	NO	83%	3

Species	RFF1	RFF2	RFF3	RFF4	RFF5	RFE6	RFF7	RFF8	RFF9	RFF10	RFF11	RFF12	RFF13	RFF14	RFF15	RFF16	RFF17	RFF18	_							
			11.120		11.120			20	11. 20	2.0			10.2.0		11. 2.10	1111210		10.2.0								
Native Herbaceous Species																							_			
species-latin name	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0.72				_			
Bromus carinatus Epilobium ciliatum (=E. watsonii)	0	0	0	1	1	2	5	0	3	0	0	0	0	0	0	0	0	0	0.72	1			1			+
Equisetum arvense	0	0	0	0	0	0	0	0	1	4	0	0	0	0	0	0	0	0	0.07	1 '			_			+
Ranunculus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0.22	1						
Scirpus microcarpus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0.11							
Tellima grandiflora	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	0	0.89							
Invasive Herbaceous Species																										
species-latin name	0	0	0	0	8	0	0	0	05	0	0	0	0	0	0	0	0	0	1.83				-			
Convolvulus arvensis Hedera helix	0	80	0	0	0	0	0	0	25 0	5	1	1	0	0	0	0	0	0	4.83	1			_			
Hypericum perforatum	0	1	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0.17							
Impatiens capensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	0	0	2.22				_			
Phalaris arundinacea	0	0	0	8	0	5	0	30	0	8	0	30	0	0	8	0	0	90	9.94							
Non-Native Herbaceous Species																										
species-latin name																										
Agrostis sp.	0	0	0	0	0	0	0	0	0	0	28	0	0	0	0	0	0	0	1.56	+			+			+
Clematis ligusticifolia	0	0	0	0	0	35 0	0	0	0	0	0	0	0	0	0	0	0	0	1.94	1			-	-		+
Daucus carota Geranium robertianum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5	0	0.11	<del>                                     </del>			+			+
Hypochaeris radicata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0.33	<del> </del>			_			+
Leucanthemum vulgare	0	0	0	0	0	0	0	0	12	0	2	0	0	0	0	0	0	0	0.78	1 '						
Plantago lanceolata	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0.44	1						
Solanum dulcamara	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	5	0.94	1						
Taraxacum officinale	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.06							
Native Tree Species																										
species-latin name Acer macrophyllum	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0.28							
Alnus rubra	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35	0	0	0	1.94							
Fraxinus latifolia	1	0	70	0	0	0	0	0	0	0	0	1	0	0	0	0	15	0	4.83				_			
Populus balsamifera trichocarpa	1	20	0	0	0	0	90	0	0	5	0	70	0	0	0	0	0	0	10.33	1						
Pseudotsuga douglasii	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	10	0	0.83							
g	-																	-		1						
Native Shrub Species																				-						
species-latin name																				1						
Cornus sericea	0	0	5	90	90	0	0	0	0	0	0	0	0	0	3	0	0	0	10.44							
Corylus cornuta Holodiscus discolor	0	0	0	0	0	0 45	0	0	0	78	0	0	0	0	0	0	0	0	4.33 2.50				_			
Lonicera involucrata	0	0	0	0	0	45	0	0	0	0	0	14	0	0	0	0	0	0	0.78							
Rosa nutkana	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0.78	-						
Rubus ursinus	0	0	0	0	0	0	0	0	0	40	0	0	0	0	0	0	65	0	5.83				_			
Symphoricarpos albus	0	0	0	0	0	0	4	50	0	0	0	0	0	0	0	0	0	0	3.00	1						
symphoricar pos atoms						_		- 00									-		0.00							
Non-Native Shrub and Tree Species																										
species-latin name		_						_			_	_			-				0.17	-			-			+
Prunus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0.17	-			-			+
Invasive Shrub and Tree Species																							-			+
species-latin name														-												
Rubus armeniacus	0	0	0	0	0	0	40	0	0	55	25	1	5	0	10	15	0	0	8.39							
																							_			
Bare Substrate water	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00				-			++
water thatch/bare ground	83	20	100	90	90	10	50	75	55	0	40	50	18	100	25	60	20	5	49.50	1			+			++
тактовге дгоини	03	20	100	90	90	10	30	10	33	U	40	υu	10	100	20	00	20	9	49.00	<del>                                     </del>			+			+
																			Habitat	Standard Standard	Percentage	Number of				
Routine Performance Standards	RFE1	RFE2	RFE3	RFE4	RFE5	RFE6	RFE7	RFE8	RFE9	RFE10	RFE11	RFE12	RFE13	RFE14	RFE15	RFE16	RFE17	RFE18	Average		with Native	Native Sp.				
Cover of Invasive Herbaceous Species <=30%	0	81	0	8	8	5	0	30	27	13	1	31	0	0	48	0	0	90	19.00	6.6 YES	Veg		_			+
Lower CI (80%)																			10.52							
Upper CI (80%)						L													27.48 3.77	00 100			_			
Cover of Native Shrubs and Trees  Lower CI (80%)	0	2	6	8	8	4	8	4	0	11	0	7	0	0	3	0	8	0	3.77 2.68	0.9 N/A			+	-		++
Upper CI (80%)																			4.86							
Cover of Invasive Shrubs and Trees	0	0	0	0	0	0	40	0	0	55	25	1	5	0	10	15	0	0	8.39	3.8 N/A						
Lower CI (80%)																			3.56 13.21	-			-			+
Upper CI (80%) Native Herb. Sp. Diversity						-													13.21	<del>                                     </del>			+			+
(>5 sp, >=5% cover, >=10% plots)	0.0	0.0	0.0	0.2	0.2	0.3	0.8	0.0	0.7	0.7	0.0	0.0	0.0	0.0	1.0	2.2	2.7	0.0	0.48	0.2 NO	50%	6				
Native Shrub Sp. Diversity					L																					
(>5 sp, >=5% cover, >=10% plots)	0.0	0.0	0.7	12.9	12.9	6.4	0.6	7.1	0.0	16.9	0.3	2.0	0.0	0.0	0.4	0.0	9.3	0.0	3.86	1.3 NO	61%	7	+			+
Native Tree Sp. Diversity (>5 sp. >=5% cover. >=10% plots)	0.4	4.0	14.0	0.0	0.0	0.0	18.0	0.0	0.0	2.0	0.0	14.2	0.0	0.0	7.0	1.0	5.0	0.0	3.64	1.4 NO	50%	5	+			+

Species	Origin (N, NN, I)	Wetland Status (1 - 5)	EMM1	ЕММ2	ЕММЗ	EMM4	EMM5	ЕММ6	ЕММ7	ЕММ8	ЕММ9	EMM10	EMM11	EMM12	EMM13	EMM14	EMM15	EMM16	EMM17	Habitat Average				
Native Herbaceous Species												-												
species-latin name																					-			
Galium aparine	N	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.06				
Juncus effusus	N	2	0	0	0	0	0	85	45	0	0	1	1	0	0	0	2	0	0	7.88				
Scirpus microcarpus	N	1	0	0	0	0	0	8	0	0	10	0	0	0	0	0	0	0	10	1.65				
Typha latifolia	N	2	0	0	0	0	0	0	0	0	70	0	0	0	0	0	0	0	0	4.12				
Invasive Herbaceous Species																								
species-latin name																								
Cirsium arvense	1	4	0	0	0	15	4	0	0	0	0	0	0	0	0	0	0	0	5	1.41				
Dipsacus fullonum (D. sylvestris)	i	3	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.47				
Impatiens capensis	i	4	25	0	0	15	0	0	25	0	1	5	0	15	0	0	6	0	80	10.12				
Phalaris arundinacea	i	2	0	0	6	0	90	8	40	0	15	95	99	0	0	5	92	10	10	27.65				
Non-Native Herbaceous Species																								
species-latin name									_					_							-			
Chicorium intybus	NN	4	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0.12	4			
Holcus lanatus	NN	3	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0.18				
Hypochaeris radicata	NN	3	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0.47	1			
Iris pseudacorus	NN	1	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0.29	1			
Leucanthemum vulgare	NN	4	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0.29	1			
Lotus corniculatus	NN	3	0	0	10	0	0	0	0	5	0	0	0	45	0	0	0	0	0	3.53				
Taraxacum officinale	NN	3	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0.29				
Trifolium repens	NN	3	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0	0.88				
Vulpia myuros	NN	4	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0	1.47				
Native Shrub and Tree Species																								
species-latin name			_		_		_			_			_								1			
Alnus rubra	N	3	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	1.47				
Lonicera involucrata	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	2.35	-			
Rubus ursinus	N	4	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	40	0	2.71				
Sambucus racemosa	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	0	0	2.35	_			
Salix sitchensis	N	2	0	0	0	0	0	0	35	0	0	0	0	0	0	0	0	0	0	2.06				
Salix sp.	N	3	0	93	20	35	0	0	0	0	0	0	0	0	0	0	0	0	0	8.71				
Symphoricarpos albus	N	4	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0.12				
Invasive Shrub and Tree Species species-latin name																								
Buddleja davidii		4	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0.47	1			
Rubus armeniacus	i	4	5	0	0	70	0	0	0	0	0	0	0	35	0	95	0	50	0	15.00				
Bare Substrate															-	18								
water			0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	5.88				
thatch/bare ground			70	100	0	0	0	0	1	25	5	0	0	0	0	0	0	0	0	11.82				
Native Shrub and Tree Count species-latin name												-												
species ia.iii name												-												
																				Habitat	Standard	Standard	Percentage	Number
Routine Performance Standards	10()		EMM1	EMM2	EMM3	EMM4	EMM5	EMM6	EMM7	EMM8	ЕММ9	EMM10	EMM11	EMM12	EMM13	EMM14	EMM15	EMM16	EMM17	Average	Error	Met?	with Native Veg	of Native Sp.
Cover of Native Herbaceous Species( >=30 Lower CI (80%)	J%)		0	0	0	0	0	93	45	0	80	1	1	0		0	2	0	11	15 4.84	7.6	NO		
Upper CI (80%)											-			-						24.29				
Cover of Invasive Herbaceous Species (<=	20%)		25	0	14	30	94	8	65	0	16	100	99	15		5	98	10	95	42	10	NO		
Lower CI (80%)																				28.91				
Upper CI (80%)																				55.34				
Cover of Non-Native Herbaceous Species			0	0	10	0	0	0	0	66	0	0	0	50		2	0	0	0	8	5	N/A		
Lower CI (80%)																				1.62				
Upper CI (80%) Cover of Invasive Shrubs and Trees (<=10	M)		5	0	0	70	0	0	0	0	0	0	0	35	1	103	0	50	1 0	14.38 16	8	N/A		
Lower CI (80%)	/0]		ا ن		U	10	U	U	U	U		U	U	30		103	U	1 00	U	6.32	0	IN/A		
Upper CI (80%)											-			-						26.55	1			
Native Herb. Sp. Diversity (>5 sp, >=5% co	ver, >=10%	plots)	0	0	0	0	0	93	45	0	80	1	1	0	0	0	2	0	11	14	7.2	NO	41.2%	4
Lower CI (80%)																				4.51				
Upper CI (80%)											1			1						22.91				
																			-					
				1								1			1									
L																				1	1			

Species		RFR1	RFR2	RFR3	RFR4	RFR5	RFR6	RFR7	RFR8	RFR9	RFR10	RFR11	RFR12	RFR13	RFR14	RFR15	RFR16	RFR17	RFR18	Habitat		
																				Average		
Native Herbaceous Species species-latin name																						
Epilobium ciliatum (=E. watsonii)		2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	3	0	0.33		
Juncus effusus Marah oregana		1 0	1 0	0	0	0	0	0 2	0 2	0	0	0	0 35	0	0	10	0	0	0	0.67 2.17		
maran oregana			U		U	0	0			U	U	U	35	0	U	0	U	U	0	2.17		
Invasive Herbaceous Species species-latin name																						
Cirsium arvense		0	0	0	0	0	0	22	0	1	0	0	0	10	0	0	0	0	0	1.83		
Cirsium vulgare Dipsacus fullonum (D. sylvestris)	1	0	3	0	0	0	0 5	0	0	0	0	0	0	0	0	0	0	0	0	0.06		
Hedera helix		0	1 0	0	0	0	5	8	8	0	0	0	2	0	0	0	0	0	0	1.33		
Hypericum perforatum Impatiens capensis	1	0	0	0	0	2	1	0	0	0	0	0	10	8	10	8	0	70	0	6.06		
Phalaris arundinacea Lythrum salicaria		0	0	0	0	35 0	0	10	10	0	0	82	0	0	0	5 2	0	0	0	8.11 0.11		
Jacobaea vulgaris	1	0	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.56		
Non-Native Herbaceous Species	1																					
species-latin name		0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.11		
Agrostis sp. Centaureum erythraea	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	- 1	0.06		
Daucus carota		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1 0	0.06 0.17		
Digitalis purpureum Geranium molle		0	0	0	0	0	- 1	0	0	0	0	0	0	0	0	0	0	0	0	0.06		
Geranium robertianum Geum urbanum		0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	20	0	1.39 0.56		
Holcus lanatus		0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.22		
Hypochaeris radicata Kickxia elatine	-	0	0	0	0	0	0	0	0	0 38	0	0	0	0	0	0	0	0	10	0.56 2.11		
Lactuca saligna	1	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0.44		
Lapsana communis Leucanthemum vulgare	-	0	10	0	0	0	0	0	5	0	0	0	0	8	0	0	0	3	4	0.94		
Lotus corniculatus		0	0	- 1	0	0	0	10	0	0	0	0	0	2	0	0	0	0	0	0.72		
Lotus corniculatus Mentha pulegium		0 45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 30	0	0	0.11 4.17		
Poa sp.		0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.22		
Rumex occidentalis Senecio vulgaris	1	0	0	0	0	0	0	0	0	2	0	0	0	8	0	0	0	0	0	0.61		
Solanum dulcamara		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0.11		
Taraxacum officinale		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0.28		
Native Shrub and Tree Species species-latin name																						
Alnus rubra		0	0	0	1 10	0	0	20	0	0	0	0	0	0	12	0	0	0	0	1.83		
Fraxinus latifolia Populus balsamifera trichocarpa	1	0	0	0	0	0	15	0	0	10	0	0	0	0	0	5	0	90	0	6.67		
Salix sitchensis		3	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.56		4.1
Salix sp.	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	35	0	0	0	2.11		1.4
Native Shrub Species species-latin name																						
Cornus sericea		10	35	0	0	0	0	0 20	20	0	0	0	0	0	0	0	0	0	0	3.61		
Corylus cornuta												0	0									
Lonicera involucrata		0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	1.11 0.28		
Sambucus racemosa		0	0	0	0 30	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0.28 1.67		
Sambucus racemosa Spiraea douglasti		0	0	0	0	0	0	0	0	0 0 0	0 0 0	5 0 0	0 0 0	0 0 0 2	0	0	0	0	0	0.28		
Sambucus racemosa Spiraea douglasii Symphoricarpos albus		0 0	0	0 0	0 30 0	0 0 85	0 0	0 0	0 0	0	0	0	0	0	0 0	0 0	0	0 0	0 0	0.28 1.67 4.72		
Sambucus racemosa Spiraea douglasii Symphoricarpos albus Invasive Shrub and Tree Species species-slain name		0 0 0 0	0 0 0	0 0 0	0 30 0	0 0 85 0	0 0 0	0 0 0	0 0 0 15	0 0	0 0	0 0	0 0	0 0 2	0 0 0 10	0 0 0	0 0 0	0 0 0	0 0 0	0.28 1.67 4.72 1.50		
Sambucus racemosa Spiraea douglasii Symphoricarpos albus Invasive Shrub and Tree Species		0 0	0	0 0	0 30 0	0 0 85	0 0	0 0	0 0	0	0	0	0	0	0 0	0 0	0	0 0	0 0	0.28 1.67 4.72		
Sambucus racemosa Spiraea douglasti Symphoricarpos albus Invasive Shrub and Tree Species species-latin name Ilex aquifolium		0 0 0 0	0 0 0 0	0 0 0 0 0 0 0	0 30 0 0	0 0 85 0	0 0 0 0	0 0 0 0	0 0 0 15	0 0 0	0 0 0	0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 2	0 0 0 10	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0 0 0	0.28 1.67 4.72 1.50 0.28 10.39		
Sambucus racemosa Spiraea douglasti Symphoricarpos albus Invasive Shrub and Tree Species species-latin name Ilex aquifolium Rubus armeniacus		0 0 0 0	0 0 0 0	0 0 0 0	0 30 0 0	0 0 85 0	0 0 0 0	0 0 0 0	0 0 0 15	0 0 0	0 0 0	0 0 0	0 0 0	0 0 2	0 0 0 10	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0.28 1.67 4.72 1.50		
Sambucus racemosa Spiraca daugustii Symphoricarpos alhus Invasive Shrub and Tree Species species-tein name Hec aquifollum Rabus armeniacus Bare Substrate		0 0 0 0	0 0 0 0	0 0 0 0 0 0 0	0 30 0 0	0 0 85 0	0 0 0 0	0 0 0 0	0 0 0 15	0 0 0	0 0 0	0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 2	0 0 0 10	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0 0 0	0.28 1.67 4.72 1.50 0.28 10.39 49.06	Standard	
Sumbuca racemosa Simera daugidatii Symphoricarpos albus Invasive Shrub and Tree Species Jesseces-Jelin name Her auguidatum Rubba armentacus Sere Substrate Anach bave ground Routine Performance Standards Cover of Imasilw Herbaceous Species < <30%		0 0 0 0	0 0 0 0	0 0 0 0 0	0 30 0 0 0	0 0 85 0	0 0 0 0 0	0 0 0 0 0	0 0 0 15 15	0 0 0 0 3	0 0 0 0	0 0 0 0 15	0 0 0 30 35	0 0 2 0 0 0	0 0 0 10 10	0 0 0 0 0	0 0 0 0	0 0 0 0 0	0 0 0 0 0	0.28 1.67 4.72 1.50 0.28 10.39 49.06	Error	
Sambucas racemona Sarmea dausglassi Symphoricarpos albus Invasivo Shrub and Tree Species Invasivo Shrub and Tree Species Ince saquifolum Rubus armentacus Bare Substrate Aucharbare ground  Routine Performance Standards		0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 30 0 0 0	0 0 85 0 0 0	0 0 0 0 0 5 0	0 0 0 0 0 0 20	0 0 0 15 0 25	0 0 0 0 3	0 0 0 0	0 0 0 15 2 RFR11	0 0 0 30 35	0 0 2 0 0 0	0 0 0 10 10 0 88	0 0 0 0 0 0	0 0 0 0	0 0 0 0 0 0	0 0 0 0 0	0.28 1.67 4.72 1.50 0.28 10.39 49.06 Habitat Average 20 12.15	Error	Met?
Sambucas racemona Sirrana danuglari Symphor carpos albus Invasive Shrub and Tree Species speces delin hame George Commentaria Rabus amentacis Bare Substrate Aucherborg ground  Routine Performance Standards Cover of Invasive Herbaceous Species <35% Usper CT (80%)  Usper CT (80%)		0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 30 0 0 0	0 0 85 0 0 0	0 0 0 0 0 5 0	0 0 0 0 0 0 20	0 0 0 15 0 25	0 0 0 0 3	0 0 0 0	0 0 0 15 2 RFR11	0 0 0 30 35	0 0 2 0 0 0	0 0 0 10 10 0 88	0 0 0 0 0 0	0 0 0 0	0 0 0 0 0 0	0 0 0 0 0	0.28 1.67 4.72 1.50 0.28 10.39 49.06 Habitat Average 20 12.15 26.96 Species	Error 5.8	Met? YES
Sambucas racemona Sirrana danuglari Symphor carpos albus Invasive Shrub and Tree Species speces delin hame George Commentaria Rabus amentacis Bare Substrate Aucherborg ground  Routine Performance Standards Cover of Invasive Herbaceous Species <35% Usper CT (80%)  Usper CT (80%)		0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 30 0 0 0	0 0 85 0 0 0	0 0 0 0 0 5 0	0 0 0 0 0 0 20	0 0 0 15 0 25	0 0 0 0 3	0 0 0 0	0 0 0 15 2 RFR11	0 0 0 30 35	0 0 2 0 0 0	0 0 0 10 10 0 88	0 0 0 0 0 0	0 0 0 0	0 0 0 0 0 0	0 0 0 0 0	0.28 1.67 4.72 1.50 0.28 10.39 49.06 Habitat Average 20 12.15 25.96 Species	Error	Met?
Sumbucas racemona  Surinea daugidarii  Symphorcarpos alhas  Invasive Shrub and Tree Species  species-sidin name  lice capalolium  Ruhan amenitasas  Bare Substrate  thatch thare ground  Routine Performance Standards  Cover of Invasive Herbaccous Species - 239%,  Loper C. (1874),  Loper C. (1874),  Loper C. (1874),  Sprub Species Richness >=5  Time Species Richness >=5  Time Species Richness >=5  Socies Socies  Socies Socies Socies Socies  Socies Socies Socies  Socies Socies Socies  Socies Socies Socies  Socies Socies Socies  Socies Socies Socies  Socies Socies Socies  Socies Socies  Socies Socies  Socies  Socies Socies  Socies  Socies Socies  Socies		0 0 0 0 0 0 0 58 <b>RFR1</b>	0 0 0 0 0 0 25 RFR2 33	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 30 0 0 0 6 95 RFR4	0 0 85 0 0 0 0 0 <b>RFRS</b>	0 0 0 0 0 5 0 80 <b>80</b>	0 0 0 0 0 20 50 <b>RFR7</b>	0 0 0 15 0 25 50 <b>RFR8</b>	0 0 0 3 60 <b>RFR9</b> 2	0 0 0 0 100 <b>RFR10</b>	0 0 0 15 2 <b>RFR11</b> 82	0 0 0 30 35 <b>RFR12</b>	0 0 2 0 0 0 8 48 <b>RFR13</b>	0 0 0 10 10 88 0 <b>RFR14</b>	0 0 0 0 0 0 0 85 RFR15	0 0 0 0 0 70 <b>RFR16</b>	0 0 0 0 0 0 20 <b>RFR17</b>	0 0 0 0 0 0 0 0 0 0 8 55 <b>RFR18</b>	0.28 1.67 4.72 1.50 0.28 10.39 49.06 Habitat Average 20 12.15 26.96 Species Present 10 8	Error 5.8	Met? YES
Sambucas racemona  Surread daugidarii  Symphoricarpos albas  Invasitiva Shrub and Tree Species  Bare Substratie  Anachich bure ground   Routine Performance Standards  Cover of Invasive Hortaceous Species <<35%  Lower C (180%)  Smrub Species Richness > 5  Species Richness > 5  Species Richness > 5  Species Count		0 0 0 0	0 0 0 0 0 0 25 RFR2 33	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 30 0 0 0 6 95 RFR4	0 0 85 0 0 0 0 0 <b>RFRS</b>	0 0 0 0 0 5 0 80 <b>80</b>	0 0 0 0 0 20 50 <b>RFR7</b>	0 0 0 15 0 25 50 <b>RFR8</b>	0 0 0 3 60 <b>RFR9</b> 2	0 0 0 0 100 <b>RFR10</b>	0 0 0 15 2 <b>RFR11</b> 82	0 0 0 30 35	0 0 2 0 0 0 8 48 <b>RFR13</b>	0 0 0 10 10 88 0 <b>RFR14</b>	0 0 0 0 0 0 0 85 <b>RFR15</b>	0 0 0 0 0 70 <b>RFR16</b>	0 0 0 0 0 0 20 <b>RFR17</b>	0 0 0 0 0 0 0 0 0 0 8 55 <b>RFR18</b>	0.28 1.67 4.72 1.50 0.28 10.39 49.06 Habitat Average 20 12.15 26.96 Species Present 10 8	Error 5.8	Met? YES
Sambucas racemona  Sirmea danaglasii  Symphoricarpos albas  Invasiva Shrub and Tree Species  Bare Substrate  Author borre ground  Routine Performance Standards  Cover of Invasiva Hortaceous Species < < < > < > < > < > < > < > < > < > <	T	0 0 0 0 0 0 0 58 RFR1 0	0 0 0 0 0 0 25 RFR2 33	0 0 0 0 0 0 0 50 <b>RFR3</b> 0	0 30 0 0 0 6 95 RFR4 0	0 0 85 0 0 0 0 0 RFR5 37	0 0 0 0 0 80 <b>RFR6</b> 11	0 0 0 0 0 20 50 <b>RFR7</b> 40	0 0 0 15 0 25 50 RFR8 18	0 0 0 3 60 RFR9 2	0 0 0 0 100 RFR10 0	0 0 0 15 2 RFR11 82	0 0 0 30 35 RFR12 12	0 0 2 0 0 0 48 RFR13 22	0 0 0 10 10 88 0 <b>RFR14</b> 10	0 0 0 0 0 0 85 RFR15	0 0 0 0 0 70 <b>RFR16</b> 0	0 0 0 0 0 0 0 7 20 RFR17 70	0 0 0 0 0 0 0 55 <b>RFR18</b>	0.28 1.67 4.72 1.50 0.28 10.39 49.06 Habitat Average 20 12.15 25.96 Species Present 10 8	Error 5.8	Met? YES
Sumbucar processors  Survey and Tree Species  Survey Surve	T T T S	0 0 0 0 0 0 0 58 RFR1 0	0 0 0 0 0 0 0 25 RFR2 33	0 0 0 0 0 0 0 0 8 FR3 0	0 30 0 0 0 0 6 8 8 8 8 8 8 8 8 8 8 8 8 8 8	0 0 85 0 0 0 0 <b>RFR5</b> 37	0 0 0 0 0 80 <b>RFR6</b> 11	0 0 0 0 20 50 RFR7 40	0 0 0 15 0 25 50 RFR8 18	0 0 0 3 60 <b>RFR9</b> 2	0 0 0 0 100 RFR10 0	0 0 0 15 2 RFR11 82	0 0 0 30 35 <b>RFR12</b> 12	0 0 2 0 0 0 8 48 <b>RFR13</b>	0 0 0 10 10 88 88 RFR14	0 0 0 0 0 0 85 <b>RFR15</b> 15	0 0 0 0 0 70 <b>RFR16</b> 0	0 0 0 0 0 0 0 20 <b>RFR17</b> 70	0 0 0 0 0 0 0 0 55 <b>RFR18</b>	0.28 1.67 4.72 1.50 0.28 10.39 49.06 Habitat Average 20 12.5 26.96 Species Present 10 8	Error 5.8	Met? YES
Sambucas racemona Sterinae dangladii Symphoricarpos albus Tumashae Shruba and Tree Species Lookee-Safin name Ilica aquifolium Robhas ameniacus  Bare Substrate Anachabure ground  Routine Performance Standards  Corer of Imasive Hertacocous Species <30% Lone C 105% Sinub Species Rothness >+5 Tree Species Rothness >+5 Tree Species Rothness >+5 Secies Native Shruba and Tree Species Count Lore and Cores service Corrus service Corrus service	T T T S S S	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 50 <b>RFR3</b> 0	0 30 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 85 0 0 0 0 <b>RFR5</b> 37	0 0 0 0 0 80 <b>RFR6</b> 11	0 0 0 0 20 50 <b>RFR7</b> 40	0 0 0 15 0 25 50 <b>RFR8</b> 18	0 0 0 3 60 <b>RFR9</b> 2	0 0 0 0 0 100 <b>RFR10</b> 0	0 0 0 15 2 RFR11 82 RFR11 0 3 0	0 0 0 30 35 RFR12 12	0 0 0 0 0 0 0 RFR13 22 RFR13	0 0 0 10 0 88 0 RFR14*	0 0 0 0 0 0 85 <b>RFR15</b> 15	0 0 0 0 0 70 <b>RFR16</b> 0	0 0 0 0 0 0 20 RFR17 70	0 0 0 0 0 0 0 55 <b>RFR18</b> 0	0.28 1.67 4.72 1.50  0.28 10.39  49.06  Habitat Average 20 12.15 26.96 Species Present 10 8	Error 5.8	Met? YES
Sambucas racemona Strimes daugidari Symphoricarpos albus Imasakus Shuha and Tree Species Robustrate Robu	T T S S S T T S S	0 0 0 0 0 0 0 0 0 0 8 8 8 8 8 8 8 8 9 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 50 <b>RFR3</b> 0 0 0 0	0 30 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 85 0 0 0 0 <b>RFRS</b> 37	0 0 0 0 0 80 <b>RFR6</b> 11	0 0 0 0 20 50 <b>RFR7</b> 40	0 0 0 15 0 25 50 <b>RFR8</b> 18	0 0 0 3 60 <b>RFR9</b> 2	0 0 0 0 0 100 <b>RFR10</b> 0 0 0 0 0	0 0 0 15 2 RFR11 82 0 0 0 1 1 3	0 0 0 30 35 <b>RFR12</b> 12	0 0 0 0 0 0 0 8 48 22 22 1 5 0 0 0	0 0 0 10 88 0 RFR14*	0 0 0 0 0 0 85 <b>RFR15</b> *	0 0 0 0 0 70 <b>RFR16</b> 0	0 0 0 0 0 0 0 0 <b>RFR17</b> 70	0 0 0 0 0 0 55 <b>RFR18</b> 0 0 0 1 0	0.28 1.67 4.72 1.50  0.28 10.39  49.06  Habitat Average 20 12.15 20 Species Present 10 8  0.06 1.06 0.56 0.17 0.11 0.28	Error 5.8	Met? YES
Sumbucar processors  Springed dangladii Symphoricarpos albus  Symphoricarpos albus  Instales Shrub and Tree Species  species-dein name  Rubhs armenticacus  Bare Sobattate  thatch hore ground  Router of Invasive Herbacous Species < 150%  Lover Cl (80%)  Lover Cl (80%)  Lover Cl (80%)  Shrub Species Richness >+5  Time Species Richness >+5  Time Species Richness >+5  Secies Shrub and Tree Species Count  species-defin name  der marcyphyllind  Mints rubra  Cormus services  Cormus services  Cormus services  Cormus services  Cormus services  Cormus contain  Louter cui unolucrusto  Dometera consistences	T T T S S S S T T S S S S T T S S S S T T S S S S T T T S S S S S T T T S S S S T T T S S S S T T T S S S S T T T S S S S S T T T S S S S S T T T S S S S S T T T S S S S S T T T S S S S S T T T S S S S S T T T S S S S S T T T S S S S S T T T S S S S S T T T S S S S S T T T S S S S S T T T S S S S S T T T S S S S S T T T S S S S S T T T S S S S S S T T T S S S S S T T T S S S S S T T T S S S S S T T T S S S S S T T T S S S S T T T S S S S S T T T S S S S S S T T T S S S S S S T T T S	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 25 RFR2 33 0 0 0 0 0 0	0 0 0 0 0 0 0 50 RFR3 0 0 0 0 0 0	0 30 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 85 0 0 0 0 <b>RFRS</b> 37	0 0 0 0 0 80 RFR6 11	0 0 0 0 20 50 RFR7 40	0 0 0 15 0 25 50 RFR8 18	0 0 0 3 8 60 RFR9 2	0 0 0 0 100 RFR10 0	0 0 0 15 2 RFR11 82 RFR11 0 3 0 0	0 0 0 30 35 RFR12 12	0 0 0 0 0 0 0 <b>RFR13</b> 22 <b>RFR13</b> 1 5 0 0	0 0 0 10 0 88 0 RFR14 10 0 3 3 1 1 0 0	0 0 0 0 0 0 0 0 85 RFR15' 15	0 0 0 0 0 70 <b>RFR16</b> 0 0 0 0	0 0 0 0 0 0 20 20 RFR17 70	0 0 0 0 0 0 0 55 RFR18 0 0 1 1 0 0 0	0.28 1.67 4.72 1.50 0.28 10.39 49.06 Habitat Average 20 12.15 25.96 Species Present 10 8	Error 5.8	Met? YES
Sumbucar processors  Serimed disciplinaria Symphoricarpos albus  Instanto Shrub and Tree Species  species-dein name  Rubhs armenticass  Bare Subatrate  hatch bare ground  Route of Instante Herbacous Species (20%)  Lower Cl (80%)  Lower Cl (80%)  Lower Cl (80%)  Shrub Species Richness >=5  Time Species Richness >=5  Time Species Richness >=5  Shrub Species Richness >=5  Spec	7 7 7 S S S 7 7 S S S 7 T T S S S S 7 T T S S S S	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 25 RFR2 33 0 0 0 8 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 30 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 85 0 0 0 0 0 <b>RFR5</b> 37	0 0 0 0 80 <b>RFR6</b> 111	0 0 0 0 20 50 <b>RFR7</b> 40	0 0 0 0 15 50 50 50 50 50 50 50 50 50 50 50 50 50	0 0 0 0 3 3 8 60 8 8 8 8 9 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 100 0 RFR10 0 0 0 0 0 0	0 0 15 2 RFR11 82 0 0 0 1 1 3 3 0 0 0	0 0 0 30 35 <b>RFR12</b> 12 0 0 0 0 1 1 0 0	0 0 0 0 0 0 0 0 8FR13 22 22 1 1 5 0 0 0 1 1 1 1 0 0 0 0 0 0 0 0 0 0	0 0 0 10 0 0 0 0 0 0 0 88 88 10 0 0 0 10 0 0 0	0 0 0 0 0 0 0 85 <b>RFR15</b> 15 0 0 0 0 0	0 0 0 0 0 0 0 70 <b>RFR16</b> 0 0 0 0 0	0 0 0 0 0 0 20 RFR17 70	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.28 1.67 4.72 1.50 0.28 10.39 49.06 Habitat Aversage 20.5 20.5 Species Prennt 10 8 0.06 0.06 0.06 0.56 0.17 0.11 0.28 0.28	Error 5.8	Met? YES
Sambucas racemona Strimes daugidasi Symphoricarpos albus Invasiva Shrub and Tree Species Bare Substrate Anacha Dare ground  Routine Performance Standards Cover of Invasiva Herbaceous Species <<30°5 Lower CE (180°b) Lower CE (180°b) Species Richness >>5 Tree Species Richness >>5 T	T T T S S S S S T T T T S S S S S T T T T S S S S S T T T T S S S S S T T T T S S S S S T T T T S S S S S T T T T S S S S S T T T T S S S S S T T T T S S S S S T T T T S S S S S T T T T S S S S S T T T T S S S S S T T T T S S S S S S T T T T S S S S S S T T T T S S S S S S T T T T S S S S S S T T T T S S S S S S T T T T S S S S S S S T T T T S S S S S S S S T T T T S S S S S S S S S T T T T S S S S S S S T T T T S S S S S S S S S T T T T S S S S S S S S S T T T T S S S S S S S S S S S S S T T T T S	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 8FR3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 6 8 8FR4 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 80 <b>RFR6</b> 111	0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1	0 0 0 15 50 FFR8 18 18 18 18 18 18 18 18 18 18 18 18 18	0 0 0 0 3 60 <b>RFR9</b> 2 0 0 0 0 0 0 0 4 0	0 0 0 0 100 RFR10 0 0 0 0 0 0 0 0	0 0 0 15 2 RFR11 82 0 0 0 1 1 3 3 0 0 0 0	0 0 0 30 35 <b>RFR12</b> 12 0 0 0 0 0 0 0	0 0 0 0 0 0 0 48 <b>RFR13</b> 22 1 1 5 0 0 0 0	0 0 10 0 10 0 88 88 RFR14*	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 20 RFR17 70 0 0 0 0 0 0 0 8 8 8 9 9 9 9 9 9 9 9 9	0 0 0 0 0 0 0 555 RFR18 0 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.28 1.67 1.50 0.28 10.39 45.06 Habitat Averace 20 12.15 26.96 0.06 1.06 0.06 1.06 0.05 0.17 0.28 0.28 0.28 0.39 0.06 0.07 0.10 0.28 0.28 0.28 0.38 0.01 0.01 0.28 0.28 0.28 0.28 0.38	Error 5.8	Met? YES
Sambucas racemona  Sambucas racemona  Sambucas racemona  Samrae davoigatia  Symphoricarpos albas  Invasiva Shrub and Tree Species  Bare Substrate  hatch bare ground  Routine Performance Standards  Cover of Invasiva Hortaceous Species  Looset C (180%)  Uspec C1 (180%)  Shrub Species Richness >-5  Shrub Species Richness >-5  Species Species Species  Species Species Species  Nativa Shrub and Tree Species Count  species-dain name  Acer macrophyllum  Alms rubra  Corrus serica  Corrus comital  Fractiona Intolia  Lonicera involucina  Lonicera involucina  Lonicera involucina  Lonicera involucina  Republicationa  Resident  Resid	T T T S S T T S S S T T T S S S S S S S	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 6 8 8FR4 0 1 1 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 80 80 87 86 111	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 25	0 0 0 0 3 60 RFR9 2 2 8 8 9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 15 2 RFR11 82 0 0 3 0 0 0 0 0 0	0 0 0 30 35 RFR12 12	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 10 10 10 10 10 10 10 10 10 10 10 1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 70 <b>RFR16</b> 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 8 8 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 555 RFR18 0 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.28 1.67 4.72 1.50 0.28 10.39 49.06 49.06 49.06 49.06 6 1.06 8 0.06 0.05 0.17 0.11 0.11 0.11	Error 5.8	Met? YES
Sambucas racemona Sterines dengliadi Symphoricarpos albus Tumastos Bruha and Tree Species species den name Itac aquifolium Robna ammentacus Sare Substrate Anachabura ground Routine Performance Blandards Cover of Invasive Hertacocous Species - 25%. Upper C. (16%). Upper C. (16%). Upper C. (16%). Shrub Species Richnes >=5 Tree Species Richnes >=6 Tree species Richnes >=6 Tree species Richnes >=6 Tree species Richnes >=6 Tree species Count Counts are recovery Cornes or recovery Cornes or recovery Cornes or recovery Cornes or recovery Combines or recovery Combines or recovery Combines or recovery Combines or recovery Presidency or recovery Ross app. Ross app. Ross app.	T T T S S S T T T S S S S T T T T S S S S S T T T T S S S S S T T T T S S S S S T T T T S S S S S T T T T S S S S S T T T T S S S S S T T T T S S S S S T T T T S S S S S T T T T S S S S S T T T T S S S S S T T T T S S S S S T T T T S S S S S T T T T S S S S S T T T T S S S S S T T T T S S S S S S T T T T S S S S S S T T T T S S S S S S T T T T S S S S S S T T T T S S S S S S T T T T S S S S S S T T T T S S S S S S T T T T S S S S S S T T T T S S S S S S T T T T S S S S S S S T T T T S S S S S S S T T T T S S S S S S S T T T T S	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 25 RFR2 33 33 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 80 80 87 88 11 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 15 50 50 8FR8 18 18 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 8 60 8 8 8 8 9 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 100 RFR10 0 0 0 0 0 0 0 0 0	0 0 0 15 2 RFR11 82 0 0 0 1 1 3 3 0 0 0 0 0	0 0 0 33 35 <b>RFR12</b> 12	0 0 2 2 0 0 0 8 8 8 8 8 8 1 1 5 0 0 0 1 1 1 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 70 70 8FR17 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0	0.28 1.50 0.28 10.39 49.06 49.	Error 5.8	Met? YES
Sambucas racemous Surmea douglasi Symphoricarpos albus Tumasha Shuha and Tree Species Lookees Adm Arme Species Lookees Adm Arme Robna memoticas  Bare Subtrate Robna memoticas  Bare Subtrate Robna memoticas  Gover of Invasiva Hertacocous Species < 250%. Loome C 100%)  Stroit Species Robness >>5  Tree Species Robness >>5  Tree Species Robness >>5  Tree Species Robness >>6  Tree Species Count  Advanced Tree Species Count	T T S S S S S S T T T T S S S T T T T T	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 6 95 RFR4 0 1 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 80 80 87 86 111 113 0 0 0 0 0 0 0 0	0 0 0 20	0 0 0 15 15 50 25 50 RFRS 18 18 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 3 8 8 8 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9	0 0 0 0 100 RFR10 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 115 2 RFR11 52 0 0 3 3 0 0 0 0 0 0 15 0	0 0 0 33 35 <b>RFR12</b> 12 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 8 8 8 8 8 8 7 22 1 1 5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0	0.28 1.50 0.28 10.39 49.06 49.	Error 5.8	Met? YES
Sambucas racemous Sirmea daugidasii Rea saquifolium Rabus armentaesis Bare Substrate hatch bure ground  Routine Performance Standards Cover of Imassiva Herbacocous Species «2007» Loose CE (180%) Uspec CE (180%) Sirme Species Richness » 5 Sirme Species Richness » 5 Societs Native Shruta and Tree Species Count species-dain name Acer macrophyllum Almis rubra Coverhis comital Fractional Institute Coverhis comital Fractional Institute Loniceru involucinus Loniceru involucinus Loniceru involucinus Republicational contitute Republicational con	T T T S S S S T T S S S T T T T T T T T	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 25 RFR2 33 33 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 20 20 8FR7 40 0 0 0 0 0 0 0 0 1 1 1 0 0 0 0 0 0 0	0 0 15 50 RFR8 18 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 3 3 8 60 8 8 8 8 9 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 100 RFR10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 15 2 RFR11 82 0 0 0 0 1 1 3 3 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 335 RFR12 12 12 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.28 1.67 4.72 1.50 0.28 10.39 49.06 49.06 20 20 12.15 26.96 6.056 0.056 0.07 0.11 0.11 0.11 0.11	Error 5.8	Met? YES
Sumbucus racemona  Sterinaed danightati  Symphoricarpos albus  Symphoricarpos albus  Symphoricarpos albus  Instakto Shrub and Tree Species  species delin name  Rubus ammenticus  Burn Subhastate  thatick hore ground  Routine Performance Standards  Corer of Invasive Herbacous, Species  - Subhastate  thatick hore ground  Routine Performance Standards  Corer of Invasive Herbacous, Species  - Subhastate  - Hore C. (189%)  Loper C. (189%)  Loper C. (189%)  Loper C. (189%)  Novel Species Richness >+5  Time Species Richness >+5  Time Species Richness >+5  Species  - Species  - Species  - Native Struct and Tree Species Count  - Species  - Species  - Native Struct and Tree Species Count  - Species  - Native Struct  - Corms services  - Corms services  - Corms corms  - Demonstrate  - Dem	7 7 7 5 5 5 5 5 5 5 7 7 7 7 7 5 5 5 5 5	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	RFR3	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 80 RFR6 11 11	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 15 50 FFR8 18 18 18 18 18 18 18 18 18 18 18 18 18	0 0 0 3 3 60 RFR9 2 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 15 15 15 15 15 15 15 15 15 15 15 15 15	0 0 30 35 RFR12 12 12 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 10 10 10 10 10 10 10 10 10 10 10 1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	RFR18	0.28 1.57 4.72 1.50 0.28 10.39 49.06 49.06 49.06 20 20 20 12.16 26.96 60 1.06 0.56 0.26 1.06 0.17 0.11 0.11 0.11 0.11 0.11 0.22	Error 5.8	Met? YES
Sambucas racemona Seriman danaglari Symphoricarpos albus Robus armeniacus Sare Substrate Robus armeniacus Sare Substrate Robus armeniacus Sare Substrate Robus armeniacus Sare Substrate Robus Species (2007) Symphoricarpos (2007) Symphoricar	T T T S S S S T T S S S T T T T T T T T	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 80 80 80 80 80 87 86 90 90 90 90 90 90 90 90 90 90 90 90 90	0 0 0 0 20 20 8 FRF7 40 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1	0 0 0 15 50 8 FFR8 18 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 3 3 60 8 8 8 8 9 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 15 2 2 RFR11 82 0 3 3 0 0 0 0 0 1 1 3 0 0 0 1 1 1 0 0 0 0	0 0 0 35 RFR12 112 112 112 112 112 112 112 112 112	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	RFR18	0.28 1.57 4.72 1.50 0.28 10.39 10.39 12.15	Error 5.8 N/A N/A	Met? YES YES YES
Sambucas racemona Serimea daugidarii Symphoricarpos albus Imraeshva Shrub and Tree Species Shrub and Tree Species Bare Substrate Anach bare ground  Routine Performance Standards Cover of Imraeshva Harbaceous Species <30°5 Lower Cel (180°b) Lower Cel (180°b) Shrub Species Richness >>5 Tree Species Richness >>5 Tree Species Richness >>5 Tree Species Richness >>5 Tree Species Richness >>6 Tree Species Richness >>	T T T S S S S T T S S S T T T T T T T T	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 25 RFR2 33 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 80 80 80 80 11 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 15 15 50 8FR8 18 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 15 15 2 RFR11 0 3 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 30 35 RFR12 12 12 12 12 12 12 12 12 12 12 12 12 1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 70 RFR16 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.28 1.57 4.72 1.50 0.28 10.39 10.39 149.06 149.01 12.15 12.15 12.15 10.06 1.06 0.05 0.17 0.28 0.29 0.20 0.10 0.10 0.20 0.20 0.20 0.20 0.20	Error 5.8 N/A N/A N/A Standard Error	Met? YES YES YES YES YES Met?
Sumbucar racemous Serines danglatii Symphoricarpos albus Immathe Shrub and Tree Species species-dain name Rubhs armenticase species-dain name Rubhs armenticase  Routine Performance Standards hatech bare ground  Routine Performance Standards Cores of Invasibe Herbacous Species < 20% Lover Cl (80%) Loper Cl (80%) Loper Cl (80%) Loper Cl (80%) Strub Species Richness >>5 Tree Species Richness >>5 Species Richness >>6 Species Richness <>6 Species Richness >>6 Species Rich	T T S S S T T T T S S S S S S S S S S S	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 80 80 80 80 80 87 86 90 90 90 90 90 90 90 90 90 90 90 90 90	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 15 50 8 FFR8 18 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 3 3 60 8 8 8 8 9 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 15 2 2 RFR11 82 0 3 3 0 0 0 0 0 1 1 3 0 0 0 1 1 1 0 0 0 0	0 0 30 35 RFR12 12 12 12 12 12 12 12 12 12 12 12 12 1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	RFR18	0.28 1.50 0.28 1.00 0.28 1.00 0.28 1.00 0.28 1.00 0.28 1.00 0.28 1.00 0.28 1.00 0.28 1.00 0.28 1.00 0.06 0.06 0.06 0.06 0.06 0.06 0.06	Error 5.8 N/A N/A N/A Standard	Met? YES YES YES
Sambucar processors  Sambucar processors  Symphoricarpos albus  Symphoricarpos albus  Symphoricarpos albus  Manatala Shruba and Tree Species  Loocea-Safin name  Robus ammentacus  Bare Substrate  Robus ammentacus  Bare Substrate  Routine Performance Standards  Corer of Imasius Hertacocous Species <30%  Longer C 100%)  Sinub Species Schriess >~5  Tree Species Species Schriess >~5  Tree Species Species Species >~5  Tree Species Species Species >~5  Tree Species Species Species Species >~5  Tree Species Species Species Species Species >~5  Tree Species Species Species Species Species >~5  Tree Species Spec	T T T S S S S T T S S S T T T T T T T T	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 25 RFR2 33 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 80 80 80 80 11 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 15 15 50 8FR8 18 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 15 15 2 RFR11 0 3 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 30 35 RFR12 12 12 12 12 12 12 12 12 12 12 12 12 1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 70 RFR16 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.28 1.57 4.72 1.50 0.28 10.39 10.39 149.06 12.15 12.15 12.15 10.06 8 0.06 1.06 0.05 0.17 0.28 0.29 0.20 0.20 0.10 0.06 1.00 0.05 0.17 0.20 0.20 0.20 0.21 0.10 0.20 0.20 0.20	Error 5.8 N/A N/A N/A Standard Error	Met? YES YES YES YES YES Met?

	URFI1	URFI2	URFI3	URFI4	URFI5	URFI6	URFI7	URFI8	URF9	URF10	URF11	URF12	
Native Herbaceous Species													
species-latin name													
Epilobium ciliatum (=E. watsonii)	0	0	2	0	0	0	0	0	0	0	0	0	0.17
Galium aparine	0	0	0	0	1	0	0	0	0	4	2	1	0.67
Marah oregana	20	0	30	0	0	0	0	0	0	0	2	0	4.33
Polystichum munitum	0	9	0	0	0	0	0	0	0	0	0	0	0.75
Invasive Herbaceous Species													
species-latin name													
Buddleja davidii	0	0	0	0	0	0	0	0	40	0	0	0	3.33
Cirsium arvense	0	0	12	0	0	0	0	0	1	10	0	0	1.92
Hedera helix	0	1	0	0	0	6	0	30	0	0	60	0	8.08
Impatiens capensis	0	0	4	0	0	0	0	0	0	0	0	10	1.17
Phalaris arundinacea	2	0	0	0	0	0	25	0	25	80	0	0	11.00
Non-Native Herbaceous Species													
species-latin name						_							
Clematis ligusticifolia	12	0	0	0	0	0	0	0	0	0	0	0	1.00
Geranium robertianum	10	0	0	0	0	0	0	6	0	0	0	0	1.33
Geum urbanum	0	0	0	0	0	0	0	2	0	0	0	0	0.17
Lapsana communis	5	0	0	0	0	0	0	2	0	0	3	0	0.83
Solanum dulcamara	0	0	0	0	0	12	0	0	0	10	0	0	1.83
Native Tree Species													
species-latin name		1	ı	ı	ı	1	ı	ı			ı	1	
Acer macrophyllum	20	0	25	95	0	0	0	0	0	0	0	30	14.17
Fraxinus latifolia	0	0	0	0	0	0	30	0	0	0	0	0	2.50
Populus balsamifera trichocarpa	0	15	0	55	0	5	0	18	0	15	50	0	13.17
Native Shrub Species													
species-latin name		1	1	1	1	T	1	1		T	1	1	
Cornus sericea	0	0	0	0	0	0	0	8	0	0	0	0	0.67
Corylus cornuta	0	55	0	0	10	0	0	8	0	0	8	0	6.75
Holodiscus discolor	0	0	0	0	0	0	0	0	0	0	10	0	0.83
Physocarpus capitatus	0	0	0	0	0	0	0	0	40	0	0	0	3.33
Rubus parviflorus	0	0	0	0	0	0	28	0	0	0	0	0	2.33
Rubus ursinus	0	48	0	76	0	35	0	8	0	0	0	0	13.92
Symphoricarpos albus	0	0	0	0	0	5	0	0	0	0	5	0	0.83
Invasive Shrub Species													
species-latin name		Г	1		1	1	1			1	1		
Ilex aquifolium	0	0	0	0	0	0	0	20	0	0	0	0	1.67
Rubus armeniacus	0	0	10	0	15	5	35	0	0	0	1	75	11.75
Bare Substrate		Г	Т	Т	T	1	Т	Т		T	T	· · · · · · · · · · · · · · · · · · ·	
thatch/bare ground	55	55	45	24	0	65	15	50	75	3	32	20	36.58

Routine Performance Standards	URFI1	URFI2	URFI3	URFI4	URFI5	URFI6	URFI7	URFI8	URF9	URF10	URF11	URF12	Habitat Average	Standard Error	Standard Met?	Percentage with Native Veg	Number of Native Sp.
Cover of Invasive Herbaceous Species	2	1	16	0	0	6	25	30	66	90	60	10	25.50	8.8	YES		·
Lower CI (80%)													14.24			_	
Upper CI (80%)													36.76			_	
Cover of Non-Native Herbaceous Species	5	0	0	0	0	2	0	2	0	2	1	0	1.03	0.5	N/A		
Lower CI (80%)																_	
Upper CI (80%)																	
Cover of Invasive Shrubs and Trees	0	0	10	0	15	5	35	20	0	0	1	75	13.42	6	N/A	]	
Lower CI (80%)			-										5.19			-	
Upper CI (80%)													21.65	1			
Native Herb. Sp. Diversity												•		•			
(>5 sp, >=5% cover, >=10% plots)	5	2	8	0	0	0	0	0	0	1	1	0	1.48	0.7	NO	58%	4
Native Shrub Sp. Diversity																	
(>5 sp, >=5% cover, >=10% plots)	0	15	0	11	1	6	4	3	6	0	3	0	4.10	1.3	NO	67%	7
Native Tree Sp. Diversity				•				•		7						-	
(>5 sp, >=5% cover, >=10% plots)	7	5	8	50	0	2	10	6	0	5	17	10	9.94	3.9	NO	83%	3

Native Herbaceous Species  species-latin name Galium aparine Juncus effusus Scirpus microcarpus Typha latifolia  Invasive Herbaceous Species species-latin name Cirsium arvense Dipsacus fullonum (D. sylvestris) Impatiens capensis Phalaris arundinacea  Non-Native Herbaceous Species	N N N N	2 2 1 2 4 3 4 2	0 0 0 0 0 0 25 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 85 8 0	0 45 0 0	0 0 0 0	0 0 10 70	0 1 0 0	0 1 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 2 0 0	0 0 0 0	1 0 10 0	0.06 7.88 1.65 4.12
species-latin name Galium aparine Juncus effusus Scirpus microcarpus Typha latifolia  Invasive Herbaceous Species species-latin name Cirsium arvense Dipsacus fullonum (D. sylvestris) Impatiens capensis Phalaris arundinacea	N N N	2 1 2 4 3 4	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0	85 8 0	45 0 0	0	0 10	1 0	1	0	0	0	2 0	0	10	7.88 1.65
Juncus effusus Scirpus microcarpus Typha latifolia  Invasive Herbaceous Species species-latin name Cirsium arvense Dipsacus fullonum (D. sylvestris) Impatiens capensis Phalaris arundinacea	N N N	2 1 2 4 3 4	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0	85 8 0	45 0 0	0	0 10	1 0	1	0	0	0	2 0	0	10	7.88 1.65
Scirpus microcarpus Typha latifolia  Invasive Herbaceous Species species-latin name Cirsium arvense Dipsacus fullonum (D. sylvestris) Impatiens capensis Phalaris arundinacea	N N	1 2 4 3 4	0 0 0 0 0 25	0 0 0 0 0	0 0 0 8 0	0 0 15 0	0 0	8 0	0	0	10			,	0	0	0	0	10	1.65
Invasive Herbaceous Species species-latin name Cirsium arvense Dipsacus fullonum (D. sylvestris) Impatiens capensis Phalaris arundinacea	N I	4 3 4	0 0 0 25	0 0 0	0 8 0	0 15 0	0 4	0	0					0		-				1
Invasive Herbaceous Species species-latin name Cirsium arvense Dipsacus fullonum (D. sylvestris) Impatiens capensis Phalaris arundinacea	 	4 3 4	0 0 25	0 0 0	0 8 0	15 0	4			0	70	0	0	0	0	0	0	0	0	4.12
species-latin name Cirsium arvense Dipsacus fullonum (D. sylvestris) Impatiens capensis Phalaris arundinacea	I I I	4	0 25	0	8	0	-	0												
Cirsium arvense Dipsacus fullonum (D. sylvestris) Impatiens capensis Phalaris arundinacea	I I I	4	0 25	0	8	0	-	0												
Dipsacus fullonum (D. sylvestris) Impatiens capensis Phalaris arundinacea	I I I	4	0 25	0	8	0	-	0	0	0	0	0	0	0	0	0	0	0	5	1.41
Impatiens capensis Phalaris arundinacea	I I	4	25	0	0			0	0	0	0	0	0	0	0	0	0	0	0	0.47
Phalaris arundinacea	I NN	2		_			0	0	25	0	1	5	0	15	0	0	6	0	80	10.12
Non-Native Herhaceous Species	NN				6	0	90	8	40	0	15	95	99	0	0	5	92	10	10	27.65
species-latin name	NN																			
Chicorium intybus		4	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0.12
Holcus lanatus	NN	3	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0.18
Hypochaeris radicata	NN	3	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0.47
Iris pseudacorus	NN	1	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0.29
Leucanthemum vulgare	NN	4	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0.29
Lotus corniculatus	NN	3	0	0	10	0	0	0	0	5	0	0	0	45	0	0	0	0	0	3.53
Taraxacum officinale	NN	3	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0.29
Trifolium repens	NN	3	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0	0.88
Vulpia myuros	NN	4	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0	1.47
Native Shrub and Tree Species  species-latin name																				
Alnus rubra	N	3	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	1.47
Lonicera involucrata	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	2.35
Rubus ursinus	N	4	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	40	0	2.71
Sambucus racemosa	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	0	0	2.35
Salix sitchensis	N	2	0	0	0	0	0	0	35	0	0	0	0	0	0	0	0	0	0	2.06
Salix sp.	N	3	0	93	20	35	0	0	0	0	0	0	0	0	0	0	0	0	0	8.71
Symphoricarpos albus	N	4	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0.12
Invasive Shrub and Tree Species species-latin name																				
Buddleja davidii	ı	4	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0.47
Rubus armeniacus	I	4	5	0	0	70	0	0	0	0	0	0	0	35	0	95	0	50	0	15.00
Bare Substrate																				
water			0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	5.88
thatch/bare ground			70	100	0	0	0	0	1	25	5	0	0	0	0	0	0	0	0	11.82

Routine Performance Standards	EMM1	EMM2	ЕММ3	EMM4	EMM5	ЕММ6	ЕММ7	EMM8	ЕММ9	EMM10	EMM11	EMM12	EMM13	EMM14	EMM15	EMM16	EMM17	Habitat Average	Standard Error	Standard Met?		Number of Native Sp.
Cover of Native Herbaceous Species( >=30%)	0	0	0	0	0	93	45	0	80	1	1	0		0	2	0	11	15	7.6	NO		_
Lower CI (80%)																		4.84				
Upper CI (80%)																		24.29				
Cover of Invasive Herbaceous Species (<=20%)	25	0	14	30	94	8	65	0	16	100	99	15		5	98	10	95	42	10	NO		
Lower CI (80%)																		28.91				
Upper CI (80%)																		55.34				
Cover of Non-Native Herbaceous Species	0	0	10	0	0	0	0	66	0	0	0	50		2	0	0	0	8	5	N/A		
Lower CI (80%)																		1.62				
Upper CI (80%)																		14.38				
Cover of Invasive Shrubs and Trees (<=10%)	5	0	0	70	0	0	0	0	0	0	0	35		103	0	50	0	16	8	N/A		
Lower CI (80%)																		6.32				
Upper CI (80%)																		26.55				
Native Herb. Sp. Diversity (>5 sp, >=5% cover, >=10% plots)	0	0	0	0	0	93	45	0	80	1	1	0	0	0	2	0	11	14	7.2	NO	41.2%	4
Lower CI (80%)																		4.51				
Upper CI (80%)																		22.91				

Species	RFE1	RFE2	RFE3	RFE4	RFE5	RFE6	RFE7	RFE8	RFE9	RFE10	RFE11	RFE12	RFE13	RFE14	RFE15	RFE16	RFE17	RFE18	1				
	1																		-				
Native Herbaceous Species  species-latin name																							
Bromus carinatus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0.72				
Epilobium ciliatum (=E. watsonii)	0	0	0	1	1	2	5	0	3	0	0	0	0	0	0	0	0	0	0.67				
Equisetum arvense	0	0	0	0	0	0	0	0	1	4	0	0	0	0	0	0	0	0	0.28				
Ranunculus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0.22				
Scirpus microcarpus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0.11				
Tellima grandiflora	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	0	0.89				
	_																						
Invasive Herbaceous Species																							
<u>species-latin name</u> Convolvulus arvensis	0	0	0	T 0	8	Π	0	0	25	0	0	0	0	0	0	0	0	0	1.83				
Hedera helix	0	80	0	0	0	0	0	0	0	5	1	1	0	0	0	0	0	0	4.83				
Hypericum perforatum	0	1	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0.17				
Impatiens capensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	0	0	2.22				
Phalaris arundinacea	0	0	0	8	0	5	0	30	0	8	0	30	0	0	8	0	0	90	9.94				
			L																				
Non-Native Herbaceous Species																							
species-latin name	_	<u> </u>	Ι .	T -	T -	Ι .		T _	_			I - I		_	_	I -		_		Ī			
Agrostis sp.	0	0	0	0	0	0	0	0	0	0	28	0	0	0	0	0	0	0	1.56				
Clematis ligusticifolia	0	0	0	0	0	35	0	0	0	0	0	0	0	0	0	0	0	0	1.94				
Daucus carota  Caranium robertianum	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.11				
Geranium robertianum Hypochaeris radicata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	5 0	0	0.33				
Leucanthemum vulgare	0	0	0	0	0	0	0	0	12	0	2	0	0	0	0	0	0	0	0.17				
Plantago lanceolata	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0.78				
Solanum dulcamara	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	5	0.94				
Taraxacum officinale	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0		0.06				
50												_											
Native Tree Species	]																						
species-latin name	_	Γ.	Ι .	т -	Т.	Ι	T -	T _		T _						Ι .			T				
Acer macrophyllum	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0.28				
Alnus rubra	0	0	70	0	0	0	0	0	0	0	0	0	0	0	35	0	- 0	0	1.94				
Fraxinus latifolia Populus balsamifera trichocarpa	1	0	70	0	0	0	0	0	0	0	0	70	0	0	0	0	15	0	4.83				
Pseudotsuga douglasii	0	20	0	0	0	0	90	0	0	0	0	70 0	0	0	0	5	10	0	10.33 0.83				
I seudoisuga douglasii	0	0	U	0	1 0	0	U	0	U	U	0	U	0	U	U	5	10	U	0.63				
Native Shrub Species	1																						
species-latin name	1				_			_															
								_	_	_	0	0	•	0	3	0	Ω						
Cornus sericea	0	0	5	90	90	0	0	0	0	0		U	0		3	U	0	0	10.44				
Corylus cornuta	0	0	0	0	90	0	0	0	0	78	0	0	0	0	0	0	0	0	4.33				
Corylus cornuta Holodiscus discolor	0	0	0	0	0	0 0 45	0	0	0	78 0	0	0	0		0	0		0	4.33 2.50				
Corylus cornuta Holodiscus discolor Lonicera involucrata	0 0 0	0 0	0 0 0	0 0	0 0 0	0 0 45 0	0 0	0 0	0 0	78 0 0	0 0 0	0 0 14	0 0 0	0 0	0	0 0 0	0 0	0 0 0	4.33 2.50 0.78				
Corylus cornuta Holodiscus discolor Lonicera involucrata Rosa nutkana	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 45 0	0	0 0 0 0	0 0 0 0	78 0 0	0 0 0 2	0 0 14 0	0 0 0 0	0	0	0 0 0 0	0 0 0 0	0 0 0	4.33 2.50 0.78 0.11				
Corylus cornuta Holodiscus discolor Lonicera involucrata Rosa nutkana Rubus ursinus	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0 0	0 0 0 0	0 0 45 0 0	0 0	0 0 0 0	0 0 0 0	78 0 0 0 40	0 0 0 2 0	0 0 14 0	0 0 0 0	0 0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0 0	0 0 0 0	4.33 2.50 0.78 0.11 5.83				
Corylus cornuta Holodiscus discolor Lonicera involucrata Rosa nutkana	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 45 0 0 0	0 0	0 0 0 0	0 0 0 0	78 0 0	0 0 0 2	0 0 14 0	0 0 0 0	0 0	0	0 0 0 0	0 0 0 0	0 0 0	4.33 2.50 0.78 0.11				
Corylus cornuta Holodiscus discolor Lonicera involucrata Rosa nutkana Rubus ursinus	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0 0	0 0 0 0	0 0 45 0 0 0	0 0	0 0 0 0	0 0 0 0	78 0 0 0 40	0 0 0 2 0	0 0 14 0	0 0 0 0	0 0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0 0	0 0 0 0	4.33 2.50 0.78 0.11 5.83				
Corylus cornuta Holodiscus discolor Lonicera involucrata Rosa nutkana Rubus ursinus Symphoricarpos albus  Non-Native Shrub and Tree Species	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0 0	0 0 0 0	0 0 45 0 0 0	0 0	0 0 0 0	0 0 0 0	78 0 0 0 40	0 0 0 2 0	0 0 14 0	0 0 0 0	0 0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0 0	0 0 0 0	4.33 2.50 0.78 0.11 5.83				
Corylus cornuta Holodiscus discolor Lonicera involucrata Rosa nutkana Rubus ursinus Symphoricarpos albus  Non-Native Shrub and Tree Species species-latin name Prunus sp.	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 45 0 0 0	0 0 0 0 0 0 4	0 0 0 0 0 0 50	0 0 0 0 0	78 0 0 0 0 40 0	0 0 0 2 0	0 0 14 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0	0 0 0 0 0	0 0 0 0 0 65	0 0 0 0 0	4.33 2.50 0.78 0.11 5.83 3.00				
Corylus cornuta Holodiscus discolor Lonicera involucrata Rosa nutkana Rubus ursinus Symphoricarpos albus  Non-Native Shrub and Tree Species species-latin name Prunus sp.  Invasive Shrub and Tree Species	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 45 0 0 0	0 0 0 0 0 0 4	0 0 0 0 0 0 50	0 0 0 0 0	78 0 0 0 0 40 0	0 0 0 2 0	0 0 14 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0	0 0 0 0 0	0 0 0 0 0 65	0 0 0 0 0	4.33 2.50 0.78 0.11 5.83 3.00				
Corylus cornuta Holodiscus discolor Lonicera involucrata Rosa nutkana Rubus ursinus Symphoricarpos albus  Non-Native Shrub and Tree Species species-latin name Prunus sp.  Invasive Shrub and Tree Species species-latin name	0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0	0 0 45 0 0 0	0 0 0 0 0 0 4	0 0 0 0 0 0 50	0 0 0 0 0	78 0 0 0 40 0	0 0 0 2 0 0	0 0 14 0 0	0 0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 65 0	0 0 0 0 0	4.33 2.50 0.78 0.11 5.83 3.00				
Corylus cornuta Holodiscus discolor Lonicera involucrata Rosa nutkana Rubus ursinus Symphoricarpos albus  Non-Native Shrub and Tree Species species-latin name Prunus sp.  Invasive Shrub and Tree Species	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 45 0 0 0 0	0 0 0 0 0 0 4	0 0 0 0 0 0 50	0 0 0 0 0	78 0 0 0 0 40 0	0 0 0 2 0	0 0 14 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0	0 0 0 0 0	0 0 0 0 0 65	0 0 0 0 0	4.33 2.50 0.78 0.11 5.83 3.00				
Corylus cornuta Holodiscus discolor Lonicera involucrata Rosa nutkana Rubus ursinus Symphoricarpos albus  Non-Native Shrub and Tree Species species-latin name Prunus sp.  Invasive Shrub and Tree Species species-latin name	0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0	0 0 45 0 0 0 0	0 0 0 0 0 0 4	0 0 0 0 0 0 50	0 0 0 0 0	78 0 0 0 40 0	0 0 0 2 0 0	0 0 14 0 0	0 0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 65 0	0 0 0 0 0	4.33 2.50 0.78 0.11 5.83 3.00				
Corylus cornuta Holodiscus discolor Lonicera involucrata Rosa nutkana Rubus ursinus Symphoricarpos albus  Non-Native Shrub and Tree Species species-latin name Prunus sp.  Invasive Shrub and Tree Species species-latin name Rubus armeniacus  Bare Substrate water	0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0	0 0 45 0 0 0 0	0 0 0 0 0 0 4	0 0 0 0 0 0 50	0 0 0 0 0 0	78 0 0 0 40 0	0 0 0 2 0 0	0 0 14 0 0	0 0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 65 0	0 0 0 0 0	4.33 2.50 0.78 0.11 5.83 3.00				
Corylus cornuta Holodiscus discolor Lonicera involucrata Rosa nutkana Rubus ursinus Symphoricarpos albus  Non-Native Shrub and Tree Species species-latin name Prunus sp.  Invasive Shrub and Tree Species species-latin name Rubus armeniacus  Bare Substrate	0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 45 0 0 0 0	0 0 0 0 0 0 4	0 0 0 0 0 0 50	0 0 0 0 0 0	78 0 0 0 40 0	0 0 0 2 0 0	0 0 14 0 0 0	0 0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 65 0	0 0 0 0 0	4.33 2.50 0.78 0.11 5.83 3.00				
Corylus cornuta Holodiscus discolor Lonicera involucrata Rosa nutkana Rubus ursinus Symphoricarpos albus  Non-Native Shrub and Tree Species species-latin name Prunus sp.  Invasive Shrub and Tree Species species-latin name Rubus armeniacus  Bare Substrate water	0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0	0 0 0 0 0 0 4	0 0 0 0 0 50	0 0 0 0 0 0	78 0 0 0 40 0	0 0 0 2 0 0	0 0 14 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 65 0	0 0 0 0 0	4.33 2.50 0.78 0.11 5.83 3.00 0.17 8.39			Percentage	
Corylus cornuta Holodiscus discolor Lonicera involucrata Rosa nutkana Rubus ursinus Symphoricarpos albus  Non-Native Shrub and Tree Species species-latin name Prunus sp.  Invasive Shrub and Tree Species species-latin name Rubus armeniacus  Bare Substrate water	0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0	0 0 0 0 0 0 4	0 0 0 0 0 50	0 0 0 0 0 0	78 0 0 0 40 0	0 0 0 2 0 0	0 0 14 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 65 0	0 0 0 0 0	4.33 2.50 0.78 0.11 5.83 3.00 0.17 8.39		Standard Met?	Percentage with Native	Number of Native Sp.
Corylus cornuta Holodiscus discolor Lonicera involucrata Rosa nutkana Rubus ursinus Symphoricarpos albus  Non-Native Shrub and Tree Species species-latin name Prunus sp.  Invasive Shrub and Tree Species species-latin name Rubus armeniacus  Bare Substrate water thatch/bare ground	0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0	0 0 0 0 0 0 4 4	0 0 0 0 0 0 50	0 0 0 0 0 0 0	78 0 0 0 40 0	0 0 0 2 0 0 0	0 0 0 14 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 65 0	0 0 0 0 0 0	4.33 2.50 0.78 0.11 5.83 3.00 0.17 8.39 0.00 49.50				
Corylus cornuta Holodiscus discolor Lonicera involucrata Rosa nutkana Rubus ursinus Symphoricarpos albus  Non-Native Shrub and Tree Species species-latin name Prunus sp.  Invasive Shrub and Tree Species species-latin name Rubus armeniacus  Bare Substrate water thatch/bare ground  Routine Performance Standards  Cover of Invasive Herbaceous Species <=30% Lower CI (80%)	0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0 10	0 0 0 0 0 4 4 0 40	0 0 0 0 0 0 50 0 0 0 75	0 0 0 0 0 0 0	78 0 0 0 40 0	0 0 0 2 0 0 0	0 0 0 14 0 0 0 0	0 0 0 0 0 0 0 0 5	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0 3 15	0 0 0 0 0 65 0 0	0 0 0 0 0 0 0	4.33 2.50 0.78 0.11 5.83 3.00  0.17  8.39  0.00 49.50  Habitat Average 19.00 10.52	Error	Met?	with Native	
Corylus cornuta Holodiscus discolor Lonicera involucrata Rosa nutkana Rubus ursinus Symphoricarpos albus  Non-Native Shrub and Tree Species species-latin name Prunus sp.  Invasive Shrub and Tree Species species-latin name Rubus armeniacus  Bare Substrate water thatch/bare ground  Routine Performance Standards  Cover of Invasive Herbaceous Species <=30% Lower CI (80%) Upper CI (80%)	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 <b>0</b> <b>0</b> <b>0</b> <b>0</b> <b>0</b>	0 0 0 0 0 0 0	0 0 0 0 0 0 0 10	0 0 0 0 0 0 4 4 0 40 50 <b>RFE7</b>	0 0 0 0 0 0 50 0 0 0 75 <b>RFE8</b>	0 0 0 0 0 0 0 0	78 0 0 0 40 0 0 55 0 RFE10	0 0 0 2 0 0 0 0 25 0 40 <b>RFE11</b>	0 0 0 14 0 0 0 0	0 0 0 0 0 0 0 0 5 5 RFE13	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 3 3 15	0 0 0 0 0 65 0 0 0 20 <b>RFE17</b>	0 0 0 0 0 0 0 0 0 0 8 FE18	4.33 2.50 0.78 0.11 5.83 3.00  0.17  8.39  0.00 49.50  Habitat Average 19.00 10.52 27.48	<b>Error</b> 6.6	Met? YES	with Native	
Corylus cornuta Holodiscus discolor Lonicera involucrata Rosa nutkana Rubus ursinus Symphoricarpos albus  Non-Native Shrub and Tree Species species-latin name Prunus sp.  Invasive Shrub and Tree Species species-latin name Rubus armeniacus  Bare Substrate water thatch/bare ground  Routine Performance Standards  Cover of Invasive Herbaceous Species <=30% Lower CI (80%) Upper CI (80%) Cover of Native Shrubs and Trees	0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0 10	0 0 0 0 0 4 4 0 40	0 0 0 0 0 0 50 0 0 0 75	0 0 0 0 0 0 0	78 0 0 0 40 0	0 0 0 2 0 0 0	0 0 0 14 0 0 0 0	0 0 0 0 0 0 0 0 5	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0 3 15	0 0 0 0 0 65 0 0	0 0 0 0 0 0 0	4.33 2.50 0.78 0.11 5.83 3.00  0.17  8.39  0.00 49.50  Habitat Average 19.00 10.52 27.48 3.77	Error	Met?	with Native	
Corylus cornuta Holodiscus discolor Lonicera involucrata Rosa nutkana Rubus ursinus Symphoricarpos albus  Non-Native Shrub and Tree Species species-latin name Prunus sp.  Invasive Shrub and Tree Species species-latin name Rubus armeniacus  Bare Substrate water thatch/bare ground  Routine Performance Standards  Cover of Invasive Herbaceous Species <=30% Lower CI (80%) Upper CI (80%) Cover of Native Shrubs and Trees  Lower CI (80%) Upper CI (80%)	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 <b>0</b> <b>0</b> <b>0</b> <b>0</b> <b>0</b>	0 0 0 0 0 0 0	0 0 0 0 0 0 0 10	0 0 0 0 0 0 4 4 0 40 50 <b>RFE7</b>	0 0 0 0 0 0 50 0 0 0 75 <b>RFE8</b>	0 0 0 0 0 0 0 0	78 0 0 0 40 0 0 55 0 RFE10	0 0 0 2 0 0 0 0 25 0 40 <b>RFE11</b>	0 0 0 14 0 0 0 0	0 0 0 0 0 0 0 0 5 5 RFE13	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 3 3 15	0 0 0 0 0 65 0 0 0 20 <b>RFE17</b>	0 0 0 0 0 0 0 0 0 0 8 FE18	4.33 2.50 0.78 0.11 5.83 3.00  0.17  8.39  0.00 49.50  Habitat Average 19.00 10.52 27.48 3.77 2.68 4.86	6.6 0.9	Met? YES N/A	with Native	
Corylus cornuta Holodiscus discolor Lonicera involucrata Rosa nutkana Rubus ursinus Symphoricarpos albus  Non-Native Shrub and Tree Species species-latin name Prunus sp.  Invasive Shrub and Tree Species species-latin name Rubus armeniacus  Bare Substrate water thatch/bare ground  Routine Performance Standards  Cover of Invasive Herbaceous Species <=30% Lower CI (80%) Upper CI (80%) Cover of Invasive Shrubs and Trees  Lower CI (80%) Upper CI (80%) Cover of Invasive Shrubs and Trees	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 <b>0</b> <b>0</b> <b>0</b> <b>0</b> <b>0</b>	0 0 0 0 0 0 0	0 0 0 0 0 0 0 10	0 0 0 0 0 0 4 4 0 40 50 <b>RFE7</b>	0 0 0 0 0 0 50 0 0 0 75 <b>RFE8</b>	0 0 0 0 0 0 0 0	78 0 0 0 40 0 0 55 0 RFE10	0 0 0 2 0 0 0 0 25 0 40 <b>RFE11</b>	0 0 0 14 0 0 0 0	0 0 0 0 0 0 0 0 5 5 RFE13	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 3 3 15	0 0 0 0 0 65 0 0 0 20 <b>RFE17</b>	0 0 0 0 0 0 0 0 0 0 8 FE18	4.33 2.50 0.78 0.11 5.83 3.00  0.17  8.39  0.00 49.50  Habitat Average 19.00 10.52 27.48 3.77 2.68 4.86 8.39	<b>Error</b> 6.6	Met? YES	with Native	
Corylus cornuta Holodiscus discolor Lonicera involucrata Rosa nutkana Rubus ursinus Symphoricarpos albus  Non-Native Shrub and Tree Species species-latin name Prunus sp.  Invasive Shrub and Tree Species species-latin name Rubus armeniacus  Bare Substrate water thatch/bare ground  Routine Performance Standards  Cover of Invasive Herbaceous Species <=30% Lower CI (80%) Upper CI (80%) Cover of Native Shrubs and Trees  Lower CI (80%) Cover of Invasive Shrubs and Trees Lower CI (80%)	0 0 0 0 0 0 0 0 0 83 <b>RFE1</b>	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 <b>0</b> <b>0</b> <b>0</b> <b>0</b> <b>0</b>	0 0 0 0 0 0 0	0 0 0 0 0 0 0 10	0 0 0 0 0 4 4 0 40 50 <b>RFE7</b>	0 0 0 0 0 0 50 0 0 75 <b>RFE8</b> 30	0 0 0 0 0 0 0 0 0 0 55 <b>RFE9</b>	78 0 0 0 40 0 0 55 0 RFE10 13	0 0 0 2 0 0 0 0 25 0 40 <b>RFE11</b>	0 0 0 14 0 0 0 0	0 0 0 0 0 0 0 0 5 5 RFE13 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 10 25 <b>RFE15</b> 48	0 0 0 0 0 0 0 3 15	0 0 0 0 0 65 0 0 0 20 <b>RFE17</b>	0 0 0 0 0 0 0 0 0 5 <b>RFE18</b> 90	4.33 2.50 0.78 0.11 5.83 3.00  0.17  8.39  0.00 49.50  Habitat Average 19.00 10.52 27.48 3.77 2.68 4.86 8.39 3.56	6.6 0.9	Met? YES N/A	with Native	
Corylus cornuta Holodiscus discolor Lonicera involucrata Rosa nutkana Rubus ursinus Symphoricarpos albus  Non-Native Shrub and Tree Species species-latin name Prunus sp.  Invasive Shrub and Tree Species species-latin name Rubus armeniacus  Bare Substrate water thatch/bare ground  Routine Performance Standards  Cover of Invasive Herbaceous Species <=30% Lower CI (80%) Upper CI (80%) Cover of Invasive Shrubs and Trees  Lower CI (80%) Upper CI (80%) Cover of Invasive Shrubs and Trees	0 0 0 0 0 0 0 0 0 83 <b>RFE1</b>	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 <b>0</b> <b>0</b> <b>0</b> <b>0</b> <b>0</b>	0 0 0 0 0 0 0	0 0 0 0 0 0 0 10	0 0 0 0 0 4 4 0 40 50 <b>RFE7</b>	0 0 0 0 0 0 50 0 0 75 <b>RFE8</b> 30	0 0 0 0 0 0 0 0 0 0 55 <b>RFE9</b>	78 0 0 0 40 0 0 55 0 RFE10 13	0 0 0 2 0 0 0 0 25 0 40 <b>RFE11</b>	0 0 0 14 0 0 0 0	0 0 0 0 0 0 0 0 5 5 RFE13 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 10 25 <b>RFE15</b> 48	0 0 0 0 0 0 0 3 15	0 0 0 0 0 65 0 0 0 20 <b>RFE17</b>	0 0 0 0 0 0 0 0 0 5 <b>RFE18</b> 90	4.33 2.50 0.78 0.11 5.83 3.00  0.17  8.39  0.00 49.50  Habitat Average 19.00 10.52 27.48 3.77 2.68 4.86 8.39	6.6 0.9	Met? YES N/A	with Native	
Corylus cornuta Holodiscus discolor Lonicera involucrata Rosa nutkana Rubus ursinus Symphoricarpos albus  Non-Native Shrub and Tree Species species-latin name Prunus sp.  Invasive Shrub and Tree Species species-latin name Rubus armeniacus  Bare Substrate water thatch/bare ground  Routine Performance Standards  Cover of Invasive Herbaceous Species <=30%	0 0 0 0 0 0 0 0 0 83 <b>RFE1</b>	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 <b>0</b> <b>0</b> <b>0</b> <b>0</b> <b>0</b>	0 0 0 0 0 0 0	0 0 0 0 0 0 0 10	0 0 0 0 0 4 4 0 40 50 <b>RFE7</b>	0 0 0 0 0 0 50 0 0 75 <b>RFE8</b> 30	0 0 0 0 0 0 0 0 0 0 55 <b>RFE9</b>	78 0 0 0 40 0 0 55 0 RFE10 13	0 0 0 2 0 0 0 0 25 0 40 <b>RFE11</b>	0 0 0 14 0 0 0 0	0 0 0 0 0 0 0 0 5 5 RFE13 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 10 25 <b>RFE15</b> 48	0 0 0 0 0 0 0 3 15	0 0 0 0 0 65 0 0 0 20 <b>RFE17</b>	0 0 0 0 0 0 0 0 0 5 <b>RFE18</b> 90	4.33 2.50 0.78 0.11 5.83 3.00  0.17  8.39  0.00 49.50  Habitat Average 19.00 10.52 27.48 3.77 2.68 4.86 8.39 3.56	6.6 0.9	Met? YES N/A	with Native	
Corylus cornuta Holodiscus discolor Lonicera involucrata Rosa nutkana Rubus ursinus Symphoricarpos albus  Non-Native Shrub and Tree Species species-latin name Prunus sp.  Invasive Shrub and Tree Species species-latin name Rubus armeniacus  Bare Substrate water thatch/bare ground  Routine Performance Standards  Cover of Invasive Herbaceous Species <=30%	0 0 0 0 0 0 0 0 0 0 83 <b>RFE1</b> 0	0 0 0 0 0 0 0 0 0 0 0 0 0 <b>0</b> <b>0</b> <b>0</b> <b>0</b>	0 0 0 0 0 0 0 0 0 0 0 100 <b>RFE3</b>	0 0 0 0 0 0 0 0 0 0 8 <b>RFE4</b> 8	0 0 0 0 0 0 0 0 0 8 <b>RFE5</b> 8	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 4 4 0 40 50 <b>RFE7</b> 0	0 0 0 0 0 0 50 0 0 75 <b>RFE8</b> 30	0 0 0 0 0 0 0 0 0 0 0 55 <b>RFE9</b> 27	78 0 0 0 40 0 0 755 0 0 0 <b>RFE10</b> 13	0 0 0 2 0 0 0 0 25 0 40 <b>RFE11</b> 1	0 0 14 0 0 0 0 0 1 1 0 50 <b>RFE12</b> 31	0 0 0 0 0 0 0 0 5 8 RFE13 0	0 0 0 0 0 0 0 0 0 0 100 <b>RFE14</b> 0	0 0 0 0 0 0 0 0 10 25 <b>RFE15</b> 48	0 0 0 0 0 0 0 0 3 15 0 60 <b>RFE16</b> 0	0 0 0 0 0 65 0 0 0 20 <b>RFE17</b> 0	0 0 0 0 0 0 0 0 0 5 <b>RFE18</b> 90	4.33 2.50 0.78 0.11 5.83 3.00  0.17  8.39  0.00 49.50  Habitat Average 19.00 10.52 27.48 3.77 2.68 4.86 8.39 3.56 13.21  0.48	6.6 0.9 3.8	Met? YES  N/A  N/A	with Native Veg	Native Sp.
Corylus cornuta Holodiscus discolor Lonicera involucrata Rosa nutkana Rubus ursinus Symphoricarpos albus  Non-Native Shrub and Tree Species species-latin name Prunus sp.  Invasive Shrub and Tree Species species-latin name Rubus armeniacus  Bare Substrate water thatch/bare ground  Routine Performance Standards  Cover of Invasive Herbaceous Species <=30%	0 0 0 0 0 0 0 0 0 83 <b>RFE1</b> 0	0 0 0 0 0 0 0 0 0 0 0 0 0 8 1 81	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 90 <b>RFE4</b> 8	0 0 0 0 0 0 0 0 0 0 8 <b>RFE5</b> 8	0 0 0 0 0 0 0 10 <b>RFE6</b> 5	0 0 0 0 0 0 4 4 0 40 8 8	0 0 0 0 0 0 50 0 0 75 <b>RFE8</b> 30	0 0 0 0 0 0 0 0 0 0 0 55 <b>RFE9</b> 27	78 0 0 0 0 40 0 0 55 0 0 RFE10 13	0 0 0 2 0 0 0 0 25 40 <b>RFE11</b> 1	0 0 0 14 0 0 0 0 0 0 7	0 0 0 0 0 0 0 0 5 8 RFE13 0	0 0 0 0 0 0 0 0 0 0 100 <b>RFE14</b>	0 0 0 0 0 0 0 0 10 25 <b>RFE15</b> 48	0 0 0 0 0 0 0 3 3 15 60 <b>RFE16</b> 0	0 0 0 0 0 65 0 0 0 20 <b>RFE17</b>	0 0 0 0 0 0 0 0 0 5 <b>RFE18</b> 90	4.33 2.50 0.78 0.11 5.83 3.00  0.17  8.39  0.00 49.50  Habitat Average 19.00 10.52 27.48 3.77 2.68 4.86 8.39 3.56 13.21	6.6 0.9	Met? YES  N/A	with Native Veg	Native Sp.
Corylus cornuta Holodiscus discolor Lonicera involucrata Rosa nutkana Rubus ursinus Symphoricarpos albus  Non-Native Shrub and Tree Species species-latin name Prunus sp.  Invasive Shrub and Tree Species species-latin name Rubus armeniacus  Bare Substrate water thatch/bare ground  Routine Performance Standards  Cover of Invasive Herbaceous Species <=30%	0 0 0 0 0 0 0 0 0 0 83 <b>RFE1</b> 0	0 0 0 0 0 0 0 0 0 0 0 0 0 <b>0</b> <b>0</b> <b>0</b> <b>0</b>	0 0 0 0 0 0 0 0 0 0 0 100 <b>RFE3</b>	0 0 0 0 0 0 0 0 0 0 8 <b>RFE4</b> 8	0 0 0 0 0 0 0 0 0 8 <b>RFE5</b> 8	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 4 4 0 40 50 <b>RFE7</b> 0	0 0 0 0 0 0 50 0 0 75 <b>RFE8</b> 30	0 0 0 0 0 0 0 0 0 0 0 55 <b>RFE9</b> 27	78 0 0 0 40 0 0 755 0 0 0 <b>RFE10</b> 13	0 0 0 2 0 0 0 0 25 0 40 <b>RFE11</b> 1	0 0 14 0 0 0 0 0 1 1 0 50 <b>RFE12</b> 31	0 0 0 0 0 0 0 0 5 8 RFE13 0	0 0 0 0 0 0 0 0 0 0 100 <b>RFE14</b> 0	0 0 0 0 0 0 0 0 10 25 <b>RFE15</b> 48	0 0 0 0 0 0 0 0 3 15 0 60 <b>RFE16</b> 0	0 0 0 0 0 65 0 0 0 20 <b>RFE17</b> 0	0 0 0 0 0 0 0 0 0 5 <b>RFE18</b> 90	4.33 2.50 0.78 0.11 5.83 3.00  0.17  8.39  0.00 49.50  Habitat Average 19.00 10.52 27.48 3.77 2.68 4.86 8.39 3.56 13.21  0.48	6.6 0.9 3.8	Met? YES  N/A  N/A	with Native Veg	Native Sp.

	RFR1	RFR2	RFR3	RFR4	RFR5	RFR6	RFR7	RFR8	RFR9	RFR10	RFR11	RFR12	RFR13	RFR14	RFR15	RFR16	RFR17	RFR18	Habita Averag
ive Herbaceous Species			•				•										•		
ecies-latin name																			
ilobium ciliatum (=E. watsonii) ncus effusus	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0 10	0	3	0	0.33 0.67
arah oregana	0	0	0	0	0	0	2	2	0	0	0	35	0	0	0	0	0	0	2.17
rasive Herbaceous Species																			
ecies-latin name rsium arvense	0	0	0	0	0	0	22	0	1	0	0	0	10	0	0	0	0	0	1.83
rsium vulgare psacus fullonum (D. sylvestris)	0	1 3	0	0	0	0 5	0	0	0	0	0	0	0	0	0	0	0	0	0.06 0.44
edera helix	0	1	0	0	0	5	8	8	0	0	0	2	0	0	0	0	0	0	1.33
ppericum perforatum apatiens capensis	0	0	0	0	0 2	0	0	0	0	0	0	0 10	0 8	0 10	0	0	70	0	0.06 6.06
alaris arundinacea	0	0	0	0	35	0	10	10	0	0	82	0	4	0	5	0	0	0	8.11
hrum salicaria cobaea vulgaris	0	0 28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.11 1.56
n-Native Herbaceous Species																			
cies-latin name		Т -	T -	1 -		T .	<del></del>				1 _			· -			T -	1 -	T
ostis sp. taureum erythraea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.11
ucus carota	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.06
ritalis purpureum ranium molle	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0.17
nium robertianum	0	0	0	0	0	0	0	0	1	0	0	0	4	0	0	0	20	0	1.39
n urbanum rus lanatus	0	0 2	0	0	0	0	0	0	0	0	0	0	10 0	0	0	0	0	2	0.56
ochaeris radicata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0.56
kxia elatine tuca saligna	0	0	0	0	0	0	0	0	38 8	0	0	0	0	0	0	0	0	0	2.11 0.44
sana communis	0	0	0	0	0	1	0	5	0	0	0	0	8	0	0	0	3	0	0.94
canthemum vulgare us corniculatus	0	10	1	0	0	0	0 10	0	0	0	0	0	0 2	0	0	0	0	4 0	0.83 0.72
us corniculatus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.11
atha pulegium	45 0	0	0 22	0	0	0	0	0	0	0	0	0	0	0	0	30 0	0	0	4.17 1.22
sp. nex occidentalis	0	0	0	0	0	0	0	0	3	0	0	0	8	0	0	0	0	0	0.61
ecio vulgaris unum dulcamara	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0 2	0	0.11 0.11
axacum officinale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 5	0.11
ve Shrub and Tree Species																			
cies-latin name	0	0	T 0	1	T 0	0	20	0	0	0	0	0	0	12	0	0	Το	T 0	1.83
xinus latifolia	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.56
ulus balsamifera trichocarpa x sitchensis	0	0	0 25	0	0	15 0	0	0	10 0	0	0	0	0	0	5	0	90	0	6.67 1.56
sp.	3	0	25 0	0	0	0	0	0	0	0	0	0	0	0	0 35	0	0	0	2.11
re Shrub Species																			
cies-latin name	40	25	1 ^	l ^	1 ^	T ^	<del></del>			^	1 ^						T ^	1 ^	T 000
us sericea lus cornuta	10 0	35 0	0	0	0	0	20	20 0	0	0	0	0	0	0	0	0	0	0	3.61 1.11
cera involucrata	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0.28
pucus racemosa nea douglasii	0	0	0	30	0 85	0	0	0	0	0	0	0	0	0	0	0	0	0	1.67 4.72
phoricarpos albus	0	0	0	0	0	0	0	15	0	0	0	0	2	10	0	0	0	0	1.50
sive Shrub and Tree Species																			
cies-latin name aquifolium	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0.28
us armeniacus	0	0	0	6	0	0	20	25	3	0	15	30	0	88	0	0	0	0	10.39
e Substrate											_								
ch/bare ground	58	25	50	95	0	80	50	50	60	100	2	35	48	0	85	70	20	55	49.06
Routine Performance Standards	RFR1	RFR2	RFR3	RFR4	RFR5	RFR6	RFR7	RFR8	RFR9	RFR10	RFR11	RFR12	RFR13	RFR14	RFR15	RFR16	RFR17	RFR18	Habita Averag
	0	33	0	0	37	11	40	18	2	0	82	12	22	10	15	0	70	0	20 12.15
	0																1		26.96 <b>Specie</b>
ver of Invasive Herbaceous Species <=30%  Lower CI (80%)  Upper CI (80%)	0		•																Sperie
Lower CI (80%) Upper CI (80%)	0																		Preser
Lower CI (80%) Upper CI (80%)  O Species Richness >=5	0																		
Lower CI (80%) Upper CI (80%)  Species Richness >=5 Species Richness >=5 Species Richness >=5	RFR1	RFR2	RFR3	RFR4	RFR5	RFR6	RFR7	RFR8	RFR9	RFR10	RFR11	RFR12	RFR13	RFR14*	RFR15*	RFR16	RFR17	RFR18	Preser 10 8
Lower CI (80%) Upper CI (80%)  ub Species Richness >=5 e Species Richness >=5 Species ive Shrub and Tree Species Count cies-latin name		RFR2	RFR3	RFR4	RFR5	RFR6	RFR7	RFR8	RFR9	RFR10	RFR11	RFR12	RFR13	RFR14*	RFR15*	RFR16	RFR17	RFR18	10 8
Lower CI (80%) Upper CI (80%)  b Species Richness >=5 Species Richness >=5  Species ve Shrub and Tree Species Count vies-latin name r macrophyllum		<b>RFR2</b> 0 0	0 0	0 1	0	0	0	0	0	0	0	<b>RFR12</b> 0 0	1	0	0	<b>RFR16</b> 0 0	0	0	10 8
Lower CI (80%) Upper CI (80%)  b Species Richness >=5 Species Richness >=5  Species  re Shrub and Tree Species Count ies-latin name r macrophyllum as rubra mus sericea	RFR1	0	0					0 0 0				0	1 5 0			0			0.06 1.06 0.56
Lower CI (80%) Upper CI (80%)  O Species Richness >=5 Species Richness >=5 Species Richness >=5  Species e Shrub and Tree Species Count des-latin name macrophyllum s rubra us sericea lus cornuta	RFR1  0 0 0 0 0	0 0 8 0	0 0 0	0 1 0	0 2 0 0	0 3 0	0 2 0 0	0 0 0 0 2	0 0 0	0 0 0 0	0 3	0 0 0	1 5	0 3 1 0	0 0 0	0 0 0	0 0 0 0	0 0 1 0	0.06 1.06 0.56 0.17
Lower CI (80%) Upper CI (80%)  b Species Richness >=5 Species Richness >=5  Species  ve Shrub and Tree Species Count vies-latin name r macrophyllum us rubra nus sericea ylus cornuta xinus latifolia	<b>RFR1</b> 0  0 0	0 0 8	0 0 0	0 1 0	0 2 0	0 3 0	0 2 0	0 0 0	0 0 0	0 0 0	0 3 0	0	1 5 0	0 3 1	0 0 0	0 0 0	0 0 0	0 0 1	0.06 1.06 0.56 0.17
Lower CI (80%) Upper CI (80%)  O Species Richness >=5 Species Richness >=5  Species e Shrub and Tree Species Count es-latin name macrophyllum s rubra us sericea lus cornuta inus latifolia cera involucrata leria cerasiformis	RFR1  0 0 0 0 0 0 0 0 0	0 0 8 0 0 0	0 0 0 0 0 0	0 1 0 0 0 0	0 2 0 0 0 0	0 3 0 0 0 0 2	0 2 0 0 0 0	0 0 0 2 0 0	0 0 0 0	0 0 0 0 0	0 3 0 0	0 0 0 1 0 0 5	1 5 0 0 1 0	0 3 1 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0 0	0 0 1 0 0 0	0.06 1.06 0.56 0.17 0.11 0.28 0.28
Lower CI (80%) Upper CI (80%)  O Species Richness >=5 Species Richness >=5  Species  Species  E Shrub and Tree Species Count  ies-latin name  macrophyllum  s rubra  tus sericea  tlus cornuta  inus latifolia cera involucrata  leria cerasiformis  adelphus lewisii	RFR1  0 0 0 0 0 0 0 0	0 0 8 0 0	0 0 0 0 0	0 1 0 0 0	0 2 0 0 0	0 3 0 0 0	0 2 0 0 0	0 0 0 2 0	0 0 0 0 0	0 0 0 0 0	0 3 0 0	0 0 0 1 0	1 5 0 0 1	0 3 1 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 1 0 0	0.06 1.06 0.56 0.17 0.11 0.28 0.28
Lower CI (80%) Upper CI (80%)  b Species Richness >=5 Species Richness >=5 Species Richness >=5  Ye Shrub and Tree Species Count ies-latin name Imacrophyllum Its rubra Inus sericea Inus latifolia Icera involucrata Ideria cerasiformis Inus balsamifera trichocarpa Indotsuga menziesii	RFR1  0 0 0 0 0 0 0 0 0 15	0 0 8 0 0 0 0 0	0 0 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 2 0 0 0 0 0 0	0 3 0 0 0 2 0 0 2	0 2 0 0 0 0 0 0	0 0 0 2 0 0 0 0	0 0 0 0 0 0 0 4 0	0 0 0 0 0 0 0	0 3 0 0 1 3 0 0	0 0 0 1 0 0 5 0	1 5 0 0 1 0 0 0	0 3 1 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 1 0 0 0 0 0 0 4	0.06 1.06 0.56 0.17 0.11 0.28 0.22 1.83 0.11
Lower CI (80%) Upper CI (80%)  b Species Richness >=5 Species Richness >=5  Species Rich	RFR1  0 0 0 0 0 0 0 0 0 15	0 0 8 0 0 0 0	0 0 0 0 0 0 0 0	0 1 0 0 0 0 0	0 2 0 0 0 0 0 0 0	0 3 0 0 0 2 0 0	0 2 0 0 0 0 0 0 0	0 0 0 2 0 0 0 0 0	0 0 0 0 0 0 0 4 0	0 0 0 0 0 0 0	0 3 0 0 1 3 0 0	0 0 0 1 0 0 5 0 0	1 5 0 0 1 0 0 0	0 3 1 0 0 0 0 0 0	0 0 0 0 0 0 0 0 2 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 8 0	0 0 1 0 0 0 0 0 0 4 0	0.06 1.06 0.56 0.17 0.11 0.28 0.22 1.83 0.11 0.11
Lower CI (80%) Upper CI (80%)  ub Species Richness >=5 e Species Richness >=5  Species ive Shrub and Tree Species Count cies-latin name er macrophyllum cus rubra rnus sericea rylus cornuta exinus latifolia micera involucrata maleria cerasiformis ciladelphus lewisii pulus balsamifera trichocarpa endotsuga menziesii es sanguineum sa sp. ix exigua	RFR1  0 0 0 0 0 0 0 0 15 0 0 0 0 6	0 0 8 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 1 0 0 0 0 0 0	0 2 0 0 0 0 0 0	0 3 0 0 0 2 0 0 2 1	0 2 0 0 0 0 0 0	0 0 0 2 0 0 0 0	0 0 0 0 0 0 0 4 0 0 0	0 0 0 0 0 0 0 0 0	0 3 0 0 1 3 0 0 0	0 0 0 1 0 0 5 0	1 5 0 0 1 0 0 0	0 3 1 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 1 0 0 0 0 0 4 0 0	0.06 1.06 0.56 0.17 0.11 0.28 0.22 1.83 0.11 0.11 0.17 0.44
Lower CI (80%) Upper CI (80%)  Trub Species Richness >=5  Species  Species  Species Count  Secies-latin name  Ser macrophyllum  Trus rubra  Trus sericea  Trylus cornuta  Trichar involucrata  Trichar	RFR1  0 0 0 0 0 0 0 0 0 15 0 0 0 2	0 0 8 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 1 0 0 0 0 0 0 0	0 2 0 0 0 0 0 0 0 0 0	0 3 0 0 0 2 0 0 2 1 0	0 2 0 0 0 0 0 0 1 1 1 0 0	0 0 0 2 0 0 0 0 0 0 2 0 0	0 0 0 0 0 0 0 4 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 3 0 0 1 3 0 0 0	0 0 0 1 0 0 5 0 0 0 0	1 5 0 0 1 0 0 0 1 0 0	0 3 1 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 2 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 8 0 0 0 0	0 0 0 1 0 0 0 0 0 4 0 0 0	0.06 1.06 0.56 0.17 0.11 0.28 0.22 1.83 0.11 0.17 0.44 1.06
Lower CI (80%) Upper CI (80%)  ub Species Richness >=5 e Species Richness Particle Richness >=5 e Species Richness >=5 e Species Richness Particle Richness >=5 e Species Richness >=5 e Species Richness Particle Richness >=5 e Species Richness >=5 e Species Richness Particle Richness >=5 e Species Richness Particle Richness >=5 e Species Richness >=5 e Species Richn	RFR1  0 0 0 0 0 0 0 0 15 0 0 0 0 6	0 0 8 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 1 0 0 0 0 0 0 0 0 0	0 2 0 0 0 0 0 0 0 0	0 3 0 0 0 2 0 0 2 1 0 0	0 2 0 0 0 0 0 0 0 1 1 1 0	0 0 0 2 0 0 0 0 0 0 0 2 0	0 0 0 0 0 0 0 4 0 0 0	0 0 0 0 0 0 0 0 0	0 3 0 0 1 3 0 0 0 0	0 0 0 1 0 0 5 0 0 0	1 5 0 0 1 0 0 0 1 0 0	0 3 1 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 2 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 8 0	0 0 0 1 0 0 0 0 0 4 0 0	10 8 0.06 1.06
Lower CI (80%) Upper CI (80%) Upper CI (80%)  Species Richness >=5 Species Richness >=5  Species Richness >=5	RFR1  0 0 0 0 0 0 0 0 0 15 0 0 0 6 2 6 0 0	0 0 8 0 0 0 0 0 0 0 0 0 0 2 2 2 2	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 3 0 0 0 2 0 0 0 2 1 0 0 0	0 2 0 0 0 0 0 0 1 1 1 0 0	0 0 0 2 0 0 0 0 0 0 2 0 0 0 0 0	0 0 0 0 0 0 0 4 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 3 0 0 1 3 0 0 0 0 0 0 0 0 0 0	0 0 0 1 0 0 5 0 0 0 0 0 0	1 5 0 0 1 0 0 1 0 0 0 1 0 0	0 3 1 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 2 0 0 2 0 1 1	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 1 0 0 0 0 0 0 4 0 0 0 0 0 0 0 0 0	0.06 1.06 0.56 0.17 0.11 0.28 0.22 1.83 0.11 0.17 0.44 1.06 1.17 0.11 0.22
Lower CI (80%) Upper CI (80%)  Upper CI (80%)  Upper CI (80%)  Species Richness >=5  Species Richness >=5  ive Shrub and Tree Species Count cies-latin name er macrophyllum us rubra rnus sericea rylus cornuta exinus latifolia nicera involucrata mleria cerasiformis ladelphus lewisii pulus balsamifera trichocarpa udotsuga menziesii es sanguineum sa sp. ix exigua ix lucida ix sitchensis ix sp. mbucus racemosa raea douglasii	RFR1  0 0 0 0 0 0 0 0 15 0 0 0 2 6 2 6 0	0 0 0 8 0 0 0 0 0 0 0 0 0 0 2 2 2	0 0 0 0 0 0 0 0 0 0 0 0 0	0 1 0 0 0 0 0 0 0 0 0 0	0 2 0 0 0 0 0 0 0 0 0 0 0 0	0 3 0 0 0 2 0 0 2 1 0 0 0	0 2 0 0 0 0 0 0 1 1 1 0 0 0	0 0 0 2 0 0 0 0 0 0 0 2 0 0 0 0	0 0 0 0 0 0 0 4 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	0 3 0 0 1 3 0 0 0 0 0 0 0 0	0 0 0 1 0 0 5 0 0 0 0 0	1 5 0 0 1 0 0 1 0 0 1 0	0 3 1 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 2 0 0 2 0	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 8 0 0 0 0 0 0 0 0 0 0	0 0 0 1 0 0 0 0 0 0 4 0 0 0 0 0 0 0	0.06 1.06 0.56 0.17 0.11 0.28 0.22 1.83 0.11 0.17 0.44 1.06 1.17 0.11 0.22 0.50 0.89
Lower CI (80%) Upper CI (80%)  Trub Species Richness >=5  Species  tive Shrub and Tree Species Count Species-latin name Ser macrophyllum Trus rubra Trus sericea Trylus cornuta Trylus cor	RFR1  0 0 0 0 0 0 0 0 15 0 0 0 6 2 6 0 0 0 0	0 0 0 8 0 0 0 0 0 0 0 0 0 0 2 2 2 2 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 3 0 0 0 2 0 0 2 1 0 0 0 0 0	0 2 0 0 0 0 0 0 1 1 1 0 0 0 0	0 0 0 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 4 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 3 0 0 1 3 0 0 0 0 0 0 0 0 0 0	0 0 0 1 0 0 5 0 0 0 0 0 0	1 5 0 0 1 0 0 0 1 0 0 0 0 1 0 0 0	0 3 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 2 0 0 2 0 1 1	0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.06 1.06 0.56 0.17 0.11 0.28 0.22 1.83 0.11 0.17 0.44 1.06 1.17 0.11
Upper CI (80%)  rub Species Richness >=5  ree Species Richness >=5  Species  stive Shrub and Tree Species Count recies-latin name rer macrophyllum rus rubra  runus sericea  rorylus cornuta raxinus latifolia rnicera involucrata remleria cerasiformis riladelphus lewisii rpulus balsamifera trichocarpa reudotsuga menziesii rese sanguineum resa sp.  lix exigua lix lucida lix sitchensis lix sp. mbucus racemosa iraea douglasii rmphoricarpos albus	RFR1  0 0 0 0 0 0 0 0 0 15 0 0 0 6 2 6 0 0 0 0 0 0	0 0 0 8 0 0 0 0 0 0 0 0 0 0 0 2 2 2 2 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 3 0 0 0 0 2 0 0 0 0 0 0 0 0 0 0 0 0 0	0 2 0 0 0 0 0 0 1 1 1 0 0 0 0 1 0 0	0 0 0 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 4 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 3 0 0 1 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 1 0 0 5 0 0 0 0 0 0 0 0 0 0	1 5 0 0 1 0 0 1 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1	0 3 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 2 0 0 2 0 1 1 0 0		0 0 0 0 0 0 0 0 0 8 0 0 0 0 0 0 0 0 0 0	0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.06 1.06 0.56 0.17 0.11 0.28 0.22 1.83 0.11 0.17 0.44 1.06 1.17 0.11 0.22 0.50 0.89 Habita Average



## Appendix F

Bird Survey Field Notes and Summary

Avian Point Count Data Sheet	
DATE: 5/24/23	OBSERVER: C. Tumer
SITE: Rinearson	START TIME: 65:45 END TIME: 07/27
	WIND (Beaufort Scale): 0 1 2 3
SITE FIELD NOTES:	
35 4 P. 20 10 10 10 10 10 10 10 10 10 10 10 10 10	

			I	TYP DETE	ICAL CTIO	N	F	LYO	VER	RS	J U	F L U S H	FIELD NOTES
			0 to	50m	> 5	50m	ASS	OC.	IN	D.	CNT	CNT	
STN#	START TIME	SPP. CODE	0-3 MIN	3-5 MIN	0-3 MIN	3-5 MIN	0-3 MIN	3-5 MIN	0-3 MIN	3-5 MIN			
1	05:45	MALL	11								N.		
		GBHE	1										
		BAEA					1				- 1		
•		SOSP	1	1							1, 5, 3		
		VGSW					11						
		BEWR		1							100		
		AMRO		\		1							
5	06:02	SPTO	11								30		
		BCCH	1										
		SOSP	11	1	1								
		BEWR	1								1/4		
		BHGR	1	1									
		WBMU	1										
		STJA		11	1								
		AMRO		1									
		BRCR		١.	1					ā			
		DOWO		1	1								
6	06:17	AMIR				2	1711				-		
	u u	SPTO	1										
		RBSA	1										

					PICAL ECTIO		F	LYO	VER	RS	J U V	F L U S H	FIELD NOTES
			0 to	50m	> 5	0m	ASS	SOC.	IN	D.	CNT	CNT	
STN#	START TIME	SPP. CODE	0-3 MIN	3-5 MIN	0-3 MIN	3-5 MIN	0-3 MIN	3-5 MIN	0-3 MIN	3-5 MIN			
6	•	SosP	1	1									
		EUST					11						
		BHGR	1										
		BEWR		1									
		AMRO		11						-			
		MOFL		1							-		
7	06131	AMRO	1	1									
		SOSP	1	1									
		AMCR					11						
		SPTO	1										
		BHGR	1										
		HOFI	1										
		CHINA	1										
		DEJU		1								1	
		WEWP		1									
		EUST						11					
4	06:48	CAST	11		,								
		MOFL	1										
		UHNA	1										
		SOSP	1	1.									
		SPTO	1	1									
		AMIR					1						
		AMRO	1	\							11/1		
		COYE	1		1								
		CEDW		11									
		WBNU		1									
		HOFI		11									

Avian Point Count Data Sheet	
DATE: 5/24/23	OBSERVER: C. Tumer
SITE: Rinearson	START TIME: OSIYS END TIME: 07/27
	WIND (Beaufort Scale): 0 1 2 3
SITE FIELD NOTES:	

			I	TYP) DETE	ICAL CTIO	N	F	LYO	VER	RS	J U V	F L U S H	FIELD NOTES
			0 to	50m	> 5	50m	ASS	OC.	IN	D.	CNT	CNT	
STN#	START TIME	SPP. CODE	0-3 MIN	3-5 MIN	0-3 MIN	3-5 MIN	0-3 MIN	3-5 MIN	0-3 MIN	3-5 MIN			
3	07:06	MALL	11								4		
		WODU	1										
		MOFL	1	1						1			
		YGSW					11						
		WBNU	\										
		CAST	1/										
		SOSP	1	1									
		HOFI	1	1									
		UHMA	1						_				
		GBHE					1		_				
		CEDW		11									
		AMCR					-	11			_		
		BCCH		1	_		-						
		RWBL			-	11	-				-		
2	07:22	MALL	11						-				
		EUST		923			11		-				
		11950					1						
		HOFI	1										
		AMCR					1						
		AMRO	1	1									

					ICAL CTIO		F	LYO	VER	RS	J U V	F L U S H	FIELD NOTES
			0 to	50m	> 5	0m	ASS	SOC.	IN	D.	CNT	CNT	
STN#	START TIME	SPP.	0-3 MIN	3-5 MIN	0-3 MIN	3-5 MIN		3-5 MIN	0-3 MIN	3-5 MIN			
2	47	CAST SOSP BEWR SPTO AMGO	1					11					
.`													
				,									

Avian Point Count Data Sheet	
DATE: 6 8 23	OBSERVER: C. Tumer
SITE: Rinearson	START TIME: 05/30 END TIME: 07/00
	WIND (Beaufort Scale): 2 3
SITE FIELD NOTES:	

			I		ICAL CTIO	Ň	F	LYO	VER	RS	J U V	F L U S H	FIELD NOTES
			0 to	50m	> 5	60m	ASS	OC.	IN	D.	CNT	CNT	
STN#	START TIME	SPP. CODE	0-3 MIN	3-5 MIN	0-3 MIN	3-5 MIN	0-3 MIN	3-5 MIN	0-3 MIN	3-5 MIN			
2	05130	GBHE	١				1				-		
		4950					11						
		MALL	1/										
		SOSP	1	1							72		
		STJA	1\										
		MOFL	1		-		,						
	a a	AMCR		1	-		1						
		AMRO	1	1									
		BEWR		11									
		HOFI		1	-								
2	~ = . 111	RBSA	1	1	-								
3	05146	HOFI	1/										
		MALL	11								lo		
		SOSP	11	1							77.		
		AMRO	1										
		CAST	il										
		WBMU	1										
		NOFL	1										

				TYP DETE	ICAL CTIO		F	LYO	VER	RS .	J U V	F L U S H	FIELD NOTES
			0 to	50m	> 5	0m	ASS	SOC.	IN	D.	CNT	CNT	
STN#	START TIME	SPP. CODE	0-3 MIN	3-5 MIN	0-3 MIN	3-5 MIN	0-3 MIN	3-5 MIN	0-3 MIN	3-5 MIN			
3		BHGR	1										
		WEWP	1	b					-				
		CEDW		11				111	-		$\vdash$		
		EUST		1				111					
		BHCO		1				1					
		AMLR	,					1					
4	06:03	COYE											
		RWBL	11	,									
		SOSP	11	1			,						
		EUST	1				1						
		AMRO		1									
		CAST	1	1									
		BCCH											
		BEWR	1										
		ANHU	1	1									
		BHGR		11							13.5		
7	06:19	HOFI	1										
+	06,17	BCCH		1									
		BEWR	1										
		SPTO	1										
		HOFL											
		SOSP	11										
		Dowo		\									
		AMCR		-			11						
		BHGR		1									
		JA9N											

DATE: 6/8/23	OBSERVER: C. Tumer						
SITE: Rinearson	START TIME: 05/30 END TIME: 07/00						
CLD: <10% 10-50% 00-900 >90% Drizzle	WIND (Beaufort Scale): 0 1 2 3						
SHEFIELD NUIES:							
SHE FIELD NOTES:							
SITE FIELD NOTES:							

			I		ICAL CTION	N	F	LYO	VER	RS	J U V	F L U S H	FIELD NOTES
			0 to	50m	> 5	0m	ASS	OC.	IN	D.	CNT	CNT	
STN#	START TIME	SPP. CODE	0-3 MIN	3-5 MIN	0-3 MIN	3-5 MIN	0-3 MIN	3-5 MIN	0-3 MIN	3-5 MIN			
le	06133	SOSP	\										
		BRCR	1										
		SWTH	\				-				1000		
		DOWO	1									-	
		AMRO	1	1									
		BEWR	1										
		NOFL	1						_				
		ACTZ	-	11			_						
		BCCH		1			-						
		WBNU											
5	06:40	BEWR							-				
		SOSP					-		-				
		STJA	1				-		-			-	
		AMTRO			1.		-						
		SWTH	1				-		-				
		WBHU	1	1									
		DOMO		1									
		DEJU					-						
		SPTO											

				TYPICAL DETECTION			F	LYO	VER	RS	J U V	F L U S H	FIELD NOTES
			0 to	50m	> 5	0m	ASSOC.		IN	ID.	CNT	CNT	
STN#	START TIME	SPP. CODE	0-3 MIN	3-5 MIN	0-3 MIN	3-5 MIN		3-5 MIN	0-3 MIN	3-5 MIN			
	06:55	MALL SOSP AMPO EUST AMCR NOFL HOFI BEWR	1										

Avian Point Count Data Sheet  DATE: 628 23	OBSERVER: C. Tumer
SITE: Riverson	START TIME: OSISO END TIME: 07/14
CLD: <10% 10-50% 2-50% >90% Drizzle	WIND (Beaufort Scale): 0 1 2 3
SITE FIELD NOTES:	

			I		ICAL CTIO!	V	FLYOVERS				J U V	F L U S H	FIELD NOTES
			0 to	50m	> 5	0m	ASS	OC.	IN	D.	CNT	CNT	
STN#	START TIME	SPP. CODE	0-3 MIN	3-5 MIN	0-3 MIN	3-5 MIN	0-3 MIN	3-5 MIN	0-3 MIN	3-5 MIN			
1	05130	GBHE	1								1		
		OSPR					1						
		AMCR	11								Till a		
		SOSP	1								V-3		
		BEWR	1										
		AMRO	1										
		VGSW					11						
		VASW					1						
		EUST					1				14.11		
2	05:46	SOSP	1	1									
		AMRO	1	1									
		BRCR											
		BCCH											
		BHGR	1										
		DOWO	1										
		SWTH	1										
		STJA	1								-		
		WBNL		1									
		SPTO		1									

					PICAL CTIO		F	LYO	VER	RS	J U V	F L U S H	FIELD NOTES
			0 to	50m	> 5	0m	ASS	SOC.	IN	D.	CNT	CNT	
STN#	START TIME	SPP. CODE	0-3 MIN	3-5 MIN	0-3 MIN	3-5 MIN	0-3 MIN	3-5 MIN	0-3 MIN	3-5 MIN			
le	06:03	SOSP	1										
		BEWR	1										
		AMCR					1						
		STJA	1										
		MOFL	1										
		SPTO	1										
		AMRO	1										
		WBNU		1									
		WEWP		1									
		PEJU		1									
7	06:18	BEWR	1	1									
		SOSP	1	1			_		_				
		SPTO	1										
		AMRO											
		MOFL	1					11					
		AMCR						11					
		BCCH		1									
4	06:38	SOSP											
		NHWA	11										
		CEDW	11										
		COYE	11								-		
		RWBL	11										
		SPTO	1				1				1117111		
		EUST	1	-									
		AMRO	l	11									
		CAST		11				1					
		VASW		11				1					
		BUSH		1									
		NOFL		1									

DATE: 6/28/23	OBSERVER: C. Tumer							
SITE: Rinearson	START TIME: 05/30 END TIME: 07/14							
CLD: <10% 10-50% 80-90% >90% Drizzle	WIND (Beaufort Scale): 0 1 2 3							
SITE FIELD NOTES:								
SITE FIELD NOTES:								

			I	TYP) DETE	ICAL CTIO	N	F	LYO	VER	RS	J U V	F L U S	FIELD NOTES
			0 to	50m	> 5	0m	ASS	OC.	IN	D.	CNT	CNT	
STN#	START TIME	SPP. CODE	0-3 MIN	3-5 MIN	0-3 MIN	3-5 MIN	0-3 MIN	3-5 MIN	0-3 MIN	3-5 MIN			
3	06'53	MALL	11								5		
		GBHE	\										
		WODL	1										
		NOFL	1										
		CAST	11										
		VGSW					1						
		WBNU	1										
		HOFI	1	1									
		SOSP	1	-1									
		BEWR	-	1									
		AMCR						11					
		Eust						11					
		AMPO		1									
		NHMA		1									
2	07:09	OSPR					1						
		MALL	1111										
		HOF1	1/										
		SOSP	11										
		CAST	[]								-		
		AMPO	1										

Sheet	of	
011001	V.7.1	

FIELD L J TYPICAL **FLYOVERS** U U NOTES **DETECTION** V S H 0 to 50m > 50m ASSOC. IND. CNT CNT 0-3 3-5 MIN MIN 3-5 SPP. 0 - 33-5 0 - 33-5 0-3 START STN# MIN MIN MIN TIME CODE MIN MIN MIN 2 DEJU BEWR MOFL AMLR STJA

Date

	Birds per	Birds per	Birds per	Change	Habita	t Type
Species Name	<b>Station</b> (2023)	Station (2021)	Station (2014) <sup>1</sup>	from Baseline	Riparian	Upland
American Crow	1.14	1.05	0.47	(+)	X	X
American Goldfinch	0.10	0	0.38	(-)	X	X
American Robin	1.24	0.43	0.38	(+)	X	X
Anna's Hummingbird	0.33	0.19	0	(+)	X	X
Bald Eagle	0.05	0.10	0	(+)	X	X
Bewick's Wren	0.81	0.19	0.52	(+)	X	X
Black-capped Chickadee	0.38	0.19	0.71	(-)	X	X
Black-headed Grosbeak	0.33	0.24	0.28	(+)	X	X
Black-throated Gray Warbler	0	0	0.05	(-)	X	X
Brown Creeper	0.10	0.29	0.29	(-)	X	X
Brown-headed Cowbird	0.05	0	0.19	(-)	X	
Bushtit	0.05	0	0.09	(-)	X	X
California Scrub-Jay	0.71	0.19	0	(+)	X	X
Cedar Waxwing	0.38	0.62	0.28	(+)	X	
Common Yellowthroat	0.19	0.10	0	(+)	X	
Dark-eyed Junco	0.19	0.10	0	(+)	X	X
Downy Woodpecker	0.24	0.38	0.14	(+)	X	X
European Starling	0.71	0.62	0	(+)	X	X
Great Blue Heron	0.24	0.29	0.23	(+)	X	
Glaucous Gull	0	0.10	0	0	X	
House Finch	0.90	0.38	0.05	(+)	X	
Mallard	1.52	3.71	1.33	(+)	X	
Muscovy Duck	0	0.05	0	0	X	
Northern Flicker	0.52	0.29	0.05	(+)	X	
Osprey	0.14	0.10	0.05	(+)	X	
Red-breasted Sapsucker	0.10	0.10	0.05	(+)	X	X
Red-winged Blackbird	0.19	0	0.23	(-)	X	
Rufous Hummingbird	0	0	0.05	(-)	X	
Song Sparrow	1.81	1.38	2.05	(-)	X	X
Spotted Towhee	0.62	0.81	1.38	(-)	X	X
Steller's Jay	0.52	0.14	0	(+)	X	X
Swainson's Thrush	0.14	0	0.05	(+)	X	X
Townsend's Warbler	0	0.05	0	0	X	X
Turkey Vulture	0	0.05	0	0	X	
Vaux's Swift	0.10	0.10	0	(+)	X	
Violet-green Swallow	0.48	0.10	0	(+)	X	
Western Wood-Pewee	0.14	0	0	(+)	X	X
White-breasted Nuthatch	0.38	0.29	0.19	(+)	X	X
Willow Flycatcher	0	0.05	0.19	(-)	X	X
Wilson's Warbler	0	0	0.14	(-)	X	
Wood Duck	0.10	0	0.05	(+)	X	
Yellow Warbler	0	0.05	0	0	X	

Notes: 1. Baseline data were re-analyzed using seven plots rather than the original fifteen plots.



## Appendix G

Bald Eagle Data Sheets
(Digital Appendix)

Table 1. Bald Eagle Surveys - Rinearson Year 5 Monitoring Report

Date	Dawn/Dusk	On-site	On-site Minutes	On-site Habitat	Time and Behavior on-site (off-site)	Off-site	Off-site Minutes	Survey Minutes
3/15/2023	Morning	2 Ad	7	Water	flushed ducks and flew over site: 5 min; sub-adult followed: 2 min (flew to west bank)	0	0	120
3/27/2023	Dawn	0	0		(1 Ad sitting tall inside nest: 35 min)	1 Ad	35	135
3/30/2023	Dusk	2 Ad	14	Riparian	2 Ad soared together over site 3 times: 14 min (on/near nest; possibly feeding young: 110 min)	2 Ad	110	120
4/14/2023	Dawn	1 Ad	43	Riparian	1 Ad perched in dead-topped cottonwood on S end of island: 43 min (1 Ad in/near nest: 120 min)	1 Ad	120	120
4/21/2023	Dusk	0	0		-2 Ad perched in/near nest: 95 min; 2 Ad perched in DF tree: 8 min)		103	135
4/25/2023	Dawn	0	0		-2 Ad perched in/near nest: 125 min)		125	125
5/1/2023	Dusk	2 Ad	117	Riparian	1 Ad perched in dead-topped cottonwood on S end of island; when it flew to nest Ad 2 took its place: 117 min (1 Ad in/near nest: 120 min; 1 juv perched 130 min)	1 Ad, 1 2y	130	130
5/10/2023	Dawn	0	0		(1 Ad perched in nest: 97 min; 1-2 Ad perched in vicinity of nest throughout 135 min survey)	2 Ad	135	135
5/19/2023	Dusk	1 Ad	2	Riparian	1 Ad flew over site: 2 min (2 Ad perched in nest, feeding chick, or perched near nest: 100 min)	2 Ad	100	120
5/27/2023	Dawn	0	0		(1 Ad perched in / near nest: 32 min; 1 Ad flying in vicinity: 7 min)	1 Ad	39	120
6/2/2023	Dusk	1 2y	64	Riparian			43	120
6/5/2023	Dawn	1 2y	100	Riparian	1 2 year-old perched in mid-canopy of cottonwood on island 96 min; foraged for ducks in bay: 4 min (1 Ad perched near nest: 5 min; 1 juv perched downstream 20 min)		25	120
6/10/2023	Dusk	1 2y	52	Riparian	1 2 year-old foraging in bay: 2min; and perched atop snaggy cottonwood on island: 50 min (2 Ad in/near nest: 22 min; 3 juv flying over river: 20 min)	2 Ad, 3 2y	42	125
6/19/2023	Dawn	1 Ad	99	Riparian	1 Ad perched in cottonwood on island: 99 min (1 Ad in/near nest: 12 min; 3 juv on river: 3 min)	1 Ad, 3 2y	18	120
6/25/2023	Dusk	0	0		(1 2y over river: 1 min; 1 Ad on nest: 67 min)	1 Ad, 1 2y	68	120
7/4/2023	Dawn	1 Ad, 1 2y	56	Riparian	1 Ad flew over site: 1 min; 1 2y perched in cottonwood on island: 55 min (1 Ad & 1 2y flew over river: 3 min)	1 Ad, 1 2y	3	120
7/10/2023	Dusk	0	0		(1 Ad on nest; could not confirm young: 39 min)	1 Ad	39	120
7/19/2023	Dawn	1 Ad, 2 2y	113	Riparian	1 Ad perched in cottonwood at mouth of Meldrum channel: 85 min; 2 juv perched in BCW on island and flew over site: 28 min (2 Ad perched in/near nest 34 min)	2 Ad	34	120
7/28/2023	Dusk	0	0		(2 Ad in/near nest: 115 min; 1-2 Ad flying over river: 5 min)	2 Ad	120	120
8/4/2023	Dawn	0	0			0	0	120
8/10/2023	Dusk	2 Ad	57	Riparian	1 Ad perched in BCW on island; 1 Ad perched in BCW at Meldrum channel mouth 55 min; 1 attempt to catch duck: 2 min (2 Ad perched in/near nest: 67 min)		67	120
8/23/2023	Dawn	1 Ad	11	Riparian	1 Ad perched in BCW on island: 11 min (1 Ad perched 78 min; foraging attempt 1 min)	2 Ad	79	120
8/29/2023	Dusk	1 Ad	1	Water	1 Ad foraging attempt in Meldrum Bay: 1 min (1 Ad perched off site: 63 min; flew over river: 3 min)	1 Ad	66	120
		Total	736 26.05%		% of Total Survey	Total	1501 53 13%	2825

% of Total Survey Minutes 26.05%

% of Total Survey Minutes 53.13%

Date:	5/1/2023	57 degrees	Start:	18:10	Other Observations:				
Name:	C Galen	23 boats fishing	End:	20:20	Status of heron rookery -	1 of 25 nest	s visible due to B	CW leaf grow	rth .
		island flooded; overcast		2 hrs 10 min					
Observation	ns:				Abundance / species of bi	irds in Meld	rum Bay and vicin	ity:	
Time	Age*	Notes			2 Canada geese (~20 fora	ging upper f	ield), 14 mallards	, 4 great blue	e heron, song sparrow,
18:1019:2	9 A1	feeding young/eating 4 min; sitting	in nest		hairy woodpecker, 1 ospr	ey, America	an robin, Europea	n starlilng, ho	ouse finch, Bewick's wren
18:1019:2	0 A2	perched on site in dead topped black when osprey flew close by	ck cottonwood;	sang 18:55	9 American crow (4 haras	sing BE), sp	otted towhee		
18:10-20:20	) juv	1-2 year old; perched in BCW south	end of parking	lot; flew to W bank					
19:20-20:13	3 A2	A2 flew to nest, feeding young/eati perched on branch down stream of	ng/fixing nest u						
20:13-20:15	A2	flew to BCW snag on-site; perched	n same spot (ce	enter top)	On-site Summary:		# Min.	# Eagles	Notes
19:29-20:14	A1	flew to dead topped black cottonwo	ood on site; per	ched left side	Adult bald eagle perching		117	2	switched places
20:14-20:19	) A1	flew to nest; feeding young/eating			Adult bald eagle foraging				
20:15-20:17	' A2	flew to nest; feeding young/eating			Adult bald eagle nesting				
20:17-20:20	) A2	flew south to DF tree above trident	snag ustream o	of nest	Adult bald eagle: other				
20:19-20:20	) A1	joined A2; then flew back to nest			Juvenile bald eagle				
						Total	117		
Note: too da	ark to see aft	er 20:20; sunset at 20:17							
					Vicinity Summary:		# Min.	# Eagles	Notes
					Adult bald eagle perching	;	4	1-2	S. of nest
Protocol:					Adult bald eagle foraging				
Dawn surve	ys: Start 15 n	nin before sunrise, 2 hrs			Adult bald eagle nesting		139	1-2	switched places
Dusk survey	s: Start 2 ho	urs before sunset			Adult bald eagle: other				
					Juvenile bald eagle		130	1	perched in BCW
						Total	273 min (130	) min of surve	ey)

Date:	6/2/2023	75 degrees	Start:	19:00	Other Observations:				
Name:	C Galen	15+ boats fishing	End:	21:00					
		island present, sunny			Abundance / species of bi	rds in Meldrum	Bay and vicin	ity:	
<b>Observation</b>	<u>s:</u>				32 Canada geese, 20 mall	ards, 9 Americar	r crows, 3 turl	key vultures,	song sparrow,
Time	Age*	Notes			American robin, cedar wa	xwing, red-brea	sted sapsucke	er, Bewick's v	vren, house finch,
19:00-19:32	A1	Perched in dead branches of cottonwo	od below ar	nd to the	red-winged blackbird, bla	ck-capped chick	adee, brown o	creeper, spot	tted towhee, tree
		right of nest; flew down towards river	and lost due	to sun	swallow, glaucous-winged	d gull, Califrnia g	ull		
19:36-20:40	Juv	1-2 year old perched atop cottonwood	on site on is	sland					
		dive-bombed by American crows							
20:4920:51	. A1	Perched on nest; then flew to branch t	o the left an	d near nest	On-site Summary:		# Min.	# Eagles	Notes
20:51-21:00	A1	Perched near nest			Adult bald eagle perching				
20:56-21:00	A2	Perched with A1 adjacent to nest			Adult bald eagle foraging				
					Adult bald eagle nesting				
					Adult bald eagle: other				
					Juvenile bald eagle		64	1	perched atop dead br.
						Total	64		facing river
					Vicinity Summary:		# Min.	# Eagles	Notes
					Adult bald eagle perching				most likely longer
					Adult bald eagle foraging				sun in eyes and difficult
					Adult bald eagle nesting		43	2	to see until 20:10
Protocol:					Adult bald eagle: other				
Dawn survey	s: Start 15 m	n before sunrise, 2 hrs			Juvenile bald eagle				
Dusk surveys	s: Start 2 hou	rs before sunset, 2 hrs				Total	43+		
	sun behind	west bank hill 20:10							

	ver below boulder; island showing	End:	7:45						
O BALD EAG			7.43						
	GLES OBSERVED			Abundance / species of bir	ds in Meld	rum Bay and vicir	nity:		
e* No	otes			20 Canada geese, 50 mallards, 20 American crow, 1 osprey, 2 turkey vultures (pe 3 great blue heron (1 on site), California gull, double-crested cormorant, downy/hairy woodpecker, black-capped chickadee, Vaux's swift, and glaucous-w					
				On-site Summary: Adult bald eagle perching Adult bald eagle foraging Adult bald eagle nesting Adult bald eagle: other Juvenile bald eagle	0	# Min.	# Eagles	Notes	
					Total	0			
				Vicinity Summary: Adult bald eagle perching Adult bald eagle foraging Adult bald eagle nesting Adult bald eagle: other Juvenile bald eagle	0 Total	<b># Min.</b> 0	# Eagles	Notes	
	art 15 min	art 15 min before sunrise, 2 hrs rt 2 hours before sunset, 2 hrs	art 15 min before sunrise, 2 hrs	art 15 min before sunrise, 2 hrs	3 great blue heron (1 on si downy/hairy woodpecker,  On-site Summary: Adult bald eagle perching Adult bald eagle foraging Adult bald eagle nesting Adult bald eagle: other Juvenile bald eagle  Vicinity Summary: Adult bald eagle  Vicinity Summary: Adult bald eagle perching Adult bald eagle foraging Adult bald eagle nesting Adult bald eagle nesting Adult bald eagle nesting Adult bald eagle nesting Adult bald eagle: other	On-site Summary: 0 Adult bald eagle perching Adult bald eagle nesting Adult bald eagle: other Juvenile bald eagle Total  Vicinity Summary: 0 Adult bald eagle perching Adult bald eagle Total  Vicinity Summary: 0 Adult bald eagle perching Adult bald eagle Total  Adult bald eagle perching Adult bald eagle perching Adult bald eagle perching Adult bald eagle perching Adult bald eagle foraging Adult bald eagle nesting Adult bald eagle nesting Adult bald eagle nesting Adult bald eagle nesting Adult bald eagle: other Juvenile bald eagle	On-site Summary:  On-site Summary:  Adult bald eagle perching  Adult bald eagle nesting  Adult bald eagle:  Adult bald eagle:  Total  O  Vicinity Summary:  Adult bald eagle perching  Adult bald eagle  Total  O  Vicinity Summary:  Adult bald eagle perching  Adult bald eagle  Total  Adult bald eagle  Total  Adult bald eagle  Total  Adult bald eagle perching  Adult bald eagle nesting  Adult bald eagle  Total	3 great blue heron (1 on site), California gull, double-crested cormora downy/hairy woodpecker, black-capped chickadee, Vaux's swift, and  On-site Summary: 0 # Min. # Eagles Adult bald eagle perching Adult bald eagle foraging Adult bald eagle nesting Adult bald eagle: other Juvenile bald eagle  Total 0  Vicinity Summary: 0 # Min. # Eagles Adult bald eagle perching Adult bald eagle perching Adult bald eagle foraging Adult bald eagle foraging Adult bald eagle perching Adult bald eagle foraging Adult bald eagle foraging Adult bald eagle nesting Adult bald eagle: other Juvenile bald eagle  Union with the perchange of the purchase of t	

Date:	7/4/2023	59 degrees F; 100% clear	Start:	5:20	Other Observations:						
Name:	C Galen	River below boulder; island showing	End:	7:20							
		,			Abundance / species of bird	ds in Meldrum	Bay and vicin	nity:			
Observation	ns:				10 Canada geese, 20 mallar	rds, 12 Americ	can crow, 1 os	prey, 20 turk	ey vultures (perched)		
Time	Age*	Notes			2 great blue heron (on site), belted kingfisher, spotted towhee, Swainson's thrush,						
5:30-5:31	Ad1	Flew up stream; over trees on west ba	nk and out	of sight	song sparrow, black-capped	d chickadee, V	/aux's swift, tr	ee swallow, a	and glaucous-winged gull.		
5:31-5:32	Ad2	Flew over on site cottonwood; downstr	eam and or	ut of sight							
6:00-6:01	Ad1	Flew over river; downstream and out o	f sight		3' dead salmon on gravel riv	verbank attra	cted great blu	e heron, turk	ey vultures, and crow.		
6:01-6:02	Juv	Flew downstream and then upstream of	ver west ba	ank.	the gbh was possessive and	d pecked at 2	of the 8 vultur	es but didn't	scare them away.		
6:25-7:20	Juv	Perched in cottonwood on site, on islar	nd; 1.5-2 ye	ars old							
					On-site Summary:		# Min.	# Eagles	Notes		
					Adult bald eagle perching						
					Adult bald eagle foraging						
					Adult bald eagle nesting						
					Adult bald eagle: other		1	1	flew over site		
					Juvenile bald eagle		55	1	perched		
						Total	56	2			
					Vicinity Summary:		# Min.	# Eagles	Notes		
					Adult bald eagle perching						
					Adult bald eagle foraging						
Protocol:					Adult bald eagle nesting						
Dawn surve	ys: Start 15 n	nin before sunrise, 2 hrs			Adult bald eagle: other		2	2	flew over river		
Dusk survey	/s: Start 2 ho	urs before sunset, 2 hrs			Juvenile bald eagle		1	1			
[						Total	3	3			

Date:	6/5/2023	52 degrees F; clear	Start:	5:30	Other Observations:				
Name:	C Galen	River below boulder; island showing	End:	7:30					
		6 fishing boats (shad; no salmon)			Abundance / species of bit	rds in Meldrui	m Bay and vicin	nity:	
<u>Observation</u>	ns:				6 (+4 chicks) mallards, 12 /	American crov	w, 1 osprey, 3 g	reat blue her	on (fly overs), belted
Time	Age*	Notes			kingfisher, spotted towher	e, yellow warb	oler, American ı	robin, spotte	d sandpiper,
5:30-5:35	Α	On branch to the left of nest; then flew	upriver and	over east bank	tree swallow.				
5:30-5:45	Juv (2y)	Perched on site; midway up left cotton	wood on isla	and					
5:45-5:47	Juv (2y)	Flew down river			On-site Summary:		# Min.	# Eagles	Notes
5:47-6:05	Juv (2y)	Perched downstream off site in cotton	wood		Adult bald eagle perching				
6:05-6:41	Juv (2y)	Perched on site; midway up left cotton	wood on isla	and	Adult bald eagle foraging				
6:41-6:45	Juv (2y)	Hunting over bay; diving at female mal	lard and 4 ch	nicks but no	Adult bald eagle nesting				
		meal; crows chased and continued to h	narass after e	eagle perched	Adult bald eagle: other				
6:45-7:30	Juv (2y)	Perched on site; midway up left cotton	wood on isla	and	Juvenile bald eagle		100	1	foraging 4 min
						Total	100		
					Vicinity Summary:		# Min.	# Eagles	Notes
					Adult bald eagle perching				
					Adult bald eagle foraging				
					Adult bald eagle nesting		5	1	
					Adult bald eagle: other				
					Juvenile bald eagle		20	1	
Protocol:						Total	25		
Dawn surve	eys: Start 15 mi	n before sunrise, 2 hrs							
Dusk survey	ys: Start 2 hour	s before sunset, 2 hrs							

Date:	8/10/2023	77 degrees F; 100% clear	Start:	18:50	Other Observations:				
Name:	C Galen	River low; long dry peninsula	End:	20:50					
		Sun below west bank trees at 19:52							
Observation	ns:				Abundance / species of bi	ds in Meldrum	n Bay and vicir	nity:	
Time	Age*	Notes			25 Canada geese, 25 malla	rds, 25 Ameri	can crow, 1 os	prey, 2 glauc	ous-winged gulls
18:50-19:54	2Ad	2 Ad perched in nest tree or in nest			5 turkey vultures, 2 great I	olue heron, 1 s	ong sparrow,	2 Vaux's swif	t, & 5 purple martin
19:54-20:49	Ad1	Flew to site; perched on black cottony	vood on island						
19:54-19:56	Ad2	Perched in nest							
19:56-19:58	Ad2	Flew to Meldrum Bay; attempted to ca	atch duck.		On-site Summary:		# Min.	# Eagles	Notes
19:58-20:49	Ad2	Perched in cottonwood on mainland a	cross from isla	and	Adult bald eagle perching		55	2	
20:49-20:50	2Ad	2 Ad perched in nest.			Adult bald eagle foraging		2	1	lame attempt
					Adult bald eagle nesting				
					Adult bald eagle: other				
					Juvenile bald eagle				
1 osprey div	e-bombed eag	gles perched on site $\sim$ 6-8 times and the	n left; eagles u	nbothered		Total	57		
site very noi	isy with jet ski	s (4) and motor boats (2)							
					Vicinity Summary:		# Min.	# Eagles	Notes
					Adult bald eagle perching		67	2	
					Adult bald eagle foraging				
NOTE: surve	eyed from boa	t ramp and peninsula			Adult bald eagle nesting				
					Adult bald eagle: other				
Protocol:					Juvenile bald eagle				
Dawn surve	ys: Start 15 mi	n before sunrise, 2 hrs				Total	67		
Dusk survey	s: Start 2 hour	s before sunset, 2 hrs							

Date:	6/10/2023	71 degrees F; clear	Start:	18:55	Other Observations:					
Name:	C Galen	River low; long dry peninsula	End:	21:00						
		No island; easy to drive to tip			Abundance / species of bi	rds in Meldrur	n Bay and vicir	nity:		
Observations	<u>s:</u>	Sun blinding until after 20:38			75 Canada geese w/43 chicks, 50 mallards w/12 chicks, 25 American crow, 1 osprey,					
Time	Age*	Notes			2 red-tailed hawk, 3 turke	y vultures, 3 gi	reat blue heroi	n (1 on bank)	. American robin,	
19:00-19:02	Juv1	Flew up and down river out of site;	viewed from so	uth point	killdeer, glaucous-winged	gull, spotted t	owhee, black-o	capped chick	adee, tree swallow.	
19:20-19:50	Juv1	Perched on site; near top of dead b	rances of cottor	nwood on island	song sparrow, European s	tarling, lesser į	goldfinch, Ame	erican goldfin	ch, killdeer, brown creeper?	
19:50-19:52	Juv1	Flew down river; heard adult sing b	ut couldn't loca	te						
19:52-19:57	Juv1	Perched on site in same site cotton	wood in mid-cai	nopy	On-site Summary:		# Min.	# Eagles	Notes	
19:57-19:58	Juv. 1&2	Flew up river together and over fir	trees on west ba	ank	Adult bald eagle perching					
20:06-20:10	3 Juv	Flew upstream and above fir trees	on west bank		Adult bald eagle foraging					
20:18-20:20	Juv1	Foraging or ducks/ducklings over b	ay at boat ramp		Adult bald eagle nesting					
20:18-20:33	Juv1	Perched on site; midway up left co	tonwood on isla	and	Adult bald eagle: other					
20:33-20:38	2 Juv	Flew upsteam; out of site			Juvenile bald eagle		52	1	perched in BCW on island	
20:38-20:50	Ad	Perched above nest				Total	52		Foraging in bay (2 min)	
20:50-21:00	2 Ad	Perched in nest; bobbing; billing								
20:54-20:58	2 Juv	Flew upstream over river and fir tro	ees		Vicinity Summary:		# Min.	# Eagles	Notes	
					Adult bald eagle perching					
					Adult bald eagle foraging					
NOTE: began	survey at BE	point 3 in NW corner of site; then w	ent to boat ramp	o	Adult bald eagle nesting		22	1-2	in/near nest	
					Adult bald eagle: other					
Protocol:					Juvenile bald eagle		20	1-3	flying over river	
Dawn surveys	s: Start 15 mi	n before sunrise, 2 hrs				Total	42			
Dusk surveys	: Start 2 hour	s before sunset, 2 hrs								

Date:	5/10/2023	44 degrees; clear skies	Start:	5:50	Other Observations:				
Name:		Very High River level; covers rx	End:	8:05					
					Abundance / species of bir	ds in Meldrum	Bay and vicir	nity:	
<u>Observatio</u>	ns:				9 Canada geese + 3 downy	geese (in N sid	de meadow), :	10 mallards (+	-4 ducklings)
Time	Age*	Notes			2 great blue heron (+6 fly	overs), song sp	arrow, Ameri	can robin, Am	erican crow
5:50-6:00	A1, A2	perched in DF behind trident-topped	tree left of ne	st	downy woodpecker, killde	er			
6:00-6:10	A1, A2	flew downstream together; out of sig	ht						
6:10-7:47	A1	flew back to nest; apeared to feed yo	ung; and sat ir	n nest					
6:10-8:05	A2	flew to tallest DF left of nest; perched	i		On-site Summary:	0	# Min.	# Eagles	Notes
7:47-8:05	A1	flew to tallest DF left of nest; perched	l near A2		Adult bald eagle perching				
					Adult bald eagle foraging				
					Adult bald eagle nesting				
					Adult bald eagle: other				
					Juvenile bald eagle				
						Total	0		
					Vicinity Summary:		# Min.	# Eagles	Notes
					Adult bald eagle perching				
					Adult bald eagle foraging				
					Adult bald eagle nesting		135	1-2	in/near nest
					Adult bald eagle: other				
Protocol:					Juvenile bald eagle				
Dawn surve	ys: Start 15 mi	n before sunrise, 2 hrs				Total	135		
Dusk survey	ys: Start 2 hour	s before sunset, 2 hrs							

Date:	4/14/2023	Start: 6	5:20 AM	Other Observations:	River high and r	muddy; no is	sland showin	g Temp.: 38-42 deg. F.
Name:	C. Galen	<b>End</b> : 8	3:20 AM	Status of heron rookery - a	bout 25 nests			
<u>Observatio</u>				Abundance / species of bir		,	,	
Time	Age*	Notes		7 Canada geese, 8 mallard				
6:20-8:20	A1	Ad sitting low on nest and appears to be feeding young.		3 American crow, 2 song s				
6:20- 6:30	A2	Ad sitting on branch in nest tree below nest; flew but los	_	spotted towhee, gc sparro				•
6:57-7:40	A2	Ad perched on site atop tallest BCW tree on island opp. faced Willamette River	Nest;	European starling, America	an goldfinch, Hai	ry woodpec	ker, fox sparı	ow, rc kinglet
7:40-8:08	A2	Ad flew up river; perched in mid-canopy below Heronry						
				On-site Summary:		# Min.	# Eagles	Notes
				Adult bald eagle perching		43	1	
				Adult bald eagle foraging				
				Adult bald eagle nesting				
				Adult bald eagle: other				
				Juvenile bald eagle				
					Total	43		
				Vicinity Summary:		# Min.	# Eagles	Notes
				Adult bald eagle perching				
Protocol:	Best observa	ation from boat ramp		Adult bald eagle foraging				
Dawn surve	eys: Start 15 mi	n before sunrise, 2 hrs		Adult bald eagle nesting		120	2	in/near nest
Dusk survey	ys: Start 2 hour	s before sunset, 2 hrs		Adult bald eagle: other				
				Juvenile bald eagle				
					Total	120		

Date:	3/15/2023		Page:	1	Other Observations:					
Name:	C. Galen		Start:	8:30	Status of heron rookery - about 25 ne	ests				
			End:	10:30						
Observations:					Abundance / species of birds in Meld	rum Bay and vicinit	:y:			
Time	Age*	Notes			Canada goose, mallard, hooded merg	ganser, common me	erganser, belted	l kingfisher,		
9:55-10:00	Α	Flew into site from River towards pond	; flushed du	icks but	red-tailed hawk, glaucous-winged gull, song sparrow, golden-crowned sparrow,					
		didn't appear to catch any and flew acr	oss river aft	ter 5 minutes	Bewick's wren, red-winged blackbird, white-breasted nuthatch, black-capped chickadee,					
10:00-10:02	sub-A	4 year old BE flew out from pond with a out of sight and lkely on-site	A; likely had	l been perched						
					On-site Summary:	# Min.	# Eagles	Notes		
					Adult bald eagle perching					
					Adult bald eagle foraging	7	2	flushed ducks		
					Adult bald eagle nesting					
					Adult bald eagle: other					
Note: toured site	between 8:30	-9:45			Juvenile bald eagle					
Protocol:					Vicinity Summary:	# Min.	# Eagles	Notes		
Dawn surveys: Sta	art 15 min bef	ore sunrise, 2 hrs			Adult bald eagle perching	5	2	flew across river; lost in trees		
Dusk surveys: Star	rt 2 hours befo	ore sunset, 2 hrs			Adult bald eagle foraging					
					Adult bald eagle nesting					
					Adult bald eagle: other					
					Juvenile bald eagle					

Date:	7/19/2023	63 degrees F; 100% clear	Start:	5:30	Other Observations:							
Name:	C Galen	River below boulder; island showing	End:	7:30								
					Abundance / species of bir	rds in Meldrum	Bay and vicir	nity:				
Observation	ns:				40 Canada geese, 45 malla	ards, 12 America	an crow, 1 os	prey, 2 turke	y vultures (perched)			
Time	Age*	Notes			4 great blue heron (on site	e), belted kingfis	her, spotted	towhee, son	g sparrow, tree swallow,			
5:30-5:37	2Ad	Perched in nest			black-headed grosbeak, black-capped chickadee, Vaux's swift, and 4 glaucous-winged gull,							
5:30-5:56	Juv	Perched in cottonwood on site, on islar	nd; 2 year old		house finch, and American goldfinch.							
5:37-5:56	Ad1	Perched in nest										
5:37-5:38	Ad2	Flew downstream and out of sight			On-site Summary:		# Min.	# Eagles	Notes			
5:57-5:58	2Juv	Flew together over island on site			Adult bald eagle perching		85	1	perched and preening			
6:01-6:02	Juv	Landed in cottonwood on island, then f	lew upstrean	n.	Adult bald eagle foraging							
6:03-6:04	Juv2	Flew upstream over river			Adult bald eagle nesting							
6:05-7:30	Ad	Perched in tall westernmost cottonwood	d on east ba	nk of outlet	Adult bald eagle: other							
					Juvenile bald eagle		28	1-2	perched & flew over site			
						Total	113					
					Vicinity Summary:		# Min.	# Eagles	Notes			
					Adult bald eagle perching							
					Adult bald eagle foraging							
					Adult bald eagle nesting		33	1-2				
					Adult bald eagle: other		1	1	flew over river			
Protocol:					Juvenile bald eagle							
Dawn surve	Dawn surveys: Start 15 min before sunrise, 2 hrs					Total	34					
Dusk survey	Dusk surveys: Start 2 hours before sunset, 2 hrs											

Date:	6/19/2023	48 degrees F; 100% overcast	Start:	5:15	Other Observations:				
Name:	C Galen	River below boulder; island showing	End:	7:15					
		O fishing boats; beaver eating cottonwood	d leaves at	t edge of bay;	Abundance / species of bi	ds in Meldrum	Bay and vicin	ity:	
<b>Observation</b>	Observations: beaver walked beneath thicket after ~30 min			15 Canada geese, 13 malla	ırds (+6 chicks),	3 American o	row, 2 ospre	y, 3 great blue heron (FO),	
Time	Age*	Notes			belted kingfisher, spotted	towhee, yellow	warbler, Am	erican robin,	Swainson's thrush
5:15-5:27	Ad1	On branch to the left of nest; then flew to	trident tr	ree	black-headed grosbeak, song sparrow, Bewick's wren, tree swallow, glaucous-winged gull				
5:23-5:24	2 Juv	1 fying over river upstream; 1 flying over r	river dowr	nstream	Caspian tern, northern flic	ker, and brown	creeper.		
5:27-5:29	Ad1	Perched in trident tree; flew south out of	site						
5:30-6:14	Ad2	Perched in cottonwood on island; not visil	ble right a	way; heard song					
6:14-6:17	Ad2	Flew downstream and upstream and back	to perch	on site	On-site Summary:		# Min.	# Eagles	Notes
6:17-7:03	Ad2	Perched in cottonwood on site, on island			Adult bald eagle perching		99	1	
6:23-6:25	Juv3	Perched on beach across river; mobbed by	y crows; f	lew upstream	Adult bald eagle foraging				
7:03-7:06	Ad2	Flew to trident tree and perched			Adult bald eagle nesting				
7:06-7:15	Ad2	Flew low over river and perched on site in	island co	ttonwood tree	Adult bald eagle: other				
					Juvenile bald eagle				
						Total	99	1	
					Vicinity Summary:		# Min.	# Eagles	Notes
					Adult bald eagle perching			_	
					Adult bald eagle foraging				
					Adult bald eagle nesting		12	1	in/near nest
Protocol:					Adult bald eagle: other		3	1	flew over river
Dawn survey	Dawn surveys: Start 15 min before sunrise, 2 hrs				Juvenile bald eagle		3	3	
Dusk surveys	Dusk surveys: Start 2 hours before sunset, 2 hrs					Total	18	5	
1		·							

Date:	5/19/2023	83 degrees; clear skies	Start:	18:30	Other Observations:				
Name:	C Galen	Highest river level yet; up ramp	End:	20:30					
		to base of highest rocks							
Observation	<u>s:</u>	*Sun is blinding; difficult to see in nes	t until 20:03		Abundance / species of bir	ds in Meldrum	Bay and vicin	ity:	
Time	Age*	Notes			8 Canada geese, 12 adult n	nallards with 6	chicks, 1 turk	ey vulture, 2	American crows,
18:48-18:50	A1	Adult flew over site			2 glaucous-winged gulls, 2	great blue here	on, spotted to	whee, song	sparrow
18:50-20:09	A1	Adult perched below and to Right of n	est in branche	s of snag					
20:09-20:11	A1	Adult flew to angled branch left of nes	t; flew behind	trees					
20:11-20:22	A2	landed on nest; feeding young; 1 your	ig visible (smal	I and downy)					
20:19-20:28	A1	landed on branch near nest; flew out of	of sight behind	trees					
20:22-20:27	A2	flew to and perched in maple tree sou	th of nest						
20:27-20:30	A2	flew to nest			On-site Summary:		# Min.	# Eagles	Notes
					Adult bald eagle perching				
					Adult bald eagle foraging				
					Adult bald eagle nesting				
					Adult bald eagle: other		2	1	flew over site
					Juvenile bald eagle				
						Total	2		
					Vicinity Summary:		# Min.	# Eagles	Notes
					Adult bald eagle perching				
Protocol:					Adult bald eagle foraging				
Dawn survey	Dawn surveys: Start 15 min before sunrise, 2 hrs			Adult bald eagle nesting		100	1-2	perched in/near nest	
Dusk surveys	Dusk surveys: Start 2 hours before sunset			Adult bald eagle: other					
					Juvenile bald eagle				
						Total	100	2	in/nearnest

Date:	4/21/2023	53-58 deg F.	Start:	18:00	Other Observations:			
Name:	C Galen	high tide	End:	20:15	Status of heron rookery - about 25 nes	ts		
<b>Observation</b>	<u>s:</u>				Abundance / species of birds in Meldru	ım Bay and vicin	ity:	
Time	Age*	Notes			2 Canada geese, 12 mallards, 2 osprey,	, 2 peregrine falo	ons, 1-2 red	tailed hawks,
18:00-18:34	A1	Sitting in nest; head, neck, back visib	ole; flew W. ou	ıt of sight	3 great blue heron, 1 glacous-winged g	gull, 1 Herring gu	II?, northern	flicker, song sparrow
18:39-18:47	A1, A2	2 Adults perched atop DF NE of nest	; Tallest tree to	o east	double-crested cormorant, American c	row, hairy wood	pecker, Ame	rican robin, American
18:47	A2	1 Adult flew downstream out of sigh	t; fisher said c	chased osprey	goldfinch, lesser goldfinch, spotted tov	vhee, black-capp	ed chickade	e, ruby-crowned kinglet
18:47-19:39	A1	A1 flew to nest fed young 2x (5 min	each); sat in n	est	red-winged blackbird, and turkey vultu	ire. 1 Beaver swi	mming and s	lapping tail in bay.
19:39-19:41	A1, A2	2 adults on nest rim; A1 flew off; A2	perched on br	ranch near nest				
19:41-19:48	A2	A2 remained by nest; flew upreiver	out of sight					
					On-site Summary:	# Min.	# Eagles	Notes
					Adult bald eagle perching			
					Adult bald eagle foraging			
					Adult bald eagle nesting			
					Adult bald eagle: other			
					Juvenile bald eagle			
					Total	0		
					Vicinity Summary:	# Min.	# Eagles	Notes
					Adult bald eagle perching	8	2	in tall DF
Protocol:					Adult bald eagle foraging			
Dawn survey	Dawn surveys: Start 15 min before sunrise, 2 hrs				Adult bald eagle nesting	95	1-2	
Dusk surveys: Start 2 hours before sunset, 2 hrs				Adult bald eagle: other				
<u> </u>					Juvenile bald eagle			
					Total	103		

Date:	8/23/2023	55 degrees F; 100% overcast	Start:	6:10	Other Observations:					
Name:	C Galen	River low; bar long and dry	End:	8:10						
					Abundance / species of bi	rds in Meldrum I	Bay and vicir	nity:		
Observation	ns:				40 Canada geese, 40 malla	ards, 50 America	n crow, 2 os	prey, 16 turk	ey vultures (10 perched)	
Time	Age*	Notes			1 great blue heron on site, California gull, glaucous-winged gull, double-crested cormorant,					
6:10-6:21	Ad1	Perched on site in cottonwood on rive	rside of island		hairy woodpecker, black-capped chickadee, Vaux's swift, barn swallow, tree swallow,					
6:21-6:29	Ad1	Flew downstream when osprey bomb	ed twice; perc	hed off site.	belted kingfisher, and 2 spotted sandpiper.					
6:29-7:35	Ad2	Perched in cottonwood on west bank								
7:35-7:36	Ad2	Foraged over river; no catch								
7:36-7:40	Ad2	Perched in cottonwood on west bank;	flew out of sit	te	On-site Summary:		# Min.	# Eagles	Notes	
					Adult bald eagle perching		11	1	Perched in BCW on island	
					Adult bald eagle foraging					
					Adult bald eagle nesting					
					Adult bald eagle: other					
					Juvenile bald eagle					
						Total	11			
					Vicinity Summary:		# Min.	# Eagles	Notes	
					Adult bald eagle perching		78	1		
					Adult bald eagle foraging		1	1		
					Adult bald eagle nesting					
Protocol:					Adult bald eagle: other					
Dawn surveys: Start 15 min before sunrise, 2 hrs				Juvenile bald eagle						
Dusk survey	Dusk surveys: Start 2 hours before sunset, 2 hrs					Total	79			
					1					

Date:	4/25/2023	42 degrees	Start:	5:55	Other Observations:					
Name:	C Galen	25 boats fishing; ramp busy	End:	8:00	Status of heron rookery - about 25 nests					
		island mostly flooded								
<b>Observation</b>	ns:				Abundance / species of bir	rds in Meldr	um Bay and vici	nity:		
Time	Age*	Notes			10 Canada geese, 4 mallards, 2 American crow, 4 great blue heron, 1 DC cormorant,					
5:55-6:10	2A (A1, A2)	A1 in nest; A2 perched on branch le	eft of nest		1 belted kingfisher, 1 ospr	ey (perched	above boat ran	np), song sparro	w, downy woodpecker	
6:10-6:13	A1, A2	A1 & A2 flew down river			northern flicker, spotted to	owhee, ruby	y-crowned kingl	et, American go	ldfinch, Amer. Robin	
6:13-7:32	A1	flew back to nest			black capped chickadee, a	nd house fir	nch.			
?-7:32	A2	perched in trident topped tree to the	ne left of nest tr	ee						
7:32-7:44	A1, A2	flew upriver together and perched west bank; preening	in tallest evergr	een tree on						
7:44-8:00	A1	flew to nest and remained in nest u	ıntil end		On-site Summary:	0	# Min.	# Eagles	Notes	
7:44-8:00	A2	remained perched in tall tree			Adult bald eagle perching					
					Adult bald eagle foraging					
					Adult bald eagle nesting					
					Adult bald eagle: other					
					Juvenile bald eagle					
						Total	0 bald eagle	s on site		
					Vicinity Summary:		# Min.	# Eagles	Notes	
					Adult bald eagle perching		80	1		
Protocol:					Adult bald eagle foraging					
Dawn surve	ys: Start 15 mii	n before sunrise, 2 hrs			Adult bald eagle nesting		110	1		
Dusk surveys: Start 2 hours before sunset, 2 hrs				Adult bald eagle: other						
					Juvenile bald eagle					
						Total	125	Perched in/ne	ar nest	

Date:	6/25/2023	79 degrees F; clear	Start:	18:50	Other Observations:				
Name:	C Galen	River low; long dry peninsula	End:	20:50					
		No island; easy to drive to tip			Abundance / species of bir	rds in Meldrui	m Bay and vicin	ity:	
Observation	ıs:	Sun blindng until 20:28; 8 jet skis, 1 kay	ak, 1 paddleb	ooard, 4 motor	18 Canada geese w/6 you	ng, 20 mallard	ls w/3 chicks, 2	20 American	crow, 1 osprey,
Time	Age*	Notes			2 tree swallows, 3 turkey v	ultures, 3 gre	eat blue heron (	1 on bank),	1 glaucous-winged gull
19:03-19:04	Juv1	Off-site downstream; Flew from fir tree	s and down r	iver out of site					
19:23-20:30	Ad1	Perched on nest; flew downstream							
					On-site Summary:	0	# Min.	# Eagles	Notes
					Adult bald eagle perching				
					Adult bald eagle foraging				
					Adult bald eagle nesting				
					Adult bald eagle: other				
					Juvenile bald eagle				
						Total	0		
					Vicinity Summary:		# Min.	# Eagles	Notes
					Adult bald eagle perching				
					Adult bald eagle foraging				
					Adult bald eagle nesting		67	1	perched in nest
					Adult bald eagle: other				
					Juvenile bald eagle		1	1	
Protocol:						Total	68		
		n before sunrise, 2 hrs							
Dusk survey	s: Start 2 hour	s before sunset, 2 hrs							

Date:	3/27/2023		Start:	7:30	Other Observations:				
Name:	C. Galen		End:	9:45	Status of heron rookery - a	about 25 nes	ts		
<u>Observatio</u>					Abundance / species of bi		•	•	
Time	Age*	Notes			4 Canada geese, 14 mallar		•		
9:10-9:45	1 Ad	Off-site on nest; sitting tall; likely eggs	natched		1 red-tailed hawk, 6 Amer		_	_	
					1 Bewick's wren, 4 Americ	an robin, 4 s	ong sparrow, 3	spotted towh	ee,
					1 Northern flicker, 4 red-b	reasted saps	suckers, and 4 bl	ack-capped c	hickadees.
					On-site Summary:	0	# Min.	# Eagles	Notes
					Adult bald eagle perching				
					Adult bald eagle foraging				
					Adult bald eagle nesting				
					Adult bald eagle: other				
					Juvenile bald eagle				
						Total			
					Vicinity Summary:		# Min.	# Eagles	Notes
					Adult bald eagle perching				
Protocol:					Adult bald eagle foraging				
Dawn surve	eys: Start 15 mir	n before sunrise, 2 hrs			Adult bald eagle nesting		35	1	sitting tall on nest
Dusk surve	ys: Start 2 hours	before sunset, 2 hrs			Adult bald eagle: other				in BCW tree across river
					Juvenile bald eagle				
						Total	35	1	

5/27/2023	57 degrees F; clear/overcast	Start:	5:30	Other Observations:			
C Galen	River high w/ no island showing	End:	7:30				
				Abundance / species of birds in Mel	drum Bay and vicir	nity:	
ns:				12 Canada geese, 11 mallards, 2 Am	nerican crow, 1 grea	at blue heron	(6 fly overs),
Age*	Notes			yellow warbler, spotted towhee, so	ng sparrow, hairy v	voodpecker,	cedar waxwing,
Α	On nest and branch to the right of no	est		American goldfinch, house finch, bla	ack-capped chickad	lee, western	tanager, 2 turkey vulture
Α	Flew down river behind fir trees on e	east bank		brown creeper, American robin, we	stern wood pewee	, Pacific slope	lycatcher, spotted
Α	On nest; feeding young and perching	S		sandpiper, belted kingfisher, dark-e	yed junco, norther	n flicker	
Α	Flew up river; circled; landed in dead tree upstream from nest	l branches in me	edium-sized				
Α	Flew down river behind Dougas fir tr	ees on east ban	k				
				On-site Summary:	# Min.	# Eagles	Notes
				Adult bald eagle perching			
				Adult bald eagle foraging			
				Adult bald eagle nesting			
				Adult bald eagle: other			
				Juvenile bald eagle			
				Total	0		
				Vicinity Summary:	# Min.	# Eagles	Notes
				Adult bald eagle perching			
				Adult bald eagle foraging			
ys: Start 15 mi	n before sunrise, 2 hrs			Adult bald eagle nesting	25	1	on nest
ys: Start 2 hour	s before sunset			Adult bald eagle: other	7	1	flew in area
				Juvenile bald eagle			
				Total	32		
	C Galen  ns: Age* A A A A A	C Galen River high w/ no island showing  ns:  Age* Notes  A On nest and branch to the right of not on the properties of	C Galen River high w/ no island showing End:  ns: Age* Notes  A On nest and branch to the right of nest  A Flew down river behind fir trees on east bank  A On nest; feeding young and perching  A Flew up river; circled; landed in dead branches in metree upstream from nest  A Flew down river behind Dougas fir trees on east band  ys: Start 15 min before sunrise, 2 hrs	C Galen River high w/ no island showing End: 7:30  ns: Age* Notes  A On nest and branch to the right of nest A Flew down river behind fir trees on east bank A On nest; feeding young and perching A Flew up river; circled; landed in dead branches in medium-sized tree upstream from nest A Flew down river behind Dougas fir trees on east bank  ys: Start 15 min before sunrise, 2 hrs	Age* Notes A On nest and branch to the right of nest A On nest, feeding young and perching A Flew up river; circled; landed in dead branches in medium-sized tree upstream from nest A Flew down river behind Dougas fir trees on east bank A Flew down river behind Dougas fir trees on east bank C On-site Summary: A A Undit bald eagle perching A Flew down river behind Dougas fir trees on east bank  On-site Summary: Adult bald eagle foraging Adult bald eagle nesting Adult bald eagle Total  Vicinity Summary: Adult bald eagle perching Adult bald eagle cother Juvenile bald eagle:	C Galen River high w/ no island showing End: 7:30  Age* Notes  A On nest and branch to the right of nest A Flew down river behind fir trees on east bank A On nest; feeding young and perching A Flew up river; circled; landed in dead branches in medium-sized tree upstream from nest A Flew down river behind Dougas fir trees on east bank  On-site Summary: # Min.  Adult bald eagle perching Adult bald eagle orbang Adult bald eagle perching Adult bald eagle orbang adult bald eagle perching Adult bald eagle nesting Adult bald eagle orbang Adult bald ea	Abundance / species of birds in Meldrum Bay and vicinity:  12 Canada geese, 11 mallards, 2 American crow, 1 great blue heror yellow warbler, spotted towhee, song sparrow, hairy woodpecker, American goldfinch, house finch, black-capped chickadee, western brown creeper, American robin, western wood pewee, Pacific slope sandpiper, belted kingfisher, dark-eyed junco, northern flicker  A Flew down river behind Dougas fir trees on east bank A Flew down river behind Dougas fir trees on east bank A Flew down river behind Dougas fir trees on east bank  On-site Summary:  Adult bald eagle perching Adult bald eagle nesting Adult bald eagle nesting Adult bald eagle: other Juvenile bald eagle  Total  O  Vicinity Summary: # Min. # Eagles Adult bald eagle perching Adult bald eagle cother Juvenile bald eagle

Date:	7/28/2023	82 degrees F; 100% clear	Start:	18:45	Other Observations:				
Name:	C Galen	River low; long dry peninsula	End:	20:45					
		Sun below west bank trees at 20:00							
Observations	<u>s:</u>				Abundance / species of bir	ds in Meldrum	Bay and vicin	ity:	
Time	Age*	Notes			31 Canada geese, 30 malla	ırds, 90 Ameri	can crow, 2 os	prey, 2 glauc	ous-winged gulls
18:45-19:16	Ad1	Perched in tree adjacent to nest and 3	/2 way down	to the river.	2 turkey vultures, 2 great l	olue heron, 1 s	potted towhe	e, and 1 Vaux	's swift
19:16-20:03	Ad1	Flew to nest; moved sticks and preen	ed in nest.						
20:03-20:05	Ad1	Flew upstream and back to nest.							
20:05-20:10	Ad2	Perched below left side of nest tree;	lid not see arr	rival.	On-site Summary:	0	# Min.	# Eagles	Notes
20:10-20:25	2Ad	Perched in nest.			Adult bald eagle perching				
20:25-20:27	Ad 1or2	Flew upstream and back to nest.			Adult bald eagle foraging				
20:27-20:42	2Ad	Perched in nest.			Adult bald eagle nesting				
20:42-20:43	Ad 1or2	Flew upstream and back to nest.			Adult bald eagle: other				
20:43-20:45	2Ad	Perched in nest.			Juvenile bald eagle				
						Total	0		
					Vicinity Summary:		# Min.	# Eagles	Notes
					Adult bald eagle perching				
					Adult bald eagle foraging				
NOTE: survey	ed from boat	ramp and peninsula			Adult bald eagle nesting		115	1-2	on/near nest; no young
					Adult bald eagle: other		5	1	flew over river
Protocol:					Juvenile bald eagle				
Dawn survey	s: Start 15 mi	n before sunrise, 2 hrs				Total	120	1-2	
Dusk surveys	: Start 2 hour	s before sunset, 2 hrs							

Date:	8/29/2023	70 deg. F; 0-10% clear; light-heavy rain Start: 18:10	Other Observations:			
Name:	C Galen	River covering bar low spot until 18:25 End: 20:10				
		Heavy rain 10 min. 18:20-18:30	Abundance / species of birds in	n Meldrum Bay an	d vicinity:	
<b>Observation</b>	<u>s:</u>		6 Canada geese, 41 mallards, 1	15 American crow	2 osprey, 1 glauc	ous-winged gulls
Time	Age*	Notes	3 turkey vultures, 1 great blue	heron, and black-	capped chickadee	
18:40-19:02	Ad	Ad perched in trident tree south of nest tree				
19:02-19:32	Ad	Flew to east bank north of site and perched on black cottonwood				
19:32-19:33	Ad	Ad flew over river	On-site Summary:	# M	in. # Eagles	Notes
19:33-19:38	Ad	Ad perched back in the same cottonwood tree	Adult bald eagle perching			
19:38-19:39	Ad	Ad flew over M Bay with talons down; assumed foraging attempt	Adult bald eagle foraging	1	1	attempt; in bay
19:39-19:45	Ad	Ad perched in same cottonwood tree north of site	Adult bald eagle nesting			
19:45-19:47	Ad	Ad flew upstream and out of site	Adult bald eagle: other			
			Juvenile bald eagle			
			Tot	tal 1		
1 osprey div	e-bombed eag	gle 2 times and then left; eagle unbothered				
site fairly qu	iet: no jet skis	, 3 motor boats, and 1 kayak	Vicinity Summary:	# M	in. # Eagles	Notes
		smolts?) jumping	Adult bald eagle perching	63		
			Adult bald eagle foraging			
			Adult bald eagle nesting			
			Adult bald eagle: other	3	1	Flew over/up river
			Juvenile bald eagle			
Protocol:			Tot	tal 66	5	
Dawn survey	s: Start 15 mi	n before sunrise, 2 hrs				
Dusk surveys	s: Start 2 hour	s before sunset, 2 hrs				
· ·						

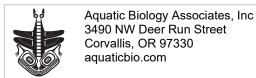
Date:	3/30/2023	52 degrees F.	Start:	17:10	Other Observations:				Temp: 52-48 degrees F.
Name:	C. Galen		End:	19:10	Status of heron rookery - a	about 25 nests			sunny and overcast
									but wind chill cold
Observation	s Viewed fro	m boat ramp as it has best visibility	of entire site		Abundance / species of bi	rds in Meldrun	n Bay and vicin	ity:	
Time	Age*	Notes			2 Canada geese, 12 mallar	ds, 26 America	an crow, song	sparrow, nor	thern flicker,
17:10-17:20	A1	sitting on nest in BCW tree on the	west side of WR	opp. Site.	5 great blue herons, 3 turk	key vultures			
17:20-17:26	2A	A1 left nest and circled over site v	with another adult	: (A2)					
17:26-17:35	A2	on nest & rim; likely feeding your	g as head down a	nd bobbing					
17:35-18:15	A2	perched on branch near nest							
17:45-17:49	A1	soared above site flushing crows	south upriver flush	ning GBH					
18:15-18:19	A1	soared above site flushing crows;	flying to nest						
18:19-19:10	A1	feeding young for 5 minutes; then	n sitting low in nes	st.	On-site Summary:		# Min.	# Eagles	Notes
					Adult bald eagle perching				
					Adult bald eagle foraging				
					Adult bald eagle nesting				
					Adult bald eagle: other		14	1-2	soaring over site
					Juvenile bald eagle				
						Total	14		
					Vicinity Summary:		# Min.	# Eagles	Notes
					Adult bald eagle perching				
Protocol:					Adult bald eagle foraging				
Dawn survey	/s: Start 15 mi	n before sunrise, 2 hrs			Adult bald eagle nesting		110	2	nesting; taking turns
Dusk survey	s: Start 2 hour	s before sunset, 2 hrs			Adult bald eagle: other				
					Juvenile bald eagle				
						Total	110		

Data	7/40/2022	C4 -l	Ctt.	10:00	Other Observations				
Date:	7/10/2023	64 degrees F; 95% overcast	Start:	19:00	Other Observations:				
Name:	C Galen	River low; long dry peninsula	End:	21:00					
		No island; easy to drive to tip			Abundance / species of bi	rds in Meldrum	Bay and vicir	nity:	
Observation	ıs:				39 Canada geese, 25 malla	ords, 23 Americ	an crow, 2 os	prey, 2 glauc	ous-winged gulls
Time	Age*	Notes			4 turkey vultures, 3 great	blue heron (1 in	tree), 1 belte	ed kingfisher,	8 tree swallows
19:00-19:39	Ad	Sitting on nest; still can't see young for	r sure		2 Vaux's swifts, song sparr	ow, American g	oldfinch		
19:39-21:00	Ad	Flew downstream and out of site							
					On-site Summary:		# Min.	# Eagles	Notes
					Adult bald eagle perching				
					Adult bald eagle foraging				
					Adult bald eagle nesting				
					Adult bald eagle: other				
					Juvenile bald eagle				
						Total	0		
					Vicinity Summary:		# Min.	# Eagles	Notes
					Adult bald eagle perching				
NOTE: surve	yed from boa	t ramp and peninsula			Adult bald eagle foraging				
					Adult bald eagle nesting		39	1	on nest;
Protocol:					Adult bald eagle: other				could not confirm young
Dawn survey	ys: Start 15 mi	n before sunrise, 2 hrs			Juvenile bald eagle				, ,
	•	rs before sunset, 2 hrs				Total	39	1	



# Appendix H

Benthic Invertebrate Survey (Digital Appendix)



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## **Sheet Explanations**

- This explanation is included as a reference for the conventions used in the data analysis.
- Refer to the "Documentation" sheet for specifics about the project.
- Short descriptions will be written at the top of metrics and summary sheets where clarification is needed.
- Bolded titles in this document correspond to sheet names. The exact sheet names may differ based on the type of analysis performed, whether or not replicates were present, and whether or not biomass was calculated.

#### **Documentation**

- Includes project information, client and laboratory contact information, overview of specifications, notes on missing or empty samples, and any irregularities encountered.
- Scroll down to the bottom of this page to see the date and time the analysis was run.

#### **Metrics**

- Provides an overview of relevant sample descriptors broken down by site.
- If replicates are present in the data, then this sheet will use the mean values for a given site calculated from the total number of replicates present for that site.
- A replicate is considered present if it is listed as empty, in which case it will be included in the mean calculations as zeros for all taxa.
- A replicate that is missing, decayed, or otherwise damaged will be omitted from the mean calculations.

#### (Mean) Summary Sheets:

- Named with "Mean" if replicates are present in the data set.
- Provides summaries of all the taxa found at each site.
- The rules for calculating the means are the same as those for the metrics sheet.

#### Mean abundance or Abundance

- Abundances are converted to a full sample basis (if subsampled) and to a standard area or volume unless otherwise specified. Refer to the bolded header line at the top of the sheet for the units used to express abundances.
- For benthic analysis, the abundances will be expressed as per m^2.
- For drift analysis, the abundances will be expressed as per 100 m^3 of water filtered.

## Mean percent abundance or Percent abundance

• Summarizes the percentage of each taxa in the sample based on the abundance of the taxa.

#### **Mean biomass** or **Biomass**

- Biomass is calculated via length-weight regression of the form (dry mass in mg) =  $a^*(body length in mm)^b$ .
- To verify the coefficients used for this particular analysis, see the "Traits" sheet columns "a" and "b".
- See the "Documentation" sheet for details on the length measurements.
- Biomass values are expressed in milligrams (mg) on a full sample basis (if subsampled) and converted to a standard area or volume unless otherwise specified. Refer to the bolded header line at the top of the sheet for the units used to express biomass.
- For benthic analysis, the biomass values are expressed as (mg) per m^2.
- For drift analysis, the biomass values are expressed at (mg) per 100 m^3 water filtered.

## Mean percent biomass or Percent biomass

• Summarizes the percentage of each taxon in the sample based on the biomass of the taxa.

If the data set includes replicates:

# Replicate metrics

- Provides an overview of relevant sample descriptors broken down by site and replicate.
- Any site for which the entire column below the sample identification is blank represents a sample that was empty. It is included here for reference and to facilitate the checking of the mean calculations.

Replicate Summary Sheets:

- Included when replicates are present in the data set, except for the case of Diet analyses.
- Provides summaries of all the taxa found at each site broken down by the individual replicates.
- If a column is entirely blank below the site identification, then it represents a sample that was empty. It is included here for reference and to facilitate the checking of the mean calculations.
- Sheets are otherwise the same as the Summary Sheets listed above.

## Replicate abundance

## Replicate percent abundance

# Replicate biomass

# Replicate percent biomass

## Long output

- Provides a format that is easier to import to a database than the summary sheets.
- The "Abundance" column here may represent a raw count, an abundance per m^2 in the case of a benthic analysis, or an abundance per 100 m^3 water filtered in the case of a diet analysis. See the summary sheets for details.
- The "Biomass" column (if present) is reported in the same manner as the abundance (raw, per m^2, or per 100 m^3) in milligrams (mg). See the summary sheets for details.
- No rounding is performed on this sheet other than the number of decimals Excel maintains.

## Long mean output

- Virtually identical to the "Long output" sheet with the values reported being mean values for the site across all the replicates.
- "MeanAbun" is the mean abundance, and "MeanBiom" is the mean biomass value reported in the same manner as in "Long output". The standard deviations are included for both of these values.

#### **Traits**

- Provides a snapshot of the coded life-history traits that were used to calculate the metrics for all of the taxa present in the data set.
- The "a" and "b" columns are the coefficients used to calculate biomass. See the explanation above for the "Mean Biomass" sheet for further details.

# **Metric explanation**

· Provides a more detailed description of what each metric is calculating.

# **Record file**

- This is the raw data as it was entered.
- Of note is the "Incidental" column (if present). Taxa marked "incidental" on this sheet will be omitted entirely from the analysis (these taxa will not appear on any other sheet in the file other than the "Taxa notes" sheet). Taxa marked "large/rare" will be included in the analysis and are treated specially in the calculation of the total biomass (on the metrics sheets) total biomass is given both with and without these taxa due to their propensity to dominate the sample biomass.
- Also of note is the "Unique" column (if present) indicating whether a taxa that was identified at a higher classification level is believed to represent a taxa that is already listed in the sample. If a taxa is marked as not unique (N), then it is not counted in any of the richness metrics.
- The STE column stands for Standard Taxonomic Effort. This column will have a code entered that describes why a taxa was not identified to the standard taxonomic effort, e.g. if it was identified to family when the STE is genus.

# Taxa notes

- Lists taxa identified in the sample that are excluded from the analysis (incidental taxa).
- Lists taxa identified to a higher classification level than the standard specification because of the specimen condition that are not believed to be unique from other taxa identified in the sample.
- This sheet may not be present for all data sets.

#### Additional notes

• Other documentation that may not have fit elsewhere.



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Columbia Restoration Group, Portland, OR Client

Client contact Evan Ocheltree, Evan@Columbia RestorationGroup.com

Rinearson Creek Restoration Monitoring Project

Medrum Bar Park, Rinearson Creek Natural Area, Clackamas County, in Gladstone, Project location

confluence Willamette River, 45.37958 N, -122.61722 W, <10 m elevation. near

Project objectives Restoration project as wetland mitigation for Portland Harbor plan.

Start of a 10 year monitoring project.

Laboratory

Contact

Robert Wisseman James DiGiulio Jon Lee General taxonomy Chironomidae taxonomy Mite taxonomy bobwisseman@mac.com ilee@humboldt1.com digiulio@peak.org

Sampling protocol

Sampling gear D-frame net Mesh size 500 micron Square area sampled 8 square feet

Includes engineered riffle, low gradient stream below remnant beaver pond, beaver Habitat sampled

pond, and emergent wetland. Pond and wetland samples are more semi-quantitative.

2023 area sampled was more qualitative

Laboratory protocol

Mesh size 500 micron

Subsampling target count 500 organism minimum

Subsampling device Caton tray

Sorting efficacy

Taxa abundances converted to a full sample and 1 square meter basis

Identification protocol

Standard taxonomic effort PNAMP level 2 Chironomidae (midges) genus/species group class Oligochaeta Oligochaeta (segmented worms) Acari (mites) aenus

Life stages:

U unknown (for non-insects)

larvae LE Larval exuvia pupae PΕ pupal exuvia Α adult eaa

**Biomass determination** 

Published length weight regressions used to calculate biomass.

Length of all macroinvertebrates measured to nearest 0.5 mm if individual <5 mm, or nearest 1 mm if > 5 mm. Reported as the biomass corresponding to the taxa abundances (see laboratory protocol above).

Data analysis

Standard taxonomic effort (STE) Version 2 ABA

Version 2 ABA (see "Traits" tab in this output for documentation) Taxa traits (e.g. feeding group, etc.)

Programmed in R by Adam and Robert Wisseman

Version 2 of ABA STE and taxa traits is a draft version still under development.

Abundances converted to a standard full sample (if subsampled) and one square meter basis.

Date run:

'2023-10-16

Analysis program in developmental phase.

Abundances and biomass (mg) converted to a standard full

Abundances and biomass (mg) converted to a standard full sample (if subsampled) and one square meter basis.	metrics tho	ught to ha	ave the m	ost interpretive	value are hic	ibliabted i	in red							
Waterbody	Rinearson Cree	ek Rinears	son Creek	Rinearson Creek	Rinearson Cree	k Rinears	son Creek	Rinearson Creek	Rinearson Creek	Rinearson Creek	Rinearson Creek	Rinearson Creek	Rinearson Creek	Rinearson Creek
Site Date	beaver pond 2020-05-19	beaver 2021-0	pond 5-04	beaver pond 2023-08-16	emergent marsl 2020-05-19	n emerge 2021-0:	ent marsh	emergent marsh 2023-08-16	engineered riffle 2020-05-19	engineered riffle 2021-05-04	engineered riffle 2023-08-16	upper control 2020-05-19	upper control 2021-05-04	upper control 2023-08-16
Subsample count		623	599	51	3	505	571	52	5 588	3 604	562	2 509	196	426
Subsample correction factor to full sample Area correction factor to square meter	1	.345	1.45 1.345	7.0	6 1 1 1	1.58 345	1 1.345	-	2 13.33 1 1.345	3 2.29 5 1.345	2.13	3 2.791 I 1.345	i 1.345	1
SUMMARY METRICS		.545	1.545		1.	340	1.545		1.5%	1.540	, .	1.540	1.5%	
Total taxa richness	]	36	32	3		47	14	39						
Total abundance EPT taxa richness	167	5.87	1168.2 1	3657.0	3 1073 2	1	768 0	1050	) 10542.16 1 3	6 1860.35 3 2	5 1197.06 2 2	5 1910.73 2 2	263.62	! 426 0
EPT abundance		2.69	1.95	190.6		8.5	0	_10						
Hilsenhoff Biotic Index (WY DEQ version)  DOMINANCE AND DIVERSITY	_	7.44	6.66	6.7	2 6	5.69	6.37	7.2	5 6.33	3 7.06	6.2	2 7.06	4.61	6.99
% Dominant taxa		2.79	20.87	19.8	3 23	3.37	26.44	38.86	60.88	3 28.64	54.09	53.44	63.78	
% Subdominant taxa % Top 3 taxa	- 1	8.14 4.57	14.36 46.91	19.1 51.5	1 11	1.29	25.22 70.23	7.43 52.5	9.69 7 77.55	9 14.74 5 51.99	13.17	7 6.68 66.8	18.88	
% Top 5 taxa	6	5.65	64.44	65.6	4 56	6.63	89.67	6	84.35	5 64.24	81.14	75.44	90.82	74.65
% Top 10 taxa Shannon-Weaver Diversity (loge)		0.58 2.67	81.3 2.7	83.7 2.6		2.08	97.55 1.87	81.14	90.99 3 17					
Shannon-Weaver Diversity (log2)		3.85	3.89	3.7	3 4	.28	2.7	3.6	5 2.45	5 3.73	2.65	2.93	1.91	3.45
Shannon Evenness Index TOLERANT AND INTOLERANT TAXA		0.74	0.78	0.7	4 0	).77	0.71	0.69	9 0.5	5 0.74	0.59	0.58	0.49	0.68
Total tolerant taxa richness	7	21	19	1	9	25	7	2:		3 12	2 9	) 11		i 18
Total tolerant abundance		9.63	766.45				396.78							
% Total tolerant by abundance Highly tolerant taxa richness		2.49 8	65.61 9	59.6	9	7.72 9	51.66 4	71.2	) 4	<b>\$</b> 5	I 10.32	3 5		5
Highly tolerant abundance		7.65	171.62	1200.			220.58	510	3 161.36					
% Highly tolerant by abundance Moderately tolerant taxa richness	7	29.7 13	14.69 10	1	)	16	28.72	13	2 9	9 7	7 6	6	; 3	13
Moderately tolerant abundance		1.98	594.83	981.3	4 163	3.63	176.2	233	2 1308.81					68
% Moderately tolerant by abundance Total intolerant taxa richness	- 2	2.79 1	50.92 1	26.8	ه 15 ا	i.25 2	22.94 1	22.	1 12.41 1 (	1 34.77	7 6.94	7.859	3.061	15.96 1
Total intolerant abundance		5.38	19.5				203.1		6 (					
% Total intolerant by abundance Highly intolerant taxa richness		.321	1.669			).89 0	26.44 0	0.571		) 1.159 ) (		3.536		
Highly intolerant abundance	1	0	0		0	0	0					) (	i d	0
% Highly intolerant by abundance Moderately intolerant taxa richness	+	0	0		) )	0	0		) ( 1 (		) (		) (	0
Moderately intolerant abundance		5.38	19.5		116		203.1		3 (	21.56	3 0	67.57		4
% Moderately intolerant by abundance VOLTINISM (length of life cycle)	0	.321	1.669		) 10	1.89	26.44	0.571	4 (	1.159	9 0	3.536	63.78	0.939
TAXA RICHNESS	7													
Semivoltine (> 1 year life cycle) taxa richness		3	4		3	5	1		3 4	4 4	5 9		2	. 3
Univoltine (1 year life cycle) taxa richness  Multivoltine (< 1 year life cycle) taxa richness	-	6 27	4 24	2	/ 4	10 32	10	2	7 2 9 24					
ABUNDANCE	1 .				6 170		4 04				25.56		5.36	
Semivoltine (> 1 year life cycle) abundance Univoltine (1 year life cycle) abundance		7.66 5.84	19.5 177.47	148.2 1228.4			4.04 10.76							
Multivoltine (< 1 year life cycle) abundance	127	2.37	971.22	2280.3	3 762	2.91	753.2	801	3 10183.59	9 1746.39	1026.66	1681.74	247.48	253
PERCENTAGE BY ABUNDANCE  % Semivoltine (> 1 year life cycle) by abundance	٠,	247	1 669	4.05	4 15	84	0.5254	1:	2 1.19	9 0.6623	2 135	2 358	2 041	25.35
% Univoltine (1 year life cycle) by abundance		1.83	15.19	33.5	9 13	3.07	1.401	11.2	4 2.211				4.082	15.26
% Multivoltine (< 1 year life cycle) by abundance		5.92	83.14	62.3	5 71	.09	98.07	76.70	96.6	93.87	85.77	88.02	93.88	59.39
% Fast seasonal life cycle by abundance	7	5.92	70.62	41.	7 41	.39	68.48	31.2	4 92.01	1 49.83	80.43	30.26	77.04	
% Slow seasonal life cycle by abundance % Nonseasonal life cycle by abundance		3.76 .321	28.71 0.6678	57.3 0.965		7.13 1.49	31.52 0	63.43 5.33						
OCCURRENCE IN DRIFT		.521												
% Rare in drift by abundance		30.5 1605	40.73 1.503	67.1	3 59	).21 584	32.4	69.7° 2.28	1 6.803 3 2.381	3 50.83 1 0.9934	3 19.04 1 1.779	71.32		
% Common in drift by abundance % Abundant in drift by abundance		9.34	57.76			0.21	67.6							
SIZE AT MATURITY	_													
TAXA RICHNESS Small size at maturity taxa richness	-	23	20	2	,	30	6	21	3 20	) 19	) 10	) 21		22
Medium size at maturity taxa richness		11	10	1	)	14	7	13	2 7	7 10		2 9		11
Large size at maturity taxa richness ABUNDANCE	-	3	2		3	3	1		1 3	3 4	1	1 3	1	1
Small size at maturity abundance		8.11	705.99	2068.5			509.76							
Medium size at maturity abundance Large size at maturity abundance		80.1 7.66	450.51 11.7	1461.4 127.0		2.27 7.63	254.2 4.04	570	681.3 4 71.72					
PERCENTAGE BY ABUNDANCE	7													
% Small size at maturity by abundance % Medium size at maturity by abundance		51.2 6.55	60.43 38.56	56.5 39.9		0.01 3.42	66.37 33.1	44.76 54.8	92.86 6.463					
% Large size at maturity by abundance		.247	1.002	3.47		574	0.5254	0.38					1.02	4.93
RHEOPHILY AND HABITAT AFFINITY	٦ -	4 03	18.2	38.6		941	19 79	13.3	3 0.5102	2 16.39	0.7117	7 0.9823	3.061	2 817
% Depositional only by abundance % Depositional and erosional by abundance		3.88	81.8	61.3	9 94	1.06	19.79 80.21	86.6	7 37.41	1 82.12	95.91	98.62	96.94	97.18
% Erosional by abundance		.087	0		)	0	0		62.07	7 1.49	3.381	0.3929		0
THERMAL PREFERENCE  % Cold stenothermal and cool eurythermal by abundance	٦ ،	.321	3.506	0.772	2 12	2.08	26.44	5.14	3 (	1.821			63.78	1.878
% Cool/warm eurythermal by abundance	9	8.88	95.83	83.9	83	1.56	73.56	90.	1 98.81	1 98.18	97.69	96.46	36.22	96.95
% Warm eurythermal by abundance NON-INSECT AND INSECT ORDERS	3.0	8026	0.6678	15.2	5 4.	356	0	4.76	2 1.19	9 0	2.313	з с		1.174
TAXA RICHNESS														
Non-insect invertebrates taxa richness Ephemeroptera (mayflies) taxa richness	4	5	12	1	3	12	6	1	3 11	1 11	9			i 13 0
Odonata (damsel- and dragonflies) taxa richness	_	1	1 2		3	1	ō		1 0	. 1 ) 1	. 2			1
Plecoptera (stoneflies) taxa richness	4	0	0			0	0	9						
Hemiptera (true bugs taxa richness Megaloptera (alderflies and hellgramites) taxa richness	1	0	1		<u>.</u> )	0	0		1 (	0 0	) (	) (	) (	Ō
Trichoptera (caddisflies) taxa richness	4	0	0		1	0	0		2	2 1	. 2	2 1	Ġ	0
Lepidoptera (moths) taxa richness Coleoptera (beetles) taxa richness	+	0 3	0		2	0	0		1 (			) 1	Ċ	0
Diptera (total)(true flies) taxa richness	1	24	16			30	8	2:						20
Chironomidae (midges) taxa richness Chironomidae (midges -Nostoc midge) taxa richness	+	19 19	15 15			24 24	7	21						
ABUNDANCE	1						,							
Non-insect invertebrates abundance Ephemeroptera (mayflies) abundance		7.77 2.69	339.34 1.95	1623. 169.4		8.53 8.5	242.1	70:				1313.86		
Odonata (damsel- and dragonflies) abundance		2.69	3.9	317.	7 2	2.13	0	:	2 (	3.08	3 25.56	6 0		1
Plecoptera (stoneflies) abundance	٠.	0 1.87	0 17.55		)	0	0			0 0	) (	) (		
Hemiptera (true bugs abundance Megaloptera (alderflies and hellgramites) abundance	ქ "	0	17.55		)	0	0				) (	) (	i d	0
Trichoptera (caddisflies) abundance	4	0	0		3	0	0							
Lepidoptera (moths) abundance Coleoptera (beetles) abundance	1	0 3.45	0	169.4	4	0 8.5	0	11			) (			, 0
			·			-	·		•			3.70	•	

Abundances and biomass (mg) converted to a standard full

Abundances and biomass (mg) converted to a standard full sample (if subsampled) and one square meter basis.	metrics thoug	nt to have the m	ost interpretive	value are highl	iahted in red							
Vaterbody	Rinearson Creek beaver pond	Rinearson Creek	Rinearson Creek	Rinearson Creek	Rinearson Creek	Rinearson Creek emergent marsh		Rinearson Creek engineered riffle	Rinearson Creek	Rinearson Creek	Rinearson Creek	Rinearson Creek upper control
oite Date	2020-05-19	beaver pond 2021-05-04	beaver pond 2023-08-16	emergent marsh 2020-05-19	emergent marsh 2021-05-04	2023-08-16	engineered riffle 2020-05-19	2021-05-04	engineered riffle 2023-08-16	upper control 2020-05-19	upper control 2021-05-04	2023-08-16
iptera (total)(true flies) abundance	1237.4	805.45	621.28	431.4	525.9	298	9645.72	914.77	986.19	555.50	3 201.75	113
Chironomidae (midges) abundance Chironomidae (midges -Nostoc midge) abundance	1127.11 1127.11		550.68 550.68	401.64 401.64	519.17 519.17	286 286	3065.83 3065.83	859.33 859.33	915.9 915.9			106 106
Chironomidae (midges -Nostoc midge) abundance	1127.11	074.78	330.00	401.04	319.17	200	3003.03	039.33	913.8	300.70	193.02	100
6 Non-insect invertebrates by abundance	21.35			56.24	31.52		6.293	49.5	14.23	68.76		73.24
6 Ephemeroptera (mayflies) by abundance	0.1605		4.633	0.7921	0	0.9524 0.1905	0.8503	0.8278		1.76	0.5102	. 0
6 Odonata (damsel- and dragonflies) by abundance 6 Plecoptera (stoneflies) by abundance	0.1605			0.198	0		0	0.1656	2.135			0.2347
6 Hemiptera (true bugs by abundance	3.692	1.503	20.08	1.782	. 0	1.905	0	Ö	Ċ	) (	0	Ō
6 Megaloptera (alderflies and hellgramites) by abundance		0	) 0	(	0	0	0	0	(			0
6 Trichoptera (caddisflies) by abundance 6 Lepidoptera (moths) by abundance	1	) 0		(	) 0	0	1.361 0	0.3311	1.246			0
6 Coleoptera (monta) by abundance	0.8026		4.633	0.7921		1.714	0	0	Č	0.196		0
6 Diptera (total)(true flies) by abundance	73.84	68.95	16.99	40.2	68.48	28.38	91.5	49.17	82.38			26.53
6 Chironomidae (midges) by abundance 6 Chironomidae (midges -Nostoc midge) by abundance	67.26 67.26			37.43 37.43			29.08 29.08	46.19 46.19	76.51 76.51		? 73.98 ? 73.98	24.88 24.88
FAMILIES AND GROUPS	J 07.20	37.70	13.00	57.40	07.0	21.24	25.00	40.10	70.5	20.5	. 75.80	24.00
AXA RICHNESS	1											
Digochaeta (segmented worms) taxa richness	1	1	1 1	1	1	1	1	1	1		1	1
Mollusca (snails and bivalves) taxa richness	1 9	) 3	1 4	6	. 0	7	4	0		2	1	5
Crustacea taxa richness Acari (mites) taxa richness	† 6	) 1	3	č	) 0		1	1	1		) 0	2
Baetidae (mayfly) taxa richness	1	1	1	-	0	1	1	1	Ċ	;	i 1	0
Baetis tricaudatus complex (mayfly) taxa richness	(	0	0	(	0	0	0	1	(	) (	) 1	0
phemerellidae (mayfly) taxa richness leptageniidae (mayfly) taxa richness	1 9	0	0	(	) 0	. 0	0	0	(	) (	0	0
eptohyphidae (mayfly) taxa richness	1 6	) 0	) 0	,	) 0	. 0	0	0	(	,	) 0	0
eptophlebiidae (mayfly) taxa richness	] ;	i		č	i	ı ö	ō	ō	č	i i	) ő	ő
Chloroperlidae (stonefly) taxa richness	4 9	0	0	(	0	0	0	0	(	) (	0	0
Vernouridae (stonefly) taxa richness Perlidae (stonefly) taxa richness	† ;	, 0	) 0	(	, 0	0	0	0	(	, (	, 0	0
Periodidae (stonelly) taxa richness	] (			(		0	0	0			. 0	0
Peltoperlidae (stonefly) taxa richness	1 6	) 0	) 0	Ċ	) 0	0	ō	ō	Č	) (	0	ō
Pteronarcyidae (stonefly) taxa richness Brachycentridae (caddisfly) taxa richness	1 9	) 0	0	(	) 0	0	0	0	Ç	) (	0	0
Glossosomatidae (caddisfly) taxa richness	1 7	, ,	, 0	(	, ,		0	0	(	, (	, U	0
lydropsychidae (caddisfly) taxa richness	] ;	) 0	0	č	) 0	ı ö	1	1	ì	ı	) 0	ő
epidostomatidae (caddisfly) taxa richness	1 9	0		(	0	0	0	0	Ç		. 0	0
imnephilidae (caddisfly) taxa richness Philopotamidae (caddisfly) taxa richness	1 9	0	0	(	0	. 0	0	0	(	) (	0	0
Thiopotamidae (caddisfly) taxa richness  Rhyacophilidae (caddisfly) taxa richness	1 6	) 0	) 0	,	) 0	. 0	0	0	(	,	) 0	0
Jenoidae (caddisfly) taxa richness	] (	) 0	0	Ċ	) 0	0	0	0	Ċ	) (	0	0
Imidae (riffle beetle) taxa richness		0	0	(	0	0	0	0	(		. 0	0
Empididae (dance fly) taxa richness	1 9	) 0	0	2	! 0	. 0	0	0	1	1 2	2 0	2
thericidae (higher flies) taxa richness Simuliidae (black fly) taxa richness	1 3		0	Č		. 0	1	1		í i	, ,	0
ipulidae (crane fly) taxa richness	] -		0	2	. 0	0	1	1	2	2	. 0	0
Chironomidae: Chironominae taxa richness	- 5	9	5	9	4	. 9	6	6	2		6	7
anytarsini taxa richness Chironomidae: Diamesinae taxa richness	1 :		: 2			. 3	3	3			1 2	4
Chironomidae: Orthocladiinae taxa richness	] :	2	3	Š	1	6	6	6	2		Ö	5
Chironomidae: Prodiamesinae taxa richness	1	2	. 0	2	! 1	1	0	2	(		1 1	1
Chironomidae: Tanypodinae taxa richness Cricotopus (Nostococladius) taxa richness	-	3 2	9 3	4	1	4	1	2	1	1 :	3 1	3
ABUNDANCE	1 '	,	, ,	,	,	U	U	0	,	,	, ,	U
Dligochaeta (segmented worms) abundance	303.97	15.6	698.94	31.88	2.69	44	107.57	52.36	63.9	127.63	3 4.04	55
Mollusca (snails and bivalves) abundance		13.65		221.01		174		0	25.56			111
Crustacea abundance Acari (mites) abundance	43.04	259.38		295.39	234.03	460	340.65 17.93	834.69 12.32	57.51 4.26		51.11	137 5
Baetidae (mayfly) abundance	2.69	1.95	169.44	8.5		10	89.64	15.4	4.20	33.79	1.34	0
laetis tricaudatus complex (mayfly) abundance			0	(	) 0	0	0	15.4	(	) (	1.34	0
phemerellidae (mayfly) abundance	4 9	0	0	(	0	0	0	0	(	) (	0	0
eptohyphidae (mayfly) abundance eptohyphidae (mayfly) abundance	1 7	) 0	) 0				0	0		) (	) 0	0
eptophlebiidae (mayfly) abundance	] [	0	0	Ċ	0	ō	ō	ō	č		0	ō
Chloroperlidae (stonefly) abundance		0	0	(	0	0	0	0	(	) (	0	0
lemouridae (stonefly) abundance Perlidae (stonefly) abundance	-	) 0		(	) 0		0	0	(	) (	, ,	0
Periodidae (stonefly) abundance	† 7			,			0	n	(			0
Peltoperlidae (stonefly) abundance	] ;	) 0	) ő	č	) 0	ı ö	ő	ő	č	) (	0	ő
Pteronarcyidae (stonefly) abundance	4 9	0	0	(	0	0	0	0	(	) (		0
trachycentridae (caddisfly) abundance Slossosomatidae (caddisfly) abundance	1 2	, 0	, 0	(	, 0	. 0	0	0	(	) (	, U	0
lydropsychidae (caddisfly) abundance	] ;	i	0	č	i	ı ö	125.5	6.16	8.52		, ,	ő
epidostomatidae (caddisfly) abundance	1 9	0	0	(	0	0	0	0	(	3.7	0	0
imnephilidae (caddisfly) abundance hilopotamidae (caddisfly) abundance	1 5	) 0	0	(	) 0	0	0	0	(	) (	0	0
thyacophilidae (caddisfly) abundance	1 7	, ,	, 0	(	) 0		0	0	(			0
enoidae (caddisfly) abundance	] -	) 0	) 0	Ċ	) 0	0	ō	ō	Č	) (	0	ō
Imidae (riffle beetle) abundance	- 9	0		(			0	0	(	3.75		0
mpididae (dance fly) abundance thericidae (higher flies) abundance	1 2	0	0	4.25	. 0	0	0	0	2.13	3 7.5°		3
imuliidae (black fly) abundance	34.97		. 0	(		. 0	6418.53	21.56	31.95	7.5		0
ipulidae (crane fly) abundance	24.21	0	0	10.63		0	35.86	3.08	21.3	3.75	5 0	ō
hironomidae: Chironominae abundance	629.46	505.11	458.9	136.01	162.74	164	663.37	517.45	658.17	150.16	14.8	59
anytarsini abundance hironomidae: Diamesinae abundance	126.43			97.75			233.08	212.52	10.65	127.6		9
hironomidae: Orthocladiinae abundance	355.08	23.4		85	13.45	30	1918.39	200.2	164.01	153.9	i o	11
hironomidae: Prodiamesinae abundance	5.38	39	0	125.38	203.1	48	0	30.8		60.00	168.12	4
hironomidae: Tanypodinae abundance	80.7			55.25	122.39	30	340.65	30.8		97.6	10.76	31
ricotopus (Nostococladius) abundance ERCENTAGE BY ABUNDANCE	- '	) 0	0	(	) 0	0	0	0	(	) (	) 0	0
Oligochaeta (segmented worms) by abundance	18.14	1.336	19.11	2.97	0.3503	4.19	1.02	2.815	5.338	6.6	1.531	12.91
6 Mollusca (snails and bivalves) by abundance	1 (	1.169	5.405	20.59	) 0		1.701	0		3.536	3 1.02	26.06
Crustacea by abundance	2.568	22.2	16.41	27.52		43.81	3.231	44.87	4.804		19.39	32.16
Acari (mites) by abundance Baetidae (mayfly) by abundance	0 1605	1.002	9 0.9653 4.633	0.7921			0.1701 0.8503	0.6623 0.8278	0.3559			1.174
	0.160			0.7921	) 0		0.8503 N	0.8278 0.8278		) 1.76		0
6 Baetis tricaudatus complex (mavfly) by abundance							0	0.0270		,	0.0102	ñ
6 Baetis tricaudatus complex (mayfly) by abundance	5	) 0	0	(	) 0	0	0	U		, ,		
6 Baetis tricaudatus complex (mayfly) by abundance 6 Ephemerellidae (mayfly) by abundance 6 Heptageniidae (mayfly) by abundance		0	0	(		0	0	0	(		0	0
Baetis tricaudatus complex (mayfly) by abundance     Ephemerellidae (mayfly) by abundance     Heptageniidae (mayfly) by abundance     Leptohyphildae (mayfly) by abundance		0	0	(	i	0	0	0		i i	0 0	0
Baetis tircaudatus complex (maylfy) by abundance Ephemerellides (maylfy) by subundance Heptagenidae (maylfy) by abundance £ upothyphides (maylfy) by abundance £ upothyphides (maylfy) by abundance £ upothyphides (onlone) by abundance £ Chicroperidise (anofly) by abundance Chicroperidise (anofly) by abundance		0 0	0 0	( ( (	0	0	0	0	Ċ	) (	0 0	

The property of the property o	Abundances and biomass (mg) converted to a standard full sample (if subsampled) and one square meter basis.	metrics though	ht to have the m	ost interpretive	value are highl	ighted in red							
Margin   M	Waterbody	Rinearson Creek	Rinearson Creek	Rinearson Creek	Rinearson Creek	Rinearson Creek	Rinearson Creek	Rinearson Creek	Rinearson Creek	Rinearson Creek	Rinearson Creek	Rinearson Creek	
			2021-05-04	2023-08-16	2020-05-19	emergent marsh 2021-05-04	emergent marsh 2023-08-16			engineered riffle 2023-08-16	upper control 2020-05-19		
Second Control of Co		9	) (			) (	)				0 0		
Section   Sect	% Peltoperlidae (stonefly) by abundance	i	) (	i d	i	,		0	o d				0
Amening and publish declared	% Pteronarcyidae (stonefly) by abundance		) (										0
Applications of the property	% Glossosomatidae (caddisfly) by abundance		) (	· c	,		5	0	0 (				0
Amenabas							) 1	0 1.1	9 0.3311 n		7 C		0
Second Property Second Prope	% Limnephilidae (caddisfly) by abundance				) (	) (	5	0		) (	0 0		0
Secondary Secondary   Second		1 8	) (			) (	) 1	0					
Secondaria Pala placement   10	% Uenoidae (caddisfly) by abundance		) (					0	0 0	) (			0
Applications of the Control of the			) (				)	0	0 (	0 1779	0.1965 9 0.3929		
March   146	% Athericidae (higher flies) by abundance			d			0			1	0 0		0
Content   Cont	% Simuliidae (black fly) by abundance % Tipulidae (crane fly) by abundance				0.990		) )			2.669 1.779	9 0.3929 9 0.1965		
Security S	% Chironomidae: Chironominae by abundance	37.56	3 43.24	12.55	12.67	7 21.19	9 15.6	2 6.29	3 27.81	54.9	8 7.859	5.612	13.85
Communication of the content of th		7.544	25.38	1.544	9.109	9 1.40	1 6.66	7 2.21 0	1 11.42 0 (	0.889	7 6.68 n 0		
Comment   Marchester   Marche	% Chironomidae: Orthocladiinae by abundance								2 10.76		7 8.055		2.582
Control processing and information by substrated by subs	% Chironomidae: Tanypodinae by abundance				11.68	3 26.4				1.95	0 3.143 7 5.108	4.08	0.939 7.277
Table	% Cricotopus (Nostococladius) by abundance				) (	) (				) (	D 0		0
Contact Annual Cont		1											
Selection personal and property laws of the personal and personal an	Predator taxa richness	11		10	11	:	3	8	4 8				10
Selection flower assessment	Parasite taxa richness Collector-gatherer taxa richness			10		2 1	1 3 1	1 8 1:	1 2 2 15		5 14		13
General Information and Info		4	1 4		1 3	3			5 4		4 2		2 3
Microsophic additions	Piercer herbivore taxa richness	18	s 19 I 1			) 		1 1 <sup>1</sup>					, 16 ) 0
Calcular photological materials   0   0   0   0   0   0   0   0   0	Macrophyte herbivore taxa richness		3 1			2	0	2	1 (	1	1 1		1 1
Victorian Sea reforms     0	Caddisfly shredder taxa richness		) (			)	)	0	0 0		2 D 1		0
Segret Ann Active								0			D 0		0
	Scraper taxa richness	1	1 1	2		3	)	4	3 1		0 3		
ABANDANCE   10   11   12   12   13   16   17   18   18   18   18   18   18   18			1 1			2	1	2			1 2		2
Pages desirations	ABUNDANCE	1				'							
		209.82	2 343.24 ) 11.7	522.44 49.42	89.25 40.38	5 133.16 3 1.3	5 5 4 1	2 502.0 0 17.9	1 86.24 3 18.48	78.8		20.17	7 39
Selection Amendment   1984.05   609.24   2075.06   590.23   499.62   488   5946.45   1315.18   440.44   694.47   198.65   193.	Collector-gatherer abundance		392	1990.92	452.65	433.0	9 33	6 2689.3	3 1164.26	325.89	9 656.93		102
Parent Inflormation advantages   56.18   17.56   748.38   19.13   0   20   17.58   0   6.39   0   0   0   3   3   5   5   5   5   5   5   5   5							2 12 2 45	2 6777.1 8 9466.4					81 5 183
Secolar de municipale   1,42   0	Piercer herbivore abundance	59.18	3 17.55	748.36	19.13	3 (	) 2	0 17.9	3 (	6.39	9 0		0
CodeSide Manufactures												2.69	9 38
Non-continues   1.0	Caddisfly shredder abundance				) (	) (		0	0 (		0 3.75		0
Centrology Bundance	Wood-eating taxa abundance	] - 7		ā	i	) (	5	0	0 0		0 3.75		0
Uniform beforing group shundence   0	Scraper abundance												
Spreading by advantages   12.20   29.88   14.29   8.317   17.34   4.903   4.702   4.008   0.9897   3.34   7.467   7.658   9.105   1.008   1.	Unknown feeding group abundance												
Spreading by abundance   0   1,002   1,351   3,762   0,1751   0,9594   0,701   0,9954   0,897   0   0   1,645   2,34	PERCENTAGE BY ABUNDANCE  % Predator by abundance	12.52	29.36	14.29	8 317	7 17.3	4 4 95	2 4.76	2 4 636	6.58	4 7.466	7 65	9 155
S. Collection filter by abundance   9.631   2.04   2.317   13.27   0.3767   11.62   64.20   8.115   6.228   1.965   2.041   19.01		1 0	1.002	1.351	3.762	0.175	1 0.952	4 0.170	1 0.9934	0.889	7 0		1.643
S. Collector (bell by abundances   77.55   59.6   56.78   55.45   57.27   43.62   89.8   70.7   33.45   39.35   71.94   42.95	% Collector-gatherer by abundance % Collector-filterer by abundance	9.631	2 33.50 I 26.04	2.317	13.27	7 0.875	9 3 7 11.6		9 8.113	6.22	2 34.38 B 1.965	2.04	19.01
St. Mestops by photographics   St. Second by photographics   St.	% Collector (total) by abundance	77.85	59.6		55.45	57.2	7 43.6	2 89.				71.9	42.96
1.46   0   0   0   0   0   0   0   0   0	% Macrophyte herbivore by abundance												
Story sheeded by abundance   0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% Shredder by abundance						)				9 0.5894	. (	0
Somewhate the plantanee   0,4815   1,336   0,3861   5,146   0   7,429   0,8803   8,069   0   1,768   0,5102   2,582   1,888   3,474   1,817   1,818	% Stonefly shredder by abundance						)				0 0		0
Secure   S	% Wood-eating taxa by abundance									)	0.1965		
HABIT   TAXA RICHNESS	% Omnivore by abundance	0.4815	5.843		23.76	3 25.23	2 39.2	4 0.510	2 14.9	2.669	9 53.63	18.88	34.74
TALK RICHNESS	% Unknown feeding group by abundance HABIT	] (	) (		0.198	3 (	0	0	0 (	)	D 0		0
Planktoric taxa richness   0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	TAXA RICHNESS												
Divert fast nichness   0													0
Cinger two archness	Diver taxa richness	] 9	) (		) (	) (	)	0	0 (		D 0		
Sprawfer taxa richness   13   7   9   14   1   12   9   11   5   13   1   14							1 4 1	4 : 3 1-	3 3 4 11		2 1 B 11		3 10
Burrower stanchness   5 9 4 11 6 7 3 6 5 6 6 4 A CALLERINAL DESIGNATIONS   1 1 1 6 7 3 6 5 6 6 6 4 A CALLERINAL DESIGNATIONS   1 1 1 6 7 3 6 5 6 6 6 4 A CALLERINAL DESIGNATIONS   1 1 1 1 1 6 7 3 6 5 6 6 6 4 A CALLERINAL DESIGNATIONS   1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Sprawler taxa richness	13	3 7	9	14				9 11		5 13		14
ABUNDANCE   Skater abundance   0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Burrower taxa richness		5 9	4	11	i	3	7	3 6		5 6		3 4
Skater shundance			) (		) (	) (	0	0	0 (	) (	D 0		0
Plankforic abundance	Skater abundance		) (										
Swimmer abundance   102.22   212.58   1468.48   78.63   26.9   80   304.79   548.25   29.82   90.09   1.34   18   18   18   18   18   18   18   1	Planktonic abundance		) (		) (	) (	)	0	0 (		0 0		0
Sprawler shundance   317.42   331.54   353   127.51   6.72   120   1398.45   215.6   55.38   277.79   6.72   522	Swimmer abundance												18
Climber abundance   18.83   78.01   381.24   257.14   207.13   428   35.86   295.88   57.51   1024.81   49.76   128											4 232.74	12.	82
Unknown habit abundance	Climber abundance	18.83	3 78.01	381.24	257.14	207.13	3 42	8 35.8	6 295.68	57.5	1 1024.81	49.76	128
FERCENTAGE BY ABUNDANCE													146
Se PlantAncio Dy abundance   0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	PERCENTAGE BY ABUNDANCE												
Solver by abundance		-					-	-	-				
% Clinger by abundance         27 61         32.55         10.62         24.75         3.678         20         80.27         28.32         72.6         12.18         4.592         19.25           % Climber by abundance         18.94         28.38         9.653         11.88         0.8757         11.43         13.27         11.59         4.624         14.54         2.551         12.21           % Burrower by abundance         1.124         6.678         10.42         23.96         26.97         40.76         0.3401         15.99         4.804         53.63         18.88         30.05           % Univoxed by abundance         46.23         14.19         29.15         32.08         64.97         20.19         3.231         16.79         4.804         53.63         18.88         30.05           % Univoxed by abundance         0	% Diver by abundance	] .	) (	· c	) (	) (	)	0	0 (	) (	0 0		0
% Sprawler by abundance         18.94         28.38         9.653         11.88         0.8757         11.43         13.27         11.99         4.626         14.54         2.551         12.21           % Eurnower by abundance         1.24         6.678         10.42         23.99         26.97         40.76         0.3401         11.58         4.804         53.63         18.88         30.05           % Burrower by abundance         46.23         14.19         29.15         32.08         64.97         20.19         3.231         16.72         15.48         14.93         73.47         34.27           % Unknown habit by abundance         0 <td< th=""><th>% Swimmer by abundance % Clinger by abundance</th><th>27.61</th><th>32.55</th><th>10.62</th><th>24.75</th><th>3.67</th><th>3 2</th><th>0 80.2</th><th>7 26.32</th><th>72.6</th><th>6 12.18</th><th>4.592</th><th>19.25</th></td<>	% Swimmer by abundance % Clinger by abundance	27.61	32.55	10.62	24.75	3.67	3 2	0 80.2	7 26.32	72.6	6 12.18	4.592	19.25
% Burrower by abundance         46.23         14.19         29.15         32.08         64.97         20.19         3.231         16.72         15.48         14.93         73.47         34.27           % Unknown habit by abundance         0	% Sprawler by abundance	18.94	28.38	9.653	11.88	0.875	7 11.4	3 13.2	7 11.59	4.620	6 14.54	2.55	12.21
\(\frac{\partial \text{turnsym} \text{high dys doundarines}}{\text{0.14} \text{FORT NO ESIGNATIONS}}\)	% Burrower by abundance	46.23	3 14.19	29.15	32.08	64.9	7 20.1	9 3.23	1 16.72	15.48	B 14.93	73.4	34.27
CA % Smithter PT	% Unknown habit by abundance	] (	) (	C	) (	) (	)	0	0 (	)	D 0		
CA % Intolerant individuals 0 0 1.386 0 1.333 0 0 0 0.5894 0 1.643	CA % Sensitive EPT	] (	) (	0.5792	! (				0 (	) (			
	CA % Intolerant individuals	] (	) (		1.386	3 (	1.33	3	0 (	) (	0.5894		1.643

# Abundances and biomass (mg) converted to a standard full sample (if subsampled) and one square meter basis.

psampled) and one square meter basis. metrics thought to have the most interpretive value are highlighted in re

sample (if subsampled) and one square meter basis.	metrics though	nt to have the m	ost interpretive '	<i>r</i> alue are highli	ghted in red							
Waterbody	Rinearson Creek	Rinearson Creek	Rinearson Creek	Rinearson Creek	Rinearson Creek	Rinearson Creek	Rinearson Creek	Rinearson Creek	Rinearson Creek	Rinearson Creek	Rinearson Creek	Rinearson Creek
Site	beaver pond	beaver pond	beaver pond	emergent marsh	emergent marsh	emergent marsh	engineered riffle	engineered riffle	engineered riffle	upper control	upper control	upper control
Date	2020-05-19	2021-05-04	2023-08-16	2020-05-19	2021-05-04	2023-08-16	2020-05-19	2021-05-04	2023-08-16	2020-05-19	2021-05-04	2023-08-16
CA % Tolerant individuals	41.73	27.55	50.97	47.72	47.29	62.8	6 10.2	26.16	6.406	58.5	23,47	55.87
CA weighted tolerance value	7.24		6.73	6.56	6.29							
CA % Predators	12.52		15.64	12.08	17.51							
CA % Collector-gatherers	67.74		50.19	56.44	81.61							
CA % Filterers	9.631		2.317	13.27	0.8757							
CA % Scrapers	0.9631		4.633	11.29	0							
CA % Shredders	1.766		4.000	3.564	ŭ							
BIOTIC CONDITION INDEX		_	-		-							
CTQa- Community Tolerance Quotient actual	97.5	104.62	100.06	101.7	108	104.7	7 104.4	103.64	100.86	101.09	105.6	106.18
CTQd-Community Tolerance Quotient dominance	102.37	107.19	99.38	103.93	108	104.9	8 104.86	105.81	104.18	103.88	107.53	107.8
BIOLOGICAL CONDITION GRADIENT (BCG) ATTRIBUTES	-											
TAXA RICHNESS	]											
Attribute 1 taxa richness	] 0	0	0	0	0	1	0 0		0		) (	0
Attribute 2 taxa richness	] 0	0	0	0	Ö	1	0 0	· ·	0			
intermediate sensitive taxa (III)	0	1	0	2	0		2 0	1	1 0		2 0	3
intermediate tolerant taxa (IV)	22	18	22	32	9	2	4 21	25	17	24	11	23
tolerant native taxa (V)	11	11	9	11	5	1	1 8	7	7 6		3 4	7
tolerant non-native taxa (VI)	0	0	0	1	0		1 0	(	) 0		1 0	1 1
Unknown attribute taxa richness	3	2	3	1	0		1 1	(	) 0		) (	0
% TAXA RICHNESS BY ATTRIBUTE OF TOTAL RICHNESS	1											
Attribute 1 % of total taxa richness	1 0	0	0	0	0	1	0 0		) 0		) (	0
Attribute 2 % of total taxa richness	1 0	0	0	0	0	) (	0 0		0			0
Attribute 3 % of total taxa richness	] 0	3.03	0	4.255	0	) !	5 0	2.941	1 0	5.882	2 0	8.571
Attribute 4 % of total taxa richness	57.89	54.55	62.86	68.09	60	6	0 67.74	73.53	70.83	70.59	68.75	65.71
Attribute 5 % of total taxa richness	28.95	33.33	25.71	23.4	33.33	27.5	5 25.81	20.59	25	17.65	5 25	20
Attribute 6 % of total taxa richness	7 0	0	0	2.128	0	2.5	5 0		) 0	2.94		2.857
Unknown attribute % of total taxa richness	7.895	6.061	8.571	2.128	0	2.5	5 3.226	(	) 0		) (	0
ABUNDANCE												
Attribute 1 abundance	] 0	0	0	0	0	1	0 0		) 0		) (	0
Attribute 2 abundance	] 0	0	0	0	0	1	0 0		) 0		) (	0
Attribute 3 abundance	0	15.6	0	6.38	0							6
Attribute 4 abundance	1019.51	655.28	2118	637.53	520.52					754.53		
Attribute 5 abundance	583.73	475.86	748.36	363.39	247.48			982.54	83.07			
Attribute 6 abundance	] 0	0	0	46.75	0	) 21			) 0	15.02	2 0	2
Unknown attribute abundance	72.63	21.45	790.72	19.13	0	) 21	0 107.57		) 0		) (	0
PERCENTAGE BY ABUNDANCE												
% Attribute 1 by abundance	0	0	0	0	0	) (	0 0		) 0		) (	0
% Attribute 2 by abundance	0	0	0	0	0	) (	0 0					0
intermediate sensitive taxa (III)	0	1.336	0	0.5941	0							
intermediate tolerant taxa (IV)	60.83		57.92	59.41	67.78					39.49		
tolerant native taxa (V)	34.83	40.73	20.46	33.86	32.22			52.81	6.94	59.14	21.43	
tolerant non-native taxa (VI)	0	0	0	4.356	0	2.476	6 0		) 0	0.785	9 0	0.4695
% Unknown attribute by abundance	4.334	1.836	21.62	1.782	0	1.90	5 1.02		0		) (	0
METALS TOLERANCE INDEX	-											
Metals Tolerance Index (HBI)	6.56	4.1	3.54	3.95	5.01	4.5	3 6.38	4 66	4.96	4.35	3.7	4.09
% of taxa utilized in index calculation	44.74		42.86	51.06	66.67							
% of individuals utilized in index calculation	59.71		34.56	71.49								
		11.20	04.00	71.40	70.10	. 04.0		02.0		70.11	00.41	00.20

Abundances and biomass (mg) converted to a standard full sample (if subsampled) and one square meter basis.

sample (if subsampled) and																					
one square meter basis.								highly tolerant non-nat Waterbody	tive taxa; in Rinearson Cr		ng the New I Rinearson Creek		ail (Potamopyre Rinearson Creek			Rinearson Creek	k Rinearson				
								Site	beaver pond	l b	eaver pond	beaver pond		emergent marsh 2021-05-04	emergent marsh	engineered riffle	engineered riffle	engineered riffle	upper control	upper control	upper con
l'axon	Stage	Insect?	Origin	n   F	Higher classification	Order	Family	Date Common name	2020-05-19 Abundance	2 A	2021-05-04 Abundance	2023-08-16 Abundance	2020-05-19 Abundance	2021-05-04 Abundance	2023-08-16 Abundance	2020-05-19 Abundance	2021-05-04 Abundance	2023-08-16 Abundance	2020-05-19 Abundance	2021-05-04 Abundance	2023-08-1 Abundanc
repaxonemata	U	non-inse	ct Agua	tic 1	Turbellaria	miscellaneous non-insect	x	flat worms		0		0 77.66	0	) (	0 1	4	0 6.1	6 4.2	6	0	0
lemata Prostoma	U		ct Aqua		Nemata Annelida: Nemertea	miscellaneous non-insect miscellaneous non-insect	X Tetrastemmatidae	round worms nemerteans		0		0 14.12	40.38	1.34	4 1	0	0 6.1	6 6.3 0 8.5		0	0
Digochaeta	Ü				Annelida: Oligochaeta	miscellaneous non-insect	X	segmented worms	3	303.97	15.		31.88					6 63.	9 127.6		.04
rpobdella	U				Annelida: Hirudinea	miscellaneous non-insect		leeches		10.76	9.7		14.88	4.04	4	0 17.9			0 3.7	/5 2.F	1.69
Helobdella stagnalis complex Fluminicola	U	non-inse	ct Aqua	tic A	Annelida: Hirudinea Mollusca: Gastropoda	miscellaneous non-insect	Glossiphoniidae Hydrobiidae	leeches snails		0	29.2	5 0	21.25	) (	0	0	0 6.1	6	) '	0	0
otamopyrgus antipodarum	U	non-ins	ct Aqua	tic I	Mollusca: Gastropoda	X	uncertain status	snails		0		0 0	46.75		0 2	16	0	0	0 15.0	32	0
vmnaeidae	Ú				Mollusca: Gastropoda	х	Lvmnaeidae	snails		0		0 7.06	12.75		0	4 17.9		0	ð	0	0
Physella Ferrissia	U		ct Agua	tic M	Mollusca: Gastropoda Mollusca: Gastropoda	×	Physidae Planorbidae	snails snails		0	5.8	5 155.32	14.88	3 (	0 1 n	4 89.6	0	0 2.1	3 3.7	0	0
Gyraulus	Ü	non-inse	ct Aqua	tic I	Mollusca: Gastropoda	x	Planorbidae	snails		0		0 7.06	0		0	4 17.9	3	0	0	0	0
Menetus	Ü	non-inse	ct Aqua	tic 1	Mollusca: Gastropoda	x	Planorbidae	snails		0		0 0	0	) (	0	0	0	0	0 18.7	rī .	0
uga	U	non-inse	ct Aqua	tic 1	Mollusca: Gastropoda	x	Pleuroceridae	snails		0		0 0	4.25		0	4	0	0	3	0	0
Sphaeriidae Musculium	U				Mollusca: Bivalvia Mollusca: Bivalvia	×	Sphaeriidae Sphaeriidae	pea clams pea clams		0	3.		121.13	3 (	D 5	i6 53.7	9	0 23.4	3 30.0	03 2.6	.69
hvdoridae	Ü				Crustacea: Cladocera	×	Chydoridae	water fleas		10.76	3		0	i	0	0 107.5	7	0	Ó	0	ő
stracoda	U				Crustacea: Ostracoda	x	x	seed shrimp		0	. 11.			) (	0	0	0 3.0		ð	0	0
rangonyx Iyalella	U		ct Aqua	tic C	Crustacea: Amphipoda	X	Crangonyctidae Talitridae	scuds scuds		24.21	167.7	2 C 0 458.9	42.5	26.9	9 4		9 532.8	5 25.5	6 90.0	.9 1.3	.34
lyalella laecidotea	Ü		ct Aqua	tic C	Crustacea: Amphipoda Crustacea: Isopoda	x	Asellidae	aquatic sow bugs		8.07	68.2		250.76	193.68			6 274.1	2 31.9	5 1021.0	06 49.7	.76
rceus	Ü	non-inse	ct Aqua		Crustacea: Isopoda	x	Asellidae	aquatic sow bugs		0	7.		2.13			0	0 21.5	6	0	0	0
acifastacus	U				Crustacea: Decapoda	x	Astacidae	crayfish		0		0 0	0	) (	0	0 17.9	3 3.0		0 3.7	5	0
rombidiformes ygrobates	U	non-inse	ct Aqua	tic A	Arachnida: Acari Arachnida: Acari	Trombidiformes	X	mites mites		0	11.	7 14.12	. 0	) (	0	0	0 12.3	2	) '	0	0
ribatida	Ü	non-inse	ct Terre	strial A	Arachnida: Acari	x	x	mites		0		0 7.06	. 0	,	0	0	0	0	ó '	0	o o
perchon	Ú	non-ins	ct Aqua	tic A	Arachnida: Acari	x	x	mites		ō		0 14.12	: 0	ì	0	0 17.9	3	0 4.2	â	0	0
perchonopsis	U		ct Aqua		Arachnida: Acari	×	x	mites		0		0 0	0	) (	0	0	0	0	)	0	0
eshnidae bellulidae	-	insect	Aqua Aqua		Arthropoda: Insecta Arthropoda: Insecta	Odonata Odonata	Aeshnidae Libellulidae	dragonflies dragonflies		2.69	1.9	0 91.78 5 28.24		, (	n n	0	0 3.0	0 8	0	0	0
rgia	Ĭ	insect	Aqua	tic A	Arthropoda: Insecta	Odonata	Coenagrionidae	damselflies		0		0 0	0		0	ō	0 3.0	0 19.1		0	ő
oenagrion/Enallagma	L	insect	Aqua	tic A	Arthropoda: Insecta	Odonata	Coenagrionidae	damselflies		0	1.9	5 197.68			0	2	0	0 6.3		0	0
aetis	- L	insect	Aqua	tic A	Arthropoda: Insecta	Ephemeroptera	Baetidae	mayflies		0		0 0	8.5		0	0 89.6	4 15.	0	0 33.7		0
aetis tricaudatus complex allibaetis		insect	Agua		Arthropoda: Insecta Arthropoda: Insecta	Ephemeroptera Ephemeroptera	Baetidae Baetidae	mavflies mavflies		2.69	1.9	0 C 5 169.44	0	) (	D 1	0	0 15.	4	) '	0 1.3	.34
bedus	- L	insect	Aqua		Arthropoda: Insecta	Hemiptera: Heteroptera	Belostomatidae	giant water bugs		0	1.0	0 7.06	0			0	0	0	ó	0	0
orixidae	L	insect	Aqua	tic A	Arthropoda: Insecta	Hemiptera: Heteroptera	Corixidae	water boatman		29.59	17.5	5 727.18	19.13	3 (	0 2	10	0	0	0	0	0
enocorixa	A	insect	Aqua		Arthropoda: Insecta	Hemiptera: Heteroptera	Corixidae	water boatman		29.59		0 0	0	) (	0	0	0	0	) '	0	0
otonecta heumatopsyche	-	insect			Arthropoda: Insecta Arthropoda: Insecta	Hemiptera: Heteroptera Trichoptera	Notonectidae Hydropsychidae	back swimmers caddisflies		2.69		0 (		) (	D D	0 125.	5 6.1	υ 6 8.5	2	0	0
/droptila	Ĺ	insect			Arthropoda: Insecta	Trichoptera	Hydroptilidae	caddisflies		0		0 0		,	0	0 17.9		0 6.3		0	0
xvethira	Ĺ	insect	Agua	tic A	Arthropoda: Insecta	Trichoptera	Hvdrootilidae	caddisflies		ō		0 21.18	ō		0	0	0	0	0	0	ō
epidostoma	L	insect	Agua	tic A	Arthropoda: Insecta	Trichoptera	Lepidostomatidae	caddisflies		2 69		0 0	2 13	) (	0	0	0	0	0 3.7	5	0
ytiscidae ara	-	insect	Aqua Aqua		Arthropoda: Insecta Arthropoda: Insecta	Coleoptera Coleoptera	Dytiscidae Elmidae	predaceous diving beetles riffle beetles		2.69		0 (	2.13	1	n n	0	0	0	0 3.7	75	0
eltodytes	Ā	insect	Agua		Arthropoda: Insecta	Coleoptera	Haliplidae	crawling water beetles		5.38		0 98.84	6.38	i	0	o o	0	0	0	0	ő
eltodytes	L	insect	Aqua	tic A	Arthropoda: Insecta	Coleoptera	Haliplidae	crawling water beetles		2.69		0 63.54	. 0	) (	0 1	8	0	0	o .	0	0
ydrophilidae	L	insect	Aqua	tic A	Arthropoda: Insecta	Coleoptera	Hydrophilidae	water scavenger beetles		2.69	128.7	0 7.06	0	) (	0	0 4 107.5	0	0	)	0	0
eratopogoninae eratopogoninae	P P	insect	Aqua		Arthropoda: Insecta Arthropoda: Insecta	Diptera Diptera	Ceratopogonidae Ceratopogonidae	no-see-um midges no-see-um midges		43.04 2.69	128.7		4.25	6.72	2	4 107.5 0 17.9		8 14.9 n	1 30.0	0 6.7	i.72
ixella	Ĺ	insect	Agua	tic A	Arthropoda: Insecta	Diotera	Dixidae	dixid midaes		0		0 0	10.63	i	0	8	0	0	Ó	0	ő
olichopodidae	L	insect	Aqua		Arthropoda: Insecta	Diptera	Dolichopodidae	long-legged flies		2.69		0 0	0	) (	0	0	0	0	3	0	0
linocera emerodromia		insect	Aqua Aqua		Arthropoda: Insecta Arthropoda: Insecta	Diptera Diptera	Empididae Empididae	dance flies dance flies		0		0 0	2.13	3 (	0	0	0	0	0 3.7	5	0
eoplasta	- i	insect	Aqua	tic A	Arthropoda: Insecta	Diptera	Empididae	dance flies		0		0 0	2.13		n	0	0	0 21	3 3.7	75	0
sychodini	L	insect	Aqua	tic A	Arthropoda: Insecta	Diptera	Psychodidae	moth flies		2.69		0 0	0	) (	0	0	0	0	ð	0	0
imulium	L	insect	Aqua	tic A	Arthropoda: Insecta	Diptera	Simulidae	black flies		34.97		0 0	0	) (	0	0 6418.5			5 7.5	31	0
imulium puloidea	P	insect	Aqua		Arthropoda: Insecta Arthropoda: Insecta	Diptera Diotera	Simulidae Tipulidae	black flies crane flies		0		0 0	2.13	) (	0	0	0 6.1	6	) '	0	0
icranomyia	Ĺ	insect	Agua		Arthropoda: Insecta	Diotera	Tipulidae	crane flies		0		0 0	2.13		0	0	0	0 19.1	, 7	0	o o
pula	L	insect	Aqua	tic A	Arthropoda: Insecta	Diptera	Tipulidae	crane flies		24.21		0 0	8.5		Ď	0 35.8					0
nironomidae	P	insect	Aqua		Arthropoda: Insecta	Diptera	Chironomidae	midges		56.49	74.1	1 7.06 0 28.24		17.48	8 1	4 143.4	3 80.0	8 70.2	9 45.0	/5 1.3	.34
olabesmyla otanypus	-	insect	Aqua		Arthropoda: Insecta Arthropoda: Insecta	Diptera Diptera	Chironomidae: Tanypodinae Chironomidae: Tanypodinae	midges midges		0	7.		14.88	122.39	D D	2	0 9.2	4	0 15.0	02 10.7	76
illia	Ĺ	insect			Arthropoda: Insecta	Diptera	Chironomidae: Orthocladinae	midges		5.38	,	0 0	29.75		0	0	0 5.2	0	0 52.5		0
nironomus	L	insect	Aqua	tic A	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	3	381.98	21.4		2.13		1	6	0 138.	6	0 3.7	75 2.6	.69
adopelma	L	insect	Agua	tic A	Arthropoda: Insecta	Diotera	Chironomidae: Chironominae	midaes		5.38	3.	9 0 0 21.18	8.5	. (	0	0 6 35.8	0	0	)	0	0
ricotopus	- L	insect	Agua Agua		Arthropoda: Insecta Arthropoda: Insecta	Diotera Diptera	Chironomidae: Orthocladiinae Chironomidae: Orthocladiinae	midges midges		5.38 228.65	7.	8 0	8.5 19.13		. 1 5	2 1021.9	4 58.5	0 2 157.6	0 7.5	0	0
yptochironomus	L	insect	Aqua	tic A	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges		59.18	136.5	2 0	6.38	3 (	0	2 17.9		0	0 3.7	/5	0
crotendipes	L	insect	Aqua		Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges		0	7.		2.13	3 (	0	0	0	0	)	0	0
ndochironomus		insect	Aqua Aqua		Arthropoda: Insecta	Diptera Diptera	Chironomidae: Chironominae Chironomidae: Orthocladiinae	midges midges		29.59 10.76		0 21.18	6.38	) (	0	0 2 735.0	8 33.8	0	0 22.5	0	0
ukiefferiella claripennis group eterotrissocladius marcidus group	Ĺ	insect			Arthropoda: Insecta Arthropoda: Insecta	Diptera	Chironomidae: Orthocadiinae Chironomidae: Orthocladiinae	midges		0		0 1	4.25		0	6 735.0	0 33.6	0	0 7.5		Ö
nnophyes	Ĺ	insect	Aqua	tic A	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges		5.38		o c	8.5		0	2	0 6.1		0 11.2	26	0
cropsectra	L.	insect	Agua	tic A	Arthropoda: Insecta	Diotera	Chironomidae: Chironominae: Tanvtarsini	midaes		0		0 0	76.5	4.04	4	4 53.7			0 127.6	i3 1.7	.34
nocladius Iontomesa	-	insect	Aqua Aqua	tic A	Arthropoda: Insecta Arthropoda: Insecta	Diptera Diptera	Chironomidae: Orthocladiinae Chironomidae: Prodiamesinae	midges midges		0	19.	0 7.06 5 C	12.75	, (	n 4	18	0 6.1		0	0	0
thocladius	Ĭ.	insect	Aqua	tic A	Arthropoda: Insecta	Diptera	Chironomidae: Prodiamesinae Chironomidae: Orthocladiinae	midges		o	15		12.75	. (	- "	2	0 89.3		0	0	ő
rachironomus	Ĺ	insect	Aqua	tic A	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges		ō	10	o č	0	, ,	0	0	0 6.1		ō	0	0
rametriocnemus	L	insect		tic A	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges		0		0	. 0	) (	0	0 17.9		0	0 7.5	4	0
ratanytarsus	- I-	insect			Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges		10.76	52.6 7.		19.13 4.25		0 € 7 7	4 53.7	9 64.6	8	) '	0 4/	0
ratendipes aenopsectra	Ĺ	insect	Aqua Aqua		Arthropoda: Insecta Arthropoda: Insecta	Diptera Diotera	Chironomidae: Chironominae Chironomidae: Chironominae	midges midaes		16.14	15.		4.25 21.25	, 142.5	. ,	8 4 35.8	6 160.1	6	0 11.2		.34
lvoedilum	Ĺ	insect	Agua	tic A	Arthropoda: Insecta	Diotera	Chironomidae: Chironominae	midaes		16.14	15	6 63.54	2.13	3 (	0	2 376.5		0 647.5			
ocladius	L	insect	Aqua	tic A	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges		53.8	25.3	5 7.06	8.5		0 1	8	0	0	0 7.5	51	0
odiamesa	- L	insect	Aqua		Arthropoda: Insecta	Diptera	Chironomidae: Prodiamesinae	midges		5.38 75.32	19	5 C 0 14.12	112.63		1	0 89.6	0 21.5	6	0 60.0	06 168.1	.12
sectrocladius sectrotanypus	-li	insect	Aqua Aqua		Arthropoda: Insecta Arthropoda: Insecta	Diptera Diptera	Chironomidae: Orthocladiinae Chironomidae: Tanypodinae	midges midges		16.14		0 14.12 0 r	14.88		n	0 89.6	0	0	0	0	0
seudochironomus	Ĺ	insect	Aqua	tic A	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges		0		0 317.7	0	) (	0	2	0	0	o '	0	0
seudosmittia	L	insect	Aqua	tic A	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges		24.21		0 0	0	) (	0	0	0	0	3	0	0
heotanvtarsus	L	insect	Agua	tic A	Arthropoda: Insecta	Diotera	Chironomidae: Chironominae: Tanvtarsini	midaes		5.38		0 0	4 25	. (	0	0 125.	5	0 10.6	5	0	0
mittia tempellinella	- L	insect	Agua Agua		Arthropoda: Insecta Arthropoda: Insecta	Diotera Diptera	Chironomidae: Orthocladiinae Chironomidae: Chironominae: Tanytarsini	midges midges		0		0 0	4.25	) (	0	0	0	0	, ,	0	0
anytarsus	Ē	insect	Aqua	tic A	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges		110.29	243.7		2.13	6.72	2	2	0 58.5		o '		2.69
		insect	Aqua	tic A	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges		10.76		0 7.06	17		n	8 340.6	5 21.5	6 23.4	3 75.0	18	0
hienemannimyia complex vetenia bavarica group		insect	Aqua		Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges		10.70		0 0				0 17.9	3 6.1		0 45.0		

one square meter basis.																			
							Waterbody	Rinearson Creek			Rinearson Creek			Rinearson Creek	Rinearson Creek	Rinearson Creek	Rinearson Creek	Rinearson Creek	Rinearson Creek
							Site Date	beaver bond 2020-05-19	beaver bond 2021-05-04	beaver bond 2023-08-16	emergent marsh 2020-05-19	emergent marsh 2021-05-04		engineered riffle 2020-05-19	engineered riffle 2021-05-04	engineered riffle 2023-08-16	upper control 2020-05-19	upper control 2021-05-04	upper control 2023-08-16
Taxon	Stage	Insect?	Origin	Higher classification	Order	Family	Common name	% abundance	% abundance	% abundance	% abundance	% abundance	% abundance	% abundance	% abundance	% abundance	% abundance	% abundance	% abundance
Trepaxonemata	U	non-insect	Aquatic	Turbellaria	miscellaneous non-insect	x	flat worms		0	0 2.124		0	1.333		0.3311	0.3559		0	0.2347
Nemata Prostoma	U	non-insect non-insect	Aquatic	Nemata Annelida: Nemertea	miscellaneous non-insect miscellaneous non-insect	X Tetrastemmatidae	round worms	-	0	0 0.3861	3.762	0.1751	0.9524		0.3311	0.5338		0	0 0.4695
Oligochaeta	Ü	non-insect			miscellaneous non-insect	X	nemerteans segmented worms	18.1	4 1.33	6 19.11	2.97	0.3503	4.19	1.02	2 2.815			8 1.53	1 12.91
Erpobdella	U	non-insect	Aquatic	Annelida: Hirudinea	miscellaneous non-insect	Erpobdellidae	leeches	0.642			1.386	0.5254	0	0.170			0.196	5 1.0	2 0
Helobdella stagnalis complex	U			Annelida: Hirudinea	miscellaneous non-insect	Glossiphoniidae	leeches	-	0 2.50	4 0	198	0	6 286	9	0.3311		)	0	0 0.2347
Fluminicola Potamopyrgus antipodarum	Ü	non-insect non-insect	Aguatic	Mollusca: Gastropoda Mollusca: Gastropoda	X X	Hvdrobiidae uncertain status	snails snails		0	0 0	1.98		2.476		0 0	) (	0.785	9	0 2.347 0 0.4695
Lymnaeidae	Ü	non-insect	Aquatic	Mollusca: Gastropoda	x	Lymnaeidae	snails		0	0.1931	1.188	3 0	0.381	0.170			)	0	0.2347
Physella	U			Mollusca: Gastropoda	x	Physidae	snails	-	0 0.500	8 4.247	1.386	0	1.333	0.850	3 0	0.1779		0	0 0
Ferrissia Gyraulus	III	non-insect		Mollusca: Gastropoda Mollusca: Gastropoda	×	Planorbidae Planorbidae	snails	-	0	0 0.1931		) 0	0.381	0.170	1 0	) (	0.196	n i	0 0
Menetus	Ü	non-insect	Aquatic	Mollusca: Gastropoda	×	Planorbidae	snails		0	0 0.1551	0	0	0.001	0.110			0.982	3	0 0
Juga	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Pleuroceridae	snails		0	0 0	0.396		0.381		0 0	) (	)	0	0 4.93
Sphaeriidae Musculium	U	non-insect	Aguatic	Mollusca: Bivalvia Mollusca: Bivalvia	X	Sphaeridae Sphaeridae	pea clams pea clams	_	0 0.333 0 0.333		11.29	0	5.333	0.510	2 0	1.957	1.57	2 1.0	2 18.08
Chydoridae	ŭ			Crustacea: Cladocera	x	Chydoridae	water fleas	0.642			. 0	, ,		1.02	2 0			0	0 0
Ostracoda	U	non-insect			x	x	seed shrimp		0 1.00			0	0		0.1656		)	0	0 0
Crangonyx	U			Crustacea: Amphipoda	x	Crangonyctidae	scuds	1.44	14.3	6 0 0 12.55	3.96	3.503	0.9524	1.70	1 28.64	2.135	4.71	5 0.510	2 2.347
Hyalella Caecidotea	III	non-insect		Crustacea: Amphipoda Crustacea: Isopoda	×	Talitridae Asellidae	aquatic sow bugs	0.481	U 5 5.84	3 12.55		25.22	0.9524 38.86	0.340	1 14.74	2.669	53.4	4 18.8	8 29.81
Lirceus	Ü			Crustacea: Isopoda	×	Asellidae	aquatic sow bugs	0.401	0 0.667		0.198		0	0.040	0 1.159		)	0	0 0
Pacifastacus	U			Crustacea: Decapoda	x	Astacidae	cravfish		0	0 0	0	0	0	0.170			0.196	5	0 0
Trombidiformes Hygrobates	U	non-insect non-insect	Aguatic	Arachnida: Acari Arachnida: Acari	Trombidiformes	X	mites		0 1.00	2 0.3861	0	0	0	9	0.6623	3 (		0	0 0 0 0.2347
Oribatida	ŭ			Arachnida: Acari	x	x	mites		0	0 0.1931		, ,		ì	0 0			0	0 0.2547
Sperchon	Ü	non-insect	Aquatic	Arachnida: Acari	x	x	mites		0	0 0.3861	0	) 0	0	0.170	1 0	0.3559	9	0	0 0
Sperchonopsis	U	non-insect		Arachnida: Acari	X	X	mites		0	0 0	0	0	0	(	0 0	) (		0	0.939
Aeshnidae Libellulidae	IL.	insect	Aquatic	Arthropoda: Insecta Arthropoda: Insecta	Odonata	Aeshnidae Libellulidae	dragonflies dragonflies	0.160	0 0.166	0 2.51 9 0.7722		, 0	0		0.1656	, (	)	0	0 0
Araia	Ĺ	insect	Aquatic	Arthropoda: Insecta	Odonata	Coenagrionidae	damselflies		0	0 0	0	0	ő	Č	0 0	1.601		0	0 0
Coenagrion/Enallagma	L	insect	Aquatic	Arthropoda: Insecta	Odonata	Coenagrionidae	damselflies	4	0 0.166	9 5.405	0.198	. 0	0.1905		0 0	0.5338		0	0.2347
Bastis tricaudatus complex	L	insect	Aquatic Aquatic	Arthropoda: Insecta	Ephemeroptera Ephemeroptera	Baetidae Baetidae	mayflies mayflies	+	0	0 0	0.7921	0	0	0.850	3 0.8278		1.76	B 0.510	u 0
Baetis tricaudatus complex Callibaetis	Ĺ	insect	Aquatic	Arthropoda: Insecta Arthropoda: Insecta	Ephemeroptera Ephemeroptera	Baetidae	mayfiles mayfiles	0.160	U 0.166	9 4.633	. 0	. 0	0.9524		0.02/8		,	0.510	
Abedus	Ĺ	insect	Aquatic	Arthropoda: Insecta	Hemiptera: Heteroptera	Belostomatidae	giant water bugs		0	0.1931		0	0	i	0 0			0	0 0
Corixidae	L	insect	Aquatic	Arthropoda: Insecta	Hemiptera: Heteroptera	Corixidae	water boatman	1.76				2 0	1.905		0 0	) (	)	0	0 0
Cenocorixa Notonecta	A	insect	Aquatic	Arthropoda: Insecta Arthropoda: Insecta	Hemiptera: Heteroptera Hemiptera: Heteroptera	Corixidae Notonectidae	water boatman back swimmers	1.76		0 0	0	0	0		0 0	) (	)	0	0 0
Cheumatopsyche	Ĭ.	insect		Arthropoda: Insecta	Trichoptera	Hydropsychidae	caddisflies	0.100	0	0 0	. 0	, ,		1.19		0.7117	,	0	0 0
Hydroptila	L	insect	Aquatic	Arthropoda: Insecta	Trichoptera	Hydroptilidae	caddisflies		0	0 0	0	) 0	0	0.170	1 0	0.5338	3	0	0 0
Oxyethira	L	insect	Aquatic	Arthropoda: Insecta	Trichoptera	Hydroptilidae	caddisflies		0	0 0.5792	. 0	0	0	9	0 0	) (	0.196	0	0 0
Lepidostoma Dytiscidae	-	insect	Aquatic Aquatic	Arthropoda: Insecta Arthropoda: Insecta	Trichoptera Coleoptera	Lepidostomatidae Dytiscidae	caddisflies predaceous diving beetles	0.160	0	0 (	0.198		0		0 0	) (	0.196	n i	0 0
Lara	Ĭ.	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Elmidae	riffle beetles	0.100	0	0 0	0.150	0	ő	i	0 0		0.196	5	0 0
Peltodytes	A	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Haliplidae	crawling water beetles	0.32		0 2.703		. 0	0		0 0	) (	)	0	0 0
Peltodytes	L	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Haliplidae	crawling water beetles	0.160		0 1.737 0 0.1931		0	1.714	9	0 0	) (	)	0	0 0
Hvdrophilidae Ceratopogoninae	-	insect	Aguatic Aguatic	Arthropoda: Insecta Arthropoda: Insecta	Coleoptera Diotera	Hvdroohilidae Ceratopogonidae	water scavenger beetles no-see-um midges	2.56				0.8757	0.381	1.03	2 1.656	1.246	1.57	2 2.55	0 0.2347
Ceratopogoninae	P	insect		Arthropoda: Insecta	Diptera	Ceratopogonidae	no-see-um midges	0.160			0	0	0	0.170		)	)	0	0 0
Dixella	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Dixidae	dixid midges		0	0 0	0.9901		0.7619		0 0	) (	)	0	0.7042
Dolichopodidae Clinocera	-	insect	Aquatic	Arthropoda: Insecta Arthropoda: Insecta	Diptera Diptera	Dolichopodidae Empididae	long-legged flies dance flies	0.160	15	0 0	0.198	0	0		0 0	) (	0.196		0 0
Hemerodromia	L.	insect	Aquatic	Arthropoda: Insecta	Diptera	Empididae	dance flies		0	0 0	0.150			ì	0 0		) 0.150	0	0.2347
Neoplasta	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Empididae	dance flies		0	0 0	0.198	3 0	0		0 0	0.1779	0.196	5	0.4695
Psychodini	L	insect	Aquatic	Arthropoda: Insecta	Diotera	Psvchodidae	moth flies	0.160	15	0 0	0	0	0	(	0 0 8 0.8278	) (	)	0	0 0
Simulium	P	insect	Aquatic Aquatic	Arthropoda: Insecta Arthropoda: Insecta	Diotera Diotera	Simulidae	black flies black flies	2.08	0	0 0	) 0	) 0	0	60.88	0.8278 0 0.3311		0.392	9	0 0
Tipuloidea	P	insect		Arthropoda: Insecta	Diptera	Tipulidae	crane flies		ō	0 0	0.198	0	ō	i	0 0	) (		0	0 0
Dicranomyia	L	insect	Aquatic		Diptera	Tipulidae	crane flies		0	0 0	0	0	0		0 0	1.60		0	0 0
Tipula Chironomidae	L	insect	Aquatic	Arthropoda: Insecta Arthropoda: Insecta	Diptera Diptera	Tipulidae Chironomidae	crane flies midges	1.44		0 C 4 0.1931	0.7921	2.277	1.333	0.340					0 2 0.2347
Ablabesmvia	Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	3.37	0.54	0.1931		) 2.2//	0.1905		0 0	) 3.072	2.55	0.510	0.4695
Alotanypus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges		0 0.667	8 0	1.386		0.1905		0.4967	,	0.785		2 0
Brillia Chironomus	L	insect	Aquatic Aquatic	Arthropoda: Insecta Arthropoda: Insecta	Diotera Diptera	Chironomidae: Orthocladiinae	midaes	0.32		0 0	2.772		0.5714	9	0 0 0 7.45		) 2.7 ) 0.196		0.4695
Cladopelma	L	insect	Aquatic	Arthropoda: Insecta Arthropoda: Insecta	Diptera	Chironomidae: Chironominae Chironomidae: Chironominae	midges midges	1 22.1	9 1.83 0 0.333		, U.198 ) A	1.226	0.5/14		0 7.45	) (	0.196	0 1.0	
Corynoneura	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	0.32	21	0 0.5792			1.524	0.340		) .	0.392	9	0.7042
Cricotopus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	13.6			1.782		0.1905			13.17		0	0 0
Cryptochironomus Dicrotendipes	IL.	insect	Aquatic	Arthropoda: Insecta Arthropoda: Insecta	Diptera Diptera	Chironomidae: Chironominae Chironomidae: Chironominae	midges midges	3.53	0 11.6 0 0.667		0.5941		0.1905	U.170	1 0	, (	0.196	0	0.2347
Endochironomus	Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	1.76	6	0 0.5792	. 0	0	ő	Č	0 0	) (	)	0	0 0
Eukiefferiella claripennis group	L	insect	Aquatic	Arthropoda: Insecta	Diotera	Chironomidae: Orthocladiinae	midaes	0.642	11	0 0	0.5941		0.1905	6.97	3 1.821		1.17		0 0
Heterotrissocladius marcidus group Limnophyes	L	insect	Aguatic Aquatic	Arthropoda: Insecta	Diotera Diotera	Chironomidae: Orthocladiinae Chironomidae: Orthocladiinae	midaes	0.32	0	0 0	0.396		0.5714 0.1905	9	0 0 0 0.3311	) (	0.392	9	0 0.939 0 0.2347
Micropsectra	Ti.	insect	Aquatic	Arthropoda: Insecta Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges midges	1 0.32	0	0 0	7.129			0.510			0.569	8 0.510	
Nanocladius	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges		0	0 0.1931	0	) 0	0	2.010	0.3311	0.5338	3	0	0 0
Odontomesa	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Prodiamesinae	midges	4	0 1.66	9 0	1.188	9 0	4.571		0.4967	,	)	0	0.939
Orthocladius Parachironomus	L	insect	Aquatic Aquatic	Arthropoda: Insecta Arthropoda: Insecta	Diptera Diptera	Chironomidae: Orthocladiinae Chironomidae: Chironominae	midges midges	+	0 1.33	6 (	0	0	0.1905	9	0 4.801 0 0.3311		)	n .	0.2347
Parametriocnemus	L	insect	Aquatic	Arthropoda: Insecta	Diotera	Chironomidae: Orthocladinae	midges	1	ŏ	0 0	. 0	. 0	0	0.170			0.392	9	0 0
Paratanytarsus	L	insect	Aguatic	Arthropoda: Insecta	Diotera	Chironomidae: Chironominae: Tanvtarsini	midaes	0.642			1.782		6.095		2 3.477	,	)	0	0.4695
Paratendipes	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	0.963	0 0.667 31 1.33		0.396	18.56	7.429	0.340	0 0		0.589	0 1.53 4 0.510	
Phaenopsectra Polypedilum	L.	insect	Aquatic	Arthropoda: Insecta Arthropoda: Insecta	Diptera Diptera	Chironomidae: Chironominae Chironomidae: Chironominae	midges midges	0.963					0.381	0.340° 3.57°		54.09			
Procladius	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae Chironomidae: Tanypodinae	midges	3.2	21 2.1	7 0.1931	0.7921	0	1.714	3.57	0 0	) (	0.392	9	0 2.582
Prodiamesa	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Prodiamesinae	midges	0.32	1.66	9 0	10.5	26.44		i	0 1.159	9 .	3.14		в 0
Psectrocladius	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	4.49		0 0.3861	0.198	. 0	0	0.850	3 0	) (		0	0 0
Psectrotanypus Pseudochironomus	i.	insect	Aquatic Aquatic	Arthropoda: Insecta Arthropoda: Insecta	Diptera Diotera	Chironomidae: Tanypodinae Chironomidae: Chironominae	midges midges	0.963	0	0 C 0 8.687	1.386	, 0	0.1905		0 0	, (	,	n i	. J
Pseudosmittia	Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	1.44		0 0.007	) 0		0.1803	č	0 0		5	0	ō ŏ
Rheotanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	0.32	21	0 0		0	0	1.19	9 0	0.8897		0	0 0
Smittia Stempellinella	L.	insect	Aquatic	Arthropoda: Insecta Arthropoda: Insecta	Diptera Diptera	Chironomidae: Orthocladiinae Chironomidae: Chironominae: Tanvtarsini	midges midges	+	0	0 0	0.396	0	0	,	0 0	) (	)	n .	0 0 0 0.2347
Tanytarsus	L	insect		Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini Chironomidae: Chironominae: Tanytarsini	midges	6.58			0.198		0.1905		3.146		j l	0 1.0	2 0.4695
Thienemannimyia complex	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	0.642		0 0.1931	1.584	. 0	0.7619	3.23	1 1.159	1.957	3.92	9	0 4.225
Tvetenia bavarica group	JL	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	_	0	0 0	0.198	0	0	0.170	1 0.3311		2.35	В	0 0

Waterbody	Site	Date	Taxon	Stage		Origin	Higher.classification	Order	Family	Common.name	Abundance
Rinearson Creek	beaver pond	2020-05-19	Caecidotea	U	non-insect	Aquatic	Crustacea: Isopoda	x	Asellidae	aquatic sow bugs	8.07
Rinearson Creek	beaver pond	2020-05-19	Notonecta	L	insect	Aquatic	Arthropoda: Insecta	Hemiptera: Heteroptera	Notonectidae	back swimmers	2.69
Rinearson Creek	beaver pond	2020-05-19	Simulium	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Simuliidae	black flies	34.97
Rinearson Creek	beaver pond	2020-05-19	Tipula	Ļ	insect	Aquatic	Arthropoda: Insecta	Diptera	Tipulidae	crane flies	24.21
Rinearson Creek	beaver pond	2020-05-19		A	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Haliplidae	crawling water beetles	5.38
Rinearson Creek	beaver pond	2020-05-19		L	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Haliplidae	crawling water beetles	2.69
Rinearson Creek	beaver pond	2020-05-19	Aeshnidae	L	insect	Aquatic	Arthropoda: Insecta	Odonata	Aeshnidae	dragonflies	2.69
Rinearson Creek	beaver pond	2020-05-19		U	non-insect	Aquatic	Annelida: Hirudinea	miscellaneous non-insect	Erpobdellidae	leeches	10.76
Rinearson Creek	beaver pond	2020-05-19		Ļ	insect	Aquatic	Arthropoda: Insecta	Diptera	Dolichopodidae	long-legged flies	2.69
Rinearson Creek	beaver pond	2020-05-19	Callibaetis	L P	insect	Aquatic	Arthropoda: Insecta	Ephemeroptera	Baetidae	mayflies	2.69
Rinearson Creek	beaver pond	2020-05-19		P	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae	midges	56.49
Rinearson Creek	beaver pond	2020-05-19	Chironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	381.98
Rinearson Creek	beaver pond	2020-05-19	Cryptochironomus	Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera Diptera	Chironomidae: Chironominae Chironomidae: Chironominae	midges	59.18 29.59
Rinearson Creek	beaver pond	2020-05-19 2020-05-19		L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	16.14
Rinearson Creek	beaver pond	2020-05-19		L	insect	Aquatic	Arthropoda: Insecta	Diptera		midges	16.14
Rinearson Creek Rinearson Creek	beaver pond beaver pond	2020-05-19		L	insect	Aquatic Aquatic	Arthropoda: Insecta Arthropoda: Insecta	Diptera	Chironomidae: Chironominae Chironomidae: Chironominae: Tanytarsini	midges midges	10.76
Rinearson Creek	beaver pond	2020-05-19		Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini		5.38
Rinearson Creek	beaver pond	2020-05-19		-	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges midges	110.29
Rinearson Creek	beaver pond	2020-05-19		L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	5.38
Rinearson Creek	beaver pond	2020-05-19		i	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	5.38
Rinearson Creek	beaver pond	2020-05-19		į.	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	228.65
Rinearson Creek	beaver pond	2020-05-19		ī	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	10.76
Rinearson Creek	beaver pond	2020-05-19		L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae Chironomidae: Orthocladiinae	midges midges	5.38
Rinearson Creek	beaver pond	2020-05-19		Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae Chironomidae: Orthocladiinae	midges	75.32
Rinearson Creek	beaver pond	2020-05-19		Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	24.21
Rinearson Creek	beaver pond	2020-05-19		ī	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Prodiamesinae	midges	5.38
Rinearson Creek	beaver pond	2020-05-19		i	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	53.8
Rinearson Creek	beaver pond	2020-05-19	Psectrotanypus	i	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	16.14
Rinearson Creek	beaver pond	2020-05-19	Thienemannimyia complex	ī	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae Chironomidae: Tanypodinae	midges	10.76
Rinearson Creek	beaver pond	2020-05-19		ī	insect	Aquatic	Arthropoda: Insecta	Diptera	Psychodidae Psychodidae	moth flies	2.69
Rinearson Creek	beaver pond	2020-05-19	Ceratopogoninae	Ī	insect	Aquatic	Arthropoda: Insecta	Diptera	Ceratopogonidae	no-see-um midges	43.04
Rinearson Creek	beaver pond	2020-05-19	Ceratopogoninae	P	insect	Aquatic	Arthropoda: Insecta	Diptera	Ceratopogonidae	no-see-um midges	2.69
Rinearson Creek	beaver pond	2020-05-19	Dytiscidae	Ė	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Dytiscidae	predaceous diving beetles	2.69
Rinearson Creek	beaver pond	2020-05-19		Ū	non-insect	Aquatic	Crustacea: Amphipoda	X	Crangonyctidae	scuds	24.21
Rinearson Creek	beaver pond	2020-05-19	Oligochaeta	Ü	non-insect	Aquatic	Annelida: Oligochaeta	miscellaneous non-insect	v	segmented worms	303.97
Rinearson Creek	beaver pond	2020-05-19	Cenocorixa	A	insect	Aquatic	Arthropoda: Insecta	Hemiptera: Heteroptera	Corixidae	water boatman	29.59
Rinearson Creek	beaver pond	2020-05-19	Corixidae	Ĺ	insect	Aquatic	Arthropoda: Insecta	Hemiptera: Heteroptera	Corixidae	water boatman	29.59
Rinearson Creek	beaver pond	2020-05-19		Ū	non-insect	Aquatic	Crustacea: Cladocera	X	Chydoridae	water fleas	10.76
Rinearson Creek	beaver pond	2020-05-19	Hydrophilidae	Ĭ	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Hydrophilidae	water scavenger beetles	2.69
Rinearson Creek	emergent marsh	2020-05-19	Caecidotea	Ū	non-insect	Aquatic	Crustacea: Isopoda	x	Asellidae	aquatic sow bugs	250.7618
Rinearson Creek	emergent marsh	2020-05-19	Lirceus	Ü	non-insect	Aquatic	Crustacea: Isopoda	x	Asellidae	aquatic sow bugs	2.1251
Rinearson Creek	emergent marsh	2020-05-19	Tipula	Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Tipulidae	crane flies	8.5004
Rinearson Creek	emergent marsh	2020-05-19	Tipuloidea	P	insect	Aquatic	Arthropoda: Insecta	Diptera	Tipulidae	crane flies	2.1251
Rinearson Creek	emergent marsh	2020-05-19		A	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Haliplidae	crawling water beetles	6.3753
Rinearson Creek	emergent marsh	2020-05-19	Coenagrion/Enallagma	Ĺ	insect	Aquatic	Arthropoda: Insecta	Odonata	Coenagrionidae	damselflies	2.1251
Rinearson Creek	emergent marsh	2020-05-19	Clinocera	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Empididae	dance flies	2.1251
Rinearson Creek	emergent marsh	2020-05-19	Neoplasta	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Empididae	dance flies	2.1251
Rinearson Creek	emergent marsh	2020-05-19	Dixella	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Dixidae	dixid midges	10.6255
Rinearson Creek	emergent marsh	2020-05-19	Erpobdella	U	non-insect	Aquatic	Annelida: Hirudinea	miscellaneous non-insect	Erpobdellidae	leeches	14.8757
Rinearson Creek	emergent marsh	2020-05-19	Baetis	L	insect	Aquatic	Arthropoda: Insecta	Ephemeroptera	Baetidae	mayflies	8.5004
Rinearson Creek	emergent marsh	2020-05-19	Chironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	2.1251
Rinearson Creek	emergent marsh	2020-05-19	Cryptochironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	6.3753
Rinearson Creek	emergent marsh	2020-05-19	Dicrotendipes	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	2.1251
Rinearson Creek	emergent marsh	2020-05-19	Paratendipes	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	4.2502
Rinearson Creek	emergent marsh	2020-05-19		L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	21.251
Rinearson Creek	emergent marsh	2020-05-19		L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	2.1251
Rinearson Creek	emergent marsh	2020-05-19	Micropsectra	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	76.5036
Rinearson Creek	emergent marsh	2020-05-19	Paratanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	19.1259
Rinearson Creek	emergent marsh	2020-05-19	Tanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	2.1251
Rinearson Creek	emergent marsh	2020-05-19	Brillia	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	29.7514
Rinearson Creek	emergent marsh	2020-05-19	Corynoneura	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	8.5004
Rinearson Creek	emergent marsh	2020-05-19	Cricotopus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	19.1259
Rinearson Creek	emergent marsh	2020-05-19	Eukiefferiella claripennis group	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	6.3753
Rinearson Creek	emergent marsh	2020-05-19	Heterotrissocladius marcidus group	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	4.2502
Rinearson Creek	emergent marsh	2020-05-19	Limnophyes	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	8.5004
Rinearson Creek	emergent marsh	2020-05-19	Psectrocladius	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	2.1251
Rinearson Creek	emergent marsh	2020-05-19	Smittia	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	4.2502
Rinearson Creek	emergent marsh	2020-05-19	Tvetenia bavarica group	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	2.1251
Milical Soll Cicck	•	0000 05 40	Odontomesa		insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Prodiamesinae	midges	12.7506
Rinearson Creek	emergent marsh	2020-05-19	Odontomesa	L	HIDOOL						
	emergent marsh emergent marsh emergent marsh	2020-05-19	Prodiamesa	Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Prodiamesinae	midges	112.6303

Waterbody	Site	Date	Taxon	Stogo	Insect	Origin	Higher.classification	Order	Family	Common.name	Abundance
Rinearson Creek	emergent marsh	2020-05-19		L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	8.5004
Rinearson Creek	emergent marsh	2020-05-19		Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae Chironomidae: Tanypodinae	midges	14.8757
Rinearson Creek	emergent marsh	2020-05-19		Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae		17.0008
		2020-05-19		Ĺ						midges	4.2502
Rinearson Creek Rinearson Creek	emergent marsh	2020-05-19		Ū	insect non-insect	Aquatic	Arthropoda: Insecta Mollusca: Bivalvia	Diptera x	Ceratopogonidae Sphaeriidae	no-see-um midges pea clams	121.1307
Rinearson Creek	emergent marsh	2020-05-19		L	insect	Aquatic			Dytiscidae	predaceous diving beetles	2.1251
Rinearson Creek	emergent marsh	2020-05-19		U		Aquatic	Arthropoda: Insecta Nemata	Coleoptera miscellaneous non-insect	Dyliscidae	round worms	
	emergent marsh	2020-05-19		U					X Cranganyatidaa		40.3769 42.502
Rinearson Creek Rinearson Creek	emergent marsh	2020-05-19		U	non-insect non-insect	Aquatic	Crustacea: Amphipoda Annelida: Oligochaeta	x miscellaneous non-insect	Crangonyctidae	scuds	31.8765
Rinearson Creek	emergent marsh emergent marsh	2020-05-19		U	non-insect	Aquatic Aquatic	Mollusca: Gastropoda	X	x Hydrobiidae	segmented worms snails	21.251
Rinearson Creek		2020-05-19		U					,		12.7506
Rinearson Creek	emergent marsh	2020-05-19		U	non-insect	Aquatic	Mollusca: Gastropoda	X	Lymnaeidae Physidae	snails snails	14.8757
Rinearson Creek	emergent marsh emergent marsh	2020-05-19		U	non-insect	Aquatic Aquatic	Mollusca: Gastropoda Mollusca: Gastropoda	X X	Pleuroceridae	snails	4.2502
Rinearson Creek	emergent marsh	2020-05-19		U	non-insect	Aquatic	Mollusca: Gastropoda	X	uncertain status	snails	46.7522
Rinearson Creek	emergent marsh	2020-05-19		ı	insect	Aquatic	Arthropoda: Insecta	Hemiptera: Heteroptera	Corixidae	water boatman	19.1259
Rinearson Creek	engineered riffle	2020-05-19		Ū	non-insect	Aquatic	Crustacea: Isopoda	пенириета, пенегориета х	Asellidae	aquatic sow bugs	35.8577
Rinearson Creek	engineered riffle	2020-05-19		L	insect	Aquatic	Arthropoda: Insecta	x Diptera	Simuliidae	black flies	6418.5283
Rinearson Creek	engineered riffle	2020-05-19		Ĺ	insect	Aquatic	Arthropoda: Insecta	Trichoptera	Hydropsychidae	caddisflies	125.50195
Rinearson Creek	engineered riffle	2020-05-19		Ĺ	insect	Aquatic	Arthropoda: Insecta	Trichoptera	Hydroptilidae	caddisflies	17.92885
Rinearson Creek	engineered riffle	2020-05-19		Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Tipulidae	crane flies	35.8577
Rinearson Creek	engineered riffle	2020-05-19		Ü	non-insect	Aquatic	Crustacea: Decapoda	Dipiera X	Astacidae	crayfish	17.92885
Rinearson Creek	engineered riffle	2020-05-19		U	non-insect	Aquatic	Annelida: Hirudinea	miscellaneous non-insect	Erpobdellidae	leeches	17.92885
Rinearson Creek	engineered riffle	2020-05-19		L	insect	Aquatic	Arthropoda: Insecta	Ephemeroptera	Baetidae	mayflies	89.64425
Rinearson Creek	engineered riffle	2020-05-19		P	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae	midges	143.4308
Rinearson Creek	engineered riffle	2020-05-19		Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	17.92885
Rinearson Creek	engineered riffle	2020-05-19		Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae		35.8577
Rinearson Creek	engineered riffle	2020-05-19		Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges midges	376.50585
	engineered riffle	2020-05-19		Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini		53.78655
Rinearson Creek Rinearson Creek	engineered riffle	2020-05-19		Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera Diptera	Chironomidae: Chironominae: Tanytarsini	midges midges	53.78655
Rinearson Creek	engineered riffle	2020-05-19		Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	125.50195
Rinearson Creek	engineered riffle	2020-05-19		Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	35.8577
Rinearson Creek	engineered riffle	2020-05-19		Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	1021.94445
Rinearson Creek	engineered riffle	2020-05-19		Ĺ	insect		Arthropoda: Insecta	Diptera Diptera	Chironomidae: Orthocladiinae Chironomidae: Orthocladiinae	midges	735.08285
Rinearson Creek	engineered riffle	2020-05-19		Ĺ	insect	Aquatic Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	17.92885
Rinearson Creek	engineered riffle	2020-05-19		Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	89.64425
		2020-05-19		_							17.92885
Rinearson Creek	engineered riffle	2020-05-19		L L	insect insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	340.64815
Rinearson Creek Rinearson Creek	engineered riffle engineered riffle	2020-05-19		Ü	non-insect	Aquatic	Arthropoda: Insecta Arachnida: Acari	Diptera x	Chironomidae: Tanypodinae	midges mites	17.92885
Rinearson Creek	engineered riffle	2020-05-19		L	insect	Aquatic Aquatic	Arthropoda: Insecta	Diptera	Ceratopogonidae		107.5731
Rinearson Creek	engineered riffle	2020-05-19		P	insect		Arthropoda: Insecta		Ceratopogonidae	no-see-um midges	17.92885
Rinearson Creek	engineered riffle	2020-05-19		Ü	non-insect	Aquatic Aquatic	Mollusca: Bivalvia	Diptera x	Sphaeriidae	no-see-um midges pea clams	53.78655
Rinearson Creek	engineered riffle	2020-05-19		IJ	non-insect	Aquatic	Crustacea: Amphipoda	X	Crangonyctidae	scuds	179.2885
Rinearson Creek	engineered riffle	2020-05-19		IJ	non-insect	Aquatic	Annelida: Oligochaeta	miscellaneous non-insect	x	segmented worms	107.5731
Rinearson Creek	engineered riffle			U	non-insect	Aquatic	Mollusca: Gastropoda	X	Lymnaeidae	snails	17.92885
Rinearson Creek	engineered riffle	2020-05-19		IJ	non-insect	Aquatic	Mollusca: Gastropoda	X	Physidae	snails	89.64425
Rinearson Creek	engineered riffle	2020-05-19		U	non-insect	Aquatic	Mollusca: Gastropoda	X	Planorbidae	snails	17.92885
Rinearson Creek	engineered riffle	2020-05-19		U	non-insect	Aquatic	Crustacea: Cladocera	X	Chydoridae	water fleas	107.5731
Rinearson Creek	upper control	2020-05-19		IJ	non-insect	Aquatic	Crustacea: Isopoda	x	Asellidae	aguatic sow bugs	1021.05944
Rinearson Creek	upper control	2020-05-19		L	insect	Aquatic	Arthropoda: Insecta	Diptera	Simuliidae	black flies	7.50779
Rinearson Creek	upper control	2020-05-19		Ĺ	insect	Aquatic	Arthropoda: Insecta	Trichoptera	Lepidostomatidae	caddisflies	3.753895
Rinearson Creek	upper control	2020-05-19		Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Tipulidae	crane flies	3.753895
Rinearson Creek	upper control	2020-05-19		Ü	non-insect	Aquatic	Crustacea: Decapoda	X	Astacidae	crayfish	3.753895
Rinearson Creek	upper control	2020-05-19		L	insect	Aquatic	Arthropoda: Insecta	Diptera	Empididae	dance flies	3.753895
Rinearson Creek	upper control	2020-05-19		Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Empididae	dance flies	3.753895
Rinearson Creek	upper control	2020-05-19		Ü	non-insect	Aquatic	Annelida: Hirudinea	miscellaneous non-insect	Erpobdellidae	leeches	3.753895
Rinearson Creek	upper control			Ĺ	insect	Aquatic	Arthropoda: Insecta	Ephemeroptera	Baetidae	mayflies	33.785055
Rinearson Creek	upper control	2020-05-19		P	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae	midges	45.04674
Rinearson Creek	upper control	2020-05-19		į.	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	3.753895
Rinearson Creek	upper control	2020-05-19		ī	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	3.753895
Rinearson Creek	upper control	2020-05-19		Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	11.261685
Rinearson Creek	upper control	2020-05-19		Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	3.753895
Rinearson Creek	upper control	2020-05-19		Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	127.63243
Rinearson Creek	upper control	2020-05-19		Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	52.55453
Rinearson Creek	upper control	2020-05-19		Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	7.50779
Rinearson Creek	upper control	2020-05-19		Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	22.52337
Rinearson Creek	upper control	2020-05-19		Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	7.50779
Rinearson Creek	upper control			Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	11.261685
Rinearson Creek	upper control			Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	7.50779
Rinearson Creek	upper control	2020-05-19		Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	45.04674
Rinearson Creek	upper control	2020-05-19		Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Prodiamesinae	midges	60.06232
Rinearson Creek	upper control	2020-05-19		i	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	15.01558
Rinearson Creek	upper control	2020-05-19		Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	7.50779
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Waterbody	Site	Date	Taxon	Stage	Insect	Origin	Higher.classification	Order	Family	Common.name	Abundance
Rinearson Creek	upper control	2020-05-19	Thienemannimyia complex	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midaes	75.0779
Rinearson Creek	upper control	2020-05-19	Ceratopogoninae	Ē	insect	Aquatic	Arthropoda: Insecta	Diptera	Ceratopogonidae	no-see-um midges	30.03116
Rinearson Creek	upper control	2020-05-19	Sphaeriidae	U	non-insect	Aquatic	Mollusca: Bivalvia	x '	Sphaeriidae	pea clams	30.03116
Rinearson Creek	upper control	2020-05-19	Lara	Ĺ	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Elmidae	riffle beetles	3.753895
Rinearson Creek	upper control	2020-05-19	Crangonyx	U	non-insect	Aquatic	Crustacea: Amphipoda	x	Crangonyctidae	scuds	90.09348
Rinearson Creek	upper control	2020-05-19	Oligochaeta	Ū	non-insect	Aquatic	Annelida: Oligochaeta	miscellaneous non-insect	x	segmented worms	127.63243
Rinearson Creek	upper control	2020-05-19	Ferrissia	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Planorbidae	snails	3.753895
Rinearson Creek	upper control	2020-05-19	Menetus	Ū	non-insect	Aquatic	Mollusca: Gastropoda	x	Planorbidae	snails	18.769475
Rinearson Creek	upper control	2020-05-19	Potamopyrgus antipodarum	U	non-insect	Aquatic	Mollusca: Gastropoda	x	uncertain status	snails	15.01558
Rinearson Creek	beaver pond	2021-05-04	Caecidotea	U	non-insect	Aquatic	Crustacea: Isopoda	x	Asellidae	aquatic sow bugs	68.25875
Rinearson Creek	beaver pond	2021-05-04	Lirceus	U	non-insect	Aquatic	Crustacea: Isopoda	x	Asellidae	aquatic sow bugs	7.801
Rinearson Creek	beaver pond	2021-05-04	Coenagrion/Enallagma	L	insect	Aquatic	Arthropoda: Insecta	Odonata	Coenagrionidae	damselflies	1.95025
Rinearson Creek	beaver pond	2021-05-04	Libellulidae	L	insect	Aquatic	Arthropoda: Insecta	Odonata	Libellulidae	dragonflies	1.95025
Rinearson Creek	beaver pond	2021-05-04	Erpobdella	U	non-insect	Aquatic	Annelida: Hirudinea	miscellaneous non-insect	Erpobdellidae	leeches	9.75125
Rinearson Creek	beaver pond	2021-05-04	Helobdella stagnalis complex	U	non-insect	Aquatic	Annelida: Hirudinea	miscellaneous non-insect	Glossiphoniidae	leeches	29.25375
Rinearson Creek	beaver pond	2021-05-04	Callibaetis	L	insect	Aquatic	Arthropoda: Insecta	Ephemeroptera	Baetidae	mayflies	1.95025
Rinearson Creek	beaver pond	2021-05-04	Chironomidae	Р	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae	midges	74.1095
Rinearson Creek	beaver pond	2021-05-04	Chironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	21.45275
Rinearson Creek	beaver pond	2021-05-04	Cladopelma	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	3.9005
Rinearson Creek	beaver pond	2021-05-04	Cryptochironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	136.5175
Rinearson Creek	beaver pond	2021-05-04	Dicrotendipes	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	7.801
Rinearson Creek	beaver pond	2021-05-04	Paratendipes	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	7.801
Rinearson Creek	beaver pond	2021-05-04	Phaenopsectra	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	15.602
Rinearson Creek	beaver pond	2021-05-04	Polypedilum	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	15.602
Rinearson Creek	beaver pond	2021-05-04	Paratanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	52.65675
Rinearson Creek	beaver pond	2021-05-04	Tanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	243.78125
Rinearson Creek	beaver pond	2021-05-04	Cricotopus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	7.801
Rinearson Creek	beaver pond	2021-05-04	Orthocladius	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	15.602
Rinearson Creek	beaver pond	2021-05-04	Odontomesa	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Prodiamesinae	midges	19.5025
Rinearson Creek	beaver pond	2021-05-04	Prodiamesa	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Prodiamesinae	midges	19.5025
Rinearson Creek	beaver pond	2021-05-04	Alotanypus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	7.801
Rinearson Creek	beaver pond	2021-05-04	Procladius	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	25.35325
Rinearson Creek	beaver pond	2021-05-04	Trombidiformes	U	non-insect	Aquatic	Arachnida: Acari	Trombidiformes	X	mites	11.7015
Rinearson Creek	beaver pond	2021-05-04	Ceratopogoninae	L P	insect	Aquatic	Arthropoda: Insecta	Diptera	Ceratopogonidae	no-see-um midges	128.7165
Rinearson Creek	beaver pond	2021-05-04	Ceratopogoninae	•	insect	Aquatic	Arthropoda: Insecta	Diptera	Ceratopogonidae	no-see-um midges	1.95025
Rinearson Creek	beaver pond	2021-05-04	Musculium	U	non-insect	Aquatic	Mollusca: Bivalvia	X	Sphaeriidae	pea clams	3.9005
Rinearson Creek	beaver pond	2021-05-04	Sphaeriidae	U	non-insect	Aquatic	Mollusca: Bivalvia	X	Sphaeriidae	pea clams	3.9005
Rinearson Creek	beaver pond	2021-05-04	Crangonyx Ostracoda	U U	non-insect	Aquatic	Crustacea: Amphipoda	X	Crangonyctidae	scuds	167.7215 11.7015
Rinearson Creek Rinearson Creek	beaver pond beaver pond	2021-05-04 2021-05-04	Oligochaeta	U	non-insect	Aquatic	Crustacea: Ostracoda Annelida: Oligochaeta	miscellaneous non-insect	X	seed shrimp segmented worms	15.602
Rinearson Creek	beaver pond	2021-05-04	Physella	U	non-insect	Aquatic Aquatic	Mollusca: Gastropoda		x Physidae	snails	5.85075
Rinearson Creek	beaver pond	2021-05-04	Corixidae	L	insect	Aquatic	Arthropoda: Insecta	x Hemiptera: Heteroptera	Corixidae	water boatman	17.55225
Rinearson Creek	beaver pond	2021-05-04	Chydoridae	Ü	non-insect	Aquatic	Crustacea: Cladocera	X	Chydoridae	water fleas	3.9005
Rinearson Creek	emergent marsh	2021-05-04	Caecidotea	U	non-insect	Aquatic	Crustacea: Isopoda	X	Asellidae	aquatic sow bugs	193.68
Rinearson Creek	emergent marsh	2021-05-04	Lirceus	Ü	non-insect	Aquatic	Crustacea: Isopoda	X	Asellidae	aquatic sow bugs	13.45
Rinearson Creek	emergent marsh	2021-05-04	Erpobdella	Ü	non-insect	Aquatic	Annelida: Hirudinea	miscellaneous non-insect	Erpobdellidae	leeches	4.035
Rinearson Creek	emergent marsh	2021-05-04	Chironomidae	P	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae	midges	17.485
Rinearson Creek	emergent marsh	2021-05-04	Chironomus	i	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	9.415
Rinearson Creek	emergent marsh	2021-05-04	Paratendipes	Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	142.57
Rinearson Creek	emergent marsh	2021-05-04	Micropsectra	ī	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	4.035
Rinearson Creek	emergent marsh	2021-05-04	Tanytarsus	ī	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	6.725
Rinearson Creek	emergent marsh	2021-05-04	Cricotopus	ī	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	13.45
Rinearson Creek	emergent marsh	2021-05-04	Prodiamesa	ī	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Prodiamesinae	midges	203.095
Rinearson Creek	emergent marsh	2021-05-04	Alotanypus	ī	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	122.395
Rinearson Creek	emergent marsh	2021-05-04	Ceratopogoninae	ī	insect	Aquatic	Arthropoda: Insecta	Diptera	Ceratopogonidae	no-see-um midges	6.725
Rinearson Creek	emergent marsh	2021-05-04	Nemata	Ū	non-insect	Aquatic	Nemata	miscellaneous non-insect	х	round worms	1.345
Rinearson Creek	emergent marsh	2021-05-04	Crangonyx	Ü	non-insect	Aquatic	Crustacea: Amphipoda	X	Crangonyctidae	scuds	26.9
Rinearson Creek	emergent marsh	2021-05-04	Oligochaeta	Ü	non-insect	Aquatic	Annelida: Oligochaeta	miscellaneous non-insect	x	segmented worms	2.69
Rinearson Creek	engineered riffle	2021-05-04	Caecidotea	Ū	non-insect	Aquatic	Crustacea: Isopoda	X	Asellidae	aquatic sow bugs	274.12445
Rinearson Creek	engineered riffle	2021-05-04	Lirceus	Ū	non-insect	Aquatic	Crustacea: Isopoda	X	Asellidae	aquatic sow bugs	21.56035
Rinearson Creek	engineered riffle	2021-05-04	Simulium	Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Simuliidae	black flies	15.40025
Rinearson Creek	engineered riffle	2021-05-04	Simulium	P	insect	Aquatic	Arthropoda: Insecta	Diptera	Simuliidae	black flies	6.1601
Rinearson Creek	engineered riffle	2021-05-04	Cheumatopsyche	Ĺ	insect	Aquatic	Arthropoda: Insecta	Trichoptera	Hydropsychidae	caddisflies	6.1601
Rinearson Creek	engineered riffle	2021-05-04	Tipula	Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Tipulidae	crane flies	3.08005
Rinearson Creek	engineered riffle	2021-05-04	Pacifastacus	Ū	non-insect	Aquatic	Crustacea: Decapoda	X	Astacidae	crayfish	3.08005
Rinearson Creek	engineered riffle	2021-05-04	Libellulidae	Ĺ	insect	Aquatic	Arthropoda: Insecta	Odonata	Libellulidae	dragonflies	3.08005
Rinearson Creek	engineered riffle	2021-05-04	Trepaxonemata	Ū	non-insect	Aquatic	Turbellaria	miscellaneous non-insect	X	flat worms	6.1601
Rinearson Creek	engineered riffle	2021-05-04	Erpobdella	Ū	non-insect	Aquatic	Annelida: Hirudinea	miscellaneous non-insect	Erpobdellidae	leeches	3.08005
Rinearson Creek	engineered riffle	2021-05-04	Helobdella stagnalis complex	Ü	non-insect	Aquatic	Annelida: Hirudinea	miscellaneous non-insect	Glossiphoniidae	leeches	6.1601
Rinearson Creek	engineered riffle	2021-05-04	Baetis tricaudatus complex	Ĺ	insect	Aquatic	Arthropoda: Insecta	Ephemeroptera	Baetidae	mayflies	15.40025
Rinearson Creek	engineered riffle	2021-05-04	Chironomidae	P	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae	midges	80.0813
Rinearson Creek	engineered riffle	2021-05-04	Chironomus	Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	138.60225
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Waterbody	Site	Date	Taxon	Stage	Insect	Origin	Higher.classification	Order	Family	Common.name	Abundance
Rinearson Creek	engineered riffle	2021-05-04	Parachironomus	l	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	6.1601
	engineered riffle	2021-05-04	Phaenopsectra	ī	insect		Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	160.1626
Rinearson Creek				L		Aquatic					
Rinearson Creek	engineered riffle	2021-05-04	Micropsectra	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	89.32145
Rinearson Creek	engineered riffle	2021-05-04	Paratanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	64.68105
Rinearson Creek	engineered riffle	2021-05-04	Tanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	58.52095
Rinearson Creek	engineered riffle	2021-05-04	Cricotopus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	58.52095
Rinearson Creek	engineered riffle	2021-05-04	Eukiefferiella claripennis group	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	33.88055
Rinearson Creek	engineered riffle	2021-05-04	Limnophyes	ī	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	6.1601
Rinearson Creek			Nanocladius	Ĭ.	insect			Diptera	Chironomidae: Orthocladiinae		6.1601
	engineered riffle	2021-05-04		_		Aquatic	Arthropoda: Insecta			midges	
Rinearson Creek	engineered riffle	2021-05-04	Orthocladius	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	89.32145
Rinearson Creek	engineered riffle	2021-05-04	Tvetenia bavarica group	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	6.1601
Rinearson Creek	engineered riffle	2021-05-04	Odontomesa	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Prodiamesinae	midges	9.24015
Rinearson Creek	engineered riffle	2021-05-04	Prodiamesa	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Prodiamesinae	midges	21.56035
Rinearson Creek	engineered riffle	2021-05-04	Alotanypus	1	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	9.24015
Rinearson Creek		2021-05-04		Ĺ							21.56035
	engineered riffle		Thienemannimyia complex		insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	
Rinearson Creek	engineered riffle	2021-05-04	Trombidiformes	U	non-insect	Aquatic	Arachnida: Acari	Trombidiformes	X	mites	12.3202
Rinearson Creek	engineered riffle	2021-05-04	Ceratopogoninae	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Ceratopogonidae	no-see-um midges	30.8005
Rinearson Creek	engineered riffle	2021-05-04	Nemata	U	non-insect	Aquatic	Nemata	miscellaneous non-insect	X	round worms	6.1601
Rinearson Creek	engineered riffle	2021-05-04	Crangonyx	U	non-insect	Aquatic	Crustacea: Amphipoda	x	Crangonyctidae	scuds	532.84865
Rinearson Creek	engineered riffle	2021-05-04	Ostracoda	Ū	non-insect	Aquatic	Crustacea: Ostracoda	X	v	seed shrimp	3.08005
Rinearson Creek	engineered riffle	2021-05-04	Oligochaeta	Ü	non-insect	Aquatic	Annelida: Oligochaeta	miscellaneous non-insect	X	segmented worms	52.36085
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Rinearson Creek	upper control	2021-05-04	Caecidotea	U	non-insect	Aquatic	Crustacea: Isopoda	X	Asellidae	aquatic sow bugs	49.765
Rinearson Creek	upper control	2021-05-04	Erpobdella	U	non-insect	Aquatic	Annelida: Hirudinea	miscellaneous non-insect	Erpobdellidae	leeches	2.69
Rinearson Creek	upper control	2021-05-04	Baetis tricaudatus complex	L	insect	Aquatic	Arthropoda: Insecta	Ephemeroptera	Baetidae	mayflies	1.345
Rinearson Creek	upper control	2021-05-04	Chironomidae	Р	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae	midges	1.345
Rinearson Creek	upper control	2021-05-04	Chironomus	Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	2.69
Rinearson Creek	upper control	2021-05-04	Paratendipes	Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	4.035
Rinearson Creek	upper control	2021-05-04	Phaenopsectra	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	1.345
Rinearson Creek	upper control	2021-05-04	Polypedilum	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	2.69
Rinearson Creek	upper control	2021-05-04	Micropsectra	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	1.345
Rinearson Creek	upper control	2021-05-04	Tanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	2.69
Rinearson Creek	upper control	2021-05-04	Prodiamesa	1	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Prodiamesinae	midges	168.125
Rinearson Creek	upper control	2021-05-04	Alotanypus	ī	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Trodiamesinae Chironomidae: Tanypodinae	midges	10.76
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Rinearson Creek	upper control	2021-05-04	Ceratopogoninae	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Ceratopogonidae	no-see-um midges	6.725
Rinearson Creek	upper control	2021-05-04	Sphaeriidae	U	non-insect	Aquatic	Mollusca: Bivalvia	X	Sphaeriidae	pea clams	2.69
Rinearson Creek	upper control	2021-05-04	Crangonyx	U	non-insect	Aquatic	Crustacea: Amphipoda	x	Crangonyctidae	scuds	1.345
Rinearson Creek	upper control	2021-05-04	Oligochaeta	U	non-insect	Aquatic	Annelida: Oligochaeta	miscellaneous non-insect	X	segmented worms	4.035
Rinearson Creek	beaver pond	2023-08-16	Oxvethira	Ĺ	insect	Aquatic	Arthropoda: Insecta	Trichoptera	Hydroptilidae	caddisflies	21.18
Rinearson Creek	beaver pond	2023-08-16	Peltodytes	Ā	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Haliplidae	crawling water beetles	98.84
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Rinearson Creek	beaver pond	2023-08-16	Peltodytes	L	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Haliplidae	crawling water beetles	63.54
Rinearson Creek	beaver pond	2023-08-16	Coenagrion/Enallagma	L	insect	Aquatic	Arthropoda: Insecta	Odonata	Coenagrionidae	damselflies	197.68
Rinearson Creek	beaver pond	2023-08-16	Aeshnidae	L	insect	Aquatic	Arthropoda: Insecta	Odonata	Aeshnidae	dragonflies	91.78
Rinearson Creek	beaver pond	2023-08-16	Libellulidae	L	insect	Aquatic	Arthropoda: Insecta	Odonata	Libellulidae	dragonflies	28.24
Rinearson Creek	beaver pond	2023-08-16	Trepaxonemata	U	non-insect	Aquatic	Turbellaria	miscellaneous non-insect	Y.	flat worms	77.66
Rinearson Creek	beaver pond	2023-08-16	Abedus	ĭ	insect	Aquatic	Arthropoda: Insecta	Hemiptera: Heteroptera	Belostomatidae	giant water bugs	7.06
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Rinearson Creek	beaver pond	2023-08-16	Callibaetis	L	insect	Aquatic	Arthropoda: Insecta	Ephemeroptera	Baetidae	mayflies	169.44
Rinearson Creek	beaver pond	2023-08-16	Chironomidae	Р	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae	midges	7.06
Rinearson Creek	beaver pond	2023-08-16	Endochironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	21.18
Rinearson Creek	beaver pond	2023-08-16	Polypedilum	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	63.54
Rinearson Creek	beaver pond	2023-08-16	Pseudochironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	317.7
Rinearson Creek	beaver pond	2023-08-16	Paratanytarsus	1	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	49.42
Rinearson Creek	beaver pond	2023-08-16	Tanytarsus	ī	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	7.06
	•			_							
Rinearson Creek	beaver pond	2023-08-16	Corynoneura	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	21.18
Rinearson Creek	beaver pond	2023-08-16	Nanocladius	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	7.06
Rinearson Creek	beaver pond	2023-08-16	Psectrocladius	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	14.12
Rinearson Creek	beaver pond	2023-08-16	Ablabesmyia	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	28.24
Rinearson Creek	beaver pond	2023-08-16	Procladius	1	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	7.06
Rinearson Creek	beaver pond	2023-08-16	Thienemannimyia complex	ī	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	7.06
				Ü					ž.		
Rinearson Creek	beaver pond	2023-08-16	Trombidiformes	-	non-insect	Aquatic	Arachnida: Acari	Trombidiformes	х	mites	14.12
Rinearson Creek	beaver pond	2023-08-16	Sperchon	U	non-insect	Aquatic	Arachnida: Acari	х	X	mites	14.12
Rinearson Creek	beaver pond	2023-08-16	Oribatida	U	non-insect	Terrestrial	Arachnida: Acari	X	X	mites	7.06
Rinearson Creek	beaver pond	2023-08-16	Ceratopogoninae	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Ceratopogonidae	no-see-um midges	70.6
Rinearson Creek	beaver pond	2023-08-16	Sphaeriidae	Ū	non-insect	Aquatic	Mollusca: Bivalvia	X	Sphaeriidae	pea clams	28.24
Rinearson Creek	beaver pond	2023-08-16	Nemata	Ü	non-insect	Aquatic	Nemata	miscellaneous non-insect	v	round worms	14.12
									A T-limid		
Rinearson Creek	beaver pond	2023-08-16	Hyalella	U	non-insect	Aquatic	Crustacea: Amphipoda	X	Talitridae	scuds	458.9
Rinearson Creek	beaver pond	2023-08-16	Ostracoda	U	non-insect	Aquatic	Crustacea: Ostracoda	x	X	seed shrimp	84.72
Rinearson Creek	beaver pond	2023-08-16	Oligochaeta	U	non-insect	Aquatic	Annelida: Oligochaeta	miscellaneous non-insect	X	segmented worms	698.94
Rinearson Creek	beaver pond	2023-08-16	Lymnaeidae	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Lymnaeidae	snails	7.06
Rinearson Creek	beaver pond	2023-08-16	Physella	Ü	non-insect	Aquatic	Mollusca: Gastropoda	X	Physidae	snails	155.32
		2023-08-16		U				, , , , , , , , , , , , , , , , , , ,	Planorbidae	snails	7.06
Rinearson Creek	beaver pond		Gyraulus		non-insect	Aquatic	Mollusca: Gastropoda	A			
Rinearson Creek	beaver pond	2023-08-16		L	insect	Aquatic	Arthropoda: Insecta	Hemiptera: Heteroptera	Corixidae	water boatman	727.18
Rinearson Creek	beaver pond	2023-08-16	Chydoridae	U	non-insect	Aquatic	Crustacea: Cladocera	x	Chydoridae	water fleas	56.48

Waterbody	Site	Date	Taxon	Stage	Incact	Origin	Higher.classification	Order	Family	Common.name	Abundance
Rinearson Creek	beaver pond	2023-08-16		I	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Hydrophilidae	water scavenger beetles	7.06
Rinearson Creek	emergent marsh	2023-08-16		Ū	non-insect	Aquatic	Crustacea: Isopoda	X	Asellidae	aquatic sow bugs	408
Rinearson Creek	emergent marsh	2023-08-16		L	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Haliplidae	crawling water beetles	18
Rinearson Creek	emergent marsh	2023-08-16		ī	insect	Aquatic	Arthropoda: Insecta	Odonata	Coenagrionidae	damselflies	2
Rinearson Creek	emergent marsh	2023-08-16		ī	insect	Aquatic	Arthropoda: Insecta	Diptera	Dixidae	dixid midges	8
Rinearson Creek	emergent marsh	2023-08-16		Ū	non-insect	Aquatic	Turbellaria	miscellaneous non-insect	Y	flat worms	14
Rinearson Creek	emergent marsh	2023-08-16		i	insect	Aquatic	Arthropoda: Insecta	Ephemeroptera	Baetidae	mayflies	10
Rinearson Creek	emergent marsh	2023-08-16		P	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae	midges	14
Rinearson Creek	emergent marsh	2023-08-16		i	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	6
Rinearson Creek	emergent marsh	2023-08-16		ī	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	2
Rinearson Creek	emergent marsh	2023-08-16		ī	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	78
Rinearson Creek	emergent marsh	2023-08-16		ī	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	4
Rinearson Creek	emergent marsh	2023-08-16		ī	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	2
Rinearson Creek	emergent marsh			ī	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	2
Rinearson Creek	emergent marsh	2023-08-16		ī	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	4
Rinearson Creek	emergent marsh	2023-08-16		ī	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	64
Rinearson Creek	emergent marsh	2023-08-16		ī	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	2
Rinearson Creek	emergent marsh	2023-08-16		ī	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	16
Rinearson Creek	emergent marsh	2023-08-16		ī	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	2
Rinearson Creek	emergent marsh	2023-08-16		Ē	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	2
Rinearson Creek	emergent marsh	2023-08-16		Ē	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	6
Rinearson Creek	emergent marsh	2023-08-16		Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	2
Rinearson Creek	emergent marsh	2023-08-16		L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	2
Rinearson Creek	emergent marsh	2023-08-16		Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Prodiamesinae	midges	48
Rinearson Creek	emergent marsh	2023-08-16		L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	2
Rinearson Creek	emergent marsh	2023-08-16		L	insect	Aquatic	Arthropoda: Insecta	Diptera .	Chironomidae: Tanypodinae	midges	2
Rinearson Creek	emergent marsh	2023-08-16		L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	18
Rinearson Creek	emergent marsh	2023-08-16	Thienemannimyia complex	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	8
Rinearson Creek	emergent marsh	2023-08-16	Ceratopogoninae	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Ceratopogonidae	no-see-um midges	4
Rinearson Creek	emergent marsh	2023-08-16	Sphaeriidae	U	non-insect	Aquatic	Mollusca: Bivalvia	X	Sphaeriidae	pea clams	56
Rinearson Creek	emergent marsh	2023-08-16	Nemata	U	non-insect	Aquatic	Nemata	miscellaneous non-insect	X	round worms	10
Rinearson Creek	emergent marsh	2023-08-16	Crangonyx	U	non-insect	Aquatic	Crustacea: Amphipoda	X	Crangonyctidae	scuds	42
Rinearson Creek	emergent marsh	2023-08-16		U	non-insect	Aquatic	Crustacea: Amphipoda	x	Talitridae	scuds	10
Rinearson Creek	emergent marsh	2023-08-16	Oligochaeta	U	non-insect	Aquatic	Annelida: Oligochaeta	miscellaneous non-insect	X	segmented worms	44
Rinearson Creek	emergent marsh	2023-08-16	Fluminicola	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Hydrobiidae	snails	66
Rinearson Creek	emergent marsh	2023-08-16	Lymnaeidae	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Lymnaeidae	snails	4
Rinearson Creek	emergent marsh	2023-08-16		U	non-insect	Aquatic	Mollusca: Gastropoda	x	Physidae	snails	14
Rinearson Creek	emergent marsh	2023-08-16		U	non-insect	Aquatic	Mollusca: Gastropoda	х	Planorbidae	snails	4
Rinearson Creek	emergent marsh	2023-08-16		U	non-insect	Aquatic	Mollusca: Gastropoda	X	Pleuroceridae	snails	4
Rinearson Creek	emergent marsh	2023-08-16	Potamopyrgus antipodarum	U	non-insect	Aquatic	Mollusca: Gastropoda	X	uncertain status	snails	26
Rinearson Creek	emergent marsh	2023-08-16	Corixidae	L	insect	Aquatic	Arthropoda: Insecta	Hemiptera: Heteroptera	Corixidae	water boatman	20
Rinearson Creek	engineered riffle	2023-08-16	Caecidotea	U	non-insect	Aquatic	Crustacea: Isopoda	X	Asellidae	aquatic sow bugs	31.95
Rinearson Creek	engineered riffle	2023-08-16		Ŀ	insect	Aquatic	Arthropoda: Insecta	Diptera	Simuliidae	black flies	31.95
Rinearson Creek	engineered riffle	2023-08-16	Cheumatopsyche	L	insect	Aquatic	Arthropoda: Insecta	Trichoptera	Hydropsychidae	caddisflies	8.52
Rinearson Creek Rinearson Creek	engineered riffle engineered riffle	2023-08-16 2023-08-16	Hydroptila Dicranomyia	L	insect insect	Aquatic	Arthropoda: Insecta Arthropoda: Insecta	Trichoptera Diptera	Hydroptilidae Tipulidae	caddisflies crane flies	6.39 19.17
Rinearson Creek	engineered riffle	2023-08-16	,	Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Tipulidae	crane flies	2.13
Rinearson Creek		2023-08-16		i	insect	Aquatic Aquatic	Arthropoda: Insecta	Odonata	•	damselflies	19.17
Rinearson Creek	engineered riffle engineered riffle	2023-08-16	Coenagrion/Enallagma	Ĺ	insect	Aquatic	Arthropoda: Insecta	Odonata	Coenagrionidae Coenagrionidae	damselflies	6.39
Rinearson Creek	engineered riffle	2023-08-16	Neoplasta	Ĺ	insect	Aquatic	Arthropoda: Insecta	Diptera	Empididae	dance flies	2.13
Rinearson Creek	engineered riffle	2023-08-16	Trepaxonemata	Ū	non-insect	Aquatic	Turbellaria	miscellaneous non-insect	Linplaidae	flat worms	4.26
Rinearson Creek	engineered riffle	2023-08-16	Chironomidae	P	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae	midges	70.29
Rinearson Creek	engineered riffle	2023-08-16			insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	647.52
Rinearson Creek	engineered riffle	2023-08-16		ī	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	10.65
Rinearson Creek	engineered riffle	2023-08-16		ī	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	157.62
Rinearson Creek	engineered riffle	2023-08-16		ī	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	6.39
Rinearson Creek	engineered riffle	2023-08-16	Thienemannimyia complex	ī	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	23.43
Rinearson Creek	engineered riffle	2023-08-16	Sperchon	Ū	non-insect	Aquatic	Arachnida: Acari	X	v	mites	4.26
Rinearson Creek	engineered riffle	2023-08-16		Ü	non-insect	Aquatic	Annelida: Nemertea	miscellaneous non-insect	Tetrastemmatidae	nemerteans	8.52
Rinearson Creek	engineered riffle	2023-08-16		L	insect	Aquatic	Arthropoda: Insecta	Diptera	Ceratopogonidae	no-see-um midges	14.91
Rinearson Creek	engineered riffle	2023-08-16		Ū	non-insect	Aquatic	Mollusca: Bivalvia	X	Sphaeriidae	pea clams	23.43
Rinearson Creek	engineered riffle	2023-08-16		Ü	non-insect	Aquatic	Nemata	miscellaneous non-insect	χ	round worms	6.39
Rinearson Creek	engineered riffle	2023-08-16		Ü	non-insect	Aquatic	Crustacea: Amphipoda	X	Crangonyctidae	scuds	25.56
Rinearson Creek	engineered riffle	2023-08-16	Oligochaeta	Ü	non-insect	Aquatic	Annelida: Oligochaeta	miscellaneous non-insect	X	segmented worms	63.9
Rinearson Creek	engineered riffle	2023-08-16		Ü	non-insect	Aquatic	Mollusca: Gastropoda	X	Physidae	snails	2.13
Rinearson Creek	upper control	2023-08-16	Caecidotea	Ü	non-insect	Aquatic	Crustacea: Isopoda	x	Asellidae	aquatic sow bugs	127
Rinearson Creek	upper control	2023-08-16		Ĺ	insect	Aquatic	Arthropoda: Insecta	Odonata	Coenagrionidae	damselflies	1
Rinearson Creek	upper control	2023-08-16	Hemerodromia	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Empididae	dance flies	1
Rinearson Creek	upper control	2023-08-16	Neoplasta	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Empididae	dance flies	2
Rinearson Creek	upper control	2023-08-16	Dixella	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Dixidae	dixid midges	3
Rinearson Creek	upper control	2023-08-16		U	non-insect	Aquatic	Turbellaria	miscellaneous non-insect	х	flat worms	1
Rinearson Creek	upper control	2023-08-16	Helobdella stagnalis complex	U	non-insect	Aquatic	Annelida: Hirudinea	miscellaneous non-insect	Glossiphoniidae	leeches	1

Waterbody	Site	Date	Taxon	Stage	Insect	Origin	Higher.classification	Order	Family	Common.name	Abundance
Rinearson Creek	upper control	2023-08-16	Chironomidae	Р	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae	midges	1
Rinearson Creek	upper control	2023-08-16	Cryptochironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	1
Rinearson Creek	upper control	2023-08-16	Paratendipes	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	11
Rinearson Creek	upper control	2023-08-16	Polypedilum	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	38
Rinearson Creek	upper control	2023-08-16	Micropsectra	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	4
Rinearson Creek	upper control	2023-08-16	Paratanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	2
Rinearson Creek	upper control	2023-08-16	Stempellinella	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	1
Rinearson Creek	upper control	2023-08-16	Tanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	2
Rinearson Creek	upper control	2023-08-16	Brillia	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	2
Rinearson Creek	upper control	2023-08-16	Corynoneura	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	3
Rinearson Creek	upper control	2023-08-16	Heterotrissocladius marcidus group	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	4
Rinearson Creek	upper control	2023-08-16	Limnophyes	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	1
Rinearson Creek	upper control	2023-08-16	Orthocladius	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	1
Rinearson Creek	upper control	2023-08-16	Odontomesa	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Prodiamesinae	midges	4
Rinearson Creek	upper control	2023-08-16	Ablabesmyia	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	2
Rinearson Creek	upper control	2023-08-16	Procladius	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	11
Rinearson Creek	upper control	2023-08-16	Thienemannimyia complex	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	18
Rinearson Creek	upper control	2023-08-16	Hygrobates	U	non-insect	Aquatic	Arachnida: Acari	x	X	mites	1
Rinearson Creek	upper control	2023-08-16	Sperchonopsis	U	non-insect	Aquatic	Arachnida: Acari	x	X	mites	4
Rinearson Creek	upper control	2023-08-16	Ceratopogoninae	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Ceratopogonidae	no-see-um midges	1
Rinearson Creek	upper control	2023-08-16	Sphaeriidae	U	non-insect	Aquatic	Mollusca: Bivalvia	x	Sphaeriidae	pea clams	77
Rinearson Creek	upper control	2023-08-16	Nemata	U	non-insect	Aquatic	Nemata	miscellaneous non-insect	X	round worms	2
Rinearson Creek	upper control	2023-08-16	Crangonyx	U	non-insect	Aquatic	Crustacea: Amphipoda	x	Crangonyctidae	scuds	10
Rinearson Creek	upper control	2023-08-16	Oligochaeta	U	non-insect	Aquatic	Annelida: Oligochaeta	miscellaneous non-insect	X	segmented worms	55
Rinearson Creek	upper control	2023-08-16	Fluminicola	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Hydrobiidae	snails	10
Rinearson Creek	upper control	2023-08-16	Lymnaeidae	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Lymnaeidae	snails	1
Rinearson Creek	upper control	2023-08-16	Juga	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Pleuroceridae	snails	21
Rinearson Creek	upper control	2023-08-16	Potamopyrgus antipodarum	U	non-insect	Aquatic	Mollusca: Gastropoda	x	uncertain status	snails	2

Taxon	Stag	e Family	Common.name	Insect.	Higher.classification	Origin	Order BCG.Attrib	ute Feeding.Group	CA.feeding.group	Habit Tolerance WY.HB	PSSB.tolerance CA.tolerance	Metals.tolerance BC	I.TV PSSB.long.lived	/oltinism   Developmen	t Occurrence.in.drift	Size.at.maturity	Rheophily Thermal.preferen	ice a b
Oligochaeta	U	x	segmented worms	non-insect	Annelida: Oligochaeta	Aquatic	miscellaneous non-insect	4 CG	CG	BU 0	5 0	5 11	108 0	2	2	1 :	2 2	2 0.0758 0.74
Erpobdella	U	Erpobdellidae	leeches		Annelida: Hirudinea	Aquatic	miscellaneous non-insect	5 PR	PR	CL HT	8 0	8 4	108 0 108 0	1	2	1	3 2	2 0.000102 3.25
Sphaeriidae Ferrissia	U	Sphaeriidae Planorhidae	pea clams snails		Mollusca: Bivalvia Mollusca: Gastropoda	Aquatic Aquatic	x	4 CF 4 SC	CF SC	BU 0 CL MT	8 0	8 3	108 0	1	3	1	1 2	2 0.0163 2.477 2 0.0208 3.03
Menetus	Ü	Planorbidae	snails		Mollusca: Gastropoda Mollusca: Gastropoda	Aquatic	×	4 SC	SC	CL MT	8 0	6 11	108 0	3	2	1	1 2	2 0.0208 3.03
Potamopyrgus antipodarum	ŭ	uncertain status	snails		Mollusca: Gastropoda	Aquatic	x x	6 CG	SC	CL HT	8 0	8 11	108 0	2	2	i	1 2	2 0.0208 3.03
Crangonyx	U	Crangonyctidae	scuds		Crustacea: Amphipoda	Aquatic	x	5 CG	CG	SW MT 1	1 0	4 11	108 0	3	2	1 :	2 2	2 0.0058 3.015
Caecidotea	U	Asellidae	aquatic sow bugs		Crustacea: Isopoda	Aquatic	x	5 OM	CG	CM HT	8 0	8 5	108 0	3	2	1 :	2 2	2 0.0054 2.948
Pacifastacus	U	Astacidae	crayfish mayflies		Crustacea: Decapoda	Aquatic	× .	4 OM 4 CG	OM CG	SP 0 CL 0	6 0	6 3 5 11	108 0 72 0	1	3	1	3 2	2 0.0147 3.626 2 0.0053 2.875
Baetis Lepidostoma	-	Baetidae Lepidostomatidae	caddisfies	insect	Arthropoda: Insecta Arthropoda: Insecta	Aquatic Aquatic	Ephemeroptera Trichoptera	4 CG 4 SH	SH	CM 0	1 0	1 1	18 0	3	2	1	1 2	2 0.0053 2.649
Lara	ř	Elmidae	riffle beetles	insect	Arthropoda: Insecta	Aquatic	Coleoptera	4 SH	SH	CL 0	4 0	4 11	104 0	1	3	1	2 2	2 0.0074 2.879
Clinocera	Ĭ.	Empididae	dance flies	insect	Arthropoda: Insecta	Aquatic	Diptera	3 PR	PR	CL 0	6 0	6 4	95 0	2	2	i :	2 2	2 0.0054 2.546
Neoplasta	L	Empididae	dance flies	insect	Arthropoda: Insecta	Aquatic	Diptera	4 PR	PR	SP 0	6 0	6 11	95 0	2	2	1 :	2 2	2 0.0054 2.546
Ceratopogoninae	L	Ceratopogonidae	no-see-um midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4 PR	PR	SP 0	6 0	6 4	108 0	2	1	1 :	2 2	2 0.0025 2.469
Simulium Tinula	L	Simuliidae Tipulidae	black flies crane flies	insect	Arthropoda: Insecta	Aquatic Aquatic	Diptera Diptera	4 CF 4 SH	CF SH	CL 0 BU 0	6 0	6 11 4 11	108 0	3	1	3	1 3	2 0.002 3.011
Chironomidae	L	Ilipulidae Chironomidae	crane flies midges	insect	Arthropoda: Insecta Arthropoda: Insecta	Aquatic	Diptera Diptera	4 SH 4 CG	CG	BU 0	4 0	4 11 6 11	108 0	1	2	1 :	3 2	2 0.0029 2.681
Alotanyous	- [	Chironomidae: Tanyoodinae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4 PR	PR	BU 0	7 0	7 8	108 0	3	1	3	1 2	2 0.0018 2.617
Brillia	Ĭ.	Chironomidae: Orthocladiinae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4 CG	SH	SP 0	5 0	5 4	108 0	3	i	3	1 2	2 0.0018 2.617
Chironomus	L	Chironomidae: Chironominae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	5 CG	CG	BU HT 1	0 0 1	0 7	108 0	3	1	3	2 1	2 0.0018 2.617
Corynoneura	L	Chironomidae: Orthocladiinae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4 CG	CG	SP 0	7 0	7 4	108 0	3	1	3	1 2	2 0.0018 2.617
Cryptochironomus	L	Chironomidae: Chironominae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	5 PR	PR	SP MT	8 0	8 5	108 0	3	1	3	1 1	2 0.0018 2.617
Eukiefferiella claripennis group	L	Chironomidae: Orthocladiinae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4 CG 3 CG	OM CG	SP MT SP MI	8 0	8 11	108 0 108 0	3	1	3	1 2	2 0.0018 2.617
Heterotrissocladius marcidus group Limnophyes	-	Chironomidae: Orthocladiinae Chironomidae: Orthocladiinae	midges midges	insect	Arthropoda: Insecta Arthropoda: Insecta	Aquatic	Diptera Diptera	3 CG 4 CG	CG	SP MT	0 0	0 11 8 11	108 0	3	1	3	1 2	1 0.0018 2.617
Micronsectra	ř	Chironomidae: Chironominae: Tanytarsini	midges	insect	Arthropoda: Insecta	Aquatic	Diplera	4 CG	CG	CI 0	7 0	7 1	108 0	3	1	3	1 2	2 0.0018 2.617
Parametriocnemus	ī	Chironomidae: Orthocladiinae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4 CG	CG	SP 0	5 0	5 11	108 0	3	i	3	1 2	2 0.0018 2.617
Phaenopsectra	Ĺ	Chironomidae: Chironominae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4 SC	SC	CL 0	7 0	7 4	108 0	3	1	3	1 1	2 0.0018 2.617
Polypedilum	L	Chironomidae: Chironominae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4 MH	MH	CL 0	6 0	6 4	108 0	3	1	3	1 2	2 0.0018 2.617
Procladius	L	Chironomidae: Tanypodinae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	5 PR	PR	SP HT	9 0	9 5	108 0	3	1	3	1 2	2 0.0018 2.617
Prodiamesa Thienemannimvia complex	L	Chironomidae: Prodiamesinae Chironomidae: Tanyoodinae	midges	insect	Arthropoda: Insecta Arthropoda: Insecta	Aquatic Aquatic	Diptera Diptera	4 CG 4 PR	CG PR	BU MI SP 0	3 0	3 3	108 0	3	1	3	1 2	1 0.0018 2.617 2 0.0018 2.617
Tvetenia bavarica group	ŀ	Chironomidae: Tanypodinae Chironomidae: Orthocladiinae	midges midges	insect	Arthropoda: Insecta Arthropoda: Insecta	Aquatic	Diptera Diptera	4 PR 4 CG	CG	SP 0	5 0	5 4	108 0	3	1	3	1 2	2 0.0018 2.617
Lymnaeidae	Ü	Lymnaeidae	mioges		Mollusca: Gastropoda	Aquatic	X	5 SC	SC	CL MT	6 0	6 11	108 0	3	2	1	2 2	3 0.0208 3.03
Physella	Ü	Physidae	snails		Mollusca: Gastropoda	Aquatic	×	5 CG	SC	CL HT	8 0	8 4	108 0	3	2	2	2 2	3 0.0208 3.03
Gyraulus	Ü	Planorbidae	snails	non-insect	Mollusca: Gastropoda	Aquatic	x	5 SC	SC	CL HT	8 0	8 3	108 0	3	2	1	1 2	3 0.0208 3.03
Chydoridae	U	Chydoridae	water fleas		Crustacea: Cladocera	Aquatic	x	0 CG	CG	SW MT 1	1 0	6 11	108 0	3	2	1	1 2	2 0.006753 2.27
Sperchon	U	x	mites		Arachnida: Acari	Aquatic	×	4 PA	PR	SW MT	5 0	8 11	108 0	3	2	2	1 2	2 0.053 2.494
Cheumatopsyche Hydroptila	L	Hydropsychidae Hydroptilidae	caddisflies caddisflies	insect	Arthropoda: Insecta Arthropoda: Insecta	Aquatic	Trichoptera Trichoptera	5 CF 4 PH	CF PH	CL MT	8 0	5 11	108 0	3	3	2	2 3	2 0.0046 2.926
Hydroptila Ceratopogoninae	L		no-see-um midges	insect	Arthropoda: Insecta Arthropoda: Insecta	Aquatic	Inchoptera Diptera	4 PH 4 PR	PH PR	SP 0	6 0	6 4	108 0	3	2	2	1 2	2 0.0056 2.839
Cricotopus	- î	Ceratopogonidae Chironomidae: Orthocladiinae	midaes	insect	Arthropoda: Insecta	Aquatic	Diptera	4 CG	CG	CL 0	7 0	7 10	108 0	3	1	3	1 2	2 0.0018 2.617
Paratanytarsus	Ē	Chironomidae: Chironominae: Tanytarsini	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4 CF	CF	CL 0	6 0	6 3	108 0	3	1	3	1 2	2 0.0018 2.617
Psectrocladius	L	Chironomidae: Orthocladiinae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4 CG	CG	SP MT 1	0 0	8 11	108 0	3	1	3	1 2	2 0.0018 2.617
Rheotanytarsus	L	Chironomidae: Chironominae: Tanytarsini	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4 CF	CF	CL 0	6 0	6 11	108 0	3	1	3	1 2	2 0.0018 2.617
Aeshnidae	L	Aeshnidae	dragonflies	insect	Arthropoda: Insecta	Aquatic	Odonata	4 PR	PR	CM MT SP HT	5 0	5 11	72 0	1	2	1	3 2	2 0.0082 2.813
Calibaetis	Ŀ	Baetidae	mayflies	insect	Arthropoda: Insecta	Aquatic	Ephemeroptera Hemiptera: Heteroptera	5 CG 0 PR	CG PR	SP HT SW 0	9 0	9 11	72 0	3	1	1	2 1	2 0.0053 2.875 3 0.0499 2.27
Notonecta Corixidae	i.	Notonectidae Corixidae	back swimmers water boatman	insect	Arthropoda: Insecta Arthropoda: Insecta	Aquatic Aquatic	Hemiptera: Heteroptera Hemiptera: Heteroptera	0 PH	PH	SW MT	, U	5 11 8 11	72 0 108 0	3	1	1	1 1	2 0.0031 2.904
Cenocorixa	Ä	Corividae	water boatman	insect	Arthropoda: Insecta	Aquatic	Hemiptera: Heteroptera	0 PH	PH	SW MT	8 0	8 11	108 0	3	i	1	i i	2 0.0031 2.904
Hydrophilidae	î	Hydrophilidae	water scavenger beetles	insect	Arthropoda: Insecta	Aquatic	Coleoptera	4 PR	PR	CM MT	5 0	5 11	72 0	2	3	i :	2 1	2 0.0077 2.91
Dytiscidae	L	Dytiscidae	predaceous diving beetles	insect	Arthropoda: Insecta	Aquatic	Coleoptera	4 PR	PR	CM MT	5 0	5 11	72 0	2	3	2	2 1	2 0.0077 2.91
Peltodytes	L	Haliplidae	crawling water beetles	insect	Arthropoda: Insecta	Aquatic	Coleoptera	5 MH	MH	CM HT	5 0	5 11	54 0	2	2	1 :	2 1	3 0.0077 2.91
Peltodytes	A	Haliplidae	crawling water beetles	insect	Arthropoda: Insecta	Aquatic	Coleoptera	5 MH	MH	SW HT SP MT	5 0	5 11	54 0	2	2	1	1 1	3 0.0271 2.744
Dolichopodidae Psychodini	Ŀ	Dolichopodidae Psychodidae	long-legged flies moth flies	insect	Arthropoda: Insecta Arthropoda: Insecta	Aquatic Aquatic	Diptera	5 PR 5 CG	PR CG	SP MT BU HT 1	4 0 ·	4 4 0 11	108 0	2	2	1	2 1	2 0.0054 2.546 3 0.0025 2.692
Endochironomus	i.	Chironomidae: Chironominae	moth files midges	insect	Arthropoda: Insecta	Aquatic	Diptera Diptera	5 MH	MH	CL HT 1	0 1	0 11	108 0	3	1	3	1 1	2 0.0025 2.692
Pseudosmittia	ī	Chironomidae: Orthocladiinae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4 CG	CG	SP 0	6 0 .	5 11	108 0	3	i	3	1 2	2 0.0018 2.617
Psectrotanypus	Ē	Chironomidae: Tanyoodinae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4 PR	PR	SP MT 1	0 0	7 11	108 0	3	1	3	1 2	2 0.0018 2.617
Tanytarsus	L	Chironomidae: Chironominae: Tanytarsini	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4 CF	CF	CL MT	6 0	6 3	108 0	3	1	3	1 2	2 0.0018 2.617
Nemata	U	x	round worms	non-insect		Aquatic	miscellaneous non-insect	4 PA	PR	BU 0	5 0	6 11	108 0	2	2	1 :	2 2	2 0.0758 0.74
Juga	U	Pleuroceridae	snails		Mollusca: Gastropoda	Aquatic	×	4 OM	SC	CL MT	7 0	7 11	108 0	1	2	1 :	3 2	2 0.0208 3.03
Fluminicola Lirceus	U	Hydrobiidae Asellidae	snails aquatic sow bugs		Mollusca: Gastropoda Crustacea: Isonoda	Aquatic	×	4 SC 5 CG	SC CG	CL MT	B U	6 11 8 5	108 0 108 0	1	2	1	1 2	2 0.0208 3.03
Coenagrion/Enallagma	ı	Asellidae Coenagriopidae	aquatic sow bugs damselflies	non-insect insect	Crustacea: Isopoda Arthropoda: Insecta	Aquatic	X Odonata	5 CG 5 PR	PR PR	CM HI	8 0	8 5 9 11	72 0	2	2	1	2 2	2 0.0054 2.948
Tipuloidea	P	Tipulidae	crane flies	insect	Arthropoda: Insecta	Aquatic	Diptera	4 UN	UN	BU 0	3 0	3 11	72 0	2	2	1	2 2	2 0.0029 2.681
Dixella	Ĺ	Dixidae	dixid midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4 CG	CG	SW MT	2 0	2 11	108 0	3	1	3	1 2	3 0.0018 2.617
Dicrotendipes	L	Chironomidae: Chironominae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4 CG	CG	BU MT	8 0	8 5	108 0	3	1	3	1 1	2 0.0018 2.617
Odontomesa	L	Chironomidae: Prodiamesinae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4 CG	CG	SP 0 BU MT	4 0	6 5	108 0	3	1	3	1 2	1 0.0018 2.617
Paratendipes Smittia	L.	Chironomidae: Chironominae Chironomidae: Orthocladiinae	midges midges	insect	Arthropoda: Insecta Arthropoda: Insecta	Aquatic Aquatic	Diptera Diotera	4 CG 4 CG	CG CG	BU MT BU MT	B U	8 11 6 11	108 0	3	1	3	1 1	2 0.0018 2.617 2 0.0018 2.617
Smittia Helobdella stagnalis complex	ii.	Chironomidae: Orthocladiinae Glossiphoniidae	midges leeches		Arthropoda: Insecta Annelida: Hirudinea	Aquatic	Diptera miscellaneous non-insect	4 CG 5 PR	PR	CL HT	6 0	6 11 6 4	108 0	2	2	1	2 2	2 0.0018 2.617
Musculium	ŭ	Sohaeriidae	pea clams		Mollusca: Bivalvia	Aquatic	X	4 CF	CF	BU MT	8 0	8 3	108 0	1	3	1	1 2	2 0.000102 3.23
Ostracoda	U	x ·	seed shrimp		Crustacea: Ostracoda	Aquatic	×	4 CG	CG	SW 0	8 0	6 11	108 0	3	2	1	1 2	2 0.006753 2.27
Trombidiformes	U	×	mites		Arachnida: Acari	Aquatic	Trombidiformes	4 PA	PR	SW 0	5 0	5 11	108 0	3	2	2	1 2	2 0.053 2.494
Libellulidae	L	Libellulidae	dragonflies	insect	Arthropoda: Insecta	Aquatic	Odonata	4 PR	PR	SP MT	9 0	9 11	72 0	1	2	1	3 2	1 0.0076 2.809
Cladopelma	L	Chironomidae: Chironominae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4 CG	CG CG	BU MT SP 0	9 0	6 11	108 0	3	1	3	1 1	2 0.0018 2.617
Orthocladius Trenaxonemata	L	Chironomidae: Orthocladiinae	midges flat worms	insect	Arthropoda: Insecta Turbellaria	Aquatic Aquatic	Diptera miscellaneous non-insect	3 CG 4 PR	CG PR	SP 0 CL 0	0 0	6 11 4 11	108 0 108 0	3	1	3	1 2	2 0.0018 2.617
I repaxonemata Baetis tricaudatus complex	Ü	x Baetidae	tlat worms mayflies	non-insect insect	Arthropoda: Insecta	Aquatic	miscellaneous non-insect Ephemeroptera	4 PR 4 CG	CG	CL 0	6 0	4 11 6 11	108 U	3	1	3	1 2	2 0.0082 2.168 2 0.0053 2.875
Simulium	P	Simuliidae	black flies	insect	Arthropoda: Insecta	Aquatic	Diptera	4 CF	CF	CL 0	6 0	6 11	108 0	3	i	3	1 3	2 0.002 3.011
Nanocladius	L	Chironomidae: Orthocladiinae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4 CG	CG	SP 0	3 0	3 11	108 0	3	1	3	1 2	2 0.0018 2.617
Parachironomus	L	Chironomidae: Chironominae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4 PR	PR	SP MT 1	0 0 1	0 4	108 0	3	1	3	1 1	2 0.0018 2.617
Prostoma	U	Tetrastemmatidae	nemerteans		Annelida: Nemertea	Aquatic	miscellaneous non-insect	5 PR	PR	SP 0	8 0	8 11	110 0	2	2	1	1 1	2 0.0758 0.74
Argia	L	Coenagrionidae	damselflies	insect	Arthropoda: Insecta	Aquatic	Odonata	4 PR 4 SH	PR SH	CM MT BU MT	, 0	7 11	108 0	2	2	1	2 2	2 0.0051 2.785
Dicranomyia Hvalella	L	Tipulidae Talitridae	crane flies scuds	insect	Arthropoda: Insecta Crustacea: Amphipoda	Aquatic Aquatic	Diptera v	4 SH 4 CG	SH CG	BU MT SW HT	0	0 2	72 0 108 0	2	2	1	2 2	3 0.0029 2.681 2 0.0058 3.015
Nyalella Oribatida	U	rannuae	scuds mites		Crustacea: Amphipoda Arachnida: Acari	Aquatic Terrestrial		4 CG 4 PA	PR PR	SW HI	5 0	8 3 5 11	108 0	3	2	2	1 2	2 0.0058 3.015
Abedus	Ľ	Belostomatidae	giant water bugs	insect	Arthropoda: Insecta	Aquatic	Hemiotera: Heteroptera	0 PR	PR	SW 0	8 0	8 11	72 0	3	1	1	3 1	3 0.0499 2.27
Oxyethira	Ĺ	Hydroptilidae	caddisflies	insect	Arthropoda: Insecta	Aquatic	Trichoptera	5 PH	PH	CM HT	3 0	3 2	108 0	3	2	1	1 2	3 0.0056 2.839
Ablabesmyia	L	Chironomidae: Tanypodinae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4 PR	PR	SP MT	8 0	8 3	108 0	3	1	3	1 2	2 0.0018 2.617
Pseudochironomus	L	Chironomidae: Chironominae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4 CG	CG	BU 0	5 0	5 4	108 0	3	1	3	1 1	2 0.0018 2.617
Sperchonopsis Hygrobates	U	x	mites mites		Arachnida: Acari Arachnida: Acari	Aquatic Aquatic	×	4 PA 4 PA	PR PR	SW MT SW MT	b 0	8 11 8 11	108 0 108 0	3	2	2	1 2	2 0.053 2.494 2 0.053 2.494
Hygrobates Hemerodromia	U	x Empididae	mites dance flies	non-insect insect	Arachnida: Acari Arthropoda: Insecta	Aquatic	x Diptera	4 PR	PR PR	SW MI SP MT	6 0	o 11	95 0	3	2	1	2 2	2 0.053 2.494 2 0.0054 2.546
Stempellinella	ĭ	Chironomidae: Chironominae: Tanytarsini	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	3 CG	CG	SP 0	4 0	4 0	108 0	3	1	3	1 2	2 0.0018 2.617
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Explanation of metrics	All should are a and his was a convented to a full cample and 1 courses weeks bests
	All abundances and biomass converted to a full sample and 1 square meter basis.
Subsample count (raw)	Total count of subsample prior to correction factors being applied for subsampling and conversion to a 1 square meter basis.
Subsample correction factor to full sample	Multiplier to convert subsample abundances to a full sample basis, e.g. if 1/2 the sample was sorted, then the subsample correction is X2.
Area correction factor to square meter	Converts abundances of full sample to a 1 square meter basis, e.g. if 8 square feet was sampled, then the conversion to 1 square meter is X1.345
SUMMARY METRICS	<del></del>
Total taxa richness	Total count of unique taxa in sample.
Total abundance	Total abundance in sample converted to a full sample and 1 square meter basis.
Total biomass (mg)  Large/rare biomass (mg)	Total biomass in full sample adjusted to a 1 square meter basis as calculated by length/mass regressions.  Biomass from taxa marked as "large/rare" in the "Incidental" column. These taxa may dominate the sample biomass.
Total biomass without large/rare (mg)	Total biomass - large/rare biomass
EPT taxa	Total biomiss - large/rate biomass Taxa in the insect orders Ephemeroptera+Plecoptera+Trichoptera, or mayflies+stoneflies+caddisflies.
Hilsenhoff Biotic Index (WY DEQ version)	Taxa in the insect orders Epromotopicia in receptora in interpreta, of mayines statistics.
	S is the number of taxa present.
$HBI = \sum \frac{n_i \cdot a_i}{n_i \cdot a_i}$	N is the total sample abundance.
$HBI = \sum_{i=1}^{S} \frac{n_i \cdot a_i}{N}$	n i is the abundance of the i-th taxa.
6-1	a i is the WY HBI index value (can be found on the Traits sheet). An index of 11 indicates a taxa that is discarded from the calculation.
DOMINANCE AND DIVERSITY	Metrics that examine how dominated the community is by a single or few taxa.
Dominant taxa	The most numerous taxon.
Subdominant taxa	The second most numerous taxon.
Shannon-Weaver Diversity (loge)	Information theory index that examines how evenly abundance is allocated among the taxa present in the community.
	S is the number of taxa present.
$H' = -\sum_{i=1}^{S} \frac{n_i}{N} \ln \left( \frac{n_i}{N} \right)$	N is the total sample abundance.
$\sum_{i=1}^{n} N \setminus N$	n i is the abundance of the i-th taxa.
Shannon-Weaver Diversity (log2)	7-
Shannon Evenness Index	
$E = H'/\ln(S)$	Where H' and S are defined above.
TOLERANT AND INTOLERANT TAXA	Based on habitat association and best professional judgement (Wisseman unpublished). Water temperature and dissolved oxygen are the dominant environmental factors.
Total tolerant taxa	Sum of the moderately and highly tolerant taxa. Taxa found frequently in habitats with warm water temperature and low dissolved oxygen. Eurythermal.
Highly tolerant taxa	Taxa highly tolerant of warm water and very low dissolved oxygen. Found often in stagnant and highly eutrophic habitat.
Moderately tolerant taxa	Taxa moderately tolerant of warm water and low dissolved oxygen.
Total intolerant taxa	Sum of moderately intolerant and highly intolerant taxa. Cool and cold water biota found in habitats with high dissolved oxygen.
Highly intolerant taxa	Taxa generally found in habitats with year-round cold water temperatures and very high dissolved oxygen. Indicative of bull trout zone. Cold water biota, cold stenotherms.
Moderately Intolerant taxa	Taxa generally found in cool water habitats, cold to cool water eurythermal. Indicative of general salmonid zone.
VOLTINISM (length of life cycle)	Modified from Poff et al. 2006
Semivoltine (> 1 year life cycle)	Taxa where a significant proportion of individuals require more than one year to complete their life cycle.
Univoltine (1 year life cycle)	Taxa where most individuals exhibit a one year life cycle.
Multivoltine (< 1 year life cycle)	Taxa where a significant proportion of the population has more than one generation a year.
GROWTH AND DEVELOPMENT	Modified from Poff et al. 2006
Fast seasonal life cycle	Taxa that grow and mature over a few months or a single season.
Slow seasonal life cycle	Taxa where growth and maturation extends over several seasons.
Nonseasonal life cycle	Taxa that exhibit asynchronous seasonal development, with multiple life stages present during most of the year.
OCCURRENCE IN DRIFT	Modified from Poff et al. 2006
Rare in drift	Found rarely in stream drift. Drift occurs during catastrophic events (e.g. floods).
Common in drift	Found commonly in stream drift.
Abundant in drift	Dominant in stream drift, behavioral drifters.
SIZE AT MATURITY	Modified from Poff et al. 2006
Small size at maturity	<9 mm long at maturity
Medium size at maturity	9-16 mm long at maturity
Large size at maturity	> 16 mm long at maturity
RHEOPHILY AND HABITAT AFFINITY	Modified from Poff et al. 2006
Depositional only	Occurs primarily in lentic habitats, stream pools and alcoves, or low gradient slowly flowing streams.
Depositional and erosional	Stream taxa found in both pools and riffles, though usually in protected pockets in riffles.
Erosional	Stream taxa associated with moderate to fast water current.
THERMAL PREFERENCE	Modified from Poff et al. 2006
Cold stenothermal and cool eurythermal	
Cool/warm eurythermal	
Warm eurythermal	
NON-INSECT AND INSECT ORDERS	
Non-insect invertebrates	Hydroids, vermiform taxa, mollusks, crustaceans and mites.
Ephemeroptera (mayflies)	
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Explanation of metrics	All abundances and biomass converted to a full sample and 1 square meter basis.
Odonata (damsel- and dragonflies)	
Plecoptera (stoneflies)	
Hemiptera (true bugs)	
Megaloptera (alderflies and hellgramites)	
Trichoptera (caddisflies)	
Lepidoptera (moths)	
Coleoptera (beetles)	
Diptera (total)(true flies)	Inclusive of the Chironomidae.
Chironomidae (true flies- midges)	Dominant and ubiquitous aquatic dipteran family.
INDICATOR TAXA	
Mollusca (snails and bivalves) taxa	
Crustacea taxa	Benthic taxa include Ostracoda, Amphipoda, Isopoda, Decapoda, and the Chydoridae (Cladocera), but not water column associated microcrustaceans (e.g. Daphnidae and Copepoda)
Baetidae (mayfly) taxa	Common, ubiquitous and diverse family of minnow-like mayfles.
Ephemerellidae (mayfly) taxa	Common, ubiquitous and diverse family of mayflies with most taxa associated with cool-cold montane rivers. Many taxa intolerant.
Heptageniidae (mayfly) taxa	Common, ubiquitous and diverse family of mayflies. Rheophilic, scraper mayflies found over a broad longitudinal range in montane and foothill rivers and streams.
Nemouridae (stonefly) taxa	Common, ubiquitous, and diverse family of stoneflies. Broadly distributed along river systems with peak diversity in small, forested streams.
Rhyacophilidae (caddisfly) taxa	Common, ubiquitous and very diverse family of caddisflies. Primarily predators. Broadly distributed along river systems with peak diversity in small to mid-size, cool/cold montane streams
Hydropsychidae (caddisfly) taxa	Common, ubiquitous, and diverse family of net spinning caddisflies.
Elmidae (riffle beetle) taxa	Common, ubiquitous, and diverse family of aquatic beetles.
FEEDING GROUPS	Functional feeding groups based on the mechanism by which taxa feed. Modified from Merritt et al. 2008.
Predator taxa	Taxa that are primarily predators, consuming living animal tissue by engulfing prey or piercing prey tissues and sucking fluids. Excluding parasites.
Parasite taxa	External parasites of invertebrates (e.g. Acari or mites), or internal parasites (e.g. Nemata or roundworms).
Collector-gatherer taxa	Utilize mouthparts and other structures to "qather" fine particulate organic matter (FPOM) that is mostly detritus but may include algae, bacteria, small animals, etc.
Collector-filterer taxa	Utilize nets, mothparts or other structures to capture and consume FPOM suspended in the water column. FPOM may include algae, bacteria, small animals, etc.
Collector (total) taxa	Sum of the collector-gatherer and collector-filterer.
Piercer herbivore taxa	Also called Macrophyte piercers. Pierce living tissue of aquatic macrophytes and suck fluids, e.g. some Hydroptilidae.
Macrophyte herbivore taxa	Chewers and miners of living macrophytes. Considered a subclass of shredders in Merritt et al. 2008.
Shredder taxa	Consume (chew) coarse particulate organic matter (CPOM) such as decaying leaves and wood.
Scraper taxa	"Scrape" periphyton (attached algae) and associated material from hard surfaces.
Omnivore taxa	Taxa exhibiting multiple feeding mechanisms (above), with no one mechanism clearly dominant.
Unknown taxa	No information available on how and what taxon feeds on.
HABIT	Mode of existence.
Skater taxa	Adapted for "skating" on the wayter surface. Generally excluded from benthic data sets.
Planktonic taxa	Inhabit the water column in lentic water or slow moving streams. Generally excluded from benthic data sets.
Diver taxa	Swim in the water column and along the benthos, but return to the water surface to obtain oxygen. Gnerally excluded from benthic data sets.
Swimmer taxa	Exhibit fishlike swimming in lotic or lentic waters, but return to the benthos between bursts of swimming, included in benthic data sets.
Clinger taxa	Taxa that have behavioral (e.g. net spinners) or morphological adaptations (e.g. claws) to attach to hard substrates in faster water current.
Sprawler taxa	Found on the surface of fine sediments or floating leaves of macrophytes.
Climber taxa	
Oli Tiber taxa	
Burrower taxa	Found on leaves and stems of aquatic macrophytes or submerged branches and roots.  Burrow into fine sediments or tunnel into plant stems, leaves or roots (miners)
Burrower taxa Unknowns taxa	Burrow into fine sediments or tunnel into plant stems, leaves or roots (miners)
Unknowns taxa	Burrow into fine sediments or tunnel into plant stems, leaves or roots (miners) Not able to classify as above.
Unknowns taxa STATE OF CALIFORNIA DESIGNATIONS	Burrow into fine sediments or tunnel into plant stems, leaves or roots (miners) Not able to classify as above. Traits coding according to CAMLnet January 27, 2003. List of California macroinvertebrate taxa and standard taxonomic effort.
Unknowns taxa  STATE OF CALIFORNIA DESIGNATIONS  CA % Sensitive EPT	Burrow into fine sediments or tunnel into plant stems, leaves or roots (miners)  Not able to classify as above.  Traits coding according to CAMLnet January 27, 2003. List of California macroinvertebrate taxa and standard taxonomic effort.  Ephemeroptera, Plecoptera and Trichoptera with California Tolerance Value (CTV) of 0-2 on a 0-10 scaling.
Unknowns taxa  STATE OF CALIFORNIA DESIGNATIONS  CA % Sensitive EPT  CA % Intolerant individuals	Burrow into fine sediments or tunnel into plant stems, leaves or roots (miners) Not able to classify as above. Traits coding according to CAMLnet January 27, 2003. List of California macroinvertebrate taxa and standard taxonomic effort. Ephemeroptera, Plecoptera and Trichoptera with California Tolerance Value (CTV) of 0-2 on a 0-10 scaling. All invertebrates with a CTV of 0-2 on a 0-10 scaling.
Unknowns taxa STATE OF CALIFORNIA DESIGNATIONS CA % Sensitive EPT CA % Intolerant individuals CA % Tolerant individuals	Burrow into fine sediments or tunnel into plant stems, leaves or roots (miners)  Not able to classify as above.  Traits coding according to CAMLnet January 27, 2003. List of California macroinvertebrate taxa and standard taxonomic effort.  Ephemeroptera, Plecoptera and Trichoptera with California Tolerance Value (CTV) of 0-2 on a 0-10 scaling.  All invertebrates with a CTV of 0-2 on a 0-10 scaling.  All invertebrates with a CTV of 8-10 on a 0-10 scaling.
Unknowns taxa  STATE OF CALIFORNIA DESIGNATIONS  CA % Sensitive EPT  CA % Intolerant individuals  CA % Tolerant individuals  CA weighted tolerance value	Burrow into fine sediments or tunnel into plant stems, leaves or roots (miners)  Not able to classify as above.  Traits coding according to CAMLnet January 27, 2003. List of California macroinvertebrate taxa and standard taxonomic effort.  Ephemeroptera, Plecoptera and Trichoptera with California Tolerance Value (CTV) of 0-2 on a 0-10 scaling.  All invertebrates with a CTV of 0-2 on a 0-10 scaling.  All invertebrates with a CTV of 8-10 on a 0-10 scaling.  Calculates the Hilsenhoff Biotic Index using the California Toilerance Values (CTV)
Unknowns taxa  STATE OF CALIFORNIA DESIGNATIONS  CA % Sensitive EPT  CA % Intolerant individuals  CA % Tolerant individuals  CA weighted tolerance value  CA % Predators	Burrow into fine sediments or tunnel into plant stems, leaves or roots (miners)  Not able to classify as above.  Traits coding according to CAMLnet January 27, 2003. List of California macroinvertebrate taxa and standard taxonomic effort.  Ephemeroptera, Plecoptera and Trichoptera with California Tolerance Value (CTV) of 0-2 on a 0-10 scaling.  All invertebrates with a CTV of 0-2 on a 0-10 scaling.  All invertebrates with a CTV of 8-10 on a 0-10 scaling.  Calculates the Hilsenhoff Biotic Index using the California Toilerance Values (CTV)  Primary designation of predator as classed by CA.
Unknowns taxa  STATE OF CALIFORNIA DESIGNATIONS  CA % Sensitive EPT  CA % Intolerant individuals  CA % Tolerant individuals  CA weighted tolerance value  CA % Predators  CA % Collector-gatherers	Burrow into fine sediments or tunnel into plant stems, leaves or roots (miners) Not able to classify as above.  Traits coding according to CAMLnet January 27, 2003. List of California macroinvertebrate taxa and standard taxonomic effort.  Ephemeroptera, Plecoptera and Trichoptera with California Tolerance Value (CTV) of 0-2 on a 0-10 scaling.  All invertebrates with a CTV of 0-2 on a 0-10 scaling.  All invertebrates with a CTV of 8-10 on a 0-10 scaling.  Calculates the Hilsenhoff Biotic Index using the California Toilerance Values (CTV)  Primary designation of predator as classed by CA.  Primary designation of gatherer as classed by collector-gatherer by CA.
Unknowns taxa STATE OF CALIFORNIA DESIGNATIONS CA % Sensitive EPT CA % Intolerant individuals CA % Tolerant individuals CA weighted tolerance value CA % Predators CA % Collector-gatherers CA % Filterers	Burrow into fine sediments or tunnel into plant stems, leaves or roots (miners)  Not able to classify as above.  Traits coding according to CAMLnet January 27, 2003. List of California macroinvertebrate taxa and standard taxonomic effort.  Ephemeroptera, Plecoptera and Trichoptera with California Tolerance Value (CTV) of 0-2 on a 0-10 scaling.  All invertebrates with a CTV of 0-2 on a 0-10 scaling.  All invertebrates with a CTV of 8-10 on a 0-10 scaling.  Calculates the Hilsenhoff Biotic Index using the California Toilerance Values (CTV)  Primary designation of gatherer as classed by CA.  Primary designation of fileter as classed by collector-gatherer by CA.  Primary designation of fileter as classed by collector-filterer by CA.
Unknowns taxa  STATE OF CALIFORNIA DESIGNATIONS  CA % Sensitive EPT  CA % Intolerant individuals  CA weighted tolerance value  CA % Predators  CA % Collector-gatherers  CA % Scrapers	Burrow into fine sediments or tunnel into plant stems, leaves or roots (miners)  Not able to classify as above.  Traits coding according to CAMLnet January 27, 2003. List of California macroinvertebrate taxa and standard taxonomic effort.  Ephemeroptera, Plecoptera and Trichoptera with California Tolerance Value (CTV) of 0-2 on a 0-10 scaling.  All invertebrates with a CTV of 0-2 on a 0-10 scaling.  All invertebrates with a CTV of 8-10 on a 0-10 scaling.  Calculates the Hilsenhoff Biotic Index using the California Toilerance Values (CTV)  Primary designation of predator as classed by CA.  Primary designation of gatherer as classed by collector-gatherer by CA.  Primary designation of fileter as classed by collector-filterer by CA.  Primary designation of scraper as classed by CA.
Unknowns taxa  STATE OF CALIFORNIA DESIGNATIONS  CA % Sensitive EPT CA % Intolerant individuals CA weighted tolerance value CA % Predators CA % Collector-gatherers CA % Fitterers CA % Scrapers CA % Shredders	Burrow into fine sediments or tunnel into plant stems, leaves or roots (miners)  Not able to classify as above.  Traits coding according to CAMLnet January 27, 2003. List of California macroinvertebrate taxa and standard taxonomic effort.  Ephemeroptera, Plecoptera and Trichoptera with California Tolerance Value (CTV) of 0-2 on a 0-10 scaling.  All invertebrates with a CTV of 0-2 on a 0-10 scaling.  All invertebrates with a CTV of 8-10 on a 0-10 scaling.  Calculates the Hilsenhoff Biotic Index using the California Toilerance Values (CTV)  Primary designation of gatherer as classed by CA.  Primary designation of fileter as classed by collector-gatherer by CA.
Unknowns taxa  STATE OF CALIFORNIA DESIGNATIONS  CA % Sensitive EPT  CA % Intolerant individuals  CA weighted tolerance value  CA % Predators  CA % Collector-gatherers  CA % Filterers  CA % Scrapers  CA % Scrapers  CA % Shredders  BIOTIC CONDITION INDEX	Burrow into fine sediments or tunnel into plant stems, leaves or roots (miners)  Not able to classify as above.  Traits coding according to CAMLnet January 27, 2003. List of California macroinvertebrate taxa and standard taxonomic effort.  Ephemeroptera, Plecoptera and Trichoptera with California Tolerance Value (CTV) of 0-2 on a 0-10 scaling.  All invertebrates with a CTV of 0-2 on a 0-10 scaling.  All invertebrates with a CTV of 8-10 on a 0-10 scaling.  Calculates the Hilsenhoff Biotic Index using the California Toilerance Values (CTV)  Primary designation of predator as classed by CA.  Primary designation of gatherer as classed by collector-gatherer by CA.  Primary designation of fileter as classed by collector-filterer by CA.  Primary designation of scraper as classed by CA.
Unknowns taxa STATE OF CALIFORNIA DESIGNATIONS CA % Sensitive EPT CA % Intolerant individuals CA % Tolerant individuals CA weighted tolerance value CA % Predators CA % Collector-gatherers CA % Strapers CA % Strapers CA % Shredders BIOTIC CONDITION INDEX CTQa- Community Tolerance Quotient actual	Burrow into fine sediments or tunnel into plant stems, leaves or roots (miners) Not able to classify as above.  Traits coding according to CAMLnet January 27, 2003. List of California macroinvertebrate taxa and standard taxonomic effort.  Ephemeroptera, Plecoptera and Trichoptera with California Tolerance Value (CTV) of 0-2 on a 0-10 scaling.  All invertebrates with a CTV of 0-2 on a 0-10 scaling.  All invertebrates with a CTV of 8-10 on a 0-10 scaling.  Calculates the Hilsenhoff Biotic Index using the California Toilerance Values (CTV)  Primary designation of predator as classed by CA.  Primary designation of gatherer as classed by collector-gatherer by CA.  Primary designation of fileter as classed by collector-filterer by CA.  Primary designation of scraper as classed by CA.  Primary designation of shredder as classed by CA.
Unknowns taxa  STATE OF CALIFORNIA DESIGNATIONS  CA % Sensitive EPT  CA % Intolerant individuals  CA weighted tolerance value  CA % Predators  CA % Collector-gatherers  CA % Filterers  CA % Scrapers  CA % Scrapers  CA % Shredders  BIOTIC CONDITION INDEX	Burrow into fine sediments or tunnel into plant stems, leaves or roots (miners)  Not able to classify as above.  Traits coding according to CAMLnet January 27, 2003. List of California macroinvertebrate taxa and standard taxonomic effort.  Ephemeroptera, Plecoptera and Trichoptera with California Tolerance Value (CTV) of 0-2 on a 0-10 scaling.  All invertebrates with a CTV of 0-2 on a 0-10 scaling.  All invertebrates with a CTV of 8-10 on a 0-10 scaling.  Calculates the Hilsenhoff Biotic Index using the California Toilerance Values (CTV)  Primary designation of predator as classed by CA.  Primary designation of gatherer as classed by collector-gatherer by CA.  Primary designation of fileter as classed by collector-filterer by CA.  Primary designation of scraper as classed by CA.
Unknowns taxa	Burrow into fine sediments or tunnel into plant stems, leaves or roots (miners)  Not able to classify as above.  Traits coding according to CAMLnet January 27, 2003. List of California macroinvertebrate taxa and standard taxonomic effort.  Ephemeroptera, Plecoptera and Trichoptera with California Tolerance Value (CTV) of 0-2 on a 0-10 scaling.  All invertebrates with a CTV of 0-2 on a 0-10 scaling.  All invertebrates with a CTV of 8-10 on a 0-10 scaling.  Calculates the Hilsenhoff Biotic Index using the California Toilerance Values (CTV)  Primary designation of predator as classed by CA.  Primary designation of glatherer as classed by collector-gatherer by CA.  Primary designation of fileter as classed by CA.  Primary designation of scraper as classed by CA.  Primary designation of sraper as classed by CA.  S is the number of taxa.
Unknowns taxa	Burrow into fine sediments or tunnel into plant stems, leaves or roots (miners)  Not able to classify as above.  Traits coding according to CAMLnet January 27, 2003. List of California macroinvertebrate taxa and standard taxonomic effort.  Ephemeroptera, Plecoptera and Trichoptera with California Tolerance Value (CTV) of 0-2 on a 0-10 scaling.  All invertebrates with a CTV of 0-2 on a 0-10 scaling.  All invertebrates with a CTV of 8-10 on a 0-10 scaling.  Calculates the Hilsenhoff Biotic Index using the California Toilerance Values (CTV)  Primary designation of predator as classed by CA.  Primary designation of glatherer as classed by collector-gatherer by CA.  Primary designation of fileter as classed by CA.  Primary designation of scraper as classed by CA.  Primary designation of sraper as classed by CA.  S is the number of taxa.
Unknowns taxa	Burrow into fine sediments or turnel into plant stems, leaves or roots (miners) Not able to classify as above.  Traits coding according to CAMLnet January 27, 2003. List of California macroinvertebrate taxa and standard taxonomic effort.  Ephemeroptera, Plecoptera and Trichoptera with California Tolerance Value (CTV) of 0-2 on a 0-10 scaling.  All invertebrates with a CTV of 0-2 on a 0-10 scaling.  All invertebrates with a CTV of 8-10 on a 0-10 scaling.  Calculates the Hilsenhoff Biotic Index using the California Toilerance Values (CTV)  Primary designation of predator as classed by CA.  Primary designation of gatherer as classed by collector-gatherer by CA.  Primary designation of scaper as classed by collector-filterer by CA.  Primary designation of scaper as classed by CA.  Primary designation of shredder as classed by CA.  S is the number of taxa.  TQ_i is the BCI TV (tolerance value) from the Traits sheet. A BCI TV of 110 indicates a taxa that is exluded from the calculation.  TQ_i and S as above.

0-2.75 mm abundance

#### **Explanation of metrics**

All abundances and biomass converted to a full sample and 1 square meter basis.

3-4.75 mm abundance
5-6.75 mm abundance
7-8.75 mm abundance
9-10.75 mm abundance
11-15 mm abundance
16-20 mm abundance
>20 mm abundance
0-2.75 mm biomass (mg)
3-4.75 mm biomass (mg)
5-6.75 mm biomass (mg)
7-8.75 mm biomass (mg)
9-10.75 mm biomass (mg)
11-15 mm biomass (mg)
16-20 mm biomass (mg)
>20 mm biomass (mg)

Waterbody	Site	Date Taxon	Stad	e Abundance Sub	sample.correction.factor Area	a.correction.factor Unique STE	Incidental Comments
Rinearson Creek	upper control	5/19/2020 Oligochaeta	U	34	2.791	1.345 Y	no
Rinearson Creek	upper control	5/19/2020 Erpobdella	Ū	1	2.791	1.345 Y	no
Rinearson Creek	upper control	5/19/2020 Sphaeriidae	Ū	8	2.791	1.345 Y	no
Rinearson Creek	upper control	5/19/2020 Ferrissia	Ū	1	2.791	1.345 Y	no
Rinearson Creek	upper control	5/19/2020 Menetus	Ü	5	2.791	1.345 Y	no
Rinearson Creek	upper control	5/19/2020 Potamopyrgus antipodarum	Ū	4	2.791	1.345 Y	no
Rinearson Creek	upper control	5/19/2020 Crangonyx	Ū	24	2.791	1.345 Y	no
Rinearson Creek	upper control	5/19/2020 Caecidotea	Ū	272	2.791	1.345 Y	no
Rinearson Creek	upper control	5/19/2020 Pacifastacus	Ū	1	2.791	1.345 Y	no
Rinearson Creek	upper control	5/19/2020 Baetis	Ĺ	9	2.791	1.345 Y	no
Rinearson Creek	upper control	5/19/2020 Lepidostoma	Ē	1	2.791	1.345 Y	no
Rinearson Creek	upper control	5/19/2020 Lara	Ē	1	2.791	1.345 Y	no
Rinearson Creek	upper control	5/19/2020 Clinocera	Ē	1	2.791	1.345 Y	no
Rinearson Creek	upper control	5/19/2020 Neoplasta	Ē	1	2.791	1.345 Y	no
Rinearson Creek	upper control	5/19/2020 Ceratopogoninae	Ē	8	2.791	1.345 Y	no
Rinearson Creek	upper control	5/19/2020 Simulium	Ē	2	2.791	1.345 Y	no
Rinearson Creek	upper control	5/19/2020 Tipula	Ē	1	2.791	1.345 Y	no
Rinearson Creek	upper control	5/19/2020 Chironomidae	P	12	2.791	1.345 N	no
Rinearson Creek	upper control	5/19/2020 Alotanypus	Ĺ	4	2.791	1.345 Y	no
Rinearson Creek	upper control	5/19/2020 Brillia	Ī.	14	2.791	1.345 Y	no
Rinearson Creek	upper control	5/19/2020 Chironomus	Ē	1	2.791	1.345 Y	no
Rinearson Creek	upper control	5/19/2020 Corynoneura	Ē	2	2.791	1.345 Y	no
Rinearson Creek	upper control	5/19/2020 Cryptochironomus	ī	1	2.791	1.345 Y	no
Rinearson Creek	upper control	5/19/2020 Eukiefferiella claripennis group	Ē	6	2.791	1.345 Y	no
Rinearson Creek	upper control	5/19/2020 Heterotrissocladius marcidus group	ī	2	2.791	1.345 Y	no
Rinearson Creek	upper control	5/19/2020 Limnophyes	ī	3	2.791	1.345 Y	no
Rinearson Creek	upper control	5/19/2020 Micropsectra	ī	34	2.791	1.345 Y	no
Rinearson Creek	upper control	5/19/2020 Parametriocnemus	ī	2	2.791	1.345 Y	no
Rinearson Creek	upper control	5/19/2020 Phaenopsectra	ī	3	2.791	1.345 Y	no
Rinearson Creek	upper control	5/19/2020 Polypedilum	Ē	1	2.791	1.345 Y	no
Rinearson Creek	upper control	5/19/2020 Procladius	Ē	2	2.791	1.345 Y	no
Rinearson Creek	upper control	5/19/2020 Prodiamesa	Ē	16	2.791	1.345 Y	no
Rinearson Creek	upper control	5/19/2020 Thienemannimyia complex	Ī	20	2.791	1.345 Y	no
Rinearson Creek	upper control	5/19/2020 Tvetenia bavarica group	Ē	12	2.791	1.345 Y	no
Rinearson Creek	engineered riffle	5/19/2020 Oligochaeta	Ū	6	13.33	1.345 Y	no
Rinearson Creek	engineered riffle	5/19/2020 Erpobdella	Ü	1	13.33	1.345 Y	no
Rinearson Creek	engineered riffle	5/19/2020 Sphaeriidae	Ü	3	13.33	1.345 Y	no
Rinearson Creek	engineered riffle	5/19/2020 Lymnaeidae	Ü	1	13.33	1.345 Y	no
Rinearson Creek	engineered riffle	5/19/2020 Physella	Ū	5	13.33	1.345 Y	no
Rinearson Creek	engineered riffle	5/19/2020 Gyraulus	Ū	1	13.33	1.345 Y	no
Rinearson Creek	engineered riffle	5/19/2020 Chydoridae	Ü	6	13.33	1.345 Y	no
Rinearson Creek	engineered riffle	5/19/2020 Crangonyx	Ū	10	13.33	1.345 Y	no
Rinearson Creek	engineered riffle	5/19/2020 Caecidotea	Ū	2	13.33	1.345 Y	no
Rinearson Creek	engineered riffle	5/19/2020 Pacifastacus	Ü	1	13.33	1.345 Y	no
Rinearson Creek	engineered riffle	5/19/2020 Sperchon	Ü	1	13.33	1.345 Y	no
Rinearson Creek	engineered riffle	5/19/2020 Baetis	Ĺ	5	13.33	1.345 Y	no
Rinearson Creek	engineered riffle	5/19/2020 Cheumatopsyche	Ĺ	7	13.33	1.345 Y	no
Rinearson Creek	engineered riffle	5/19/2020 Hydroptila	Ĺ	1	13.33	1.345 Y	no
Rinearson Creek	engineered riffle	5/19/2020 Ceratopogoninae	Ĺ	6	13.33	1.345 Y	no
Rinearson Creek	engineered riffle	5/19/2020 Ceratopogoninae	P	1	13.33	1.345 Y	no
Rinearson Creek	engineered riffle	5/19/2020 Simulium	Ĺ	358	13.33	1.345 Y	no
Rinearson Creek	engineered riffle	5/19/2020 Tipula	Ĺ	2	13.33	1.345 Y	no
Rinearson Creek	engineered riffle	5/19/2020 Chironomidae	P	8	13.33	1.345 N	no
Rinearson Creek	engineered riffle	5/19/2020 Corynoneura	Ĺ	2	13.33	1.345 Y	no
Rinearson Creek	engineered riffle	5/19/2020 Cricotopus	Ĺ	57	13.33	1.345 Y	no
Rinearson Creek	engineered riffle	5/19/2020 Cryptochironomus	Ī.	1	13.33	1.345 Y	no
Rinearson Creek	engineered riffle	5/19/2020 Eukiefferiella claripennis group	Ĺ	41	13.33	1.345 Y	no
Rinearson Creek	engineered riffle	5/19/2020 Micropsectra	Ĺ	3	13.33	1.345 Y	no
Rinearson Creek	engineered riffle	5/19/2020 Parametriocnemus	Ĺ	1	13.33	1.345 Y	no
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Waterbody	Site	Date Taxon	Stage	Abundance S	Subsample.correction.factor	Area.correction.factor Uni	que STE Incidental Comments
Rinearson Creek	engineered riffle	5/19/2020 Paratanytarsus	L	3	13.33	1.345 Y	no
Rinearson Creek	engineered riffle	5/19/2020 Phaenopsectra	Ĺ	2	13.33	1.345 Y	no
Rinearson Creek	engineered riffle	5/19/2020 Polypedilum	L	21	13.33	1.345 Y	no
Rinearson Creek	engineered riffle	5/19/2020 Psectrocladius	L	5	13.33	1.345 Y	no
Rinearson Creek	engineered riffle	5/19/2020 Rheotanytarsus	L	7	13.33	1.345 Y	no
Rinearson Creek	engineered riffle	5/19/2020 Thienemannimyia complex	L	19	13.33	1.345 Y	no
Rinearson Creek	engineered riffle	5/19/2020 Tvetenia bavarica group	L	1	13.33	1.345 Y	no
Rinearson Creek	beaver pond	5/19/2020 Oligochaeta	U	113	2	1.345 Y	no
Rinearson Creek	beaver pond	5/19/2020 Erpobdella	U	4	2	1.345 Y	no
Rinearson Creek	beaver pond	5/19/2020 Chydoridae	U	4	2	1.345 Y	no
Rinearson Creek	beaver pond	5/19/2020 Crangonyx	U	9	2	1.345 Y	no
Rinearson Creek	beaver pond	5/19/2020 Caecidotea	U	3	2	1.345 Y	no
Rinearson Creek	beaver pond	5/19/2020 Aeshnidae	L	1	2	1.345 Y	early instar no
Rinearson Creek	beaver pond	5/19/2020 Callibaetis	L	1	2	1.345 Y	no
Rinearson Creek	beaver pond	5/19/2020 Notonecta	L	1	2	1.345 Y	no
Rinearson Creek	beaver pond	5/19/2020 Corixidae	L	11	2	1.345 N	no
Rinearson Creek	beaver pond	5/19/2020 Cenocorixa	Α	11	2	1.345 Y	no
Rinearson Creek	beaver pond	5/19/2020 Hydrophilidae	L	1	2	1.345 Y	no
Rinearson Creek	beaver pond	5/19/2020 Dytiscidae	L	1	2	1.345 Y	no
Rinearson Creek	beaver pond	5/19/2020 Peltodytes	L	1	2	1.345 Y	no
Rinearson Creek	beaver pond	5/19/2020 Peltodytes	Α	2	2	1.345 Y	no
Rinearson Creek	beaver pond	5/19/2020 Dolichopodidae	L.	1	2	1.345 Y	no
Rinearson Creek	beaver pond	5/19/2020 Ceratopogoninae	L	16	2	1.345 Y	no
Rinearson Creek	beaver pond	5/19/2020 Ceratopogoninae	P	1	2	1.345 Y	no
Rinearson Creek	beaver pond	5/19/2020 Psychodini	L.	1	2	1.345 Y	no
Rinearson Creek	beaver pond	5/19/2020 Simulium	L	13	2	1.345 Y	no
Rinearson Creek	beaver pond	5/19/2020 Tipula	L P	9	2 2	1.345 Y	no
Rinearson Creek	beaver pond	5/19/2020 Chironomidae	Ρ .	21 2	2	1.345 N 1.345 Y	no
Rinearson Creek Rinearson Creek	beaver pond beaver pond	5/19/2020 Brillia 5/19/2020 Chironomus	Ŀ	142	2 2	1.345 Y 1.345 Y	no no
Rinearson Creek	beaver pond	5/19/2020 Chironomus 5/19/2020 Corynoneura	į.	2	2	1.345 Y	
Rinearson Creek	beaver pond	5/19/2020 Corynoneura 5/19/2020 Cricotopus	L	85	2	1.345 Y	no no
Rinearson Creek	beaver pond	5/19/2020 Cricotopus 5/19/2020 Cryptochironomus	ī	22	2	1.345 Y	no
Rinearson Creek	beaver pond	5/19/2020 Cryptochilonomus	i	11	2	1.345 Y	no
Rinearson Creek	beaver pond	5/19/2020 Endocrinonomus 5/19/2020 Eukiefferiella claripennis group	ī	4	2	1.345 Y	no
Rinearson Creek	beaver pond	5/19/2020 Limnophyes	ī	2	2	1.345 Y	no
Rinearson Creek	beaver pond	5/19/2020 Paratanytarsus	Ĺ	4	2	1.345 Y	no
Rinearson Creek	beaver pond	5/19/2020 Phaenopsectra	ī	6	2	1.345 Y	no
Rinearson Creek	beaver pond	5/19/2020 Polypedilum	ī	6	2	1.345 Y	no
Rinearson Creek	beaver pond	5/19/2020 Procladius	ī	20	2	1.345 Y	no
Rinearson Creek	beaver pond	5/19/2020 Prodiamesa	Ĺ	2	2	1.345 Y	no
Rinearson Creek	beaver pond	5/19/2020 Psectrocladius	Ĺ	28	2	1.345 Y	no
Rinearson Creek	beaver pond	5/19/2020 Pseudosmittia	Ĺ	9	2	1.345 Y	no
Rinearson Creek	beaver pond	5/19/2020 Psectrotanypus	L	6	2	1.345 Y	no
Rinearson Creek	beaver pond	5/19/2020 Rheotanytarsus	L	2	2	1.345 Y	no
Rinearson Creek	beaver pond	5/19/2020 Tanytarsus	Ĺ	41	2	1.345 Y	no
Rinearson Creek	beaver pond	5/19/2020 Thienemannimyia complex	L	4	2	1.345 Y	no
Rinearson Creek	emergent marsh	5/19/2020 Nemata	U	19	1.58	1.345 Y	no
Rinearson Creek	emergent marsh	5/19/2020 Oligochaeta	U	15	1.58	1.345 Y	no
Rinearson Creek	emergent marsh	5/19/2020 Erpobdella	U	7	1.58	1.345 Y	no
Rinearson Creek	emergent marsh	5/19/2020 Sphaeriidae	U	57	1.58	1.345 Y	no
Rinearson Creek	emergent marsh	5/19/2020 Lymnaeidae	U	6	1.58	1.345 Y	no
Rinearson Creek	emergent marsh	5/19/2020 Physella	U	7	1.58	1.345 Y	no
Rinearson Creek	emergent marsh	5/19/2020 Juga	U	2	1.58	1.345 Y	no
Rinearson Creek	emergent marsh	5/19/2020 Fluminicola	U	10	1.58	1.345 Y	no
Rinearson Creek	emergent marsh	5/19/2020 Crangonyx	U	20	1.58	1.345 Y	no
Rinearson Creek	emergent marsh	5/19/2020 Caecidotea	U	118	1.58	1.345 Y	no
Rinearson Creek	emergent marsh	5/19/2020 Lirceus	U	1	1.58	1.345 Y	no
Rinearson Creek	emergent marsh	5/19/2020 Potamopyrgus antipodarum	U	22	1.58	1.345 Y	no

Waterbody	Site	Date Taxon	Stage Abundance	Subsample.correction.factor	Area.correction.factor Unique STI	E Incidental Comments
Rinearson Creek	emergent marsh	5/19/2020 Baetis	L	·		no
Rinearson Creek	emergent marsh	5/19/2020 Coenagrion/Enallagma	L 1			no
Rinearson Creek	emergent marsh	5/19/2020 Corixidae	L 9			no
Rinearson Creek	emergent marsh	5/19/2020 Dytiscidae	L 1	1.0		no
Rinearson Creek	emergent marsh	5/19/2020 Peltodytes	Α 3			no
Rinearson Creek	emergent marsh	5/19/2020 Neoplasta	L 1	1.0		no
Rinearson Creek	emergent marsh	5/19/2020 Tipuloidea	P 1			no
Rinearson Creek	emergent marsh	5/19/2020 Ceratopogoninae	L 2			no
Rinearson Creek	emergent marsh	5/19/2020 Dixella	L 5			no
Rinearson Creek	emergent marsh	5/19/2020 Clinocera	L 1			no
Rinearson Creek	emergent marsh	5/19/2020 Tipula	L 4			no
Rinearson Creek	emergent marsh	5/19/2020 Alotanypus	L 7			no
Rinearson Creek	emergent marsh	5/19/2020 Brillia	L 14			no
Rinearson Creek	emergent marsh	5/19/2020 Chironomus	L 1			no
Rinearson Creek Rinearson Creek	emergent marsh emergent marsh	5/19/2020 Corynoneura 5/19/2020 Cricotopus	L 2			no no
Rinearson Creek	emergent marsh	5/19/2020 Cricotopus 5/19/2020 Cryptochironomus	L S	· · · · · · · · · · · · · · · · · · ·		no
Rinearson Creek	emergent marsh	5/19/2020 Dicrotendipes	L 1			no
Rinearson Creek	emergent marsh	5/19/2020 Eukiefferiella claripennis group	L 3			no
Rinearson Creek	emergent marsh	5/19/2020 Eukleheriella damperinis group 5/19/2020 Heterotrissocladius marcidus group	L 2			no
Rinearson Creek	emergent marsh	5/19/2020 Limnophyes	L			no
Rinearson Creek	emergent marsh	5/19/2020 Micropsectra	L 36			no
Rinearson Creek	emergent marsh	5/19/2020 Odontomesa	L 6			no
Rinearson Creek	emergent marsh	5/19/2020 Paratanytarsus	L S			no
Rinearson Creek	emergent marsh	5/19/2020 Paratendipes	- Z			no
Rinearson Creek	emergent marsh	5/19/2020 Phaenopsectra	L 10			no
Rinearson Creek	emergent marsh	5/19/2020 Polypedilum	L			no
Rinearson Creek	emergent marsh	5/19/2020 Procladius	L			no
Rinearson Creek	emergent marsh	5/19/2020 Prodiamesa	L 53	3 1.5	8 1.345 Y	no
Rinearson Creek	emergent marsh	5/19/2020 Psectrocladius	L 1	1.5	8 1.345 Y	no
Rinearson Creek	emergent marsh	5/19/2020 Psectrotanypus	L 7			no
Rinearson Creek	emergent marsh	5/19/2020 Smittia	L 2	•		no
Rinearson Creek	emergent marsh	5/19/2020 Tanytarsus	L 1			no
Rinearson Creek	emergent marsh	5/19/2020 Thienemannimyia complex	L 8			no
Rinearson Creek	emergent marsh	5/19/2020 Tvetenia bavarica group	L 1			no
Rinearson Creek	beaver pond	5/4/2021 Oligochaeta	U 8			no
Rinearson Creek	beaver pond	5/4/2021 Helobdella stagnalis complex	U 15			no
Rinearson Creek	beaver pond	5/4/2021 Sphaeriidae	U 2			no
Rinearson Creek	beaver pond	5/4/2021 Physella	U S			no
Rinearson Creek	beaver pond	5/4/2021 Musculium	U 2 U 6			no
Rinearson Creek Rinearson Creek	beaver pond	5/4/2021 Ostracoda 5/4/2021 Lirceus	U			no
Rinearson Creek	beaver pond beaver pond	5/4/2021 Crangonyx	U 86			no no
Rinearson Creek	beaver pond	5/4/2021 Caecidotea	U 35			no
Rinearson Creek	beaver pond	5/4/2021 Trombidiformes	U			no
Rinearson Creek	beaver pond	5/4/2021 Chydoridae	U 2			no
Rinearson Creek	beaver pond	5/4/2021 Erpobdella	U 5			no
Rinearson Creek	beaver pond	5/4/2021 Libellulidae	1 1			no
Rinearson Creek	beaver pond	5/4/2021 Coenagrion/Enallagma				no
Rinearson Creek	beaver pond	5/4/2021 Callibaetis				no
Rinearson Creek	beaver pond	5/4/2021 Corixidae	L 9			no
Rinearson Creek	beaver pond	5/4/2021 Ceratopogoninae	L 66			no
Rinearson Creek	beaver pond	5/4/2021 Ceratopogoninae	P 1			no
Rinearson Creek	beaver pond	5/4/2021 Chironomidae	P 38			no
Rinearson Creek	beaver pond	5/4/2021 Alotanypus	L 4			no
Rinearson Creek	beaver pond	5/4/2021 Chironomus	L 11			no
Rinearson Creek	beaver pond	5/4/2021 Cladopelma	L 2			no
Rinearson Creek	beaver pond	5/4/2021 Cricotopus	L	1.4	5 1.345 Y	no
Rinearson Creek	beaver pond	5/4/2021 Cryptochironomus	L 70	1.4	5 1.345 Y	no

Waterbody	Site	Date	Taxon	Stage	Abundance Subsar	mple.correction.factor Area.com	rection.factor Unique STE	Incidental Comments
Rinearson Creek	beaver pond		Dicrotendipes	L	4	1.45	1.345 Y	no
Rinearson Creek	beaver pond		Odontomesa	L	10	1.45	1.345 Y	no
Rinearson Creek	beaver pond		Orthocladius	L	8	1.45	1.345 Y	no
Rinearson Creek	beaver pond		Paratanytarsus	L	27	1.45	1.345 Y	no
Rinearson Creek	beaver pond		Paratendipes	L	4	1.45	1.345 Y	no
Rinearson Creek	beaver pond		Phaenopsectra	Ē	8	1.45	1.345 Y	no
Rinearson Creek	beaver pond		Polypedilum	ī	8	1.45	1.345 Y	no
Rinearson Creek	beaver pond		Procladius	ī	13	1.45	1.345 Y	no
Rinearson Creek	beaver pond		Prodiamesa	ī	10	1.45	1.345 Y	no
Rinearson Creek	beaver pond		Tanytarsus	Ē	125	1.45	1.345 Y	no
Rinearson Creek	emergent marsh		Nemata	Ū	1	1	1.345 Y	no
Rinearson Creek	emergent marsh		Oligochaeta	Ŭ	2	i	1.345 Y	no
Rinearson Creek	emergent marsh		Erpobdella	Ŭ	3	i	1.345 Y	no
Rinearson Creek	emergent marsh		Crangonyx	Ü	20	1	1.345 Y	no
Rinearson Creek	emergent marsh		Caecidotea	Ü	144	1	1.345 Y	no
Rinearson Creek	emergent marsh	5/4/2021		Ü	10	i	1.345 Y	no
Rinearson Creek	emergent marsh		Ceratopogoninae	ı	5	1	1.345 Y	no
Rinearson Creek	•		Chironomidae	P	13	1	1.345 N	no
Rinearson Creek	emergent marsh			L	91	1	1.345 N 1.345 Y	
Rinearson Creek	emergent marsh		Alotanypus	L	7	1 1	1.345 Y 1.345 Y	no
	emergent marsh		Crientonus	L		1		no
Rinearson Creek	emergent marsh		Cricotopus	L	10	•	1.345 Y	no
Rinearson Creek	emergent marsh		Micropsectra	Ŀ	3	1	1.345 Y	no
Rinearson Creek	emergent marsh		Paratendipes	Ŀ	106	1	1.345 Y	no
Rinearson Creek	emergent marsh		Prodiamesa	L	151	1	1.345 Y	no
Rinearson Creek	emergent marsh		Tanytarsus	L 	5	1	1.345 Y	no
Rinearson Creek	engineered riffle		Trepaxonemata	U	2	2.29	1.345 Y	no
Rinearson Creek	engineered riffle	5/4/2021		U	2	2.29	1.345 Y	no
Rinearson Creek	engineered riffle		Oligochaeta	U	17	2.29	1.345 Y	no
Rinearson Creek	engineered riffle		Helobdella stagnalis complex	U	2	2.29	1.345 Y	no
Rinearson Creek	engineered riffle		Erpobdella	U	1	2.29	1.345 Y	no
Rinearson Creek	engineered riffle		Ostracoda	U	1_	2.29	1.345 Y	no
Rinearson Creek	engineered riffle	5/4/2021		U	7	2.29	1.345 Y	no
Rinearson Creek	engineered riffle		Crangonyx	U	173	2.29	1.345 Y	no
Rinearson Creek	engineered riffle		Caecidotea	U	89	2.29	1.345 Y	no
Rinearson Creek	engineered riffle		Pacifastacus	U	1	2.29	1.345 Y	no
Rinearson Creek	engineered riffle		Trombidiformes	U	4	2.29	1.345 Y	no
Rinearson Creek	engineered riffle		Libellulidae	L	1	2.29	1.345 Y	no
Rinearson Creek	engineered riffle		Baetis tricaudatus complex	L	5	2.29	1.345 Y	no
Rinearson Creek	engineered riffle		Cheumatopsyche	L	2	2.29	1.345 Y	no
Rinearson Creek	engineered riffle		Ceratopogoninae	L	10	2.29	1.345 Y	no
Rinearson Creek	engineered riffle		Simulium	L	5	2.29	1.345 Y	no
Rinearson Creek	engineered riffle		Simulium	P	2	2.29	1.345 Y	no
Rinearson Creek	engineered riffle	5/4/2021		L	1	2.29	1.345 Y	no
Rinearson Creek	engineered riffle		Chironomidae	Р	26	2.29	1.345 N	no
Rinearson Creek	engineered riffle		Alotanypus	L	3	2.29	1.345 Y	no
Rinearson Creek	engineered riffle		Chironomus	L	45	2.29	1.345 Y	no
Rinearson Creek	engineered riffle		Cricotopus	L	19	2.29	1.345 Y	no
Rinearson Creek	engineered riffle	5/4/2021	Eukiefferiella claripennis group	L	11	2.29	1.345 Y	no
Rinearson Creek	engineered riffle		Limnophyes	L	2	2.29	1.345 Y	no
Rinearson Creek	engineered riffle	5/4/2021	Micropsectra	L	29	2.29	1.345 Y	no
Rinearson Creek	engineered riffle	5/4/2021	Nanocladius	L	2	2.29	1.345 Y	no
Rinearson Creek	engineered riffle	5/4/2021	Odontomesa	L	3	2.29	1.345 Y	no
Rinearson Creek	engineered riffle	5/4/2021	Orthocladius	L	29	2.29	1.345 Y	no
Rinearson Creek	engineered riffle	5/4/2021	Parachironomus	L	2	2.29	1.345 Y	no
Rinearson Creek	engineered riffle	5/4/2021	Paratanytarsus	L	21	2.29	1.345 Y	no
Rinearson Creek	engineered riffle	5/4/2021	Phaenopsectra	L	52	2.29	1.345 Y	no
Rinearson Creek	engineered riffle	5/4/2021	Prodiamesa	L	7	2.29	1.345 Y	no
Rinearson Creek	engineered riffle	5/4/2021	Tanytarsus	L	19	2.29	1.345 Y	no
Rinearson Creek	engineered riffle		Thienemannimyia complex	L	7	2.29	1.345 Y	no
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Waterbody	Site	Date Taxon	Stage	Abundance Su	ubsample.correction.factor Are	ea.correction.factor Unique STE	Incidental	Comments
Rinearson Creek	engineered riffle	5/4/2021 Tvetenia bavarica group	L	2	2.29	1.345 Y	no	
Rinearson Creek	upper control	5/4/2021 Oligochaeta	U	3	1	1.345 Y	no	
Rinearson Creek	upper control	5/4/2021 Sphaeriidae	U	2	1	1.345 Y	no	
Rinearson Creek	upper control	5/4/2021 Erpobdella	U	2	1	1.345 Y	no	
Rinearson Creek	upper control	5/4/2021 Crangonyx	U	1	1	1.345 Y	no	
Rinearson Creek	upper control	5/4/2021 Caecidotea	U	37	1	1.345 Y	no	
Rinearson Creek	upper control	5/4/2021 Baetis tricaudatus complex	L	1	1	1.345 Y	no	
Rinearson Creek	upper control	5/4/2021 Ceratopogoninae	L	5	1	1.345 Y	no	
Rinearson Creek	upper control	5/4/2021 Chironomidae	Р	1	1	1.345 N	no	
Rinearson Creek	upper control	5/4/2021 Alotanypus	L	8	1	1.345 Y	no	
Rinearson Creek	upper control	5/4/2021 Chironomus	L	2	1	1.345 Y	no	
Rinearson Creek	upper control	5/4/2021 Micropsectra	L	1	1	1.345 Y	no	
Rinearson Creek	upper control	5/4/2021 Paratendipes	L	3	1	1.345 Y	no	
Rinearson Creek	upper control	5/4/2021 Phaenopsectra	L	1	1	1.345 Y	no	
Rinearson Creek	upper control	5/4/2021 Polypedilum	L	2	1	1.345 Y	no	
Rinearson Creek	upper control	5/4/2021 Prodiamesa	L	125	1	1.345 Y	no	
Rinearson Creek	upper control	5/4/2021 Tanytarsus	L	2	1	1.345 Y	no	
Rinearson Creek	engineered riffle	8/16/2023 Trepaxonemata	U	2	2.13	1 Y	no	sample 1 for 2023
Rinearson Creek	engineered riffle	8/16/2023 Nemata	U	3	2.13	1 Y	no	
Rinearson Creek	engineered riffle	8/16/2023 Oligochaeta	U	30	2.13	1 Y	no	
Rinearson Creek	engineered riffle	8/16/2023 Prostoma	U	4	2.13	1 Y	no	
Rinearson Creek	engineered riffle	8/16/2023 Sphaeriidae	U	11	2.13	1 Y	no	
Rinearson Creek	engineered riffle	8/16/2023 Physella	U	1	2.13	1 Y	no	
Rinearson Creek	engineered riffle	8/16/2023 Crangonyx	U	12	2.13	1 Y	no	
Rinearson Creek	engineered riffle	8/16/2023 Caecidotea	U	15	2.13	1 Y	no	
Rinearson Creek	engineered riffle	8/16/2023 Sperchon	U	2	2.13	1 Y	no	
Rinearson Creek	engineered riffle	8/16/2023 Argia	L	9	2.13	1 Y	no	
Rinearson Creek	engineered riffle	8/16/2023 Coenagrion/Enallagma	L	3	2.13	1 Y	no	
Rinearson Creek	engineered riffle	8/16/2023 Cheumatopsyche	L	4	2.13	1 Y	no	
Rinearson Creek	engineered riffle	8/16/2023 Hydroptila	L	3	2.13	1 Y	no	
Rinearson Creek	engineered riffle	8/16/2023 Dicranomyia	L	9	2.13	1 Y	no	
Rinearson Creek	engineered riffle	8/16/2023 Ceratopogoninae	L	7	2.13	1 Y	no	
Rinearson Creek	engineered riffle	8/16/2023 Neoplasta	L	1	2.13	1 Y	no	
Rinearson Creek	engineered riffle	8/16/2023 Simulium	L	15	2.13	1 Y	no	
Rinearson Creek	engineered riffle	8/16/2023 Tipula	L	1	2.13	1 Y	no	
Rinearson Creek	engineered riffle	8/16/2023 Chironomidae	P	33	2.13	1 N	no	
Rinearson Creek	engineered riffle	8/16/2023 Cricotopus	L	74	2.13	1 Y	no	
Rinearson Creek	engineered riffle	8/16/2023 Nanocladius	L	3	2.13	1 Y	no	
Rinearson Creek	engineered riffle	8/16/2023 Polypedilum	L	304	2.13	1 Y	no	
Rinearson Creek	engineered riffle	8/16/2023 Rheotanytarsus	L	5	2.13	1 Y	no	
Rinearson Creek	engineered riffle	8/16/2023 Thienemannimyia complex	L	11	2.13	1 Y	no	
Rinearson Creek	beaver pond	8/16/2023 Trepaxonemata	U U	11 2	7.06 7.06	1 Y 1 Y	no	sample 2 for 2023
Rinearson Creek	beaver pond	8/16/2023 Nemata	U	99	7.06 7.06	1 Y	no	
Rinearson Creek Rinearson Creek	beaver pond beaver pond	8/16/2023 Oligochaeta 8/16/2023 Sphaeriidae	U	4	7.06 7.06	1 Y	no	
Rinearson Creek	beaver pond	•	U	1	7.06	1 Y	no	
Rinearson Creek	•	8/16/2023 Lymnaeidae 8/16/2023 Physella	U	22	7.06	1 Y	no	
Rinearson Creek	beaver pond beaver pond	8/16/2023 Gyraulus	U	1	7.06 7.06	1 Y	no no	
Rinearson Creek	beaver pond	8/16/2023 Ostracoda	Ü	12	7.06	1 Y	no	
Rinearson Creek	beaver pond	8/16/2023 Chydoridae	U	8	7.06	1 Y	no	
Rinearson Creek	beaver pond	8/16/2023 Hyalella	U	65	7.06	1 Y	no	
Rinearson Creek	beaver pond	8/16/2023 Tryalella 8/16/2023 Trombidiformes	U	2	7.06	1 Y	no	
Rinearson Creek	beaver pond	8/16/2023 Sperchon	U	2	7.06 7.06	1 Y	no	
Rinearson Creek	beaver pond	8/16/2023 Oribatida	U	1	7.06 7.06	1 Y	no	
Rinearson Creek	beaver pond	8/16/2023 Coenagrion/Enallagma	I	28	7.06 7.06	1 Y	no	
Rinearson Creek	beaver pond	8/16/2023 Aeshnidae	Ī	13	7.06	1 Y	no	
Rinearson Creek	beaver pond	8/16/2023 Callibaetis	Ĺ	24	7.06	1 Y	no	
Rinearson Creek	beaver pond	8/16/2023 Libellulidae	Ī	4	7.06	1 Y	no	
Rinearson Creek	beaver pond	8/16/2023 Corixidae	Ī	103	7.06	1 Y	no	
MIICAISON OIGEN	Scaver portu	J. 13,2020 CONNIGGE	L	100	7.00	1 1	110	

Waterbody	Site	Date	Taxon	Stage Abundance	Subsample.correction.factor	Area.correction.factor	Unique STE	Incidental	Comments
Rinearson Creek	beaver pond	8/16/2023	Abedus	L	7.06	5 1	Υ	no	
Rinearson Creek	beaver pond	8/16/2023	Oxyethira	L	3 7.06	5 1	Υ	no	
Rinearson Creek	beaver pond	8/16/2023	Hydrophilidae	L	1 7.06	5 1	Υ	no	
Rinearson Creek	beaver pond	8/16/2023	Peltodytes	L	7.06	5 1	Υ	no	
Rinearson Creek	beaver pond	8/16/2023	Peltodytes	A 1			Υ	no	
Rinearson Creek	beaver pond	8/16/2023	Ceratopogoninae	L 1	7.06	5 1	Υ	no	
Rinearson Creek	beaver pond	8/16/2023	Chironomidae	Р	1 7.06	5 1	N	no	
Rinearson Creek	beaver pond	8/16/2023	Ablabesmyia	_	4 7.06	5 1	Υ	no	
Rinearson Creek	beaver pond	8/16/2023	Corynoneura		3 7.06	5 1	Υ	no	
Rinearson Creek	beaver pond		Endochironomus	L	3 7.06		Υ	no	
Rinearson Creek	beaver pond		Nanocladius	_	1 7.06		Υ	no	
Rinearson Creek	beaver pond		Paratanytarsus	_	7 7.06		Υ	no	
Rinearson Creek	beaver pond		Polypedilum	L	9 7.06		Υ	no	
Rinearson Creek	beaver pond	8/16/2023	Procladius	_	1 7.06		Υ	no	
Rinearson Creek	beaver pond		Psectrocladius	_	2 7.06		Υ	no	
Rinearson Creek	beaver pond	8/16/2023	Pseudochironomus	L 4			Υ	no	
Rinearson Creek	beaver pond		Tanytarsus		1 7.06		Υ	no	
Rinearson Creek	beaver pond		Thienemannimyia complex	_	1 7.06		Υ	no	
Rinearson Creek	emergent marsh		Trepaxonemata	-	7 2		Υ	no	sample 3 for 2023
Rinearson Creek	emergent marsh	8/16/2023			5 2		Υ	no	
Rinearson Creek	emergent marsh		Oligochaeta	U 2			Υ	no	
Rinearson Creek	emergent marsh		Sphaeriidae	U 2		-	Υ	no	
Rinearson Creek	emergent marsh		Lymnaeidae		2 2		Υ	no	
Rinearson Creek	emergent marsh	8/16/2023			7 2		Υ	no	
Rinearson Creek	emergent marsh		Gyraulus		2 2		Υ	no	
Rinearson Creek	emergent marsh	8/16/2023			2 2		Υ	no	
Rinearson Creek	emergent marsh		Fluminicola	U 3			Υ	no	
Rinearson Creek	emergent marsh		Crangonyx	U 2			Υ	no	
Rinearson Creek	emergent marsh		Caecidotea	U 20			Y	no	
Rinearson Creek	emergent marsh	8/16/2023			5 2		Y	no	
Rinearson Creek	emergent marsh		Potamopyrgus antipodarum	U 1			Y	no	
Rinearson Creek	emergent marsh		Coenagrion/Enallagma	_	1 2		Y	no	
Rinearson Creek	emergent marsh		Callibaetis		5 2		Y	no	
Rinearson Creek	emergent marsh		Corixidae	L 1			Y	no	
Rinearson Creek	emergent marsh		Peltodytes		9 2		Y	no	
Rinearson Creek	emergent marsh		Ceratopogoninae		2		Y	no	
Rinearson Creek	emergent marsh	8/16/2023		_	4 7		Y	no	
Rinearson Creek	emergent marsh		Chironomidae	•	·		N	no	
Rinearson Creek	emergent marsh		Ablabesmyia	_			Y	no	
Rinearson Creek	emergent marsh		Alotanypus	_	1 2 3 2		Y Y	no	
Rinearson Creek Rinearson Creek	emergent marsh emergent marsh		Chironomus Corynoneura		3 2		Y	no	
Rinearson Creek	emergent marsh		Cricotopus		1 2		Y	no	
Rinearson Creek	emergent marsh		Cryptochironomus	-	1 2		Y	no no	
Rinearson Creek	emergent marsh		Eukiefferiella claripennis group	_	1 2		Y	no	
Rinearson Creek	emergent marsh		Heterotrissocladius marcidus group		3		Y	no	
Rinearson Creek	emergent marsh		Limnophyes	_	1 2	-	Y	no	
Rinearson Creek	emergent marsh		Micropsectra		2 2		Ϋ́	no	
Rinearson Creek	emergent marsh		Odontomesa	L 2			Ϋ́	no	
Rinearson Creek	emergent marsh		Orthocladius		1 2		Ϋ́	no	
Rinearson Creek	emergent marsh		Paratanytarsus	L 3			Ϋ́	no	
Rinearson Creek	emergent marsh		Paratendipes	L 3			Y	no	
Rinearson Creek	emergent marsh		Phaenopsectra		2 2		Ϋ́	no	
Rinearson Creek	emergent marsh		Polypedilum		1 2		Ϋ́	no	
Rinearson Creek	emergent marsh		Procladius	-	9 2		Ϋ́	no	
Rinearson Creek	emergent marsh		Pseudochironomus	<del>-</del>	1 2		Ϋ́	no	
Rinearson Creek	emergent marsh		Tanytarsus	_	1 2		Ϋ́	no	
Rinearson Creek	emergent marsh		Thienemannimyia complex	_	4		Ϋ́	no	
Rinearson Creek	upper control		Trepaxonemata	_	1 1		Ϋ́	no	
	_,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	S, . S, E S E O	p	-	· '	· '	•		

Waterbody	Site	Date	Taxon	Stage	Abundance Subsample.correction.factor	Area.correction.factor	Unique STE	Incidental Comments
Rinearson Creek	upper control	8/16/2023	Nemata	U	2	1	1 Y	no
Rinearson Creek	upper control	8/16/2023	Oligochaeta	U	55	1	1 Y	no
Rinearson Creek	upper control	8/16/2023	Helobdella stagnalis complex	U	1	1	1 Y	no
Rinearson Creek	upper control	8/16/2023	Sphaeriidae	U	77	1	1 Y	no
Rinearson Creek	upper control	8/16/2023	Lymnaeidae	U	1	1	1 Y	no
Rinearson Creek	upper control	8/16/2023	Juga	U	21	1	1 Y	no
Rinearson Creek	upper control	8/16/2023	Potamopyrgus antipodarum	U	2	1	1 Y	no
Rinearson Creek	upper control		Crangonyx	U	10	1	1 Y	no
Rinearson Creek	upper control		Caecidotea	U	127	1	1 Y	no
Rinearson Creek	upper control		Sperchonopsis	U	4	1	1 Y	no
Rinearson Creek	upper control		Hygrobates	U	1	1	1 Y	no
Rinearson Creek	upper control		Fluminicola	U	10	1	1 Y	no
Rinearson Creek	upper control		Coenagrion/Enallagma	L	1	1	1 Y	no
Rinearson Creek	upper control		Ceratopogoninae	L	1	1	1 Y	no
Rinearson Creek	upper control	8/16/2023		L	3	1	1 Y	no
Rinearson Creek	upper control		Hemerodromia	L	1	1	1 Y	no
Rinearson Creek	upper control		Neoplasta	L	2	1	1 Y	no
Rinearson Creek	upper control		Chironomidae	Р	1	1	1 N	no
Rinearson Creek	upper control		Ablabesmyia	L	2	1	1 Y	no
Rinearson Creek	upper control	8/16/2023		L	2	1	1 Y	no
Rinearson Creek	upper control		Corynoneura	L	3	1	1 Y	no
Rinearson Creek	upper control		Cryptochironomus	L	1	1	1 Y	no
Rinearson Creek	upper control		Heterotrissocladius marcidus group	L	4	1	1 Y	no
Rinearson Creek	upper control		Limnophyes	L	1	1	1 Y	no
Rinearson Creek	upper control		Micropsectra	L	4	1	1 Y	no
Rinearson Creek	upper control		Odontomesa	L	4	1	1 Y	no
Rinearson Creek	upper control		Orthocladius	L	1	1	1 Y	no
Rinearson Creek	upper control		Paratanytarsus	L	2	1	1 Y	no
Rinearson Creek	upper control		Paratendipes	L	11	1	1 Y	no
Rinearson Creek	upper control		Polypedilum	L	38	1	1 Y	no
Rinearson Creek	upper control		Procladius	L	11	1	1 Y	no
Rinearson Creek	upper control		Stempellinella	L	1	1	1 Y	no
Rinearson Creek	upper control		Tanytarsus	L	2	1	1 Y	no
Rinearson Creek	upper control	8/16/2023	Thienemannimyia complex	L	18	1	1 Y	no

These samples were poorly preserved

Sphaeriidae

Lymnaeidae Asellidae

Cenocorixa

2023 sampling notes

Left town for the AFS fisheries meeting in Michigan before getting some notes to you about the sampling locations. Headed back to Corvallis on Thursday.

Sample 1: Slow flowing stream like constriction of Rinearson Cr. east the mouth to the Willamette river. Perhaps 2 cfs while we were there. Small boulder material (must be non native rock material armoring the reach with very little fines. Rocks were moved to by to find some smaller substrate undermeath for standard disturbance kick net sampling. Some larger rocks were scrubbed to collect more individuals for the sample. Minimal gradient.

Sample 2- Edge of ponded section. Fine silt and lots of filamentous algae. Bottom was disturbed and sweep sampled. Edge habital just 1/2m away was also sampled. Had overhanging grassy herbaceous foliage. Spent long time removing fine silt from sample.

and 3. Constriction at upper end of pond. Incised channel (5ft.) with lots of overhanging herbaceous foliage. Slow water movement, soft bottom. about 2 feet deep

Sample 4. Farthest upstream. Sample collected under 100% shade canopy. Incised Stream was about 8 ft wetted width and 2.5 inches deep with a slow glide like habitat. Substrate was silt and lots of allochthonous woody debris and definus from steep banks on either side

Hope this helps a bit,

most specimens with shells partially decalofiled. Many juveniles. Most are Pistdium, but Muscullum also present, so roll ID up to family level Mondity juveniles. A Pseudosuccinea columella Almost all seen are Caecidotea, but there was one large (though damaged) specimen that differed significantly in appearance from Caecidotea and acceses to be Liveus. This may be first record for the Williamette Valev. On Caecidotea and acceses to be Liveus. The single to the first record for the Williamette Valev. See the Caecidotea and believes they are probably introduced from eastern North America.

Specimens damaged because of por preservation. Color pattern variable. No appeared seate on antennal scapes, but ther may have been rubbed off. Promotum with kidney shaped dark marking. Color pattern varies from 8. Includation complex to dissert bit. Risinfartia corrollex. Cerb broken off, so can't look for dark bands. Roll up to Baels until better preserved late-instant iterative identification.

Incidental taxa rejected from the analysis. Large/rare taxa treated specially for total biomass. Non-unique taxa omitted from richness metrics.

Waterbody	Site	Date Taxon	Stage	Abundance	Subsample.correction.factor	Area.correction.factor	Unique	STE	Incidental	Comments
Rinearson Creek	upper control	05/19/2020 00:00:00 Chironomidae	Р	12	2.791	1.345	N		no	
Rinearson Creek	engineered riffle	05/19/2020 00:00:00 Chironomidae	Р	8	13.33	1.345	N		no	
Rinearson Creek	beaver pond	05/19/2020 00:00:00 Aeshnidae	L	1	2	1.345	Υ	early instar	no	
Rinearson Creek	beaver pond	05/19/2020 00:00:00 Corixidae	L	11	2	1.345	N		no	
Rinearson Creek	beaver pond	05/19/2020 00:00:00 Chironomidae	Р	21	2	1.345	N		no	
Rinearson Creek	beaver pond	05/04/2021 00:00:00 Chironomidae	Р	38	1.45	1.345	N		no	
Rinearson Creek	emergent marsh	05/04/2021 00:00:00 Chironomidae	Р	13	1	1.345	N		no	
Rinearson Creek	engineered riffle	05/04/2021 00:00:00 Chironomidae	Р	26	2.29	1.345	N		no	
Rinearson Creek	upper control	05/04/2021 00:00:00 Chironomidae	Р	1	1	1.345	N		no	
Rinearson Creek	engineered riffle	08/16/2023 00:00:00 Trepaxonemat	a U	2	2.13	1	Υ		no	sample 1 for 2023
Rinearson Creek	engineered riffle	08/16/2023 00:00:00 Chironomidae	Р	33	2.13	1	N		no	
Rinearson Creek	beaver pond	08/16/2023 00:00:00 Trepaxonemat	a U	11	7.06	1	Υ		no	sample 2 for 2023
Rinearson Creek	beaver pond	08/16/2023 00:00:00 Chironomidae	Р	1	7.06	1	N		no	
Rinearson Creek	emergent marsh	08/16/2023 00:00:00 Trepaxonemat	a U	7	2	1	Υ		no	sample 3 for 2023
Rinearson Creek	emergent marsh	08/16/2023 00:00:00 Chironomidae	Р	7	2	1	N		no	
Rinearson Creek	upper control	08/16/2023 00:00:00 Chironomidae	Р	1	1	1	N		no	



# Appendix I

**Equipment Calibration Certificate** 

# INSTRUMENT CALIBRATION REPORT



## Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

## Pine Environmental Services, Inc.

Instrument ID 43887

Description YSI Pro Plus

Calibrated 7/10/2023 1:19:26PM

Manufacturer YSI

Model Number Professional Plus

Serial Number/Lot 18J103055

Number

Location Seattle

**Department** 

State Certified

Status Pass

Temp °C 21

Humidity % 42

		Calibra	tion Specificat	ions			
Group Group Nan Stoted Ac		ding		Range Acc % Reading Acc % Plus/Minus	3.0000		
Nom In Val / In Val 7.00 / 7.00 4.00 / 4.00 10.00 / 10.00	In Type PH PH PH	Out Val 7.00 4.00 10.00	Out Type PH PH PH	Fnd As 7.02 4.00 10.05	Lft As 7.00 4.00 10.00	<u>Dev%</u> 0.00% 0.00% 0.00%	Pass/Fail Pass Pass Pass Pass
Group N	Group # 2 Group Name Conductivity Stated Accy Pct of Reading		Out Type	Range Acc % Reading Acc % Plus/Minus Fnd As	<b>c</b> % 3.0000		Pass/Fail
Group	roup # 3 Name Redox (d Accy Pct of R		ms/cm	Range Acc % Reading Acc % Plus/Minus	3.0000	0.00%	Pass
Nom In Val / In Val 240.00 / 240.00	<u>In Type</u> mv	Out Val 240.00	Out Type mv	Fnd As 245.00	Lft As 240.00	<u>Dev%</u> 0.00%	Pass/Fail Pass
Group	Group # 4 Group Name Disolved Oxygen Span Stated Accy Pct of Reading			Range Acc % Reading Acc % Plus/Minus	3.0000		
Nom In Val / In Val 100.00 / 100.00	<u>In Type</u> %	Out Val 100.00	Out Type %	Fnd As 102.80	Lft As 100.00	<u>Dev%</u> 0.00%	Pass/Fail Pass

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Location Seattle

Department

State Certified

Status Pass

Temp °C 21

Humidity % 42

		Calib	ration Specific	cations			
Group Na	p# 1 ame PH accy Pct of Rea	ading		Range Acc S Reading Acc S Plus/Minu	<b>%</b> 3.0000		
Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
7.00 / 7.00	PH	7.00	PH	7.02	7.00	0.00%	6 Pass
4.00 / 4.00	PH	4.00	PH	4.00	4.00	0.00%	Pass
10.00 / 10.00	PH	10.00	PH	10.05	10.00	0.00%	Pass
Group I	Name Conduction  Accy Pct of Re			Range Acc % Reading Acc % Plus/Minus	3.0000		
Nom In Val / In Val 1.413 / 1.413	In Type ms/cm	Out Val 1.413	Out Type ms/cm	Fnd As 1.323	<u>Lft As</u> 1.413	<u>Dev%</u> 0.00%	Pass/Fail Pass
Group	roup# 3 Name Redox ( I Accy Pct of Ro			Range Acc % Reading Acc % Plus/Minus	3.0000	At a la	
Nom In Val / In Val	In Type	Out Val	<b>Out Type</b>	Fnd As	Lft As	Dev%	Pass/Fail
240.00 / 240.00	mv	240.00	mv	245.00	240.00	0.00%	Pass
Group N	oup # 4 Name Disolved Accy Pct of Re		Range Acc % Reading Acc % Plus/Minus	3.0000			
Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
100.00 / 100.00	%	100.00	%	102.80	100.00	0.00%	Pass



# INSTRUMENT CALIBRATION REPORT

# Pine Environmental Services LLC

3225 South 116th St. Building 1 Suite 181 Tukwila, WA 98168 425-285-9102

## Pine Environmental Services, Inc.

Instrument ID 43887

Description YSI Pro Plus

Calibrated 7/10/2023 1:19:26PM

Test Instrum	ents Used During the Cali	<u>bration</u>		Serial Number /	(As Of Cal Entry Date) Next Cal Date /
Test Standard	D Description	Manufacturer	Model Number	Lot Number	Last Cal Date/ Expiration Date Opened Date
SEA COND	Conductivity solution	AquaPhoenix	31986	2GI642	9/30/2023
1413 09/23 SEA ORP 240	1.413 μS/cm SEA ORP 240 3GB560	Scientific	32001	3GB560	11/30/2023
GB560 EA PH10	pH 10 Buffer Solution	Scientific AquaPhoenix	32034	1GL764	12/31/2023
GL764 A PH4		Scientific AquaPhoenix	32017	2GG184	7/31/2024
G184	pH 7 Buffer Solution	Scientific AquaPhoenix Scientific	32025	1GI1017	9/30/2023

Notes about this calibration

Calibration Result Calibration Successful

Who Calibrated Dzung Pham

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

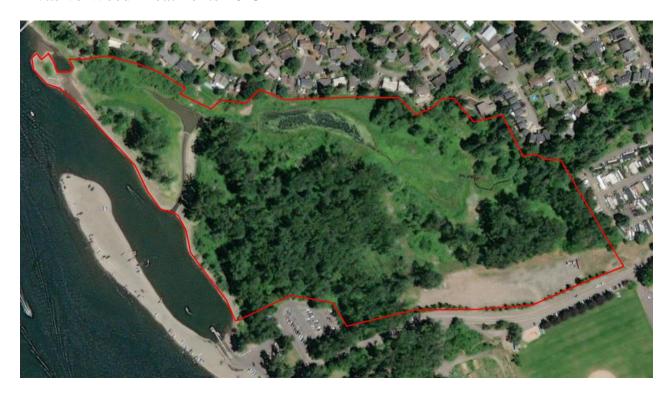
Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment Please call 800-301-9663 for Technical Assistance



# Appendix J

Adaptive Management

### Rinearson Natural Area Invasive Weed Treatments 2023



#### December 2022/ January 2023

- Site Treatment Winter spot/broadcast spray of full 36 acres on site.
- Invasive Targets Himalayan blackberry, English ivy, Thistles.
- *Herbicide prescriptions* 2% Garlon3a (Triclopyr), 2% AquaNeat (Glyphosate), 1% Competitor (Surfactant); 2% Garlon3a (Triclopyr), 4% AquaNeat (Glyphosate), 2% Competitor (Surfactant)
- *Habitat Management* broadcast sprayed, brush cut, and removed debris from turtle nesting habitat areas.

#### **June 2023**

- *Site Treatment* brush cut through brambles of previously sprayed Himalayan Blackberry to create access throughout site.
- *Invasive Targets* Himalayan Blackberry.
- *Habitat Management* brush cut and removed debris from turtle nesting habitat areas.

#### **July 2023**

- Site Treatment Summer spot/broadcast spray of full 36 acres on site.
- *Invasive Targets* Himalayan blackberry, Dune tansy, Tansy ragwort, Common teasel, Thistles, Yellow flag iris, English ivy, Reed canary grass, Pennyroyal.
- *Herbicide prescriptions* 2% Garlon3a (Triclopyr), 2% AquaNeat (Glyphosate), 1% Competitor (Surfactant); 4% AquaNeat (Glyphosate), 2% Competitor (Surfactant); 1% Imazapyr, 1% Competitor.
- *Habitat Management* broadcast sprayed weed regrowth of turtle nesting habitat areas.

#### August 2023

- Site Treatment Late Summer spot/broadcast spray of North 10 acres of site
- *Invasive Targets* Pennyroyal, Yellow flag iris, Purple loosestrife, Dune tansy, Tansy ragwort, Common teasel, Thistles.
- *Herbicide prescriptions* 2% Garlon3a (Triclopyr), 2% AquaNeat (Glyphosate), 1% Competitor (Surfactant); 4% AquaNeat (Glyphosate), 2% Competitor (Surfactant); 1% Imazapyr, 1% Competitor.
- Habitat Management –brush cut and removed debris from new turtle nesting habitat area.

#### October 2023

- *Site Treatment* Fall spot/ broadcast spray of South 26 acres of site.
- *Invasive Targets* Himalayan blackberry, Yellow flag iris, Knotweed, Reed canary grass, Poison hemlock, Dune tansy, Tansy ragwort, Common teasel, Canada Thistle, Bull Thistle.
- *Herbicide prescriptions* 2% Garlon3a (Triclopyr), 2% AquaNeat (Glyphosate), 1% Competitor (Surfactant); 4% AquaNeat (Glyphosate), 2% Competitor (Surfactant).
- *Habitat Management* more finely brush cut and removed debris from new turtle nesting habitat area; separated rocks in seasonal stream connection for fish passage. (Before and After Photos in Exhibit B)

#### **November 2023** (spray log attached):

- Site Treatment Cut down and stump treated non-native Birch trees; follow up spot spray in select areas of site.
- Invasive Targets Common teasel, Thistles, Himalayan Blackberry, Ivy, Knotweed, Birch.
- *Herbicide prescriptions* 2% Garlon3a (Triclopyr), 2% AquaNeat (Glyphosate), 1% Competitor (Surfactant).

## **EXHIBIT A**

## **Photo Logs**

## **Invasive Treatments**

April











# June









# August











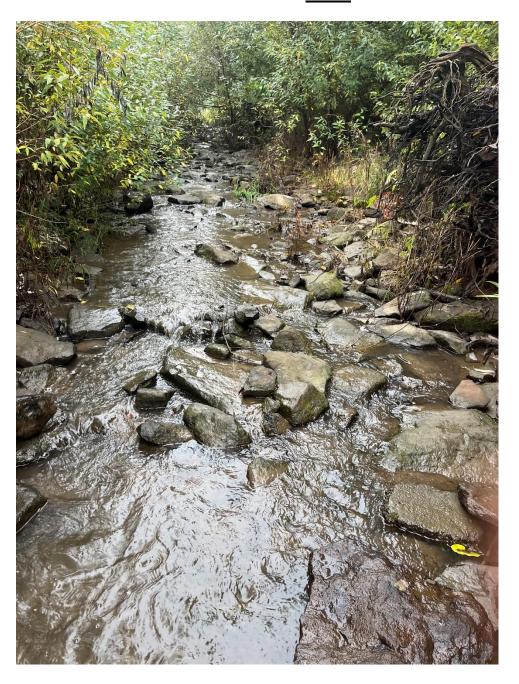




# EXHIBIT B

# **Roughened Channel**

# **Before**



# After:



#### Ash Creek Forest Management, LLC

 $2796\,\mathrm{SE}$ 73rd Ave. Hillsboro, OR 97123

Phone: (503) 624-0357 Fax: (503) 620-1701

www.ashcreekforestry.com

Nick Lewis

 $\underline{nlew is@ashcreek for estry.com}$ 

415-994-7054

Evan Ocheltree & Gary Howard Columbia Restoration Group



#### Rinearson Natural Area - Scope of Work 2024

Date	Task	Number	Unit	Cost/unit	<b>Total Cost</b>	Notes
Winter 2024	Container Plant Purchase	50	each	\$12.00	\$600.00	Purchase cost of large native container plants
Winter 2024	Container Plant Install	50	each	\$7.50	\$375.00	Install native container plants to provide native buffer for turtle habitat areas and path between them.
Winter 2024	Hourly Cutting	120	hour	\$65.00	\$7,800.00	Cut down and clear brush and dead blackberry canes surrounding natives for release and better access throughout site.
Winter 2024	Container Plant: Purchase	1,200	each	\$5.00	\$6,000.00	Purchase cost of 1-gallon native herbaceous container plants for emergent marsh.
Winter 2024	Container Plant: Install	1,200	each	\$4.00	\$4,800.00	Install cost of 1-gallon native herbaceous container plants in ermergent marsh
Winter 2024	Hourly Cut Stump	80	hour	\$68.00		Cut stump and treat weedy trees throughout site including laurel, holly, hawthorne, and tree of heaven. This will also include tree ivy.
Winter 2024	Hourly Spray	40	hour	\$68.00	\$2,720.00	Spot spray Ivy visible under natives and Himalayan Blackberry tangled in natives during Winter when native plants are void of
Spring 2024	Hourly Spray	160	hour	\$68.00	\$10,880.00	Spot spray throughout site.
Summer 2024	Hourly Spray	160	hour	\$68.00	\$10,880.00	Spot spray throughout site.
Fall 2024	Hourly Spray	160	hour	\$68.00	\$10,880.00	Spot spray throughout site.
Ongoing	Hourly Labor	50	hour	\$63.00	\$3,150.00	Mow, rake and clear out turtle habitat areas at desired times throughout the year.
Ongoing	Materials	1	LS	\$3,000.00	\$3,000.00	Estimated cost of herbicide.
Ongoing	Project Management	35	hour	\$125.00	\$4,375.00	Professional services including site meetings, site walks, client/ trustee coordination and communication, treatment planning, and logistics.
				Total:	\$70,900.00	

#### **HOA Border - Scope of Work 2024**

Date	Task	Number	Unit	Cost/unit	<b>Total Cost</b>	Notes
Winter 2024	Hourly Spray	24	hour	\$68.00	\$1,632.00	Spot spray Himalayan Blackberry between natural area and HOA.
Winter 2024	Hourly Cutting	50	hour	\$65.00	\$3,250.00	Cut down all sprayed blackberry between natural area and HOA.
Summer 2024	Hourly Spray	12	hour	\$68.00	\$816.00	Spray resprouts of Himalayan Blackberry between natural area and HOA.
Ongoing	Materials	1	LS	\$500.00	\$500.00	Estimated cost of herbicide.
Ongoing	Project Management	5	hour	\$125.00	\$625.00	Professional services including site meetings, site walks, client/ trustee coordination and communication, treatment planning, and logistics.
				Total:	\$6,823.00	

<sup>\*</sup> Ash Creek Forest Management, LLC (Ash Creek) brings professional expertise to the development of project scopes, schedules and budgets. Recipient agrees that this document is Ash Creek's protected work product. As such, the information herein may not be altered, shared or reproduced, nor used on any other project or for any other purposes, except as specifically authorized in writing by Ash Creek prior to such use.

 $<sup>\</sup>ensuremath{^{**}}$  Rates and Prices guaranteed for 30 days after bid submission.

PROJECT: Rinearson									
CLIENT: Colombia Restoration	n Group		CATEGORY (hi	ighlight one):	Forestry	Aquatics			
ADDRESS: 19 Meldrum Bar Pa	ark Rd, Gladstone	e, OR 97027							
TREATMENT TYPE (highlight o	one):	Site Prep	Establishment	Stewardship					
DATE: 1/10/2023		TIME IN: 8:00 A.M.		TIME OUT: 12:00 P.M.		TOTAL ACRES: 10.	.88		
T	Targets		Prescription (o	z/ac or v/v%)	Equipment & App	lication Method	Acres		
A. Himalayan Blackberry			A. 2% Garlon, 2% AquaNeat, Light	1% Competitor, 0.5% Hi-	A. Backpack, Spot S	oray	A. 10.88		
В.			В.	В.		В.			
C.			C.	C.		C.			
D.	).			D.			D.		
HERBICIDE INVENTORY									
Glyphosate			Herbicide A	mount (oz)	Water (gal or oz)	Purch	ased by:		
Rodeo · EPA Reg #62719-324									
AquaNeat · EPA Reg #228-365			19	0	71 gal	A	CFM		
Triclopyr									
Vastlan · EPA Reg #62719-687						A	CFM		
Garlon 3A · EPA Reg #62719-3	7		19	0					
Other Herbicides									
Transline · EPA Reg #62719-25	59								
Imazapyr 4 SL · Reg# 81927-24	1								
Mixed Herbicides									
Surfactants/ Adjuvants									
Competitor			95	5		A	CFM		
Class Act									
Hasten									
Colorant									
Hi-Light Blue Dye			47	7		А	CFM		
			WEATHER CON	IDITIONS					
Time C	Conditions	Relative Humidity (%)	Temperature (°F)	Wind Speed - High (mph)	Wind Speed - Low (mph)	Wind	Direction		
8:00 AM	Cloudy	69%	43	9	0		NE		
10:00 AM	Cloudy	64%	46	10	0		NE		
12:00 AM	Cloudy	58%	51	11	0		ENE		
	CERTIFIED LICEN	SED APPLICATOR:		CE	RTIFIED LICENSED AF	PPLICATOR NO.:			
	Laure	n Smith			AG-L108108	ЗСРА			

DATE: 01/11/2023	PI	PROJECT: Rinearson						
Applicators	Applicator IST #	CPA License #	Washington CPO	Categories	On Site ONLY?			
Abbey Schole	AG-L1081486IST							
Addison Dillon	AG-L1082187IST	AG-L1083125CPA	104418	Forest, Aquatic				
Adriana Pianalto	AG-L1082303IST							
Aissa Bennett	AG-L1074697IST	AG-L1076653CPA	103167	Forest, Aquatic				
Andrew Robinson	AG-L1080655IST	AG-L1082758CPA		Forest				
Armand Tirado	AG-L1076206IST	AG-L1079568CPA		Forest				
Bethany Luth	AG-L1082379IST							
Brad Burke	AG-L1052766IST	AG-L1071184CPA		Forest				
Bryant Young	AG-L1040738IST	AG-L1046535CPA		Forest				
Carlos Estrada	AG-L1080870IST	AG-L1084136CPA		Forest				
Claire Newell	AG-L1083171IST			7 0 1 0 0 0				
Coleman Krohn	AG-L1076007IST	AG-L1079092CPA	105150	Forest, Aquatic				
Cooper Clarke	AG-L1082002IST		103130	1 orest, riquatio				
Crosby Buchstaber	AG-L1083172IST							
David Chiang	AG-L1054240IST							
Elise Snortum	AG-L1034240131 AG-L10818331ST							
Ella Brinkman	AG-L1081655151 AG-L1081485IST	AG-L1084135CPA		Forest				
	AG-L1081485151 AG-L1083815IST	VQ 51004133CLV		101631				
Emily Hayden Erik Saastamo				Forest				
	AG-L1080198IST AG-L1070504IST	AG-L1073266CPA						
Evan Stewart		AG-LIU/3200CPA		Forest				
Gabriel Donaldson	AG-L1082095IST	AG-L1064755CPA		F*				
Heather Cashmore	AG-L1063458IST		400750	Forest				
lan Christie	AG-L1071763IST	AG-L1050813CPA	102752	Forest, Aquatic				
Isabella Lopez-Dion	A.C. L4074040ET	AG-L1083844CPA		Forest				
Jamison Holcombe	AG-L1074818IST	AG-L1077020CPA		Forest				
Jenifer Nugent	AG-L1076963IST			Forest				
Jill Tamborello	AG-L1074236IST	AG-L1084134CPA		Forest				
Josh Schmuhl	AG-L1073343IST							
Kaleigh Andreoni	AG-L1078162IST	AG-L1080433CPA		Forest				
Kelly Gaughan	AG-L1082967IST	AG-L1083843CPA		Forest				
Kobe Rossi	AG-L1083168IST							
Kyle Peterson	AG-L1074677IST	AG-L1077904CPA	104877	Forest, Aquatic				
Kyle Sorensen	AG-L1063597IST	AG-L1065011CPA	102274	Forest, Aquatic				
Lauren Smith	AG-L1079006IST				Х			
Llew Whipps	AG-L1073649IST	AG-L1075847CPA	105034	Forest, Aquatic				
Mackenzie Lovelace	AG-L1074676IST	AG-L1076427CPA	103061	Forest, Aquatic				
Mark Dickison	AG-L1079023IST							
Max Osofsky	AG-L1080639IST	AG-L1082476CPA		Forest				
Nate McMullen	AG-L1079207IST	AG-L1080914CPA	105149	Forest, Aquatic				
Nick Crosby	AG-L1082952IST	AG-L1083823CPA		Forest				
Nick Lewis	AG-L1045857IST	AG-L1049790CPA		Forest				
Owen Phinney	AG-L1059333IST	AG-L1063122CPA	100928	Forest, Aquatic				
Rachel Viera	AG-L1079880IST							
Rio Hybert-Zack	AG-L1055229IST	AG-L1069212CPA		Forest				
Samantha Marcotte	AG-E1003333131							
Saul Garcia	AG-L1082953IST							
Spencer Hansen	AG-L1041281IST							
Spencer Page	AG-L1083169IST							
Tiana Zlotoff	AG-L1082049IST							
Trevor Burrows	AG-L1082674IST							
Tyler Csolkovits	AG-L1084026IST							
Vaughn Monaghan	AG-L1070401IST	AG-L1071976CPA		Forest				
Vince Wagner	AG-L1083493IST							
Will Dyer	AG-L1083592IST	AG-L1083801CPA		Forest				
Will Matthews	AG-L1083727IST							
Zach Bergonzine	AG-L1084018IST							
Zach Lopez	AG-L1052858IST							
			1					

A. Himalayan Blackberry  B.  C.  D.	ark Rd, Gladston	Site Prep TIME IN: 8:00 A.M.	CATEGORY (h  Establishment  Prescription (c  A. 2% Garlon, 2% AquaNeat, Light  B.  C.	Stewardship TIME OUT: 3:15 P.M. pz/ac or v/v%) 1% Competitor, 0.5% Hi-	Equipment & App A. Backpack, Spot Sp B.		A. 3.86
TREATMENT TYPE (highlight of DATE: 01/11/2023  A. Himalayan Blackberry  B.  C.  D.	one):	Site Prep TIME IN: 8:00 A.M.	Prescription (c A. 2% Garlon, 2% AquaNeat, Light B. C.	TIME OUT: 3:15 P.M. vz/ac or v/v%) . 1% Competitor, 0.5% Hi-	Equipment & App A. Backpack, Spot Sp B.	lication Method	Acres A. 3.86
A. Himalayan Blackberry  B.  C.		TIME IN: 8:00 A.M.	Prescription (c A. 2% Garlon, 2% AquaNeat, Light B. C.	TIME OUT: 3:15 P.M. vz/ac or v/v%) . 1% Competitor, 0.5% Hi-	Equipment & App A. Backpack, Spot Sp B.	lication Method	Acres A. 3.86
A. Himalayan Blackberry  B.  C.	Targets		A. 2% Garlon, 2% AquaNeat, Light B. C.	nz/ac or v/v%) . 1% Competitor, 0.5% Hi-	Equipment & App A. Backpack, Spot Sp B.	lication Method	Acres A. 3.86
A. Himalayan Blackberry  B.  C.  D.	Targets		A. 2% Garlon, 2% AquaNeat, Light B. C.	, 1% Competitor, 0.5% Hi-	A. Backpack, Spot Sp B.		A. 3.86
B. C. D.			Light B. C.		В.	oray	
C.			В.				B.
D.					<u></u>		
			5		C.		C.
			D.		D.		D.
			HERBICIDE IN\	/ENTORY			
Glyphosate			Herbicide A	mount (oz)	Water (gal or oz)	Purch	ased by:
Rodeo · EPA Reg #62719-324							
AquaNeat · EPA Reg #228-365	5		4	8	18 gal	A	CFM
Triclopyr							
Vastlan · EPA Reg #62719-687	7						
Garlon 3A · EPA Reg #62719-3	37		4	8		Α	CFM
Other Herbicides							
Transline · EPA Reg #62719-25	59						
Imazapyr 4 SL · Reg# 81927-24	4						
Mixed Herbicides							
Surfactants/ Adjuvants							
Competitor			2	4		A	CFM
Class Act							
Hasten							
Colorant							
Hi-Light Blue Dye			1	2		A	CFM
<u> </u>			WEATHER CON				
		Relative Humidity			Wind Speed - Low		
Time	Conditions	(%)	Temperature (°F)	Wind Speed - High (mph)	(mph)	Wind	Direction
8:00 AM N	lostly cloudy	73%	44	15	0		ESE
12:00 PM	Cloudy	37%	48	16	0		ESE
3:00 PM N	lostly cloudy	68%	47	12	0		ESE
		ISED APPLICATOR:		CERTIFIED LICENSED APPLICATOR NO.:			
		r Nugent		AG-L1079256CPA			

DATE: 1/12/2023	F				
Applicators	Applicator IST #	CPA License #	Washington CPO	Categories	On Site ONLY?
Abbey Schole	AG-L1081486IST				
Addison Dillon	AG-L1082187IST	AG-L1083125CPA	104418	Forest, Aquatic	
Adriana Pianalto	AG-L1082303IST			•	
Aissa Bennett	AG-L1074697IST	AG-L1076653CPA	103167	Forest, Aquatic	
Andrew Robinson	AG-L1080655IST	AG-L1082758CPA			
Armand Tirado	AG-L1076206IST	AG-L1079568CPA			
Bethany Luth	AG-L1082379IST				
Brad Burke	AG-L1052766IST	AG-L1071184CPA		Forest	
Bryant Young	AG-L1040738IST	AG-L1046535CPA		Forest	
Carlos Estrada	AG-L1080870IST				
Claire Newell	AG-L1083171IST				
Coleman Krohn	AG-L1076007IST	AG-L1079092CPA	105150	Forest, Aquatic	
Cooper Clarke	AG-L1082002IST		103130	. 0. 000, 7. qualit	
Crosby Buchstaber	AG-L1083172IST				
David Chiang	AG-L1054240IST				
Elise Snortum	AG-L1081833IST				
Ella Brinkman	AG-L1081485IST				
Emily Hayden	AG-L1083815IST				
Erik Saastamo	AG-L1080198IST	AG-L1083719CPA			
	AG-L1080198151 AG-L1070504IST	AG-L1083719CPA AG-L1073266CPA		Forest	
Evan Stewart Gabriel Donaldson	AG-L1070304131 AG-L1082095IST	AG-L1073200CFA		roiest	
	AG-L1062458IST	AG-L1064755CPA		Forest	
Heather Cashmore			402752	Forest	
lan Christie	AG-L1071763IST	AG-L1050813CPA AG-L1083844CPA	102752	Forest, Aquatic	
Isabella Lopez-Dion	AG-L1081480IST			Forest	
Jamison Holcombe	AG-L1074818IST	AG-L1077020CPA		Forest	
Jenah Alseth	AG-L1083190IST	AC 1407025CCD4			
Jenifer Nugent	AG-L1076963IST	AG-L1079256CPA			
Jill Tamborello	AG-L1074236IST				
Josh Schmuhl	AG-L1073343IST	4.6.14.0004.00.004			
Kaleigh Andreoni	AG-L1078162IST	AG-L1080433CPA		Forest	
Kelly Gaughn	AG-L1082967IST	AG-L1083843CPA		Forest	
Kobe Rossi	AG-L1083168IST				
Kyle Peterson	AG-L1074677IST	AG-L1077904CPA	104877	Forest, Aquatic	
Kyle Sorensen	AG-L1063597IST	AG-L1065011CPA	102274	Forest, Aquatic	
Lauren Smith	AG-L1079006IST				
Llew Whipps	AG-L1073649IST	AG-L1075847CPA	105034	Forest, Aquatic	
Mackenzie Lovelace	AG-L1074676IST	AG-L1076427CPA	103061	Forest, Aquatic	
Mark Dickison	AG-L1079023IST				
Max Osofsky	AG-L1080639IST	AG-L1082476CPA			
Nate McMullen	AG-L1079207IST	AG-L1080914CPA	105149	Forest, Aquatic	
Nick Crosby	AG-L1082952IST	AG-L1083823CPA		Forest	
Nick Lewis	AG-L1045857IST	AG-L1049790CPA		Forest	
Owen Phinney	AG-L1059333IST	AG-L1063122CPA	100928	Forest, Aquatic	
Rachel Viera	AG-L1079880IST				
Rio Hybert-Zack	AG-L1055229IST	AG-L1069212CPA		Forest	
Ryan Queen	AG-L1083030IST				
Samantha Marcotte	AG-L1083359IST				
Saul Garcia	AG-L1082953IST				
Spencer Hansen	AG-L1041281IST				
Spencer Page	AG-L1083169IST				
Tiana Zlotoff	AG-L1082049IST				
Trevor Burrows	AG-L1082674IST				
Tyler Csolkovits	AG-L1084026IST				
Vaughn Monaghan	AG-L1070401IST	AG-L1071976CPA		Forest	

Vince Wagner	AG-L1083493IST				
Will Dyer	AG-L1083592IST	AG-L1083801CPA		Forest	
Will Matthews	AG-L1083727IST				
Zach Bergonzine	AG-L1084018IST				
Zach Lopez	AG-L1052858IST				
Zach Vande Slunt	AG-L1055689IST	AG-L1061383CPA	100807	Forest, Aquatic	

PROJECT: Rinearson Na	tural Area						
CLIENT: Colombia Resto	oration Group		CATEGORY (h	ighlight one):	Forestry	Aquatics	
ADDRESS: 19 Meldrum	Bar Park Rd, Gla	adstone, OR 9702	27				
TREATMENT TYPE (high	nlight one):	Site Prep	Establishment	Stewardship			
DATE: 1/12/2023		TIME IN: 12:30 F		TIME OUT: 3:45 P.M.		.8	
	Targets		Prescription (o	z/ac or v/v%)	<b>Equipment &amp; Application Method</b>		Acres
A. Himalayan Blackberry	У		A. 2% AquaNeat, 2% Gar 0.5% Hi-Light	rlon, 1% Competitor,	A. Backpack, Spot S	Spray	A. 0.8
B. English Ivy			B. 4% AquaNeat, 2% Garlon, 2% Competitor, 0.5% Hi-Light		B. Backpack, Spot S	Spray	B. 0.8
C.			C.		C.		C.
D.			D.		D.		D.
			HERBICIDE IN	NVENTORY			
Glyphosate			Herbicide A	mount (oz)	Water (gal or oz)	Purcha	ased by:
Rodeo · EPA Reg #6271	9-324						
AquaNeat · EPA Reg #22	28-365		8	0	28.5 gal	AC	CFM
Triclopyr							
Vastlan · EPA Reg #6271	L9-687						
Garlon 3A · EPA Reg #62719-37			7	6		AC	CFM
Other Herbicides							
Transline · EPA Reg #62	719-259						
lmazapyr 4 SL · Reg# 81	927-24						
Mixed Herbicides							
Surfactants/ Adjuvants							
Competitor			2	2		AC	CFM
Class Act							
Hasten							
Colorant							
Hi-Light Blue Dye			1	_		AC	CFM
			WEATHER CO	ONDITIONS			
Time	Conditions	Humidity (%)	Temperature (°F)	(mph)	(mph)	Wind [	Direction
12:00 PM	Cloudy	76	44	2	0		SW
1:00 PM	Cloudy	75	44	4	0		S
2:00 PM	Cloudy	74	45	2	0	S	SW
	CERTIFIED LICEN	ISED APPLICATO	R:				
	Aissa	Bennett			AG-L107665	ЗСРА	

DATE: 1/23/2023 PROJECT: Rinearson Natural Area										
Applicators	Applicator IST #	CPA License #	Washington CPO	Categories	On Site ONLY?					
Abbey Schole	AG-L1081486IST			<u> </u>						
Addison Dillon	AG-L1082187IST	AG-L1083125CPA	104418	Forest, Aquatic						
Adriana Pianalto	AG-L1082303IST			, ,						
Aissa Bennett	AG-L1074697IST	AG-L1076653CPA	103167	Forest, Aquatic						
Andrew Robinson	AG-L1080655IST	AG-L1082758CPA		Forest						
Armand Tirado	AG-L1076206IST	AG-L1079568CPA		Forest						
Bethany Luth	AG-L1082379IST									
Brad Burke	AG-L1052766IST	AG-L1071184CPA		Forest						
Bryant Young	AG-L1040738IST	AG-L1046535CPA		Forest						
Cailin Warner										
Carlos Estrada	AG-L1080870IST	AG-L1084136CPA		Forest						
Claire Newell	AG-L1083171IST									
Coleman Krohn	AG-L1076007IST	AG-L1079092CPA	105150	Forest, Aquatic						
Cooper Clarke	AG-L1082002IST		103130	. o. est, / iquatio						
Crosby Buchstaber	AG-L1083172IST									
David Chiang	AG-L1054240IST									
Elise Snortum	AG-L1081833IST									
	AG-L1081833131 AG-L1081485IST	AG-L1084135CPA		Forest						
Ella Brinkman	AG-L1081483131 AG-L1083815IST	VO FINDATION V		FULEST						
Emily Hayden		AC 14003740004		Forest						
Erik Saastamo	AG-L1080198IST AG-L1070504IST	AG-L1083719CPA AG-L1073266CPA		Forest						
Evan Stewart	AG-L1070504IST AG-L1082095IST	AG-LIU/3200CPA		Forest						
Gabriel Donaldson		AC 140C47FFCDA		F .						
Heather Cashmore	AG-L1063458IST	AG-L1064755CPA	100750	Forest						
lan Christie	AG-L1071763IST	AG-L1050813CPA	102752	Forest, Aquatic						
Isabella Lopez-Dion	AG-L1081480IST	AG-L1083844CPA		Forest						
Jamison Holcombe	AG-L1074818IST	AG-L1077020CPA		Forest						
Jenifer Nugent	AG-L1076963IST	AG-L1079256CPA		Forest						
Jill Tamborello	AG-L1074236IST	AG-L1084134CPA		Forest						
Josh Schmuhl	AG-L1073343IST									
Kaleigh Andreoni	AG-L1078162IST	AG-L1080433CPA		Forest						
Kelly Gaughan	AG-L1082967IST	AG-L1083843CPA		Forest						
Kobe Rossi	AG-L1083168IST	AG-L1084397CPA								
Kyle Peterson	AG-L1074677IST	AG-L1077904CPA	104877	Forest, Aquatic						
Kyle Sorensen	AG-L1063597IST	AG-L1065011CPA	102274	Forest, Aquatic						
Lauren Smith	AG-L1079006IST	AG-L1081083CPA								
Llew Whipps	AG-L1073649IST	AG-L1075847CPA	105034	Forest, Aquatic						
Mackenzie Lovelace	AG-L1074676IST	AG-L1076427CPA	103061	Forest, Aquatic						
Mark Dickison	AG-L1079023IST									
Max Osofsky	AG-L1080639IST	AG-L1082476CPA		Forest						
Nate McMullen	AG-L1079207IST	AG-L1080914CPA	105149	Forest, Aquatic						
Nick Crosby	AG-L1082952IST	AG-L1083823CPA		Forest						
Nick Lewis	AG-L1045857IST	AG-L1049790CPA		Forest						
Owen Phinney	AG-L1059333IST	AG-L1063122CPA	100928	Forest, Aquatic						
Rachel Viera	AG-L1079880IST	AG-L1084178CPA								
Ricardo Peralta	AG-L1084270IST									
Rio Hybert-Zack	AG-L1055229IST	AG-L1069212CPA		Forest						
Samantha Marcotte	AG-L1083359IST									
Saul Garcia	AG-L1082953IST									
Spencer Hansen	AG-L1041281IST									
Spencer Page	AG-L1083169IST									
Tiana Zlotoff	AG-L1082049IST									
Trevor Burrows	AG-L1082674IST	AG-L1084398CPA								
Tyler Csolkovits	AG-L1084026IST	112 2230 103031 11								
Vaughn Monaghan	AG-L108402013T AG-L1070401IST	AG-L1071976CPA		Forest						
Vince Wagner	AG-L1083493IST			. 01030						
Will Dyer	AG-L1083592IST	AG-L1083801CPA		Forest						
Will Matthews	AG-L1083392131 AG-L1083727IST	VO FINESONICLY		TOTEST						
	AG-L1083727131 AG-L1084018IST									
Zach Vando Slunt	AG-L1054018131 AG-L1055689IST	AG-L1061383CPA	100807	Forest, Aquatic						
Zach Vande Slunt	VO [102200312]	VO FINATORIA	100007	i orest, Aquatic						

PROJECT: Rinearson Na							
CLIENT: Columbia Resto			CATEGORY (hi	ighlight one):	Forestry	Aquatics	
ADDRESS: (45.377674, - TREATMENT TYPE (high	-122.615357)						
TREATMENT TYPE (high	ilight one):	Site Prep	Establishment	Stewardship			
DATE: 1/23/2023		TIME IN: 8:00 A.M.		TIME OUT: 4:00 P.M.		TOTAL ACRES: 6.4	1
	Targets		Prescription (o	z/ac or v/v%)	Equipment & App	lication Method	Acres
A. Himalayan Blackberr	у		A. 2% Garlon, 2% AquaNeat, Light	1% Competitor, 0.5% Hi-	A. Backpack, Spot Sp	oray	A. 6.4
В.			В.		В.		В.
C.			C.		C.		C.
D.			D.		D.		D.
			HERBICIDE INV	/ENTORY			
Glyphosate Rodeo · EPA Reg #62719			Herbicide A	mount (oz)	Water (gal or oz)	Purch	ased by:
Rodeo · EPA Reg #62719	9-324						
AquaNeat · EPA Reg #22	28-365		16	54	61.5 gal	А	CFM
Triclopyr							
Vastlan · EPA Reg #6271	19-687						
Garlon 3A · EPA Reg #62	2719-37		16	4		A	CFM
Other Herbicides							
Transline · EPA Reg #62	719-259						
Imazapyr 4 SL · Reg# 81	927-24						
Mixed Herbicides							
Surfactants/ Adjuvants							
Competitor			82	2		А	CFM
Class Act							
Hasten							
Colorant							
Hi-Light Blue Dye			4:	1		А	CFM
			WEATHER CON	IDITIONS			
Time	Conditions	Relative Humidity (%)	Temperature (°F)	Wind Speed - High (mph)	Wind Speed - Low (mph)	Wind	Direction
8:00 AM	Clear	90%	37	3	0		E
11:00 AM	Clear	83%	42	3	0	1	NNE
1:00 PM	Clear	70%	46	4	0	1	WV
	CERTIFIED LICEN	ISED APPLICATOR:		CEI	RTIFIED LICENSED AF	PPLICATOR NO.:	
	Trevor	Burrows			AG-L108439	8CPA	

DATE: 7/3/2023		PROJECT: Rinearson			
Applicators	Applicator IST #	CPA License #	Washington CPO	Categories	On Site ONLY?
Aaron Fry	AG-L1086316IST				
Addison Dillon	AG-L1082187IST	AG-L1083125CPA	104418	Forest, Aquatic	
Aissa Bennett	AG-L1074697IST	AG-L1076653CPA	103167	Forest, Aquatic	
Alex Maitland	AG-L1086710IST				
Andrew Robinson	AG-L1080655IST	AG-L1082758CPA		Forest	
Bethany Luth	AG-L1082379IST				
Bethany Morrow	AG-L1086748IST				
Brad Burke	AG-L1052766IST	AG-L1071184CPA		Forest	
Bryant Young	AG-L1040738IST	AG-L1046535CPA		Forest	
Camille Oster	AG-L1085533IST				
Carlos Estrada	AG-L1080870IST	AG-L1084136CPA		Forest	
Catherine Luecht	AG-L1086006IST				
Charly Yocius	AG-L1087065IST				
Coleman Krohn	AG-L1086040IST	AG-L1079092CPA	105150	Forest, Aquatic	
Crosby Buchstaber	AG-L1083172IST			, ,	
David Chiang	AG-L1054240IST				
Dion Brannan	AG-L1087066IST			1	1
Edward Benkhin	AG-L1086713IST			1	
Elise Snortum	AG-L1081833IST				
Ellie Winter	AG-L1086747IST				
Emily Martin	AG-L1061041IST	AG-L1064107CPA		Forest	1
Erik Saastamo	AG-L1080198IST	AG-L1083719CPA		Forest	
Evan Stewart	AG-L1070504IST	AG-L1073266CPA		Forest	
Emily Stewart	AG-L1086314IST			. 5. 650	
Gavin Stockwell	AG-L1086226IST				
Greg Muller	AG-L1086712IST				
Hanna Horton	AG-L1086715IST				
Heather Cashmore	AG-L1063458IST	AG-L1064755CPA		Forest	
lan Christie	AG-L1071763IST	AG-L1050813CPA	102752	Forest, Aquatic	
Isabella Lopez-Dion	AG-L1081480IST	AG-L1083844CPA	102752	Forest	
Jack Delaney	AG-L1086968IST	710 220000 110171		101630	
Jessica Riccardi	AG-L1086970IST				
Jill Tamborello	AG-L1074236IST	AG-L1084134CPA		Forest	
Katelyn Kompara	AG-L1085915IST	7.0 2200 120 10.71		101630	
Kobe Rossi	AG-L1083168IST	AG-L1084397CPA		Forest, Aquatic	
Kyle Peterson	AG-L1074677IST	AG-L1077904CPA	104877	Forest, Aquatic	
Kyle Sorensen	AG-L1063597IST	AG-L1065011CPA	102274	Forest, Aquatic	
Lauren Smith	AG-L1079006IST	AG-L1081083CPA	106759	Forest, Aquatic	
Llew Whipps	AG-L1073649IST	AG-L1075847CPA	105034	Forest, Aquatic	
Mackenzie Lovelace	AG-L1074676IST	AG-L1076427CPA	103061	Forest, Aquatic	
Mallory Mitsui	AG-L1086102IST	710 22070 1270 17	103001	Torest, Aquatic	
Madison Smith	AG-L1086749IST				
Mark Dickison	AG-L1079023IST				
Mathew Lipski	AG-L1087020IST			+	1
Max Osofsky	AG-L1080639IST	AG-L1082476CPA	106342	Forest, Aquatic	
Megan Greene	AG-L1086317IST	7.0 22002 1700171	1005-12	10.030, Aquatic	
Michael Briggs	AG-L1086597IST			+	<del>                                     </del>
Miguel Madden	AG-L1086600IST	+		+	
Mille Isbell	AG-L1087021IST	+		+	
Nick Crosby	AG-L1082952IST	AG-L1083823CPA		Forest	
Nick Lewis	AG-L1045857IST	AG-L1049790CPA		Forest	
Owen Phinney	AG-L1059333IST	AG-L1063122CPA	100928	Forest, Aquatic	
Ricardo Peralta	AG-L1084270IST	AG EIOOSIZZOI A	100320	i oi est, Aquatic	
Rio Hybert-Zack	AG-L1055229IST	AG-L1069212CPA		Forest	
•	AG-L1035229IST AG-L1086709IST	AG-L1003212CFA		rorest	+
Ruby Gunter	AG-L1080709IST AG-L1083359IST			+	+
Samantha Marcotte	AG-L1083339IST AG-L1086440IST			+	+
Scott Smethurst	AG-L1086440IST AG-L1041281IST			+	
Spencer Hansen	AG-L1041201131				

Spencer Page	AG-L1083169IST	AG-L1084646CPA		Forest	
Tiana Zlotoff	AG-L1082049IST	AG-L1085924CPA		Forest	
Tom Hauser	AG-L1086596IST				
Tomasz Cunha	AG-L1086595IST				
Tova Broadbent	AG-L1086714IST				
Trevor Burrows	AG-L1082674IST	AG-L1084398CPA		Forest	
Tyler Csolkovits	AG-L1084026IST				
Valentin Mitsui	AG-L1085741IST				
Vaughn Monaghan	AG-L1070401IST	AG-L1071976CPA		Forest	
Vince Wagner	AG-L1083493IST				
Will Dyer	AG-L1083592IST	AG-L1083801CPA		Forest	
Zach Vande Slunt	AG-L1055689IST	AG-L1061383CPA	100807	Forest, Aquatic	

PROJECT: Rinearson							
CLIENT: Columbia Rest	toration Group		CATEGORY (high	nlight one):	Forestry	Aquatics	
ADDRESS: 45.3778358,	,-123.6124366						•
TREATMENT TYPE (hig	hlight one):	Site Prep	Establishment	Stewardship			
DATE: 7/3/2023		TIME IN: 6:30 am		TIME OUT: 3:00 pm	•	TOTAL ACRES: 4.1	.8
	Targets		Prescription (oz/	ac or v/v%)	Equipment & App	lication Method	Acres
A. Yellow Flag Iris			A. 4% Aquaneat, 1% Compe	titor, 0.5% Hi-Light	A. Spray pack		A. 4.18
B. Reed Canary Grass	. Reed Canary Grass		B. 2% Aquaneat, 1% Compe	titor, 0.5% Hi-Light	B. Spray pack		B. 4.18
C.			C.		C.		C.
D.			D.		D.		D.
			HERBICIDE INVEN	TORY			
Glyphosate			Herbicide Am	ount (oz)	Water (gal or oz)	Purcha	sed by:
Rodeo · EPA Reg #6271	19-324						
AquaNeat · EPA Reg #2	28-365		88		30g	AC	FM
Triclopyr							
Vastlan · EPA Reg #627	19-687						
Garlon 3A · EPA Reg #6	2719-37						
Other Herbicides							
Transline · EPA Reg #62	2719-259						
Imazapyr 4 SL · Reg# 81	1927-24						
Mixed Herbicides							
Surfactants/ Adjuvants	s						
Competitor			40		30 g	AC	FM
Class Act							
Hasten							
Colorant							
Hi-Light Blue Dye			20		30 g	AC	FM
			WEATHER CONDI	TIONS			
Time	Conditions	Relative Humidity (%)	Temperature (°F)	Wind Speed - High (mph)	Wind Speed - Low (mph)	Wind D	irection
7:00 AM	Sunny	55%	58	0	0	EI	NE .
10:00 AM	Sunny	45%	69	4	0	N'	W
1:00 PM	Sunny	25%	79	7	0	N'	
	· · · · · · · · · · · · · · · · · · ·	NSED APPLICATOR:	. 3	·	RTIFIED LICENSED A		
		Stewart			AG-L107326		

	PROJECT: Rinearson								
Site Prep	CLIENT: Columbia Resto	ration Group		CATEGORY (highligh	nt one):	Forestry	Aquatics		
DATE: 7/3/2023   TIME IN: 6:30 AM	ADDRESS: (45.3778358,	-123.6124366)				1		•	
Targets			Site Prep	Establishment	Stewardship				
A. Himalayan blackberry, thistle, teasel, tansy Competitor, 0.5 Hi-Light B.	DATE: 7/3/2023		TIME IN: 6:30 AM		TIME OUT: 3:00 p	om	ACRES: 9.44		
Competitor, 0.5 Hi-Light   B.   B.   B.   B.   B.   B.   B.   B		Targets		Prescription (c	z/ac or v/v%)	Equipment/Application	on (Pack/Spot, etc.)	Acres	
B.   B.   B.   B.   B.   B.   B.   B.	A. Himalayan blackberry,	, thistle, teasel, tansy		A. 2% Garlon, 2% Ac	juaneat, 1%	A. Spray pack		A. 9.44	
C. D.				Competitor, 0.5 Hi-l	ight				
D.   D.   D.   D.   D.   D.   D.   D.	В.			B.		В.		В.	
D.   D.   D.   D.   D.   D.   D.   D.	•								
### HERBICIDE INVENTORY   Herbicide Amount (oz)   Water (gal or oz)   Purchased by	C.			C.		C.		C.	
Herbicide Amount (oz)   Water (gal or oz)   Purchased by Rodeo - EPA Reg #62719-324   Rodeo - EPA Reg #62719-324   Rodeo - EPA Reg #628-365   168   63 gal   ACFM	D.			D.		D.		D.	
Herbicide Amount (oz)   Water (gal or oz)   Purchased by Rodeo - EPA Reg #62719-324   Rodeo - EPA Reg #62719-324   Rodeo - EPA Reg #6228-365   168   63 gal   ACFM									
Rodeo - EPA Reg #62719-324			Н	ERBICIDE INVEN	TORY				
AquaNeat - EPA Reg #228-365   168   63 gal   ACFM	Glyphosate			Herbicide A	mount (oz)	Water (gal or oz)	Purchase	ed by:	
Vastlan - EPA Reg #62719-687   168   63 gal   ACFM	Rodeo · EPA Reg #62719	-324							
Vastlan · EPA Reg #62719-687       168       63 gal       ACFM         Other Herbicides         Transline · EPA Reg #62719-259       Imazapyr 4 SL · Reg# 81927-24       Imazapyr 4 SL · Reg# 81927-24 <td co<="" td=""><td>AquaNeat · EPA Reg #228</td><td colspan="2">uaNeat · EPA Reg #228-365</td><td>16</td><td>58</td><td colspan="2">63 gal ACFI</td><td>M</td></td>	<td>AquaNeat · EPA Reg #228</td> <td colspan="2">uaNeat · EPA Reg #228-365</td> <td>16</td> <td>58</td> <td colspan="2">63 gal ACFI</td> <td>M</td>	AquaNeat · EPA Reg #228	uaNeat · EPA Reg #228-365		16	58	63 gal ACFI		M
Garlon 3A · EPA Reg #62719-37	Triclopyr								
Other Herbicides           Transline · EPA Reg #62719-259	Vastlan · EPA Reg #62719	9-687							
Transline   EPA Reg #62719-259	Garlon 3A · EPA Reg #62	arlon 3A · EPA Reg #62719-37			58	63 gal	ACFI	M	
Imazapyr 4 St. Reg# 81927-24	Other Herbicides								
Mixed Herbicides   2% Garlon/ 2% Rodeo	Transline · EPA Reg #627	19-259							
2% Garlon/ 2% Rodeo	lmazapyr 4 SL · Reg# 819	27-24							
Surfactants/ Adjuvants   Surfactants/ Adjuvants/ Adjuvants	Mixed Herbicides								
Competitor   84   63 gal   ACFM	2% Garlon/ 2% Rodeo								
Competitor         84         63 gal         ACFM           Class Act         63 gal         ACFM           Colorant           WEATHER CONDITIONS           WEATHER CONDITIONS           Time         Conditions         Relative Humidity (%)         Temperature (°F)         Wind Speed - High (mph)         Wind Speed - Low (mph)         Wind Direction           7:00 AM         Sunny         55%         58         0         0         NW           10:00 AM         Sunny         45%         69         4         0         NW           1:00 PM         Sunny         25%         79         7         0         NW           CERTIFIED LICENSED APPLICATOR:         CERTIFIED LICENSED APPLICATOR NO.:									
Competitor   84   63 gal   ACFM									
Competitor   84   63 gal   ACFM									
Colorant	Surfactants/ Adjuvants					•			
Colorant	Competitor			8	4	63 gal	ACFI	M	
Hi-Light Blue Dye   42   63 gal   ACFM	Class Act								
Hi-Light Blue Dye   42   63 gal   ACFM									
WEATHER CONDITIONS           Time         Conditions         Relative Humidity (%)         Temperature (°F)         Wind Speed - High (mph)         Wind Speed - Low (mph)         Wind Direction           7:00 AM         Sunny         55%         58         0         0         NW           10:00 AM         Sunny         45%         69         4         0         NW           1:00 PM         Sunny         25%         79         7         0         NW           CERTIFIED LICENSED APPLICATOR:         CERTIFIED LICENSED APPLICATOR NO.:	Colorant								
WEATHER CONDITIONS           Time         Conditions         Relative Humidity (%)         Temperature (°F)         Wind Speed - High (mph)         Wind Speed - Low (mph)         Wind Direction           7:00 AM         Sunny         55%         58         0         0         NW           10:00 AM         Sunny         45%         69         4         0         NW           1:00 PM         Sunny         25%         79         7         0         NW           CERTIFIED LICENSED APPLICATOR:         CERTIFIED LICENSED APPLICATOR NO.:	Hi-Light Blue Dye			4	2	63 gal	ACFI	M	
Time         Conditions         (%)         Temperature (°F)         High (mph)         (mph)         Wind Direction           7:00 AM         Sunny         55%         58         0         0         NW           10:00 AM         Sunny         45%         69         4         0         NW           1:00 PM         Sunny         25%         79         7         0         NW           CERTIFIED LICENSED APPLICATOR:         CERTIFIED LICENSED APPLICATOR NO.:			W	EATHER CONDI	TIONS				
10:00 AM         Sunny         45%         69         4         0         NW           1:00 PM         Sunny         25%         79         7         0         NW           CERTIFIED LICENSED APPLICATOR:         CERTIFIED LICENSED APPLICATOR NO.:	Time	Conditions		Temperature (°F)		· ·	Wind Dir	ection	
1:00 PM Sunny 25% 79 7 0 NW  CERTIFIED LICENSED APPLICATOR: CERTIFIED LICENSED APPLICATOR NO.:	7:00 AM	Sunny	55%	58	0	0	NW	/	
CERTIFIED LICENSED APPLICATOR: CERTIFIED LICENSED APPLICATOR NO.:	10:00 AM	Sunny	45%	69	4	0	NW	/	
	1:00 PM	Sunny	25%	79	7	0	NW	1	
Evan Stewart AG-L1073266CPA		CERTIFIED LICENSEE	APPLICATOR:		CE	RTIFIED LICENSED AF	PPLICATOR NO.:		
To Edulation And		Fyan Ster	wart			AG-I 107326	6CPA		
		Lvan Ster				AG-E10/320			

DATE: 7/5/2023		PROJECT: Rinearson			
Applicators	Applicator IST #	CPA License #	Washington CPO	Categories	On Site ONLY?
Aaron Fry	AG-L1086316IST		3		
Addison Dillon	AG-L1082187IST	AG-L1083125CPA	104418	Forest, Aquatic	
Aissa Bennett	AG-L1074697IST	AG-L1076653CPA	103167	Forest, Aquatic	
Alex Maitland	AG-L1086710IST			, , , , , , , , , , , , , , , , , , , ,	
Andrew Robinson	AG-L1080655IST	AG-L1082758CPA		Forest	
Bethany Luth	AG-L1082379IST	1 11 111			
Bethany Morrow	AG-L1086748IST				
Brad Burke	AG-L1052766IST	AG-L1071184CPA		Forest	
Bryant Young	AG-L1040738IST	AG-L1046535CPA		Forest	
Camille Oster	AG-L1085533IST	1.0 200 100001.11		1 01 050	
Carlos Estrada	AG-L1080870IST	AG-L1084136CPA		Forest	
Catherine Luecht	AG-L1086006IST			10.000	
Charly Yocius	AG-L1087065IST				
Coleman Krohn	AG-L1086040IST	AG-L1079092CPA	105150	Forest, Aquatic	
Crosby Buchstaber	AG-L1083172IST	7.6 220736326171	103130	Torest, riquatio	
David Chiang	AG-L1054240IST				
	AG-L1087066IST				
Dion Brannan Edward Benkhin	AG-L1086713IST				
Elise Snortum	AG-L1080713131 AG-L1081833IST				
	AG-L1081833131 AG-L1086747IST				
Ellie Winter	AG-L1060747131 AG-L1061041IST	AG-L1064107CPA		Enrost	
Emily Martin	AG-L1080198IST	AG-L1083719CPA  AG-L1083719CPA		Forest Forest	
Erik Saastamo	AG-L1080198151 AG-L1070504IST	AG-L1083719CPA AG-L1073266CPA			
Evan Stewart	AG-L1070504IST AG-L1086314IST	AG-L10/3200CPA		Forest	
Emily Stewart Gavin Stockwell	AG-L1086314IST AG-L1086226IST				
Greg Muller	AG-L1086712IST				
Hanna Horton	AG-L1086715IST	AG-L1064755CPA		F	
Heather Cashmore	AG-L1063458IST		400750	Forest	
lan Christie	AG-L1071763IST	AG-L1050813CPA	102752	Forest, Aquatic	
Isabella Lopez-Dion	AG-L1081480IST	AG-L1083844CPA		Forest	
Jack Delaney	AG-L1086968IST				
Jessica Riccardi	AG-L1086970IST	AC 14004124CDA		Frank	
Jill Tamborello	AG-L1074236IST	AG-L1084134CPA		Forest	
Katelyn Kompara	AG-L1085915IST	A.C.   4.00,420,7CD.4			
Kobe Rossi	AG-L1083168IST	AG-L1084397CPA	101077	Forest, Aquatic	
Kyle Peterson	AG-L1074677IST	AG-L1077904CPA	104877	Forest, Aquatic	
Kyle Sorensen	AG-L1063597IST	AG-L1065011CPA	102274	Forest, Aquatic	
Lauren Smith	AG-L1079006IST	AG-L1081083CPA	106759	Forest, Aquatic	Х
Llew Whipps	AG-L1073649IST	AG-L1075847CPA	105034	Forest, Aquatic	
Mackenzie Lovelace	AG-L1074676IST	AG-L1076427CPA	103061	Forest, Aquatic	
Mallory Mitsui	AG-L1086102IST				
Madison Smith	AG-L1086749IST				
Mark Dickison	AG-L1079023IST				
Mathew Lipski	AG-L1087020IST				
Max Osofsky	AG-L1080639IST	AG-L1082476CPA	106342	Forest, Aquatic	
Megan Greene	AG-L1086317IST				
Michael Briggs	AG-L1086597IST				
Miguel Madden	AG-L1086600IST				
Mille Isbell	AG-L1087021IST	AC 1400000000			
Nick Crosby	AG-L1082952IST	AG-L1083823CPA		Forest	
Nick Lewis	AG-L1045857IST	AG-L1049790CPA		Forest	
Owen Phinney	AG-L1059333IST	AG-L1063122CPA	100928	Forest, Aquatic	
Ricardo Peralta	AG-L1084270IST	1011000000		-	
Rio Hybert-Zack	AG-L1055229IST	AG-L1069212CPA		Forest	
Ruby Gunter	AG-L1086709IST				
Samantha Marcotte	AG-L1083359IST				
Scott Smethurst	AG-L1086440IST				
Spencer Hansen	AG-L1041281IST				
Spencer Page	AG-L1083169IST	AG-L1084646CPA		Forest	
Tiana Zlotoff	AG-L1082049IST	AG-L1085924CPA		Forest	
Tom Hauser	AG-L1086596IST				
Tomasz Cunha	AG-L1086595IST				
Tova Broadbent	AG-L1086714IST				
Trevor Burrows	AG-L1082674IST	AG-L1084398CPA		Forest	]
Tyler Csolkovits	AG-L1084026IST				

Valentin Mitsui	AG-L1085741IST				
Vaughn Monaghan	AG-L1070401IST	AG-L1071976CPA		Forest	
Vince Wagner	AG-L1083493IST				
Will Dyer	AG-L1083592IST	AG-L1083801CPA		Forest	
Zach Vande Slunt	AG-L1055689IST	AG-L1061383CPA	100807	Forest, Aquatic	

CLIENT: Columbia Restoration Group Address: 45.3778358, -122.6124366 TREATMENT TYPE (highlight one):  DATE: 7/5/2023  TIME IN: 6:00 / Targets  A. Yellow Flag Iris B. Himalayan Blackberry, Teasel, Tansy Ragwort, Canada This thistle  C.  D.  HERBICIDE INVENTORY Glyphosate Rodeo · EPA Reg #62719-324 AquaNeat · EPA Reg #228-365 Triclopyr Vastlan · EPA Reg #62719-687 Garlon 3A · EPA Reg #62719-37 Other Herbicides Transline · EPA Reg #62719-259 Imazapyr 4 SL · Reg# 81927-24 Mixed Herbicides	A.M. Pr A.b. A.tle, Bull B.	rescription (oz/ac or v/v%)  . 4% Aquaneat, 1% Competit  . 2% Garlon, 2% Aquaneat, 1 ight	Stewardship TIME OUT: 1:00 P.M. or, 0.5% Hi-Light	Equipment/Application (Pack/S  A. Backpack, Spot Spray  B. Backpack, Spot Spray	Aquatics  TOTAL ACRES: 6.46 pot, etc.) Acres  A.3
TREATMENT TYPE (highlight one):  DATE: 7/5/2023  TIME IN: 6:00 of Targets  A. Yellow Flag Iris  B. Himalayan Blackberry, Teasel, Tansy Ragwort, Canada This thistle  C.  D.  HERBICIDE INVENTORY  Glyphosate  Rodeo · EPA Reg #62719-324  AquaNeat · EPA Reg #228-365  Triclopyr  Vastlan · EPA Reg #62719-687  Garlon 3A · EPA Reg #62719-37  Other Herbicides  Transline · EPA Reg #62719-259  Imazapyr 4 SL · Reg# 81927-24	A. tle, Bull B. Li	rescription (oz/ac or v/v%)  . 4% Aquaneat, 1% Competit  . 2% Garlon, 2% Aquaneat, 1 ight	TIME OUT: 1:00 P.M. or, 0.5% Hi-Light	Equipment/Application (Pack/S A. Backpack, Spot Spray	pot, etc.) Acres
DATE: 7/5/2023 TIME IN: 6:00 A Targets  A. Yellow Flag Iris B. Himalayan Blackberry, Teasel, Tansy Ragwort, Canada This thistle C.  D.  HERBICIDE INVENTORY Glyphosate Rodeo · EPA Reg #62719-324 AquaNeat · EPA Reg #228-365 Triclopyr Vastlan · EPA Reg #62719-687 Garlon 3A · EPA Reg #62719-37 Other Herbicides Transline · EPA Reg #62719-259 Imazapyr 4 SL · Reg# 81927-24	A. tle, Bull B. Li	rescription (oz/ac or v/v%)  . 4% Aquaneat, 1% Competit  . 2% Garlon, 2% Aquaneat, 1 ight	TIME OUT: 1:00 P.M. or, 0.5% Hi-Light	Equipment/Application (Pack/S A. Backpack, Spot Spray	pot, etc.) Acres
Targets  A. Yellow Flag Iris  B. Himalayan Blackberry, Teasel, Tansy Ragwort, Canada This thistle  C.  D.  HERBICIDE INVENTORY  Glyphosate  Rodeo · EPA Reg #62719-324  AquaNeat · EPA Reg #228-365  Triclopyr  Vastlan · EPA Reg #62719-687  Garlon 3A · EPA Reg #62719-37  Other Herbicides  Transline · EPA Reg #62719-259  Imazapyr 4 SL · Reg# 81927-24	A. tle, Bull B. Li	rescription (oz/ac or v/v%)  . 4% Aquaneat, 1% Competit  . 2% Garlon, 2% Aquaneat, 1 ight	or, 0.5% Hi-Light	Equipment/Application (Pack/S A. Backpack, Spot Spray	pot, etc.) Acres
A. Yellow Flag Iris  B. Himalayan Blackberry, Teasel, Tansy Ragwort, Canada This thistle  C.  D.  HERBICIDE INVENTORY Glyphosate Rodeo · EPA Reg #62719-324 AquaNeat · EPA Reg #228-365 Triclopyr Vastlan · EPA Reg #62719-687 Garlon 3A · EPA Reg #62719-37 Other Herbicides Transline · EPA Reg #62719-259 Imazapyr 4 SL · Reg# 81927-24	A. tle, Bull B. Li <sub>l</sub>	. 4% Aquaneat, 1% Competit . 2% Garlon, 2% Aquaneat, 1 ight		A. Backpack, Spot Spray	, ,
B. Himalayan Blackberry, Teasel, Tansy Ragwort, Canada This thistle  C.  D.  HERBICIDE INVENTORY Glyphosate Rodeo · EPA Reg #62719-324 AquaNeat · EPA Reg #228-365 Triclopyr Vastlan · EPA Reg #62719-687 Garlon 3A · EPA Reg #62719-37 Other Herbicides Transline · EPA Reg #62719-259 Imazapyr 4 SL · Reg# 81927-24	tle, Bull B. Li <sub>l</sub>	. 2% Garlon, 2% Aquaneat, 1 ight			A.3
thistle C.  D.  HERBICIDE INVENTORY  Glyphosate  Rodeo · EPA Reg #62719-324  AquaNeat · EPA Reg #228-365  Triclopyr  Vastlan · EPA Reg #62719-687  Garlon 3A · EPA Reg #62719-37  Other Herbicides  Transline · EPA Reg #62719-259  Imazapyr 4 SL · Reg# 81927-24	Li <sub>l</sub>	ght	% Competitor, 0.5% Hi-	B. Backpack, Spot Sprav	
D.  HERBICIDE INVENTORY  Glyphosate  Rodeo · EPA Reg #62719-324  AquaNeat · EPA Reg #228-365  Triclopyr  Vastlan · EPA Reg #62719-687  Garlon 3A · EPA Reg #62719-37  Other Herbicides  Transline · EPA Reg #62719-259  Imazapyr 4 SL · Reg# 81927-24				, , , , , , , , , , , , , , , , , , , ,	B. 3.46
HERBICIDE INVENTORY Glyphosate Rodeo · EPA Reg #62719-324 AquaNeat · EPA Reg #228-365 Triclopyr Vastlan · EPA Reg #62719-687 Garlon 3A · EPA Reg #62719-37 Other Herbicides Transline · EPA Reg #62719-259 Imazapyr 4 SL · Reg# 81927-24	D.			c.	C.
Glyphosate  Rodeo · EPA Reg #62719-324  AquaNeat · EPA Reg #228-365  Triclopyr  Vastlan · EPA Reg #62719-687  Garlon 3A · EPA Reg #62719-37  Other Herbicides  Transline · EPA Reg #62719-259  Imazapyr 4 SL · Reg# 81927-24				D.	D.
Rodeo · EPA Reg #62719-324  AquaNeat · EPA Reg #228-365  Triclopyr  Vastlan · EPA Reg #62719-687  Garlon 3A · EPA Reg #62719-37  Other Herbicides  Transline · EPA Reg #62719-259  Imazapyr 4 SL · Reg# 81927-24					
AquaNeat · EPA Reg #228-365  Triclopyr  Vastlan · EPA Reg #62719-687  Garlon 3A · EPA Reg #62719-37  Other Herbicides  Transline · EPA Reg #62719-259  Imazapyr 4 SL · Reg# 81927-24		Herbicide An	nount (oz)	Water (gal or oz)	Purchased by:
Triclopyr Vastlan · EPA Reg #62719-687 Garlon 3A · EPA Reg #62719-37 Other Herbicides Transline · EPA Reg #62719-259 Imazapyr 4 SL · Reg# 81927-24					
Vastlan · EPA Reg #62719-687 Garlon 3A · EPA Reg #62719-37 Other Herbicides Transline · EPA Reg #62719-259 Imazapyr 4 SL · Reg# 81927-24		216	j	72 gal	ACFM
Garlon 3A · EPA Reg #62719-37  Other Herbicides  Transline · EPA Reg #62719-259  Imazapyr 4 SL · Reg# 81927-24					
Other Herbicides Transline · EPA Reg #62719-259 Imazapyr 4 SL · Reg# 81927-24					
Transline · EPA Reg #62719-259 Imazapyr 4 SL · Reg# 81927-24		168	3	ACFM	
lmazapyr 4 SL · Reg# 81927-24					
.,					
Mixed Herbicides					
Surfactants/ Adjuvants					
Competitor		96			ACFM
Class Act					
Colorant					
Hi-Light Blue Dye		48			ACFM
		WEATHER CON	IDITIONS		
Time Conditions Relative Humi	dity (%)	Temperature (°F)	Wind Speed - High (mph)	Wind Speed - Low (mph)	Wind Direction
8:00 AM Sunny 53%		69	2	0	NE
10:00 AM Sunny 37%		77	5	0	NNW
12:00 PM Sunny 29%		85	5	0	NNW
CERTIFIED LICENSED APPLICA	, , , , , , , , , , , , , , , , , , , ,				
Erik Saastamo AG-L1083719CPA					

Rine	earson		7/17/2023		
Applicators	Applicator IST #	CPA License #	Washington CPO	Categories	On Site ONLY?
Aaron Fry	AG-L1086316IST			,	
Abigail Mortensen	AG-L1087265IST				
Addison Dillon	AG-L1082187IST	AG-L1083125CPA	104418	Forest, Aquatic	
Aissa Bennett	AG-L1074697IST	AG-L1076653CPA	103167	Forest, Aquatic	
Alex Maitland	AG-L1086710IST				
Andrew Robinson	AG-L1080655IST	AG-L1082758CPA		Forest	
Bethany Luth	AG-L1082379IST				
Bethany Morrow	AG-L1086748IST				
Brad Burke	AG-L1052766IST	AG-L1071184CPA		Forest	
Bryant Young	AG-L1040738IST	AG-L1046535CPA		Forest	
Camille Oster	AG-L1085533IST				
Carlos Estrada	AG-L1080870IST	AG-L1084136CPA		Forest	
Catherine Luecht	AG-L1086006IST				
Charly Yocius	AG-L1087065IST				
Coleman Krohn	AG-L1086040IST	AG-L1079092CPA	105150	Forest, Aquatic	
Crosby Buchstaber	AG-L1083172IST			111,	
David Chiang	AG-L1054240IST				
Dion Brannan	AG-L1087066IST				
Edward Benkhin	AG-L1086713IST				
Elise Snortum	AG-L1081833IST	AG-L1087294CPA		Forest	
Ellie Winter	AG-L1086747IST			. 0. 050	1
Emily Martin	AG-L1061041IST	AG-L1064107CPA		Forest	
Erik Saastamo	AG-L1080198IST	AG-L1083719CPA		Forest	
Evan Stewart	AG-L1070504IST	AG-L1073266CPA		Forest	1
Emily Stewart	AG-L1086314IST			. 1.650	
Emma Ortiz	AG-L1087197IST				
Ethan Yarish	AG-L1087487IST				
Greg Muller	AG-L108/48/15T				
Hanna Horton	AG-L1086715IST				
Heather Cashmore	AG-L1063458IST	AG-L1064755CPA		Forest	
Ian Christie	AG-L1071763IST	AG-L1050813CPA	102752	Forest, Aquatic	
Isabella Lopez-Dion	AG-L1081480IST	AG-L1083844CPA	102732	Forest	
Jack Delaney	AG-L1086968IST			101630	
Jessica Riccardi	AG-L1086970IST				
Jill Tamborello	AG-L1074236IST	AG-L1084134CPA		Forest	
Katelyn Kompara	AG-L1085915IST	710 110041546171		101630	
Kobe Rossi	AG-L1083168IST	AG-L1084397CPA		Forest, Aquatic	
Kyle Peterson	AG-L1083108IST	AG-L1077904CPA	104877	Forest, Aquatic	
Kyle Sorensen	AG-L10/40/7/31 AG-L1063597IST	AG-L1065011CPA	102274	Forest, Aquatic	
Lauren Smith	AG-L1079006IST	AG-L1081083CPA	106759	Forest, Aquatic	
Mackenzie Lovelace	AG-L1073606IST AG-L1074676IST	AG-L1081083CFA AG-L1076427CPA	103061	Forest, Aquatic	
Mallory Mitsui	AG-L1074070IST AG-L1086102IST	AG-L1070427CFA	103001	Forest, Aquatic	
Madison Smith	AG-L1086749IST				
Malia Moritz	AG-L108674915T				
	AG-L1080909131 AG-L1079023IST				
Mark Dickison	AG-L1079023I3T AG-L1087020IST				
Mathew Lipski Matthew DeCosta	AG-L1087020I3T AG-L1087195IST				
	AG-L1087193131 AG-L1080639IST	AG-L1082476CPA	106242	Forest Aquatic	
Max Osofsky  Megan Greene	AG-L1086317IST	//G L10024/UCFA	106342	Forest, Aquatic	
Michael Briggs Mille Isbell	AG-L1086597IST AG-L1087021IST		+		<b> </b>
Mille Isbell Mychal Hellie	AG-L1087021IST AG-L1087317IST		1		1
,		AG-I 1092922CDA		Egraph	
Nick Crosby	AG-L1082952IST	AG-L1083823CPA		Forest	
Nick Lewis	AG-L1045857IST AG-L1059333IST	AG-L1049790CPA AG-L1063122CPA	100020	Forest Aquatic	<del> </del>
Owen Phinney		MO-LIUDOIZZCPA	100928	Forest, Aquatic	
Ricardo Peralta	AG-L1084270IST				
Rick Pedersen	AG-L1087194IST	AG.   1060212CDA		Faces	
Rio Hybert-Zack	AG-L1055229IST	AG-L1069212CPA		Forest	1
Ruby Gunter	AG-L1086709IST	AG.   100721FCDA		Faract	+
Samantha Marcotte	AG-L1083359IST	AG-L1087215CPA		Forest	
Scott Smethurst	AG-L1086440IST				
Spencer Hansen	AG-L1041281IST	AC 1109464660A		Forest	
Spencer Page	AG-L1083169IST	AG-L1084646CPA		Forest	
Tom Hauser	AG-L1086596IST				1
Tomasz Cunha	AG-L1086595IST				1
Tova Broadbent	AG-L1086714IST	AC 1400430000	1		1
Trevor Burrows	AG-L1082674IST	AG-L1084398CPA		Forest, Aquatic	ļ
Tyler Csolkovits	AG-L1084026IST		1		<b> </b>
Valentin Mitsui	AG-L1085741IST				1
Vaughn Monaghan	AG-L1070401IST	AG-L1071976CPA		Forest	ļ
Vince Wagner	AG-L1083493IST	AG-L1087222CPA		Forest	ļ
Will Dyer	AG-L1083592IST	AG-L1083801CPA		Forest	
Will Matthews	AG-L1083727IST				
· · · · · · · · · · · · · · · · · · ·		AG-L1061383CPA			

PROJECT:	Rinearson		CATEGO	DRY		TREATMENT TYPE	
CLIENT:	Columbia Restoration	Group	Forestry	Aquatics	Site Prep	Establishment	Stewardship
ADDRESS:	45.3774476, -122.615	1989					
DATE:	7/17/2023						
TIME IN:	6:30 A.M.						
TIME OUT:	2:30 P.M.					TOTAL ACRES:	10.38
Pre	escription (oz/ac or v/v	%)		Targets		Equipment & Method	Acres
A.	2% Garlon, 2% Aquane Competitor, 0.5% Hi-Li	-	Himalayan Blackberry,	Thistle, Teasel		Backpack, Spot Spray	7.36
В.	2% Garlon, 4% Aquane Competitor, 0.5% Hi-Li		English Ivy			Backpack, Spot Spray	3.02
C.							
D.							
			HERBI	CIDE INVENTORY	1		
G	ilyphosate	Herbio	cide Amount (oz)	Wate	r (gal or oz)	Purchase	d by:
	Reg #62719-324						
AquaNeat · El	PA Reg #228-365		216		54	ACFN	1
	Triclopyr						
Vastlan · EPA	Reg #62719-687						
Garlon 3A · El	PA Reg #62719-37		144			ACFN	1
Oth	er Herbicides						
Transline · EP	A Reg #62719-259						
Imazapyr 4 SL	· Reg# 81927-24						
	PA Reg #62719-519						
Poast · EPA R	eg #7969-58						
	ants/ Adjuvants						
Competitor			108			ACFN	1
Class Act							
Hasten							
	Colorant		26			1.051	A
Hi-Light Blue	руе		36	HER CONDITIONS	•	ACFN	71
			Relative Humidity	Temperature	Wind Speed - High	Wind Speed - Low	
Time	Condition	s	(%)	(°F)	(mph)	(mph)	Wind Direction
6:30 AM	Cloudy		72	62	0	0	SE
11:00 AM	Cloudy		55	70	5	0	WSW
2:00 PM	Partly Cloud	dv	47	73	5	0	NW
2.00 F IVI	CERTIFIED LICENS			,,	_	ED APPLICATOR NO.:	1444
	Spence					84646CPA	

Rin	earson		7/18/2023				
Applicators	Applicator IST #	CPA License #	Washington CPO	Categories	On Site ONLY?		
Aaron Fry	AG-L1086316IST			-			
Abigail Mortensen	AG-L1087265IST						
Addison Dillon	AG-L1082187IST	AG-L1083125CPA	104418	Forest, Aquatic			
Aissa Bennett	AG-L1074697IST	AG-L1076653CPA	103167	Forest, Aquatic			
Alex Maitland	AG-L1086710IST			·			
Andrew Robinson	AG-L1080655IST	AG-L1082758CPA		Forest			
Bethany Luth	AG-L1082379IST						
Bethany Morrow	AG-L1086748IST						
Brad Burke	AG-L1052766IST	AG-L1071184CPA		Forest			
Bryant Young	AG-L1040738IST	AG-L1046535CPA		Forest			
Camille Oster	AG-L1085533IST						
Carlos Estrada	AG-L1080870IST	AG-L1084136CPA		Forest			
Catherine Luecht	AG-L1086006IST						
Charly Yocius	AG-L1087065IST						
Coleman Krohn	AG-L1086040IST	AG-L1079092CPA	105150	Forest, Aquatic			
Crosby Buchstaber	AG-L1083172IST						
David Chiang	AG-L1054240IST						
Dion Brannan	AG-L1087066IST						
Edward Benkhin	AG-L1086713IST						
Elise Snortum	AG-L1081833IST	AG-L1087294CPA		Forest			
Ellie Winter	AG-L1086747IST						
Emily Martin	AG-L1061041IST	AG-L1064107CPA		Forest			
Erik Saastamo	AG-L1080198IST	AG-L1083719CPA		Forest			
Evan Stewart	AG-L1070504IST	AG-L1073266CPA		Forest			
Emily Stewart	AG-L1086314IST						
Emma Ortiz	AG-L1087197IST						
Ethan Yarish	AG-L1087487IST						
Greg Muller	AG-L1086712IST						
Hanna Horton	AG-L1086715IST						
Heather Cashmore	AG-L1063458IST	AG-L1064755CPA		Forest			
Ian Christie	AG-L1071763IST	AG-L1050813CPA	102752	Forest, Aquatic			
Isabella Lopez-Dion	AG-L1081480IST	AG-L1083844CPA		Forest			
Jack Delaney	AG-L1086968IST						
Jessica Riccardi	AG-L1086970IST						
Jill Tamborello	AG-L1074236IST	AG-L1084134CPA		Forest			
Katelyn Kompara	AG-L1085915IST						
Kobe Rossi	AG-L1083168IST	AG-L1084397CPA		Forest, Aquatic			
Kyle Peterson	AG-L1074677IST	AG-L1077904CPA	104877	Forest, Aquatic			
Kyle Sorensen	AG-L1063597IST	AG-L1065011CPA	102274	Forest, Aquatic			
Lauren Smith	AG-L1079006IST	AG-L1081083CPA	106759	Forest, Aquatic			
Mackenzie Lovelace	AG-L1074676IST	AG-L1076427CPA	103061	Forest, Aquatic			
Mallory Mitsui	AG-L1086102IST						
Madison Smith	AG-L1086749IST						
Malia Moritz	AG-L1086969IST						
Mark Dickison	AG-L1079023IST						
Mathew Lipski	AG-L1087020IST						
Matthew DeCosta	AG-L1087195IST						
Max Osofsky	AG-L1080639IST	AG-L1082476CPA	106342	Forest, Aquatic			
Megan Greene	AG-L1086317IST						
Michael Briggs	AG-L1086597IST						
Mille Isbell	AG-L1087021IST						
Mychal Hellie	AG-L1087317IST						
Nick Crosby	AG-L1082952IST	AG-L1083823CPA		Forest			

Nick Lewis	AG-L1045857IST	AG-L1049790CPA		Forest	
Owen Phinney	AG-L1059333IST	AG-L1063122CPA	100928	Forest, Aguatic	
Ricardo Peralta	AG-L1084270IST		100320	1 or est, riquatio	
Rick Pedersen	AG-L1087194IST				
Rio Hybert-Zack	AG-L1055229IST	AG-L1069212CPA		Forest	
Ruby Gunter	AG-L1086709IST				
Samantha Marcotte	AG-L1083359IST	AG-L1087215CPA		Forest	
Scott Smethurst	AG-L1086440IST				
Spencer Hansen	AG-L1041281IST				
Spencer Page	AG-L1083169IST	AG-L1084646CPA		Forest	
Tom Hauser	AG-L1086596IST				
Tomasz Cunha	AG-L1086595IST				
Tova Broadbent	AG-L1086714IST				
Trevor Burrows	AG-L1082674IST	AG-L1084398CPA		Forest, Aquatic	
Tyler Csolkovits	AG-L1084026IST				
Valentin Mitsui	AG-L1085741IST				
Vaughn Monaghan	AG-L1070401IST	AG-L1071976CPA		Forest	
Vince Wagner	AG-L1083493IST	AG-L1087222CPA		Forest	
Will Dyer	AG-L1083592IST	AG-L1083801CPA		Forest	
Will Matthews	AG-L1083727IST				
Zach Vande Slunt	AG-L1055689IST	AG-L1061383CPA	100807	Forest, Aquatic	

PROJECT: Rinearson			CATEGO	DRY		TREATMENT TYPE	
CLIENT: Columbia Restoration Group			Forestry	Aquatics	Site Prep	Establishment	Stewardship
ADDRESS	45.378249, -122.6163	08					
DATE	: 7/18/2023						
TIME IN:	6:30 A.M.						
TIME OUT	: 2:30 P.M.					TOTAL ACRES:	10.75
Pre	escription (oz/ac or v/v	%)		Targets		Equipment & Method	Acres
Α.	2% Garlon, 2% Aquand Competitor, 0.5% Hi-L		Himalayan Blackberry, Teasel, Tansy, Thistle, Reed Canary Grass, Pennyroyal			Backpack, Spot Spray	5.92
В.	2% Garlon, 4% Aquand Competitor, 0.5% Hi-L		English Ivy, Yellow Flag Iris			Backpack, Spot Spray	4.83
C.							
D.							
			HERBI	CIDE INVENTORY	1		
(	Slyphosate	Herbio	cide Amount (oz)	Wate	r (gal or oz)	Purchase	d by:
Rodeo · EPA I	Reg #62719-324						
AquaNeat · E	PA Reg #228-365		168 54 gal		ACFM		
	Triclopyr						
Vastlan · EPA	Reg #62719-687						
Garlon 3A · E	PA Reg #62719-37		136			ACFN	1
Oth	er Herbicides						
	A Reg #62719-259						
	L · Reg# 81927-24						
	PA Reg #62719-519						
Poast · EPA R	eg #7969-58						
2.1.							
	tants/ Adjuvants		72			4.053	4
Competitor			72			ACFN	1
Class Act							
Hasten							
	Colorant						
Hi-Light Blue			34			ACFN	1
	· , -			HER CONDITIONS	5	7.011	
Time	Condition	s	Relative Humidity (%)	Temperature (°F)	Wind Speed - High (mph)	Wind Speed - Low (mph)	Wind Direction
6:30 AM	Sunny		80%	56	4	0	NW
11:00 AM	Sunny		53%	71	8	0	NNW
2:00 PM	Sunny		36%	81	11	4	NW
	CERTIFIED LICENS	SED APPLICAT	OR:		CERTIFIED LICENS	ED APPLICATOR NO.:	
	Spence	er Page			AG-L10	84646CPA	

Rin	earson		8/7/2023		
Applicators	Applicator IST #	CPA License #	Washington CPO	Categories	On Site ONLY?
Aaron Fry	AG-L1086316IST				
Abigail Mortensen	AG-L1087265IST				
Addison Dillon	AG-L1082187IST	AG-L1083125CPA	104418	Forest, Aquatic	
Aissa Bennett	AG-L1074697IST	AG-L1076653CPA	103167	Forest, Aquatic	
Alex Maitland	AG-L1086710IST				
Ana Perez	AG-L1087321IST				
Andrew Robinson	AG-L1080655IST	AG-L1082758CPA		Forest	
Aspen Scott-Lewis	AG-L1087551IST				
Bethany Luth	AG-L1082379IST				
Bethany Morrow	AG-L1086748IST				
Brad Burke	AG-L1052766IST	AG-L1071184CPA		Forest	
Bryant Young	AG-L1040738IST	AG-L1046535CPA		Forest	
Camille Oster	AG-L1085533IST				
Carlos Estrada	AG-L1080870IST	AG-L1084136CPA		Forest	
Catherine Luecht	AG-L1086006IST				
Charly Yocius	AG-L1087065IST				
Coleman Krohn	AG-L1086040IST	AG-L1079092CPA	105150	Forest, Aquatic	
Corina Hajj	AG-L1087686IST				
David Chiang	AG-L1054240IST				
Dion Brannan	AG-L1087066IST				
Edward Benkhin	AG-L1086713IST				
Elise Snortum	AG-L1081833IST	AG-L1087294CPA		Forest	
Ellie Winter	AG-L1086747IST			. 0.000	
Emily Martin	AG-L1061041IST	AG-L1064107CPA		Forest	
Erik Saastamo	AG-L1080198IST	AG-L1083719CPA		Forest	
Evan Stewart	AG-L1070504IST	AG-L1073266CPA		Forest	
Emily Stewart	AG-L1086314IST	7.0 220702000.71		101030	
Emma Ortiz	AG-L1087197IST				
Fiona O'Loughlin	AG-L1087196IST				
Greg Muller	AG-L1086712IST				
Gryston Fonseca	AG-L1087320IST				
Hanna Horton	AG-L1086715IST				
Heather Cashmore	AG-L1063458IST	AG-L1064755CPA		Forest	
Ian Christie	AG-L1003458IST	AG-L1050813CPA	102752	Forest, Aquatic	
Isabella Lopez-Dion	AG-L1071703IST AG-L1081480IST	AG-L1030813CFA AG-L1083844CPA	102732	Forest	
Jack Delaney	AG-L1081480IST  AG-L1086968IST	AG-L1003044CFA		rorest	
Jessica Riccardi	AG-L1086970IST				
Jill Tamborello	AG-L1080970IST AG-L1074236IST	AG-L1084134CPA		Forest	
Kara Atiyeh	AG-L1074230IST AG-L1087323IST	AG-L1064134CFA		Forest	
Katelyn Kompara	AG-L1087323131 AG-L1085915IST				
	AG-L1087831IST				
Kathryn Pierce					
Kenneth Jones	AG-L1087683IST				
Kita Hastings	AG-L1087318IST	AC 11004307004	+	Famout Associate	+
Kobe Rossi	AG-L1083168IST	AG-L1084397CPA	404077	Forest, Aquatic	
Kyle Peterson	AG-L1074677IST	AG-L1077904CPA	104877	Forest, Aquatic	+
Kyle Sorensen	AG-L1063597IST	AG-L1065011CPA	102274	Forest, Aquatic	
Lauren Smith	AG-L1079006IST	AG-L1081083CPA	106759	Forest, Aquatic	
Mackenzie Lovelace	AG-L1074676IST	AG-L1076427CPA	103061	Forest, Aquatic	
Mallory Mitsui	AG-L1086102IST				
Madison Smith	AG-L1086749IST				
Malia Moritz	AG-L1086969IST				
Mark Dickison	AG-L1079023IST				
Mathew Lipski	AG-L1087020IST				
Matthew DeCosta	AG-L1087195IST				

Max Osofsky	AG-L1080639IST	AG-L1082476CPA	106342	Forest, Aquatic	
Michael Briggs	AG-L1086597IST				
Michael Weatherford	AG-L1087687IST				
Mille Isbell	AG-L1087021IST				
MJ Mirho	AG-L1087319IST				
Morgan Seitzer	AG-L1087550IST				
Mychal Hellie	AG-L1087317IST				
Nick Crosby	AG-L1082952IST	AG-L1083823CPA		Forest	
Nick Lewis	AG-L1045857IST	AG-L1049790CPA		Forest	
Owen Phinney	AG-L1059333IST	AG-L1063122CPA	100928	Forest, Aquatic	
Ricardo Peralta	AG-L1084270IST				
Rick Pedersen	AG-L1087194IST				
Rio Hybert-Zack	AG-L1055229IST	AG-L1069212CPA		Forest	
Ruby Gunter	AG-L1086709IST				
Samantha Marcotte	AG-L1083359IST	AG-L1087215CPA		Forest	
Scott Smethurst	AG-L1086440IST				
Spencer Hansen	AG-L1041281IST				
Spencer Page	AG-L1083169IST	AG-L1084646CPA		Forest	
Tom Hauser	AG-L1086596IST				
Tomasz Cunha	AG-L1086595IST				
Tennyson Schill	AG-L1087682IST				
Trevor Burrows	AG-L1082674IST	AG-L1084398CPA		Forest, Aquatic	
Tyler Csolkovits	AG-L1084026IST				
Tyler Nagel	AG-L1087322IST				
Valentin Mitsui	AG-L1085741IST				
Vaughn Monaghan	AG-L1070401IST	AG-L1071976CPA		Forest	
Vince Wagner	AG-L1083493IST	AG-L1087222CPA		Forest	
Will Dyer	AG-L1083592IST	AG-L1083801CPA		Forest	
Zach Vande Slunt	AG-L1055689IST	AG-L1061383CPA	100807	Forest, Aquatic	

PROJECT: Rinearson			CATEGO	DRY		TREATMENT TYPE	
CLIENT:	Columbia Restoration	Group	Forestry	Aquatics	Site Prep	Establishment	Stewardship
ADDRESS:	45.380558, -122.6151	79					
DATE:	8/7/2023						
TIME IN:	7:00 AM						
TIME OUT:	10:30 AM					TOTAL ACRES:	6.51
Pre	escription (oz/ac or v/v	%)		Targets		Equipment & Method	Acres
Α.	2% Garlon, 2% Aquane Competitor, 0.5% Hi-L		Himalayan Blackberry, Teasel, Tansy, Thistle, Reed Canary Grass, Pennyroyal, Purple Loosestrife			Backpack, Spot Spray	6.09
В.	4% Aquaneat, 1% Com 0.5% Hi-Light	petitor,	Yellow Flag Iris			Backpack, Spot Spray	0.42
C.							
D.							
			HERBI	CIDE INVENTORY	1		
G	ilyphosate	Herbio	ide Amount (oz)	Wate	r (gal or oz)	Purchased by:	
Rodeo · EPA F	Reg #62719-324						
AquaNeat · El	PA Reg #228-365		54 17.25 gal		ACFM		
	Triclopyr						
Vastlan · EPA	Reg #62719-687						
Garlon 3A · EF	PA Reg #62719-37		38			ACFN	1
Oth	er Herbicides						
Transline · EP.	A Reg #62719-259						
Imazapyr 4 SL	. · Reg# 81927-24						
	PA Reg #62719-519						
Poast · EPA Re	eg #7969-58						
	ants/ Adjuvants						
Competitor			19			ACFN	1
Class Act							
Hasten							
	Colorant						
Hi-Light Blue			11.5			ACFN	1
2.6 2.00	, -			HER CONDITIONS	5	7.C.I.I.	
Time	Condition	s	Relative Humidity (%)	Temperature (°F)	Wind Speed - High (mph)	Wind Speed - Low (mph)	Wind Direction
7:00 AM	Cloudy		81%	65	2	0	NE
9:00 AM	Cloudy		73%	68	6	0	NNW
10:00 AM	Cloudy		67%	69	5	0	NNW
	CERTIFIED LICENS	ED APPLICAT	OR:		CERTIFIED LICENS	ED APPLICATOR NO.:	
	Vince V	Vagner			AG-L10	87222CPA	

Rine	earson		8/14/2023		
Applicators	Applicator IST #	CPA License #	Washington CPO	Categories	On Site ONLY?
Aaron Fry	AG-L1086316IST				
Abigail Mortensen	AG-L1087265IST				
Addison Dillon	AG-L1082187IST	AG-L1083125CPA	104418	Forest, Aquatic	
Aissa Bennett	AG-L1074697IST	AG-L1076653CPA	103167	Forest, Aquatic	
Alex Maitland	AG-L1086710IST			•	
Ana Perez	AG-L1087321IST				
Andrew Robinson	AG-L1080655IST	AG-L1082758CPA		Forest	
Aspen Scott-Lewis	AG-L1087551IST				
Bethany Luth	AG-L1082379IST				
Bethany Morrow	AG-L1086748IST				
Brad Burke	AG-L1052766IST	AG-L1071184CPA		Forest	
Bryant Young	AG-L1040738IST	AG-L1046535CPA		Forest	
Camille Oster	AG-L1085533IST	====		1 01 030	
Carlos Estrada	AG-L1080870IST	AG-L1084136CPA		Forest	
Catherine Luecht	AG-L1086006IST	7.0 2200 12000.71		101030	
Charly Yocius	AG-L1087065IST				
Coleman Krohn	AG-L1086040IST	AG-L1079092CPA	105150	Forest, Aquatic	
Corina Hajj	AG-L1087686IST	AG 11073032CI A	103130	Forest, Aquatic	
David Chiang	AG-L105/080IST				
	AG-L1034240I3T AG-L1087066IST				
Dion Brannan	AG-L108/000131 AG-L1086713IST				
Edward Benkhin		AC 11007204CDA			
Elise Snortum	AG-L1081833IST	AG-L1087294CPA		Forest	
Ellie Winter	AG-L1086747IST	A.C. 1.40C.4407CDA			
Emily Martin	AG-L1061041IST	AG-L1064107CPA		Forest	
Erik Saastamo	AG-L1080198IST	AG-L1083719CPA		Forest	
Evan Stewart	AG-L1070504IST	AG-L1073266CPA		Forest	
Emily Stewart	AG-L1086314IST				
Emma Ortiz	AG-L1087197IST				
Fiona O'Loughlin	AG-L1087196IST				
Greg Muller	AG-L1086712IST				
Gryston Fonseca	AG-L1087320IST				
Hanna Horton	AG-L1086715IST				
Heather Cashmore	AG-L1063458IST	AG-L1064755CPA		Forest	
Ian Christie	AG-L1071763IST	AG-L1050813CPA	102752	Forest, Aquatic	
Isabella Lopez-Dion	AG-L1081480IST	AG-L1083844CPA		Forest	
Jack Delaney	AG-L1086968IST				
Jessica Riccardi	AG-L1086970IST				
Jill Tamborello	AG-L1074236IST	AG-L1084134CPA		Forest	
Kara Atiyeh	AG-L1087323IST				
Katelyn Kompara	AG-L1085915IST				
Kathryn Pierce	AG-L1087831IST				
Kenneth Jones	AG-L1087683IST				
Kita Hastings	AG-L1087318IST				
Kobe Rossi	AG-L1083168IST	AG-L1084397CPA		Forest, Aquatic	
Kyle Peterson	AG-L1074677IST	AG-L1077904CPA	104877	Forest, Aquatic	
Kyle Sorensen	AG-L1063597IST	AG-L1065011CPA	102274	Forest, Aquatic	
Lauren Smith	AG-L1079006IST	AG-L1081083CPA	106759	Forest, Aquatic	
Mackenzie Lovelace	AG-L1074676IST	AG-L1076427CPA	103061	Forest, Aquatic	
Mallory Mitsui	AG-L1086102IST				1
Madison Smith	AG-L1086749IST				1
Malia Moritz	AG-L1086969IST				
Mark Dickison	AG-L1080909131 AG-L1079023IST				
Mathew Lipski	AG-L1079023I3T AG-L1087020IST				
			+		+
Matthew DeCosta	AG-L1087195IST				

Max Osofsky	AG-L1080639IST	AG-L1082476CPA	106342	Forest, Aquatic	
Michael Briggs	AG-L1086597IST				
Michael Weatherford	AG-L1087687IST				
Mille Isbell	AG-L1087021IST				
MJ Mirho	AG-L1087319IST				
Morgan Seitzer	AG-L1087550IST				
Mychal Hellie	AG-L1087317IST				
Nick Crosby	AG-L1082952IST	AG-L1083823CPA		Forest	
Nick Lewis	AG-L1045857IST	AG-L1049790CPA		Forest	
Owen Phinney	AG-L1059333IST	AG-L1063122CPA	100928	Forest, Aquatic	
Ricardo Peralta	AG-L1084270IST	AG-L1087705CPA		Forest	
Rick Pedersen	AG-L1087194IST				
Rio Hybert-Zack	AG-L1055229IST	AG-L1069212CPA		Forest	
Ruby Gunter	AG-L1086709IST				
Samantha Marcotte	AG-L1083359IST	AG-L1087215CPA		Forest	
Scott Smethurst	AG-L1086440IST				
Spencer Hansen	AG-L1041281IST				
Spencer Page	AG-L1083169IST	AG-L1084646CPA		Forest	
Tennyson Schill	AG-L1087682IST				
Tom Hauser	AG-L1086596IST				
Tomasz Cunha	AG-L1086595IST				
Trevor Burrows	AG-L1082674IST	AG-L1084398CPA		Forest, Aquatic	
Tyler Csolkovits	AG-L1084026IST				
Tyler Fizek	AG-L1087685IST				
Tyler Nagel	AG-L1087322IST				
Valentin Mitsui	AG-L1085741IST				
Vaughn Monaghan	AG-L1070401IST	AG-L1071976CPA		Forest	
Vince Wagner	AG-L1083493IST	AG-L1087222CPA		Forest	
Will Dyer	AG-L1083592IST	AG-L1083801CPA		Forest	
Zach Vande Slunt	AG-L1055689IST	AG-L1061383CPA	100807	Forest, Aquatic	

PROJECT: Rinearson			CATEGO	DRY		TREATMENT TYPE	
CLIENT	Columbia Restoration	Forestry	Aquatics	Site Prep	Establishment	Stewardship	
ADDRESS:	45.380558, -122.6151	79					
DATE:	8/14/2023						
TIME IN:	5:30 AM						
TIME OUT:	11:00 AM					TOTAL ACRES:	3.02
Pre	escription (oz/ac or v/v	%)		Targets		Equipment & Method	Acres
A.	1% Imazapyr, 1% Rodeo, 1% Hasten, 0.5% Hi-Light		Purple Loosestrife, Pennyroyal, Yellowflag Iris		Backpack, Spot Spray	3.02	
В.	2% Garlon, 2% Hasten Light	, 0.5% Hi-	Pennyroyal			Backpack, Spot Spray	3.02
C.							
D.							
			HERBI	CIDE INVENTORY	1		
	Slyphosate	Herbi	cide Amount (oz)	Wate	r (gal or oz)	Purchased by:	
	Reg #62719-324		10	34.5 gal		ACFM	
	PA Reg #228-365						
	Triclopyr						
	Reg #62719-687						
	PA Reg #62719-37		72			ACFN	1
	er Herbicides						
	A Reg #62719-259						
	· Reg# 81927-24		10			ACFN	1
	PA Reg #62719-519						
Poast · EPA R	eg #7969-58						
Surfact	ants/ Adjuvants						
Competitor	untaj Aujuvanta						
Class Act							
Hasten			82			ACFN	1
							•
	Colorant					•	
Hi-Light Blue	dye		23			ACFM	
				HER CONDITION			
Time	Condition	s	Relative Humidity (%)	Temperature (°F)	Wind Speed - High (mph)	Wind Speed - Low (mph)	Wind Direction
6:00 AM	Sunny		65%	69	2	0	N
8:00 AM	Sunny		61%	73	2	0	N
10:00 AM	Sunny		44%	80	8	0	NW
	CERTIFIED LICENS	ED APPLICAT	ΓOR:		CERTIFIED LICENS	ED APPLICATOR NO.:	
	Max O	sofsky			AG-L10	82476CPA	
1							