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Rinearson Natural Area Restoration
Year 6 (2024) Monitoring Report



prepared for
Columbia Restoration Group, LLC

prepared by

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December 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**: December 23, 2024
Monitoring Year: 6	
Date Restoration was Completed: Fall 2018	**Planting:** Fall 2018
Date(s) of Data Collection: March through November 2024	

	Performance Standards (required by the HDP)	Fully Met?	Comments/Reason for Shortfall
1	**Geomorphic:** 100% of installed large wood pieces will be retained downstream of the remnant pond outlet.	N/A	No habitat structures survey was required for Year 6, per the HDP.
2	**Geomorphic:** 80% of placed large wood pieces and structures will be retained upstream of the remnant pond outlet.	N/A	No habitat structures survey was required for Year 6, per the HDP.
3	**Riparian/Upland:** 80% of placed terrestrial habitat structures will be retained within upland and riparian areas.	N/A	No habitat structures survey was required for Year 6, per the HDP.
4	**Active Channel Margin:** ACM acreage will not decrease by more than 10% compared to as-built drawings.	N/A	No cross-section survey was required for Year 6, per the HDP.
5	**Fish Passage:** Jump height will not exceed 6 inches.	Yes	No drops in the low flow channel water surface were observed during the monitoring period. Localized flow obstructions do occur at six 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 will discharge continuously.	Yes	During the monitoring period Rinearson Creek was perennial and flowed continuously on the surface through the entire project area. This standard is met.
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).	N/A	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. There were no storm events that produced a stage height at or above 17.5ft NAVD88, and therefore no results can be reported for this metric.

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).	N/A	No storm event in the 2024 monitoring season resulted in the Willamette River reaching 21.76 feet NGVD29 at the USGS gauge, and a cross sections survey was not required for Year 6.
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 4%; the site does not meet 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 51%, largely due to high cover of jewelweed (Impatiens capensis) and some reed canarygrass. This standard is not met.
12	**Emergent Marsh - Diversity:** At least 5 species of herbaceous plants that provide at least 5% cover and are present in at least 10% of the plots.	**No**	A total of seven native species were sampled, but only two (Typha latifolia and Urtica dioica) had any plots with more than 5% cover, but no more than once each.
13	**Riparian Forest Restoration – Woody Species Density:** At least 1,200 living native stems/ac in Y2–5.	Yes	Density of woody vegetation was 3,284 living native stems per acre and meets the performance standard, and while this is an increase from Year 5, it remains significantly lower than the count in 2019 (5,432).
14	**Riparian Forest Restoration – Invasive Cover:** 30% or less cover by invasive herbaceous species Y2–5. This changes to ≤20% by non-native herbaceous species and ≤10% cover by non-native shrubs by Year 7 and ≤20% cover by non-native vegetation in Year 10.	Yes	Mean invasive herb cover was 18%. This standard is met. Mean non-native cover for 2024 sampling is estimated to be 12% (CI80 = 5-18%; CI = 4.8) While the performance standard does not clarify if non-native includes invasive plants, which are also non-native, the cover of both combined still meets the standard with a total of 30% cover.
15	**Riparian Forest Restoration – Shrub Species Richness:** At least 5 native shrub species present in Y2–5.	Yes	12 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	5 native tree species were present, where the most abundant species was black cottonwood. This standard is met.
17	**Riparian Forest Enhancement – Invasive Cover:** 30% or less cover by invasive herbaceous species Y2–5. The standard changes in Year 10 to ≥80% cover by native woody species and ≥10% cover by native herbaceous species.	Yes	Mean non-native herb was 15%, within the maximum threshold and a considerable increase from 3% in Year 5 (2023). The mean invasive herbaceous cover is currently estimated to be 31% (CI80 = 20-43%; CI = 8.8), also an increase from 21% in Year 5 (2024). This standard is met.
18	**Upland/Riparian Forest Invasive – Invasive Cover:** 30% or less cover by invasive herbaceous species Y2–5. This changes in Year 7 to ≤20% cover by non-native herbaceous species and ≤10% cover of non-native woody species. In Year 10, it changes again to ≤20% cover by non-native herbaceous and woody species combined.	Yes	Mean invasive herbaceous was 28%, which is slightly up from 25% in Year 5. The standard is met.

Remedial Work Recommended Yes ☒ 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?	Environmental eDNA sampling was performed for the 2024 monitoring efforts. Six native Willamette River system taxa were identified and included dace, sucker, Northern pikeminnow, coho salmon, three-spined stickleback, and sculpin. eDNA sampling does not give information for density or population size of the taxa found.
2.	What birds are using the site? Do changes in the bird diversity and abundance indicate habitat improvement?	Bird Species were not monitored for Year 6, per the HDP.
3	How much time are eagles spending on-site and vicinity and for which activities (perching, nesting)? Which features (riparian, upland)?	Bald eagles were not monitoring for Year 6, per the HDP.
4	Are mink using the site (presence/absence)? Has mink abundance at the site increased?	Mink were not monitoring for Year 6, per the HDP.

5	Is water quality (temp, DO, pH, cond.) improving over time?	For Year 6, water quality was monitored every other month (four times) from May through November. The Year 5 (2023) data was only collected in July. The 2024 data show that conditions for water temperature, DO, pH, and conductivity were relatively similar to those measured at the site in previous efforts. The data collected for temperature, DO, and pH at some of the monitoring stations do not meet Oregon water quality standards for those parameters. Temperatures in the Remnant Pond are above the standard for most of the summer season (May-September). Five pH measurements (four of them measured in June) were outside of the standard range and were located between Meldrum Channel (above the lower beaver dam) and the Remnant Pond. Likely due to photosynthetic activity of aquatic vegetation, DO levels in August and November at stations between the Meldrum Lagoon and the lower reach of the Emergent Wetlands Meander Channel were below the Oregon standard of a minimum of 6.5 mg/L for cold water aquatic life. However, many of these low DO measurements occurred when water levels at these stations were low, and therefore could have hindered reliable data collected based on equipment restraints. In general water quality standards are being met but could be improved if shading increases through the emergent marsh and along the margins of the open water areas.
6	Has the benthic macroinvertebrate community improved (species abundance and diversity/richness)	Total taxa richness increased markedly in 2024, particularly in the engineered riffle (increase of about 50%). The metric, percent total tolerant by abundance, also increased, though not significantly. The most significant change overall at the site was the increasing dominance of a single taxon in the engineered riffle. The freshwater isopod, Lirceus fontinalis, an aquatic sowbug, made up 72.63% of the abundance in 2024. The highly tolerant and invasive New Zealand mud snail, Potamopyrgus antipodarum, continues to be present in the emergent marsh and control areas of the site though its abundance has not increased substantially since 2020.

TABLE OF CONTENTS

1.0 Introduction – Monitoring Overview 1

1.1 Project Area 1
1.2 Photo Monitoring 1

2.0 Geomorphic and Structural Habitat Monitoring 1

2.1 Habitat Structures and Large Woody Debris 1
2.2 Active Channel Margin (ACM) 1
2.3 Fish Passage 1
2.4 Hydrology and Hydraulics 2

3.0 Vegetation Monitoring 3

3.1 Emergent Marsh (EmMa) 5
3.2 Riparian Forest RestORation Area (RFR) 6
3.3 Riparian Forest Enhancement Area (RFE) 7
3.4 Upland/Riparian Forest Invasive Management Area (URFI) 9

4.0 Fish and Wildlife Monitoring 10

4.1 Fish Monitoring 10
4.2 Breeding Birds 12
4.3 Bald Eagles 12
4.4 Other Species 12
4.5 Mink 12

5.0 Water Quality Monitoring 13

5.1 Results 14
5.2 Temperature 17
5.3 Dissolved Oxygen (DO) 20
5.4 pH 21
5.5 Conductivity 22

6.0 Benthos Monitoring 22

7.0 Adaptive Management 23

7.1 Establishment of Streamside Vegetation 23

8.0 REFERENCES 24

List of Figures

Figure 1-1: Project Site and Photo Monitoring Map

Figure 1-2: through 1-9: Example Comparison Photos between Years 3 and 5

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

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

Figure 2-6: Maximum Inundation Map for 2023

Figure 3-1: Permanent Vegetation Monitoring Points

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

Figure 4-1: Collecting eDNA 1

Figure 4-2: Permanent eDNA Monitoring Points

Figure 5-1: Water Quality and Benthic Monitoring Map

Figure 5-2: Water Temperature Monitoring Year 6 (2024)

Figure 5-3.1: Upper Site 7-Day-Average Maximum Water Temperature for Year 6 (2024)

Figure 5-3.2: Remnant Pond Outlet 7-Day-Average Maximum Water Temperature for Year 6 (2024)

Figure 5-4: Algae growth in the remnant pond on August 23, 2024

Figure 6-1: Permanent Benthic Invertebrates Monitoring Points

List of Tables

Table 3-1: Vegetation Sample Plot Summary

Table 5-1: Water Quality Monitoring Locations

Table 5-2: Summary of Water Quality Results

List of Appendices

Appendix A: Photo Monitoring
Appendix B: Fish Passage Monitoring Data and Notes
Appendix C: Vegetation Monitoring Data
Appendix D: Fish Monitoring Data
Appendix E: Benthic Invertebrate Data
Appendix F: Equipment Calibration Certificates

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 6 (2024) monitoring at the Rinearson Natural Area Restoration Project. This monitoring is the sixth year 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, 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, Year 3 monitoring was performed by Environmental Science Associates (ESA) in 2021, Year 4 was incomplete, and Year 5 was completed by Waterways in 2023.

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. Similar to Year 5, the locations used for photo monitoring for Year 6 (2024) were consistent with the Year 3 monitoring points, which are shown in **Figure 1-1**.

Appendix A contains the compilation of the photo monitoring efforts from May 2024 – September 2024 as a digital appendix. **Figures 1-2 through 1-9** show example comparison photos between monitoring Years 5 and 6.



Project Site and Photo Monitoring Map

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FIGURE 1-1



***Figure 1-2**: PP20 (May 4, 2023) looking east into emergent wetland with meander channel.*



***Figure 1-3**: PP20 (May 17, 2024) looking east into emergent wetland with meander channel.*



***Figure 1-4**: PP15 (July 12, 2023) looking south into the emergent wetland area.*



***Figure 1-5**: PP15 (July 23, 2024) looking south.*



***Figure 1-6**: PP5 (July 12, 2023) looking east and upstream into the lagoon/historic creek outlet.*



***Figure 1-7**: PP5 (July 23, 2024).*



***Figure 1-8**: PP3 (August 21, 2021) looking south and upstream at the roughened channel.*



***Figure 1-9**: PP3 (August 21, 2023).*

2.0 GEOMORPHIC AND STRUCTURAL HABITAT MONITORING

2.1 HABITAT STRUCTURES AND LARGE WOODY DEBRIS

Habitat structures and large woody debris were not monitored for Year 6, as indicated in the HDP.

2.2 ACTIVE CHANNEL MARGIN (ACM)

The ACM was not measured or analyzed for Year 6, as indicated in the HDP.

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. After the Year 5 monitoring efforts, NOAA requested a more quantitative rather than qualitative approach to fish passage monitoring, including stadia rod measurements to measure water depth along the entire project area, including the roughened channel at equally spaced points.

Figure 2-1 shows a map of the fish passage observation points where data was collected during the two field surveys performed by Waterways biologist, John Dvorsky on July 24, 2024 and October 2, 2024. A summary of all data and field notes from the two surveys are included in **Appendix B, Table 2-1**. Field observations and measurements reveal that there have not been any significant changes, migration, or erosion of the roughened channel. The most significant changes were those related to the establishment of or changes in existing beaver dams, which affected the extents of backwater conditions upstream of the dams. Six (6) beaver dams – two larger (at top of Meldrum Bar Channel and Remnant Pond Outlet) and four smaller (along the Emergent Wetlands Meander Channel) have been established 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 being discharged from the remnant pond outlet. During the two fish passage



Fish Passage Monitoring Map

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FIGURE 2-1

surveys, 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. Even when water levels were low in the summer months, the project area experienced flow through and beneath the beaver dams, with visible flows along the entire length of the thalweg. The surveys took place during a low tide, and therefore the depths in the lower areas of the site were, on average, 0.5 feet. Water levels below the roughened channel fluctuate with the tide cycles. Based on the Year 6 measurements and observations, no passage barriers were identified.

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 March 28, 2024. These loggers remained on site through the peak snowmelt season and were removed on July 23, 2024. 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 2-2** for images of the installed loggers).



Figure 2-2: *Waterways water level loggers installed on site in March 2024.*

Per the as-built records, the top of the engineered channel was constructed at an elevation of 16.85 feet. Based on the Year 6 (2024) field observations, the roughened channel grade has remained relatively 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 occurred once in Year 6 during a storm lasting about 10 days from January 19, 2024 through February 1, 2024, as shown in **Figure 2-3**. However, the Waterways loggers were not installed until March 28, 2024. For the length of the monitoring period (March 28-November 6), the water levels in the Willamette River at the project site never exceed 15 feet (NAVD88).

The Waterways logger in the upper reach of the project site on Rinearson Creek reported higher water surface elevations than the pond outlet logger (see **Figure 2-3)**. The upper site recorded an average water surface elevation of approximately 22.5 feet (NAVD88), while the pond outlet logger had an average of 18.57 ft. This difference is partially due to the slight slope of the channel, but primarily because of the additional beaver dams that have formed at the upper portion of the meander channel (see **Figure 1-1**), which have caused more backwater conditions upstream at the logger location. In comparison to the Year 5 water level data, the Year 6 (2024) water surface elevations are higher than those in 2023, which had an average water surface elevation of 21.8 ft at the upper site location.

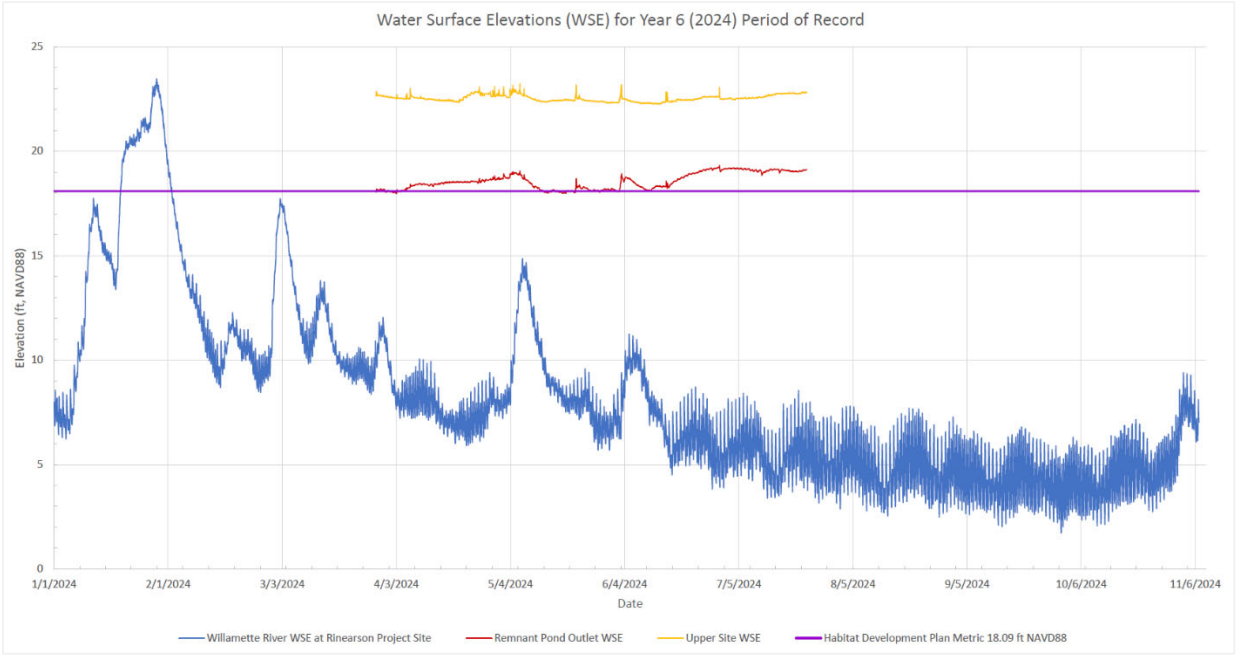
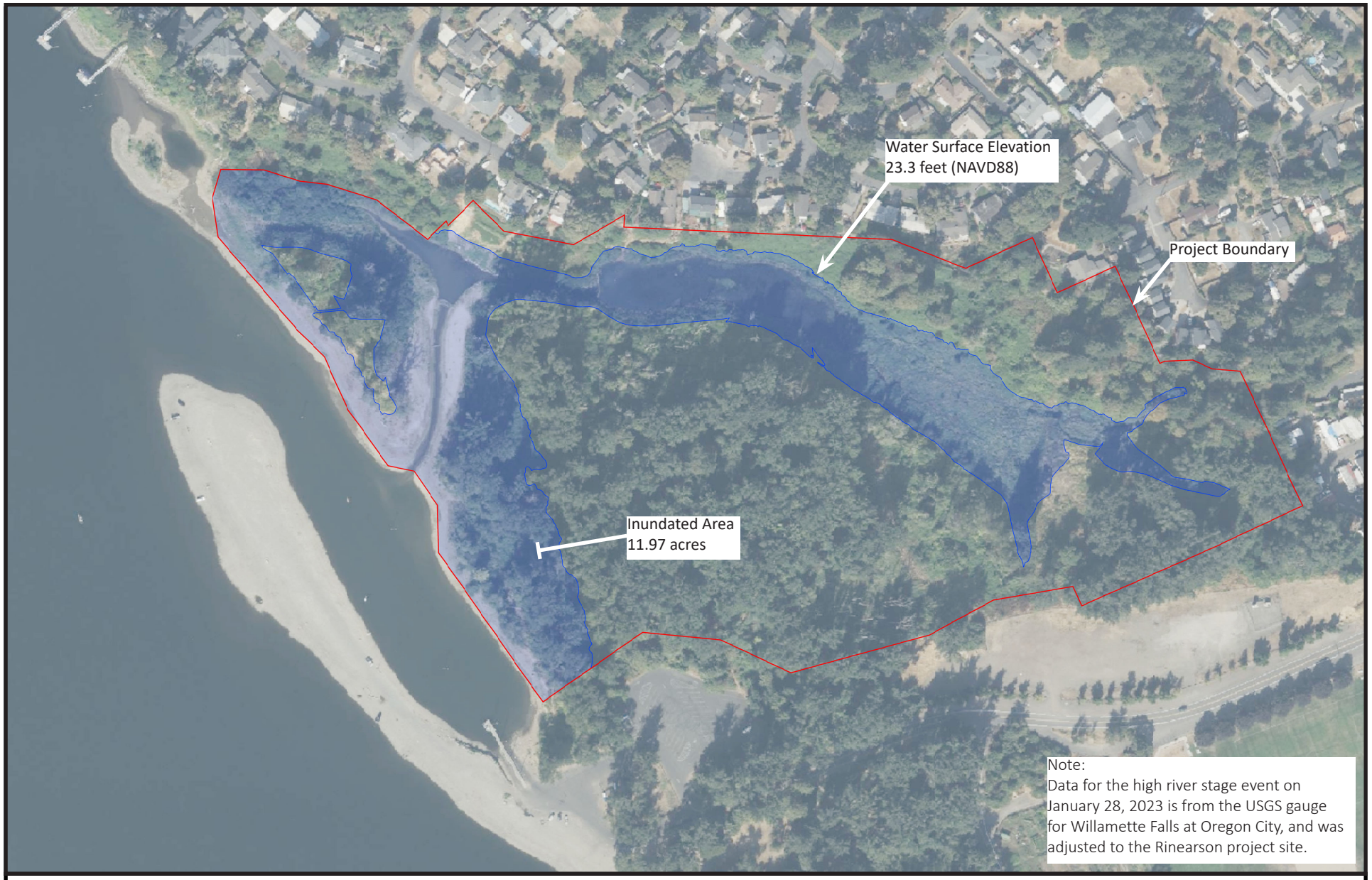


Figure 2-3: *Water Surface Elevations for 2024 (Year 6) Period of Record*

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. No storm event occurred during the Waterways data collection, but an analysis was performed for the January 2024 storm that produced a maximum river stage elevation of 23.3 feet (NAVD88), for which the inundation boundary can be seen in **Figure 2-4**. The inundated area of 11.97 acres meets the HDP performance standard.

3.0 VEGETATION MONITORING

The following details the findings of 2024 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



FIGURE

2-4

Maximum Inundation Map for 2024

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Habitat Services on August 16, 29, and September 12-13, 2024. All vegetation monitoring data can be found in **Appendix C**.

A total of 65 1-m^2 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 a map of the vegetation monitoring points. 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 from the sample point, the "top left" corner of the quadrat is placed on the sample point, aligning with the bearing of 0°. The "bottom left" corner is aligned directly south, or at a bearing of approximately 180°. 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, 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^2 plot in which all living woody plants were identified and counted in order to determine woody plant density.



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 C**. 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



FIGURE **3-1**

PERMANENT VEGETATION **MONITORING POINTS**

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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.

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 EmMa #10

Native Species: The cover of native species, as defined by the City of Portland Native Plant List, in the herbaceous stratum is 30% or greater for Years 2–5. In Year 7, the standard increases to 50% or greater and to 70% or greater in Year 10.

Result: The performance standard is not met. The mean herbaceous cover across the Emergent Marsh plots is calculated to be approximately 4% (CI80 = 1-6%; CI = 1.8), down significantly from the previous year's estimate of 15%. It is important to note that seven species were observed, an increase from four in the previous year. Despite this increase in overall diversity, most plants averaged less than 1% cover. Most notably, soft rush (Juncus effusus) was observed in the area in 2023 as the dominant plant with 8% cover but was not observed in any plots this year. This may be due to the slight increase in invasive and non-native vegetation, or due to accidental removal during invasive maintenance.

Performance Standard EmMa #11

Invasive Species: Less than or equal to 20% cover by invasive herbaceous species in Years 2 through 10.

Result: The performance standard is not met. The mean invasive herbaceous cover across the Emergent Marsh plots is estimated to be 51% (CI80 = 41-61%; CI = 8.0), a small increase from the previous year's estimate of 42%. This is largely due to the high cover of jewelweed (Impatiens capensis) of 33%, and to a lesser degree, reed canarygrass (Phalaris arundinacea) with 11% cover. Both of these species aggressively colonize and will need to be more heavily managed if performance standards for invasive vegetation are to be met in the future. Removal of jewelweed can be easier than removal of reed canarygrass since it is a broadleaf annual. Chemical treatment prior to flowering is often sufficient enough to provide moderate control. Additionally, reducing the cover of 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), bull thistle (Cirsium vulgare), and bittersweet nightshade (Solanum dulcamara).

Himalayan blackberry (Rubus armeniacus) cover is an estimated 7% (CI80 = 0-14%; CI = 5.5), and butterfly bush (Buddleja davidii) was not observed at all. No invasive trees were observed. Together, cover of all invasive species is estimated to be 58% in Emergent Marsh plots. While it appears that management of

invasive vegetation was undertaken following 2023 recommendations, areas denuded by removal of target plants provided ample space for colonizing annuals like jewelweed to take hold. Continued management of the area will be a crucial component of increasing the average cover of native vegetation in these plots and may require reseeding or planting of native plugs.

Performance Standard EmMa #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 met. A total of seven native herbaceous plants were sampled in the plots, as outlined under results for Performance Standard #10, exceeding the minimum requirement of five. Of these seven, only two (Typha latifolia and Urtica dioica) had any plots with more than 5% cover, but no more than once each.

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: While not required for the current year, the performance standard is met. Woody stem density is estimated to be 3,284 living native stems per acre, an increase from the previous year's estimate of 2,037. This average exceeds the performance standard requirement of a minimum of 1,200 stems per acre, it is still significantly lower than the 5,432 living native stems counted during 2019 (Year 3) monitoring. Four plots (RFR 4, 9, 10, 16) were moved following the approval of the Committee, after previously being determined to be in locations that were poor representations of RFR conditions, likely contributing to the improvement in woody stem density. Despite this, some areas remained to have thick cover (>50%) with Himalayan blackberry, which competes strongly with saplings and shrubs as well as native groundcover.

Performance Standard #14

Invasive Species: The cover of invasive herbaceous species is 30% or less in Years 2 through 5. This changes to ≤20% by non-native herbaceous species and ≤10% cover by non-native shrubs by Year 7 and ≤20% cover by non-native vegetation in Year 10.
Result: The performance standard is met. Mean invasive cover for 2024 sampling is estimated to be 18% (CI80 = 10-26%; CI = 6.4), meeting the performance standard. This value represents no change from the previous year's estimate of 18% (CI80 = 11-26%; CI = 7.5). Mean non-native cover for 2024 sampling is estimated to be 12% (CI80 = 5-18%; CI = 4.8) While the performance standard does not clarify if non-native includes invasive plants, which are also non-native, the cover of both combined still meets the standard with a total of 30% cover. As it stands now, the performance standard will not be met in Year 7 if both invasive and non-native herbaceous vegetation is not reduced. Keeping non-native and invasive vegetation under control will be crucial in maintaining adequate habitat for native woody and herbaceous species. Invasive herbaceous species present were dominated by jewelweed, English ivy (Hedera helix), and reed canarygrass, as well as some patches of nine other invasive species. Invasive woody species included one plot with English holly (Ilex aquifolium), but was dominated by Himalayan blackberry, which accounted for an average of 13% cover in all RFR plots. Aggressive management of all invasives for the following three years before Year 10 monitoring will be crucial to ensure native woody

and herbaceous plants can survive, as well as keep the cover within the range of performance standard #14.

Performance Standard #15
Shrub Species Richness: At least five native shrub species present in Years 2 through 5.
Result: While not required for the current year, the performance standard is met. Between the 1-m2 herbaceous and 20-m2 woody plots, twelve shrub species were observed. The most abundant of any species is Hooker's willow (Salix hookeriana) with nearly 12% cover, followed by sitka willow (Salix sitchensis) with 8%. Detailed data of other species sampled in the RFR plots can be found in **Appendix C**.

Performance Standard #16
Tree Species Richness: At least three native species present in Years 2 through 5.
Result: While not required for the current year, the performance standard is met. Between the 1-m2 herbaceous and 20-m2 woody plots, five native tree species were observed. The most abundant of any species is red alder (Alnus rubra) with 7%, followed by black cottonwood (Populus balsamifera var. trichocarpa), with an average cover of nearly 5%. Detailed data of other species sampled in the RFR plots can be found in **Appendix C**.

Performance Standard RFR #5, #7
Native Woody and Herbaceous Species Cover: The cover of native woody species is ≥55% by Year 7. The standard changes in Year 10 to ≥80% cover by native woody species and ≥10% cover by native herbaceous species.
Result: This performance standard was not analyzed in previous monitoring but will be addressed in the 2025 monitoring results. Using the cover calculated in the 1-m2 plots, cover of all native woody species in the RFR area is estimated to be 65% (CI80 = 53-77%; CI = 9.4), exceeding the minimum requirement of 55% by Year 7. If this trend continues, it is likely that the 80% minimum native woody cover could be met by Year 10 monitoring in 2028.

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. This changes in Year 7 to ≤20% by non-native herbaceous species and <10% cover of non-native woody species. The standard changes again in Year 10 to ≤20% cover of non-native herbaceous and woody combined.
Result: While this performance standard does not apply to Year 6 specifically, the standard changes from ≤30% to ≤20% in Year 7 and is likely to be met. The mean non-native herbaceous cover is currently estimated to be 15% (CI80 = 9-21%; CI = 4.8), a considerable increase from 3% in Year 5 (2024). The mean invasive herbaceous cover is currently estimated to be 31% (CI80 = 20-43%; CI = 8.8), also an increase from 21% in Year 5 (2024). Combined, there is an estimated 46% non-native and invasive cover. If only non-native species are considered, the performance standard is met—though it does represent a considerable change from the previous year. Bird's foot trefoil (Lotus corniculatus) accounted for a large jump in these plots, with an estimated 7% cover this year compared to none observed in plots in 2023. This is likely a result of the timing of monitoring, which occurred relatively later in the season when compared to 2023 monitoring.

No non-native woody species were sampled, although English hawthorn (Crataegus monogyna) and English holly (Ilex aquifolium) were both observed within the RFE area. Given these observations and

the results, it is reasonable to assume that the actual non-native cover is not 0% but will remain well below the 10% threshold of the performance standard in Year 7 (2025) monitoring.

The invasive species that accounted for the majority of this increase is jewelweed, with an estimated 10% cover—which was not detected during 2023 monitoring. This is likely due to timing of monitoring rather than a new infestation since jewelweed is considered a more typical late growing annual. As discussed in the results from performance standard #11, jewelweed is an aggressively colonizing annual that can readily grow when soils are denuded by disturbance such as invasive removal. Management of jewelweed should occur prior to flowering to minimize further establishment in the future. It is also worth noting that data for this category was extremely skewed by five of eighteen plots with extremely high invasive cover ≥80%, while eleven other plots were less than≤16%. Only one plot fell within the confidence interval, resulting in a majority of values that would be considered outliers. This is indicative of a study design that potentially does not have sufficient plots to determine the actual average of RFE areas. Future efforts to effectively monitor may benefit from altering the study design by either moving or adding more plots. Detailed data of other species sampled in the RFE plots can be found in **Appendix C**.

The following performance standards A, B, and C for the RFE habitat are not required by the HDP but have been included in previous reporting as well provide greater understanding to the overall trends in 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 eight native herbaceous species were found in sample plots, only three plots contain two native herbaceous species with ≥5% cover. Two other plots contain just one species with ≥5% cover. As mentioned in the results for performance standard RFE #1 - #3, non-native and invasive species coverage are 15% and 31% respectively, an additional 46% cover is accounted for by bare ground. These values would seem to indicate that there is a large amount of competition for native plants, which are more likely to colonize the abundant available ground.

Performance Standard B
Shrub cover will include at least five native species with 5% cover present in at least 10% of monitored plots.
Result: While six native shrub species were sampled, only one species—red osier dogwood (Cornus alba)—has at least 5% in at least 10% of the RFE plots. Similar to the above findings with native herbaceous cover, this low cover of shrubs is likely partially explained by the high coverage of non-native herbaceous species, invasive shrub and herbaceous species, and bare ground.

Performance Standard C

Tree cover will include at least three native species with 10% cover present in at least 10% of monitored plots.
Result: While six native species of trees were sampled, only three species—Oregon ash, (Fraxinus latifolia) black cottonwood, and Douglas fir (Pseudotsuga menziesii)—have ≥5% cover in ≥10% of plots. Despite this, overall average cover remains low. While the goal of this 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 ≥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. This changes in Year 7 to ≤20% cover by non-native herbaceous species and ≤10% cover of non-native woody species. In Year 10, it changes again to ≤20% cover by non-native herbaceous and woody species combined.

Result: The mean invasive herbaceous cover is estimated to be 28% (CI80 = 15-40%; CI = 9.9), slightly up from 25% in Year 5 monitoring. Invasive species found in the greatest abundance include English ivy and old man's beard (Clematis vitalba). English ivy increased from approximately 8% to 13%, reed canarygrass decreased from 11% to 8%, and most notably old man's beard increased significantly from 1% to nearly 8%. Detailed data of other species sampled in the URFI plots can be found in **Appendix C**.

Regarding non-native woody species, this performance standard was not previously addressed as it is not required until 2025 (Year 7) monitoring. Using data from 2024 is likely to provide some insight into what to expect and is being included here. Two non-native woody species, English walnut (Juglans regia) and an unknown ornamental cherry (Prunus sp.), were observed during sampling with an estimated coverage of 1% (CI80 = 0-3%; CI = 1.2). Given this result, it is highly unlikely that the cover will exceed 10% even by Year 10 monitoring. Regardless, it is recommended that these species—particularly English walnut—be targeted for removal as they both reproduce via abundant fruits that are easily dispersed by wildlife.

The following performance standards D, E, and F for the URFI habitat are not required by the HDP but have been included in previous reporting as well provide greater understanding of the overall trends in the area. 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: Seven native herbaceous plants are present in 66% of plots sampled, an increase from the previous year's count of four native herbaceous species occurring in 61% of the plots. None of these species occurred with ≥5% cover in ≥10% of the monitored plots. Manroot (Marah oregana) occurring in 2 plots with ≥5% cover, and three others occurred a single time with ≥5% cover: shade phacelia (Phacelia nemoralis), sword fern (Polystichum munitum), and stinging nettle (Urtica dioica). Overall cover of native herbaceous plants is an estimated 3% and likely due to the high cover of invasive herbaceous plants of approximately 28%, which is dominated by English ivy. Non-native herbaceous vegetation on the other hand, only averaged about 2% and does not appear to be out-competing native vegetation. With bare ground dominating the groundcover at an estimated 60%, there is an opportunity to reseed the area with native seed and keep non-natives from colonizing these available areas through continued aggressive management.

Performance Standard E

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

Result: Six native shrubs are present in 83% of plots sampled, whereas last year the same number of species were observed in in 67% of plots sampled. None of these species occurred with ≥5% cover in

≥10% of the monitored plots. Two plots had two species each with ≥5% cover: FRE 2 with trailing blackberry (Rubus ursinus) and snowberry (Symphoricarpos albus), and RFE 3 with snowberry and beaked hazel (Corylus cornuta). Overall cover of native shrub species is an estimated 21%. Similar to the above standard for native herbaceous species, this is likely due to the high cover of invasive herbaceous species and bare ground. Replanting of shrubs may be beneficial, as would the continued aggressive management of invasive vegetation.

It is worth noting here that Himalayan blackberry was previously estimated to be 13% cover and is now as estimated 3%. This change, paired with the increase in bare ground, is a strong indicator that management of Himalayan blackberry has been productive in reducing invasive shrub cover. By pairing that aggressive management with replanting and reseeding, all native plants now have an opportunity to get a foothold.

Performance Standard F
Tree cover will include at least three native species with 10% cover present in at least 10% of monitored plots.
Result: Four native tree species are present in 92% of plots sampled, an increase from last year where three species were observed in in 83% of plots sampled. None of these species occurred with ≥5% cover in ≥10% of the monitored plots. One plot had two species each with ≥5% cover—URFI 6 with big leaf maple (Acer macrophyllum) and black cottonwood (Populus trichocarpa). Overall cover of native tree species is an estimated 41%. A minimum woody cover of 80% is required by Year 10, which is likely to be met with the combined native tree and shrub cover if current trends continue and the above recommendations for URFI areas are undertaken.

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 beaver pond during the monitoring period. In 2021, seining was not permitted because juvenile salmonids were caught in seine nets during the 2020 surveys, and non-contact 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 was recommended for future surveys and a proposed methodology for conducting eDNA analysis was submitted as part of an addendum to the 2020



Figure 4-1: *Collecting eDNA 1*

monitoring report. In 2024, eDNA sampling was approved and performed (see **Figure 4-1**). Samples were collected in 4 locations (**Figure 4-2**) on June 17th, 2024. Filtered samples were collected with kits developed by Jonas Ventures and sent to them for qPCR analysis. Sample 1 was collected from the inlet stream (Rinearson Cr.) to the beaver pond. The water was clear and cool, originating from shaded areas upstream. Sample 2 was collected in the nearshore on the south side of the pond. The pond was warm and filled with flocculant and filamentous algae. Sample 3 was collected from the roughened channel which drains the pond. Since 2020, the channel has become covered by willow growth providing both shading and cooling. PHS collected water sample 4 in a backwater channel to the Willamette River just downstream of the roughened channel. **Table 4-1** summarizes the results of the fish taxa identified by site with eDNA qPCR analysis. The full data set collected can be found in **Appendix D**.

Fish sampling using the eDNA method is quick due to simple water collection. However, a drawback with the analysis is that only presence is reported. We do not have any information about potential abundance or habitat use. The method just identifies fish presence somewhere "upstream or local' to the collected sample.

Fish presence was confirmed at both Sites 2 and 4. Analysis by Jonas Ventures for Sites 1 and 3 may have been compromised since results found no fish or other vertebrates, only algae and bacteria. PHS is requesting further information from Jonas Ventures about samples at sites 1 and 3. Results from Sites 2 and 4 were nearly identical with a total of at least 14, or possibly 15 taxa identified, depending upon whether the bullhead species (*Ameiurus sp*.) identified was a black or yellow bullhead. Five of the nonnative taxa (bullheads, bluegill, killifish, mosquitofish, yellow shiner) were more tolerant warm water species from the Midwest that have been introduced into the Columbia drainage at some point. Three other warm tolerant nonnatives, pond loach, goldfish, and the amur goby, are originally from eastern Asia. These fish take advantage of the warmer water in the beaver pond.

The six native Willamette River system taxa included dace, sucker, Northern pikeminnow, coho salmon, three-spined stickleback, and sculpin. Finding coho using a pond for rearing if available occurs regularly but given the apparent poorer water quality and warmer temperatures of the pond, it was surprising to find one in June at Rinearson pond. The fish may survive by using the thermal refugia of the cooler water inflows of Rinearson creek. Sampling in August could be illuminating regarding the potential for coho to survive the entire summer in the pond as water temperatures further increase.



FIGURE 4-2

PERMANENT eDNA **MONITORING POINTS**

Year 6 Monitoring Report
Rinearson Natural Area Restoration Project

PHS

TABLE 4-1: FISH TAXA IDENTIFIED AT RINEARSON BY SITE WITH EDNA QPCR ANALYSIS

Common name	Genus species	Site 1	Site 2	Site 3	Site 4
Bullhead sp[2]	*Ameiurus*		x		x
Yellow bullhead[2]	*Ameiurus natalis*		x		x
Goldfish[2]	*Carassius sp.*		x		x
Sucker sp.[1]	*Catostomus sp.*		x		x
Sculpin sp.[1]	*Cottus sp.*		x		x
Banded killifish[2]	*Fundulus diaphanus*		x		x
Western mosquitofish[2]	*Gambusia affinis*		x		x
Three-spined stickleback[1]	*Gasterosteus aculeatus*		x		**x**
Bluegill[2]	*Lepomis macrochirus*		x		**x**
Pond loach[2]	*Misgurnus anguillicaudatus*		x		**x**
Golden shiner[2]	*Notemigonus crysoleucas*		x		x
Coho salmon[1]	*Oncorhynchus kisutch*		x		x
Northern pikeminnow[1]	*Ptychocheilus oregonensis*		x		x
Dace sp.[1]	*Rhinichthys sp.*		x		
Amur Goby[2]	*Rhinogobius brunneus*		x		

1Native
2Nonnative

4.2 BREEDING BIRDS

Breeding bird surveys are not required for Year 6 monitoring, per the HDP.

4.3 BALD EAGLES

Bald Eagle surveys are not required for Year 6 monitoring, per the HDP.

4.4 OTHER SPECIES

American Beaver

On most field surveys by Waterways, field staff observed American beaver was in the Remnant Pond and Emergent Wetland Meader Channel areas, often slapping their tails or swimming in the pond away from the human disturbance. There is also significant evidence of numerous dens and entrance/exit slicks along the southern bank of the pond. New beaver dams have formed or been rebuilt in the upper reaches of the meander channel, near the Rinearson Creek entrance into the project site.

4.5 MINK

Mink were not required to be monitored in Year 6, per the HDP.

5.0 WATER QUALITY MONITORING

Following the Year 5 report, the Trustees expressed interest in sampling water quality beyond a single event to better understand seasonal trends. In response, Waterways conducted four water quality monitoring events, which occurred every other month from April through November. Water quality monitoring was conducted at 11 locations (consistent with Year 5) within the project area (see **Figure 5-1**). The stations for the 2024 monitoring were approximated in the field based on the monitoring map and stations used in previous reports, but may vary slightly based on access during either high or low water conditions at the time of sampling. **Table 5-1** describes the 2024 water quality monitoring locations that are shown in **Figure 5-1**.

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 handheld YSI Professional Plus or YSI Pro DSS multi-parameter sonde was used to collect the water quality data for the required parameters. The water quality meter was calibrated by Pine Equipment, Inc. (from whom the YSI multi-parameter was rented) 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 5 monitoring efforts, the data were collected beginning with WQ-1 in the Willamette River at the beginning of the day (9:00am-11:00am) and moving upstream to end with WQ-11 in Upper Rinearson Creek by mid-morning to early afternoon (10:30am-1:30pm). Data collection was aimed at mid-depth in the water column at each monitoring station, where feasible. However, when data was collected during summer months, this was more difficult in some areas due to lower water levels.

The water quality monitoring, per the HDP, is required 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, the Year 5 monitoring was not performed until early July. The results provide comparisons to previous years, as well as Year 5, and are discussed in the following sections.



Water Quality Monitoring Map

Year 6 Monitoring Report

Rinearson Natural Area Restoration Project

WATERWAYS CONSULTING, INC.
Santa Cruz, CA | watways.com | Portland, OR

FIGURE 5-1

5.1 RESULTS

Using the YSI handheld probe, data was collected on April 25, June 21, August 23, and November 6 for water temperature, pH, dissolved oxygen, and conductivity. Temperature has been continuously measured since March 28, 2024 (to present), using the water level sensors and temperature loggers at two locations (see **Figure 1-1**) that are nearest water quality monitoring stations WQ6.2 and WQ10.2. On April 25, 2024, the weather conditions were cloudy and rainy with an air temperature of 52 degrees Fahrenheit, or 11.1 degrees Celsius. On June 21, 2024, the weather conditions were sunny with air temperatures of 64-77 degrees Fahrenheit, or 17.8-25 degrees Celsius. On August 23, 2024, the weather conditions were cloudy with light rain and air temperatures of 59-63 degrees Fahrenheit, or 15-17.2 degrees Celsius. On November 6, 2024, the weather conditions were sunny with air temperatures of 46-54 degrees Fahrenheit, or 7.8-12.2 degrees Celsius. The results are shown in **Tables 5-2** through **5-5**.

TABLE 5-2

SUMMARY OF WATER QUALITY RESULTS FOR APRIL 25, 2024

Station ID	Sample Time	Temperature	pH (S.U.)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)
WQ-1	9:09 AM	12.1 °C 53.78 °F	7.73	10.74	71.5
WQ-2	9:22 AM	13.5 °C 56.3°F	7.84	10.32	123.3
WQ-3	9:28 AM	14.7 °C 58.46 °F	7.7	10.18	153.4
WQ-4	9:34 AM	15.2 °C 59.36 °F	8.03	11.22	182.7
WQ-5	9:40 AM	15.2 °C 59.36 °F	8.14	11.62	182.4
WQ-6.1	9:47 AM	15.2 °C 59.36 °F	8.25	12.12	182.1
WQ-6.2	9:51 AM	15.2 °C 59.36 °F	8.35	10.65	182
WQ-7	10:00 AM	15 °C 59 °F	7.73	12.1	183.8
WQ-8	10:08 AM	13.4 °C 56.12 °F	6.99	9.76	147.2
WQ-9	10:13 AM	13.1 °C 55.58 °F	7.17	7.34	184
WQ-10.1	10:21 AM	13.5 °C 56.3°F	6.94	9.42	111.3
WQ-10.2	10:26 AM	13.5 °C 56.3°F	6.97	9.55	107
WQ-11	10:34 AM	13.6 °C 56.48 °F	7.02	10.49	100.9

TABLE 5-3

SUMMARY OF WATER QUALITY RESULTS FOR JUNE 21, 2024

Station ID	Sample Time	Temperature	pH (S.U.)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)
WQ-1	9:34 AM	17.7 °C 63.86 °F	6.54	9.15	68.7
WQ-2	9:41 AM	17.6 °C 63.68°F	6.73	9.07	71.1
WQ-3	9:47 AM	21.1 °C 69.98 °F	8.4	9.85	143.7
WQ-4	9:52 AM	21.7 °C 71.06 °F	8.55	9.4	150.2
WQ-5	10:00 AM	21.8 °C 71.24 °F	8.67	9.87	150.1
WQ-6.1	10:06 AM	21.9 °C 71.42 °F	8.8	11.17	149.2
WQ-6.2	10:12 AM	21.4 °C 70.52 °F	8.87	14.81	150.4
WQ-7	10:19 AM	20.5 °C 68.9 °F	8.12	11.15	161.3
WQ-8	10:25 AM	17.3 °C 63.14 °F	7.78	11.96	168
WQ-9	10:32 AM	15.9 °C 60.62 °F	6.97	7.68	167.7
WQ-10.1	10:38 AM	16.8 °C 62.24°F	6.94	9.07	170.5
WQ-10.2	10:41 AM	16.5 °C 61.7°F	6.97	9.26	170.1
WQ-11	10:49 AM	15.9 °C 60.62°F	7.26	9.65	168.2

TABLE 5-4

SUMMARY OF WATER QUALITY RESULTS FOR AUGUST 23, 2024

Station ID	Sample Time	Temperature	pH (S.U.)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)
WQ-1	10:59 AM	20.33 °C 68.6 °F	7.1	8.56	89.5
WQ-2	11:09 AM	19.72 °C 67.5°F	7.04	7.88	103.3
WQ-3	11:23 AM	18.94 °C 66.1 °F	6.92	6.13	174.5
WQ-4	11:29 AM	18.89 °C 66 °F	6.95	5.73	182
WQ-5	10:49 AM	19.11 °C 66.4 °F	6.9	6.66	181.7
WQ-6.1	*Unable to sample due to low water depth	-- °C -- °F	---	---	---
WQ-6.2	12:12 PM	19.28 °C 66.7 °F	6.76	6.21	180.2
WQ-7	12:30 PM	18.67 °C 65.6 °F	6.66	4.42	181.2
WQ-8	12:42 PM	16.44 °C 61.6 °F	6.67	8	176.2
WQ-9	12:54 PM	16.44 °C 61.6 °F	6.46	5.52	170.5
WQ-10.1	1:03 PM	16.11 °C 61° F	6.72	8.45	179.3
WQ-10.2	1:10 PM	16.17 °C 61.1 °F	6.74	8.57	179
WQ-11	1:14 PM	16.33 °C 61.4 °F	7.13	9.26	178.2

TABLE 5-5
SUMMARY OF WATER QUALITY RESULTS FOR NOVEMBER 6, 2024

Station ID	Sample Time	Temperature	pH (S.U.)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)
WQ-1	11:22 AM	10.2 °C 50.36 °F	7.21	12.62	64.2
WQ-2	11:29 AM	10.5 °C 50.9 °F	6.95	8.56	137.4
WQ-3	11:33 AM	10.2 °C 50.36 °F	6.92	7.33	138.6
WQ-4	11:36 AM	10.4 °C 50.72 °F	6.97	7.53	139.9
WQ-5	11:41 AM	10.4 °C 50.72 °F	6.91	7.11	139.9
WQ-6.1	11:48 AM	10.6 °C 51.08 °F	6.9	6.04	140.3
WQ-6.2	11:51 AM	10.6 °C 51.08 °F	6.86	6.05	140.5
WQ-7	12:01 PM	10.6 °C 51.08 °F	9.63	6.02	152.1
WQ-8	12:10 PM	11.6 °C 52.88 °F	7.07	8.39	165.3
WQ-9	12:16 PM	8.1 °C 46.58 °F	6.69	1.81*	236.4
WQ-10.1	12:19 PM	11.7 °C 53.06 °F	7.07	8.51	165.1
WQ-10.2	12:24 PM	11.7 °C 53.06 °F	7.17	8.78	163.3
WQ-11	12:31 PM	11.9 °C 53.42 °F	7.21	8.84	164.5

*Errant data point due to low water conditions and/or equipment error

5.2 TEMPERATURE

The data collected for temperature during the four water quality point sampling efforts indicate that, in general, the monitoring locations in the Willamette River and nearest the inlet of Rinearson Creek into the project site experience the lowest temperatures (regardless of season) (around 10-16 °C), whereas the highest temperatures (approximately 22 °C) were recorded in the remnant pond and along the roughened channel during the August sampling. 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.

The water level loggers utilized by Waterways for water surface elevation monitoring also record water temperature (see **Figure 1-1** for locations). The Waterways loggers were deployed from March 28, 2024 through July 23, 2023. After the water level loggers were removed from the project site, water temperature loggers were deployed at the same locations to provide continuous temperature logging.

The temperature loggers have been deployed since July 23, and data was collected for this report on November 6, 2024 (the loggers are still deployed and measuring until the next collection date). The recorded water temperatures are displayed in **Figure 5-2**. The Oregon water quality standard for temperature is defined in OAR 340-041-00 28 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). Waterways calculated the 7-day-average maximum temperature for the data collected from March through November, and the results for the upper (in the Upper Meander Channel near the Rinearson Creek inlet to the project site) and lower logger (in the Remnant Pond near its outlet) locations are shown in **Figure 5-3.1 and Figure 5-3.2**. The water temperature for the upper site logger remained under the standard the majority of the collection period. However, the 7-day-average maximum at the upper site exceeded 18 °C for most of July and parts of August and September. The 7-day-average maximum water temperature for the remnant pond logger exceeded the standard for the entire summer season (mid-May through the end of September). Overall, the sites monitored within the project area for water temperature do not meet the Oregon standards for water temperature for salmon and trout rearing. But this analysis does not include the areas of the site from the roughened channel to the Willamette River, which are frequently inundated by cooler water from the Willamette River. The upper portions of the site have less large, woody vegetation and therefore less shade cover, which results in warmer water temperatures. Rinearson Creek remains relatively cool throughout the summer months and so a warming trend can be seen as water flows more slowly in sun-exposed areas through the emergent wetland and remnant pond.

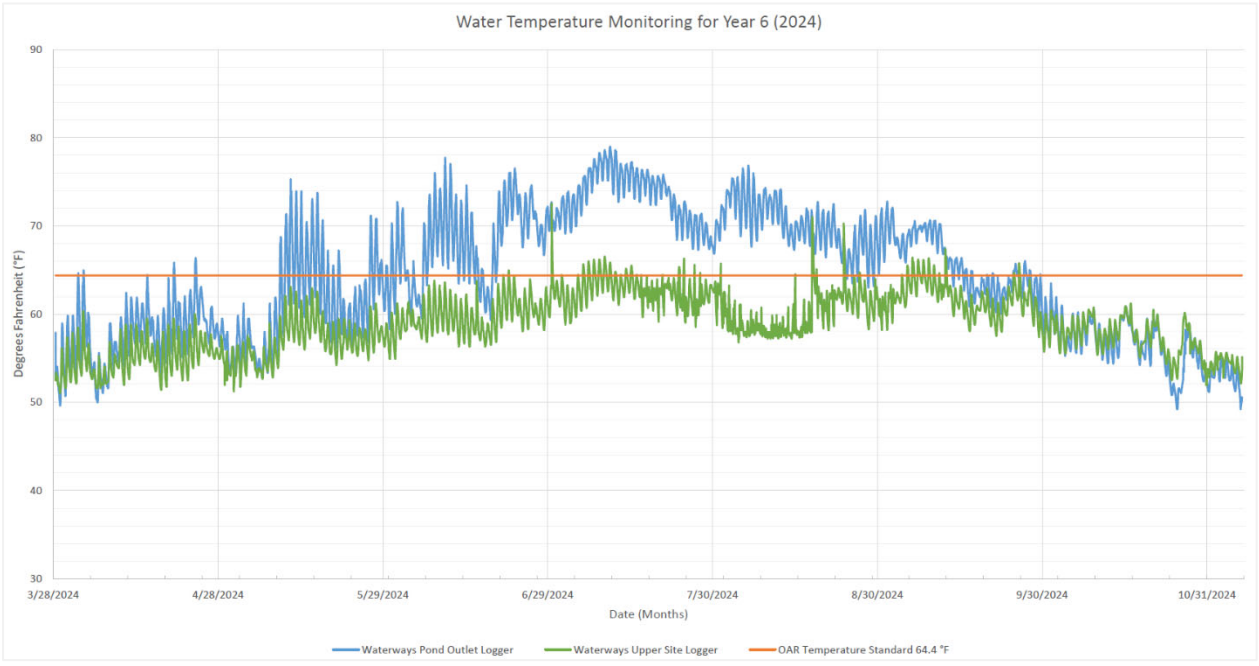

Figure 5-2: *Water Temperature Monitoring for Year 6 (2024)*

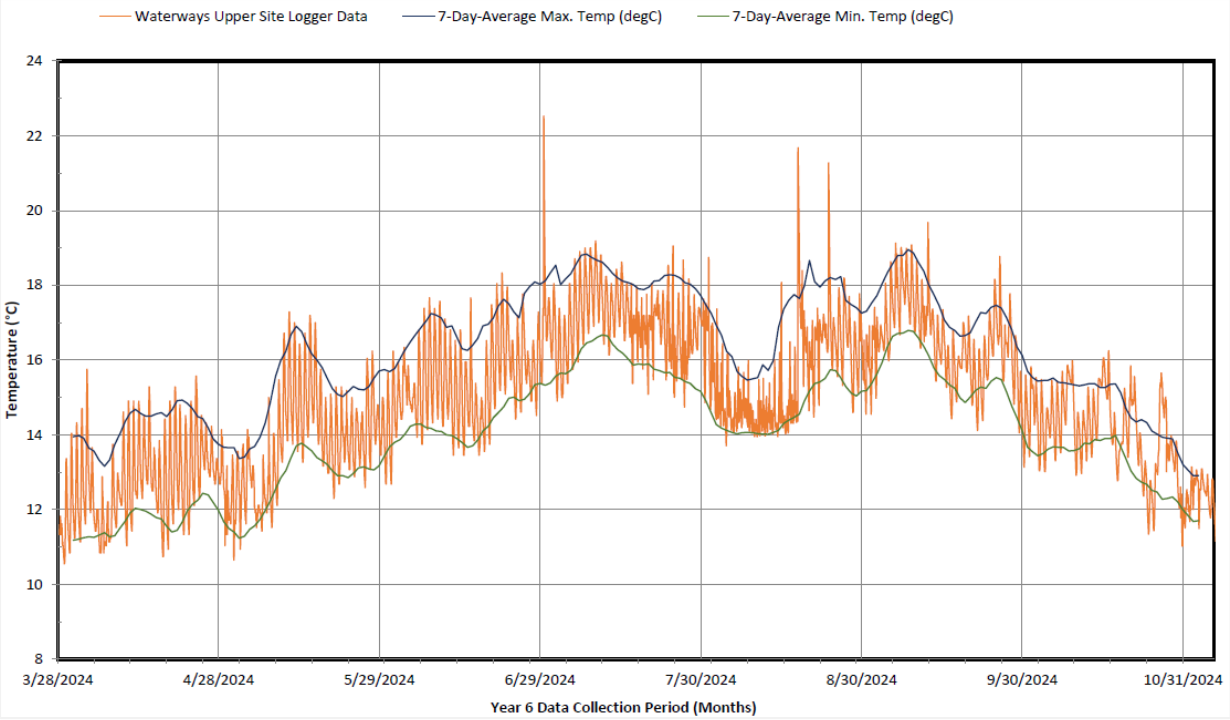

Figure 5-3.1: *Upper Site 7-Day-Average Maximum Water Temperature for Year 6 (2024)*

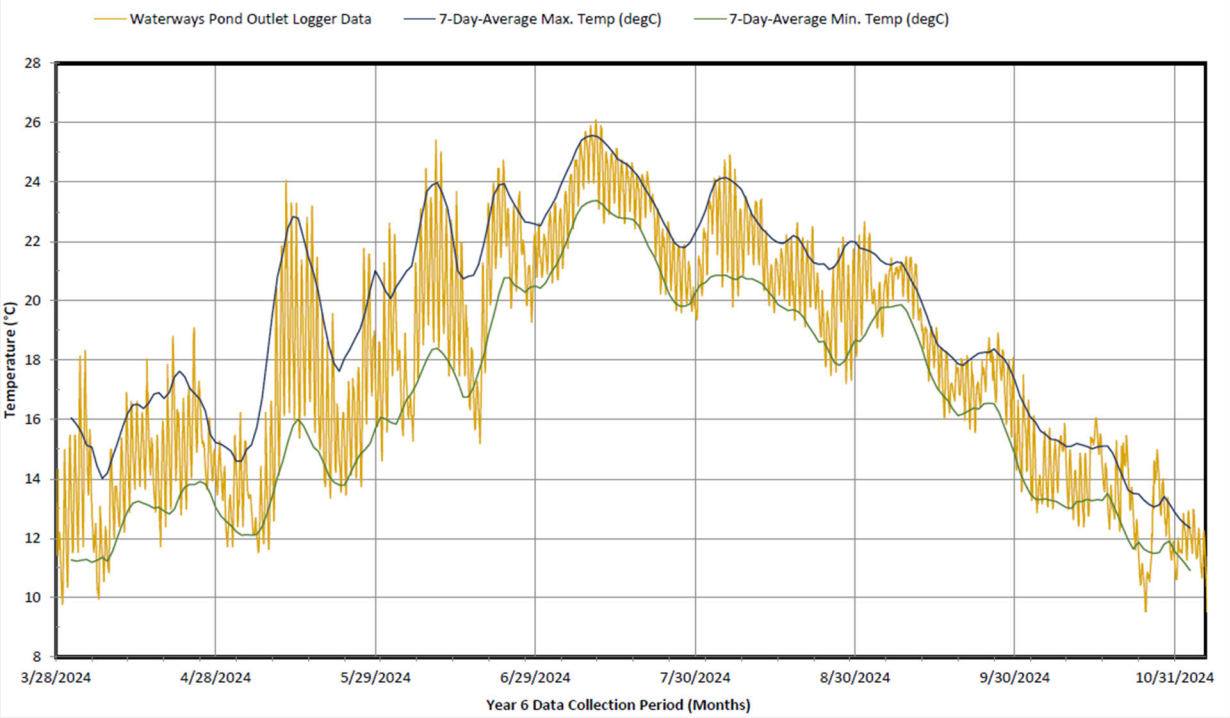

Figure 5-3.2: *Remnant Pond Outlet 7-Day-Average Maximum Water Temperature for Year 6 (2024)*

The temperature point sampling efforts for Year 5 (taken in July 2023) reflect similar patterns across the site to the temperatures recorded in June and August of the Year 6 data. However, Year 6 had overall lower water temperatures in June and August than Year 5 did in the July samples. In Year 5, temperature was only recorded from mid-April through mid-July. During that period, the upper site logger showed temperatures consistently hovering around 60 °F. During the same period for Year 6, water temperatures appear to begin cooler (closer to 55 °F) and increase gradually to exceed the 64.4 °F OAR standard by mid-July. For the pond outlet logger, the water temperatures in Year 5 began to exceed the OAR standard in early May, which is also true for Year 6. In both years, by mid-July, the pond outlet logger recorded temperatures consistently above the standard. However, Year 5 temperatures reached (and exceeded) 80 °F beginning in mid-May and continued to do so through July, but Year 6 temperatures never reached 80 °F during the period of record. The consistent high temperatures in the pond are likely due to the slow-moving water that has been a result of the open-water condition of the pond. There is also little-to-no canopy or shade around the pond, which leaves it exposed to the sun in the heat of the summer months. It should also be noted that the temperature logger location is near the edge of the pond. The center of the pond is not accessible by foot due to the extensive "muck" (deep, heavy sediment) build up throughout the pond bottom, but the temperatures may vary with depth within the pond.

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 6.5 mg/L in waters designated for cool water aquatic life. For this project, that consists of Rinearson Creek and the Willamette River. The DO values measured in April and June were well above the minimum needed to meet the water quality standard. However, the sampling in August and November both recorded DO values under 6.5 mg/l. In August, WQ-3, WQ-4, WQ76.2. WQ-7 and WQ-9 experienced low dissolved oxygen levels. The August rental YSI handheld sampling device was equipped with a longer probe guard, which, in combination with low water levels, made sampling more difficult since it is a best practice to submerge the probe at least 6-12 inches from the top of the probe and to move the probe slowly in a circle while the probe is submerged vertically to ensure water flows across the DO sensor. Therefore, it is possible that the longer probe guard hindered reliable sample gathering. In November, WQ-6.1, WQ-6.2, WQ-7, and WQ-9 also showed low DO values. These point samples were taken at the top of the roughened channel, at the remnant pond outlet (top of the beaver dam), along the edge of the remnant pond, and at the lower section of the emergent marsh. The value for WQ-9 (1.81 mg/l) is significantly lower than the remainder of the data, so we assume that this is an errant data point and non-indicative of low oxygen levels in the system. However, like the conditions in August, water levels at WQ-9 on the sampling day were low and the field crew noted difficulty fully submerging the probe without stirring up sediment at the bottom of the channel at this location.

Outside of the few measurements that were less than 6.5 mg/L, the DO data collected in this monitoring effort displayed measurements with a minimum of 6.66 mg/L at WQ-5 (middle of the roughened channel) in August and a maximum of 14.81 mg/L at WQ-6.2 (at the remnant pond outlet above the beaver dam) in June. Readings at the remaining stations ranged from 7.11 mg/L to 12.62 mg/L. In general, the DO values were higher in the remnant pond and at the monitoring points below the roughened channel (influenced by Willamette River tides and ponded due to the beaver dam at the top of Meldrum Bar Channel), and lower throughout the emergent marsh and upper site. Both Years 3 and 5 also recorded high dissolved oxygen levels 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 reach from the remnant pond

down to the lower portion of the site is more ponded due to beaver activity, which slows velocities and allows for warmer water conditions, and therefore the opportunity for algae growth. This area is also more densely vegetated. The measurements in the remnant pond were consistently taken at midday, a time at which photosynthetic activity is likely at its highest. **Figure 5-4** shows a photo of the remnant pond on August 23, 2024, which demonstrates the extent of algae growth in the remnant pond during the warmer months of the year.

In general, the measurements for Year 6 (2024) show similar patterns as Years 1, 3, and 5. As in Years 1 and 3, the DO readings increased moving upstream in the site, hit their peak in the remnant pond, and then decreased in the emergent marsh and Rinearson Creek inlet to the site. The Year 6 August measurements are the primary outlier, likely due to the combination of the equipment used, low water levels, and time of year (peak summer).



Figure 5-4: *Algae growth in the remnant pond on August 23, 2024*

5.4 PH

The pH measurements for Year 6 (2024) indicated values from a low of 6.46 Standard Units (S.U.) at station WQ-9 in August to a high of 9.63 at station WQ-7 in November. The pH measurements at the remaining stations were recorded within the range of 6.54 to 8.8 S.U.

These data were slightly lower as compared to the pH measurements recorded for Year 5, which ranged from 7.24 – 9.52 S.U. This difference is likely caused by the time of year – Year 5 only sampled in July, while Year 6 recorded samples four times from April through November. Higher ambient air temperatures and lower water levels in Rinearson Creek and the Willamette River are both factors that cause an increased water temperature, which decreases the solubility of carbon dioxide. Lower levels of carbon dioxide reflect a lower concentration of hydrogen, which increases pH. Additionally, a larger number of photosynthesizing aquatic plants and algae release oxygen, which also can increase the pH of the water. Therefore, the variability in these factors for the four sampling dates as compared to those in previous monitoring years can affect the range of pH values.

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. Five of the 52 pH values measured for Year 6 (2024) were above 8.5 S.U. and one measurement was below 6.5 S.U. and therefore do not meet the standards. The five higher measurements – four of which were collected in June – consisted of all stations located between Meldrum Channel (above the lower beaver dam) and the remnant pond (WQ-4 to WQ-7), and the low value was recorded at WQ-9 (lower emergent marsh). 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 6 (2024) measurements of conductivity ranged from a low of 64.2 μS/cm at station WQ-1 in November to a high of 236.4 μS/cm at WQ-9 in November (though this sample point was noted to be difficult to measure due to low water levels). The readings at the two stations nearest the Willamette River (WQ-1 and WQ-2) show the lowest conductivity values during all four monitoring days for Year 6, while the conductivity values were higher and more consistent throughout the rest of the project site (100.9-181.7 μS/cm). These data and the patterns they indicate are consistent with those recorded for Years 1, 3, and 5 which ranged from about 100 to 200 μS/cm (ESA 2022, Cardno 2020, Waterways 2023).

6.0 BENTHOS MONITORING

In 2024, PHS sampled benthic macroinvertebrates using a D-ring kicknet from the same locations sampled in 2020, as seen in **Figure 6-1**. Kicknet collections 1-4 within the roughened channel were composited as Sample 1. Kicknet collections 5-8 from the south side of the pond were composited as Sample 2. Sample 3 from the emergent marsh channel was a composite of kicknet Samples 9-12, and Sample 4 (the control) included kicknet collections 13-16 from Rinearson Creek upstream of the pond and marsh. The samples were keyed to genus by Bob Wissman, a Senior Scientist at Aquatic Biology Associates. The full set of data collected for Year 6 (2024) can be found in **Appendix E**.

It was noted that since sampling initiated in 2020, total tolerant taxa richness increased markedly in 2024, particularly in the engineered riffle (increase of about 50% from 12-13 to 18) and the control (from 11 and 6 in 2020-2021 to 18 and 21 in 2023 and 2024; composite sample 4). The metric, percent total tolerant by abundance, also increased for these two composite samples, though not significantly.

The most significant change overall at the site has been increasing dominance of a single taxon in the engineered riffle. The freshwater isopod, Lirceus fontinalis, an aquatic sowbug, made up 72.63% of the abundance in 2024 after a presence of only 0-1% in the three previous years. It replaced the previously dominate Diptera and chironomid larvae. Initially in 2020, black flies, Simuliidae comprised 60% of the taxa in this riffle. First records of the freshwater isopod Lirceus fontinalis Rafineque, 1820 (ISOPODA: ASELLIDAE), a paper recently published and co-authored by Bob Wissman, documents the presence of this organism in the Columbia River drainage and identifies several locations where this organism has been found, including Rinearson.



FIGURE 6-1

PERMANENT BENTHIC INVERTEBATES
MONITORING POINTS

Year 6
Monitoring Report
Rinearson Natural Area
Restoration Project

PHS

The highly tolerant and invasive New Zealand mud snail, Potamopyrgus antipodarum, continues to be present in the emergent marsh and control areas of the site though its abundance has not increased substantially since 2020.

7.0 ADAPTIVE MANAGEMENT

7.1 ESTABLISHMENT OF STREAMSIDE VEGETATION

In the 2023 Year 5 Monitoring Report, adaptive management recommendations were made to focus intensive weed management and native vegetation establishment in the Emergent Vegetation habitat community located upstream of the remnant pond. The vegetation monitoring results for 2023 showed that this portion of the Rinearson Natural Area did not meet the performance criteria and, given the longer-term trends identified through the monitoring, it would likely not meet the performance criteria benchmarks established for Year 10. In addition to not meeting the vegetation monitoring requirements, beaver, which is a critical species necessary to create and maintain wetland characteristics within the project area, were not utilizing the downstream portion of the emergent wetland area closest to the pond, resulting in some channel incision and development of localized knickpoints. It was postulated, based on a general understanding of beaver behavior and their vulnerability to predation, that beaver will avoid areas that do not have adequate water depth or require the beaver to move over open terrain to obtain food or building materials, even if that distance is only on the order of 30 to 40 feet.

To address this habitat limitation for a key species within the project area, the 2023 report recommended that these areas are focused on, with the understanding that it may take multiple years to adequately remove invasive plant species, such as reed canary grass to the point where native woody vegetation can be established. The template for the need to establish streamside woody vegetation is the upstream portion of the emergent wetland closer to where Rinearson Creek enters the project area. In this area the valley bottom narrows considerably and dense stands of alder have developed along the hillslope margin. In this area, beaver are utilizing the alder and are building dams within the multiple channel pathways that occur within the emergent wetland. Dense willow and alder have also established within the roughened channel, just downstream of the remnant pond, providing a source of material, food, and cover for the beaver to build a higher dam on the roughened channel crest, which has resulted in the pond backwatering further up into the emergent wetland and inundating the knickpoints that were observed in 2023.

In 2024, efforts were made to remove invasive vegetation within the emergent wetland, with a specific focus on reed canary grass. Despite these efforts, native species cover was only 4%, which is down from 2023, though the percent cover of reed canary grass has decreased. Unfortunately, the reduction in reed canary grass cover and resulted in increased establishment of jewelweed, another non-native invasive species. Control of invasive species needs to be followed by aggressive planting of native woody species, especially along the margin of the channel where plants can establish to shade the creek and provide food and building material for beaver. Formation of beaver dams in the lower emergent wetland would improve backwater conditions throughout the entire emergent wetland.

8.0 REFERENCES

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Appendix A

Photo Monitoring

(Digital Appendix)

Appendix B

Fish Passage Monitoring Data and Notes

Table 2-1: Fish Passage Monitoring Summary for Year 6 (2024)

Fish Passage Monitoring Point ID	Location Description	Depth of Flow (ft)		Grade Held (ft)		Notes
		July	October	July	October	
FP-1	Meldrum Bar Channel outlet	0.5	0.3-0.5			July 24, 2024 4:37pm: backwater from medium bar lagoon at time of assessment. October 2, 2024 8:55am: There is no backwater from Meldrum Bar Lagoon. There is still flow, though depths are shallow.
FP-2	Meldrum Bar Channel mid-point	0.55	0.4-0.6			July 24, 2024 4:40pm October 2, 2024 8:57am
FP-3	Meldrum Bar Channel upper reach, below beaver dam	0.5	0.7			July 24, 2024 4:42pm October 2, 2024 8:59am
FP-4	At Rinearson Lagoon beaver dam			2.5		July 24, 2024 4:46pm: There is a clear flow path along right margin of dam that likely allows upstream and downstream juvenile movement. There is a large ponded area upstream of the beaver dam. October 2, 2024 9:02am: similar characteristics to previous monitoring visit. The beaver dam reamined at a similar height with significant flow along right margin.
FP-5	Roughened Channel outlet	0.65	0.8-1.1			July 24, 2024 4:53pm: This is the upstream extent of beaver dam backwater (up to the roughened channel). October 2, 2024 9:05am: There is slight backwatering in this location from the downstream beaver dam, so the dam must be slightly higher than previous monitoring effort.
FP-6	Lower Roughened Channel	0.5	0.4-0.6			July 24, 2024 4:55pm October 2, 2024 9:07am
FP-7	Middle of Roughened Channel	0.6-0.8	0.5-0.8			July 24, 2024 4:58pm October 2, 2024 9:09am
FP-8	Upper Roughened Channel	0.5-0.8	0.4-0.6			July 24, 2024 5:00pm October 2, 2024 9:12am
FP-9	Roughened Channel Crest/Remnant Pond Outlet, at beaver dam			2.5-3		July 24, 2024 5:05pm: Large beaver dam. The dominate spillway point is currently along the right side of the dam. This should not be considered a barrier to juvenile fish movement. October 2 9:15am: The beaver dam is in similar condition to previous monitoring effort, but has more of a dispersed flow path. It still should not be considered a passage barrier.
FP-10	Emergent Wetland Meander Side Channel	>1				July 24, 2024 5:24pm: Backwater of beaver pond at top of roughened channel extends to here. Backwater continues upstream of here but depths are <1ft. Beaver activity observed in side channel, and the beaver appear to be utilizing dense alder growth along the valley bottom margin.
FP-11	Emergent Wetland Meander Channel	>1	0.6-0.8			July 24, 2024 5:28pm: Backwater of roughened channel beaver dam extends to here on mainstem Rinearson Meander Channel . Upstream of here is the beginning of a new beaver dam and sediment storage associated with a constructed log jam. October 2: No backwatering present.
FP-12	Emergent Wetland Meander Channel	0.9	0.6-0.8			July 24, 2024 5:33pm October 2, 2024 9:41am
FP-13	Emergent Wetland Meander Channel	1.3			1	July 24, 2024 5:36pm: Small blown out beaver dam is not maintained. System needs more vegetation in this area. October 2, 2024 9:43am: Beaver dam rebuilt. Spirea and some willow beginning to establish.
FP-14	Emergent Wetland Meander Channel	0.7 downstream >1 upstream	>1	1.5-2		July 24, 2024 5:39pm: New active beaver dam backwaters WW temperature gage. October 2, 2024 9:50am: Beaver dam still active but backwatered from new downstream dam.
FP-15	Lower Meander Channel Outlet to Remnant Pon					October 2, 2024 9:24 am: lower Rinearson channel at pond backwatered by beaver dam
FP-16	Emergent Wetland Meander Channel					October 2, 2024 9:26 am: backwatered by beaver dam
FP-17	Emergent Wetland Meander Channel					October 2, 2024 9:30am: backwatering from pond and beaver dam only extends to here so beaver dam must be lower or more porous than in July.
FP-18	Emergent Wetland Meander Channel					October 2, 2024 9:32am: backwater from pond and beaver dam only extends to this location.
FP-19	Emergent Wetland Meander Channel				1	October 2, 2024 9:32am: backwater from pond and beaver dam only extends to this location.

Appendix C

Vegetation Monitoring Data

Species	URFI1	URFI2	URFI3	URFI4	URFI5	URFI6	URFI7	URFI8	URF9	URF10	URF11	URF12	Habitat Average
Native Herbaceous Species													
species-latin name													
Epilobium ciliatum (=E. watsonii)	0	0	0	0	0	0	1	0	2	0	0	0	0.25
Galium aparine	0	0	0	0	0	0	0	1	0	0	0	0	0.08
Marah oregana	0	0	0	0	20	0	2	0	0	0	0	30	4.33
Phacelia nemoralis	0	0	0	1	22	2	0	0	0	0	0	0	2.08
Polystichum munitum	0	0	0	0	0	0	0	11	4	0	0	0	1.25
Tolmeia menziesii	0	3	0	0	0	1	0	0	0	0	0	0	0.33
Urtica dioica	0	0	0	0	6	0	0	0	0	0	0	0	0.50
Invasive Herbaceous Species													
species-latin name													
Clematis vitalba	90	0	0	0	0	0	0	0	0	0	0	0	7.50
Convolvulus arvensis	0	0	0	0	0	0	0	0	0	2	0	0	0.17
Geum urbanum	0	0	0	0	0	0	0	0	0	0	1	0	0.08
Hedera helix	0	15	38	4	2	8	4	75	6	0	8	0	13.33
Phalaris arundinacea	0	0	0	0	0	0	0	0	0	73	0	0	6.08
Solanum dulcamara	0	0	0	0	0	0	0	0	0	5	0	0	0.42
Non-Native Herbaceous Species													
species-latin name													
Agrostis sp.	0	0	0	0	0	3	0	0	0	0	0	0	0.25
Geranium robertianum	0	0	0	0	0	0	9	16	0	0	0	0	2.08
Lapsana communis	0	0	0	0	3	0	5	0	4	0	2	10	2.00
Vicia sp.	0	0	0	0	0	0	1	0	0	0	0	0	0.08
Native Tree Species													
species-latin name													
Acer macrophyllum	0	95	0	42	0	88	0	40	0	0	0	0	22.08
Alnus rubra	70	0	0	0	0	0	0	0	0	0	0	22	7.67
Fraxinus latifolia	0	0	0	0	0	0	5	0	0	0	0	0	0.42
Populus balsamifera trichocarpa	0	0	50	0	5	10	0	0	0	10	50	0	10.42
Native Tree Species													
species-latin name													
Corylus cornuta	0	0	6	0	0	0	0	0	0	0	0	0	0.50
Holodiscus discolor	0	0	0	0	0	0	0	0	0	0	18	0	1.50
Rosa gymnocarpa	0	0	0	0	0	14	0	0	6	0	0	0	1.67
Rubus parviflorus	0	0	0	0	0	0	20	0	0	0	0	0	1.67
Rubus ursinus	12	38	0	38	0	0	0	26	0	0	0	0	9.50
Symphoricarpos albus	0	7	60	5	3	0	0	0	0	0	0	0	6.25
Non-Native Tree Species													
species-latin name													
Juglans nigra	0	0	0	15	0	0	0	0	0	0	0	0	1.25
Prunus sp.	0	0	0	0	0	0	0	2	0	0	0	0	0.17
Invasive Shrub Species													
species-latin name													
Rubus armeniacus	0	0	0	0	12	0	2	0	20	4	0	0	3.17
Bare Substrate													
thatch/bare ground	10	82	62	99	50	85	80	0	84	20	90	60	60

Routine Performance Standards	URFI1	URFI2	URFI3	URFI4	URFI5	URFI6	URFI7	URFI8	URF9	URF10	URF11	URF12	Habitat Average	Standard Error	Standard Met?
Cover of Invasive Herbaceous Species	90	15	38	4	2	8	4	75	6	80	9	0	28	9.9	YES
Lower CI (80%)													15		
Upper CI (80%)													40		
Cover of Non-Native Herbaceous Species	0	0	0	0	8	0	1	2	1	0	0	6	2	0.8	N/A
Lower CI (80%)													1		
Upper CI (80%)													3		
Cover of Invasive Shrubs and Trees	0	0	0	0	12	0	2	0	20	4	0	0	3	2	N/A
Lower CI (80%)													1		
Upper CI (80%)													6		
Cover of Native Herbaceous Species	0	0	0	1	42	2	3	12	6	0	0	30	8	4	N/A
Lower CI (80%)													3		
Upper CI (80%)													13		
Cover of Native Trees	70	95	50	42	5	98	5	40	0	10	50	22	41	10	N/A
Lower CI (80%)													28		
Upper CI (80%)													53		
Cover of Native Shrubs	12	45	66	43	3	14	20	26	6	0	18	0	21	6	N/A
Lower CI (80%)													13		
Upper CI (80%)													29		
Cover of all Invasive Species	90	15	38	4	14	8	6	75	26	84	9	0	31	10	N/A
Lower CI (80%)													18		
Upper CI (80%)													43		

Species	RFE1	RFE2	RFE3	RFE4	RFE5	RFE6	RFE7	RFE8	RFE9	RFE10	RFE11	RFE12	RFE13	RFE14	RFE15	RFE16	RFE17	RFE18	Habitat Average
Native Herbaceous Species																			
species-latin name																			
Bidens frondosa	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0	2	0	0.94
Carex sp.	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0.11
Epilobium brachycarpum	0	0	0	0	0	0	0	28	0	0	0	0	0	0	0	0	0	0	1.56
Epilobium ciliatum (=E. watsonii)	1	0	0	0	1	55	0	1	0	0	0	0	0	8	0	0	0	7	4.06
Elymus trachycaulis	0	0	0	0	0	0	6	2	0	0	0	0	0	0	0	0	0	0	0.44
Erigeron canadensis	1	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0.28
Galium aparine	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0.39
Juncus effusus	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0.50
Invasive Herbaceous Species																			
species-latin name																			
Cirsium arverse	0	0	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0.67
Conium maculatum	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0.17
Convolvulus arvensis	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0.11
Clematis vitalba	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Dipsacus fullonum	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.72
Geranium robertianum	4	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0.33
Hedera helix	0	70	0	0	0	0	0	0	0	4	1	14	0	0	0	0	0	0	4.94
Impatiens capensis	0	0	0	0	0	10	0	0	0	0	0	0	0	0	40	0	90	40	10.00
Linaria vulgaris	0	0	0	0	0	0	0	0	0	0	0	0	99	0	0	0	0	0	5.50
Lythrum salicaria	0	10	0	0	3	0	0	0	9	0	0	0	0	0	0	0	0	0	1.22
Phalaris arundinacea	0	0	80	0	0	0	2	0	0	0	0	0	0	0	0	0	0	40	6.78
Solanum dulcamara	0	7	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	1	0.61
Verbascum thapsus	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0.22
Non-Native Herbaceous Species																			
species-latin name																			
Agrostis sp.	0	0	0	0	0	0	0	3	0	0	4	0	0	0	0	0	0	0	0.39
Bromus sylvaticum	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.11
Dactylis glomerata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	0	0	1.78
Daucus carota	16	0	0	0	0	0	0	0	1	0	4	0	0	0	0	0	0	0	1.17
Hypochaeris radicata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Lactuca serriola	4	6	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0.83
Lapsana communis	2	0	0	1	0	0	8	0	0	1	0	1	0	0	0	20	0	0	1.83
Leucanthemum vulgare	0	0	0	0	0	0	0	0	0	0	14	0	0	0	0	0	0	0	0.78
Lolium perenne	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0.06
Lotus corniculatus	1	0	0	0	0	0	0	20	0	0	0	0	0	51	60	0	0	0	7.33
Plantago lanceolata	0	0	0	0	0	0	0	0	5	0	1	0	0	0	0	0	0	0	0.33
Rumex crispus	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0.28
Tanacetum vulgare	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.17
Unknown grass	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.11

Native Tree Species																			
species-latin name																			
Acer macrophyllum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0	1.39
Alnus sp. (rhombifolia, rubra)	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0.56
Cornus alba	0	0	40	5	27	0	0	0	0	22	0	0	0	0	90	0	0	0	10.22
Corylus cornuta	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0.11
Fraxinus latifolia	15	0	20	90	0	0	0	0	0	0	0	0	0	0	0	20	80	0	12.50
Physocarpus capitatus	0	0	0	0	0	38	0	0	0	0	0	0	0	0	0	0	0	0	2.11
Populus balsamifera trichocarpa	7	60	0	0	0	0	18	0	55	70	10	100	30	0	0	0	0	2	19.56
Pseudotsuga menziesii	0	0	0	0	0	0	0	0	0	0	14	0	0	0	0	10	0	0	1.33
Rosa nutkana	0	2	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0.44
Rubus parviflorum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0.44
Rubus ursinus	0	8	0	3	0	0	0	0	30	12	0	0	0	0	0	0	0	0	2.94
Thuja plicata	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0.11
Non-Native 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	0.00
Invasive Shrub and Tree Species																			
species-latin name																			
Rubus armeniacus	15	10	0	1	0	50	14	0	2	0	0	0	0	40	50	5	2	0	10.50
Bare Substrate																			
thatch/bare ground	56	5	18	98	94	25	67	33	70	99	60	85	1	42	0	47	8	12	46

Routine Performance Standards	RFE1	RFE2	RFE3	RFE4	RFE5	RFE6	RFE7	RFE8	RFE9	RFE10	RFE11	RFE12	RFE13	RFE14	RFE15	RFE16	RFE17	RFE18	Habitat Average	Standard Error	Standard Met?
Cover of Invasive Herbaceous Species <=30%	16	80	80	0	3	10	2	1	10	4	1	14	99	0	40	1	90	80	30	8.8	YES
Lower CI (80%)																			18		
Upper CI (80%)																			41		
Cover of Native Shrubs and Trees	2	7	7	11	3	5	2	0	8	11	3	11	4	0	10	3	11	0	5	1.0	N/A
Lower CI (80%)																			4		
Upper CI (80%)																			7		
Cover of Invasive Shrubs and Trees	15	10	0	1	0	50	14	0	2	0	0	0	0	0	50	5	2	0	8	3.8	N/A
Lower CI (80%)																			3		
Upper CI (80%)																			13		
Cover of Native Herbaceous Species	2	0	0	0	1	62	8	40	4	0	0	0	0	8	0	0	0	7	7	3.9	N/A
Lower CI (80%)																			2		
Upper CI (80%)																			12		
Cover of all Invasive Species	31	97	80	1	3	60	16	3	13	4	1	14	99	40	90	6	92	81	41	9.2	N/A
Lower CI (80%)																			29		
Upper CI (80%)																			52		

Species	Origin (N, NN, I)	Wetland Status (1 - 5)	EMM1	EMM2	EMM3	EMM4	EMM5	EMM6	EMM7	EMM8	EMM9	EMM10	EMM11	EMM12	EMM13	EMM14	EMM15	EMM16	EMM17	Habitat Average
Native Herbaceous Species																				
species-latin name																				
Cyperus strigosus	**N**	**2**	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0.12
Epilobium ciliatum	**N**	**2**	0	0	0	0	0	0	0	0	0	1	0	3	2	0	0	0	0	0.35
Galium aparine	**N**	**4**	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0.24
Ludwigia palustris	**N**	**1**	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0.06
Scirpus microcarpus	**N**	**1**	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0.18
Typha latifolia	**N**	**1**	0	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0.88
Urtica diocia	**N**	**3**	0	1	0	0	0	28	0	0	0	0	0	0	0	0	0	0	0	1.71
Invasive Herbaceous Species																				
species-latin name																				
Cirsium arvense	**I**	**4**	0	0	12	2	50	0	0	0	0	0	0	0	0	0	0	0	0	3.76
Cisium vulgare	**I**	**4**	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0.41
Convolvulus arvensis	**I**	**3**	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0.12
Impatiens capensis	**I**	**4**	100	15	10	0	0	8	45	0	24	0	60	65	0	0	97	90	54	33.41
Iris pseudacorus	**I**	**1**	0	0	0	8	0	0	0	0	0	0	0	0	6	0	0	0	0	0.82
Jacobaea vulgaris	**I**	**4**	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0.18
Phalaris arundinacea	**I**	**2**	0	0	23	0	22	50	1	0	20	0	2	10	46	10	2	1	6	11.35
Solanum dulcimara	**I**	**3**	0	0	0	0	0	0	0	0	2	0	0	0	14	0	0	0	0	0.94
Non-Native Herbaceous Species																				
species-latin name																				
Bromus sp.	**NN**	**3**	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0.29
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**	**4**	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0.59
Leucanthemum vulgare	**NN**	**4**	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0.18
Lotus corniculatus	**NN**	**3**	0	0	5	7	16	0	0	2	0	0	0	0	1	0	0	0	0	1.82
Persicara hydropiper	**NN**	**1**	0	0	0	0	3	0	0	0	0	58	38	12	0	0	0	8	0	7.00
Persicaria maculosa	**NN**	**2**	0	0	0	15	0	15	0	0	0	40	0	0	0	0	0	0	0	4.12
Sonchus asper	**NN**	**4**	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0.18
Trifolium repens	**NN**	**3**	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0.12
Unknown grass	**NN**	**3**	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0.29
Native Shrub and Tree Species																				
species-latin name																				
Alnus rubra	**N**	**3**	0	0	0	60	0	0	0	0	0	0	0	0	0	60	0	0	0	7.06
Cornus alba	**N**	**2**	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0.71
Lonicera involucrata	**N**	**3**	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	8	0	1.76
Populus balsamifera	**N**	**3**	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0.24
Rosa sp.	**N**	**3**	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.41
Rubus ursinus	**N**	**4**	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	14	0	1.41
Sambucus racemosa	**N**	**4**	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	1.18
Salix sitchensis	**N**	**2**	100	0	0	0	0	0	65	0	0	0	0	0	0	0	0	0	0	9.71
Salix sp.	**N**	**3**	0	95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.59
Spiraea douglasii	**N**	**2**	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.71
Symphoricarpos albus	**N**	**4**	0	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0.71
Invasive Shrub Species																				
species-latin name																				
Rubus armeniacus	**I**	**3**	0	0	0	30	0	0	0	0	0	0	0	0	0	90	0	0	0	7.06
Bare Substrate																				
thatch/bare ground			0	85	50	56	1	0	55	70	40	2	0	10	32	90	1	1	40	31

Routine Performance Standards		EMM1	EMM2	EMM3	EMM4	EMM5	EMM6	EMM7	EMM8	EMM9	EMM10	EMM11	EMM12	EMM13	EMM14	EMM15	EMM16	EMM17	Habitat Average	Standard Error	Standard Met?
Cover of Native Herbaceous Species	(>=30%)	0	1	0	4	0	28	0	0	15	1	0	6	5	0	0	0	0	4	1.8	NO
Lower CI (80%)																			1		
Upper CI (80%)																			6		
Cover of Invasive Herbaceous Species	(<=20%)	100	15	45	17	77	58	46	0	46	0	62	75	66	10	99	91	60	51	8.0	NO
Lower CI (80%)																			41		
Upper CI (80%)																			61		
Cover of Non-Native Herbaceous Species		0	0	5	22	22	15	0	30	0	98	38	12	1	0	0	8	0	15	6.0	N/A
Lower CI (80%)																			7		
Upper CI (80%)																			22		
Cover of Invasive Shrubs	(<=10%)	0	0	0	30	0	0	0	0	0	0	0	0	0	90	0	0	0	7	5.5	N/A
Lower CI (80%)																			0		
Upper CI (80%)																			14		
Prevalence Index--All strata	<3.0	3	3	3	3	3	2	3	4	3	1	3	3	2	3	4	4	4	3	N/A	N/A
Weighted Prevalence Index		600	348	260	485	365	246	312	163	157	140	282	301	152	470	392	450	228			
Sum of plant cover		200	111	91	165	109	101	111	46	61	99	100	93	72	160	99	121	60			

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																			
Carex sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0.17
Epilobium ciliatum (=E. watsonii)	0	4	0	2	0	0	0	2	7	2	0	0	0	1	0	0	0	0	1.00
Marah oregana	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.06
Prunella vulgaris	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.06
Invasive Herbaceous Species																			
species-latin name																			
Cirsium arvense	3	0	0	0	0	1	0	3	0	0	0	0	0	0	0	0	4	0	0.61
Clematis vitalba	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0.56
Dipsacus fullonum (D. sylvestris)	0	2	10	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.72
Geranium robertianum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35	0	1.94
Geum urbanum	0	0	0	0	0	1	1	0	0	0	0	1	2	2	0	0	0	0	0.39
Hedera helix	0	0	0	0	0	2	3	4	0	0	0	77	0	5	0	0	0	0	5.06
Hypericum perforatum	0	0	0	1	0	1	0	0	0	3	0	0	1	0	0	0	0	1	0.39
Impatiens capensis	0	0	0	0	0	0	0	0	0	5	0	0	2	0	75	0	8	0	5.00
Mentha pulegium	8	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.50
Phalaris arundinacea	0	0	0	0	0	0	0	0	0	0	5	0	40	8	0	0	1	0	3.00
Solanum dulcamara	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.11
Verbascum thapsus	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0.11
Non-Native Herbaceous Species																			
species-latin name																			
Agrostis sp.	0	0	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	5	0.50
Anthemis cotula	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.06
Brachycarpum sylvatica	0	38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.11
Chenopodium album	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.22
Convolvulus arvensis	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0.06
Cuscuta sp.	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.44
Daucus carota	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0.17
Holcus lanatus	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0.11
Hypochaeris radicata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.11
Lapsana communis	0	0	0	4	0	0	2	1	0	1	0	0	0	7	0	0	4	0	1.06
Leucanthemum vulgare	1	1	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1.56
Leontodon saxitalis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.11
Lolium perenne	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0.06
Lotus corniculatus	60	0	3	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	3.56
Persicaria maculosa	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.11
Plantago lanceolata	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.11
Senecio vulgaris	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0.83
Trifolium pratense	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.06
Trifolium repens	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0.17
Unknown grass	0	0	0	0	2	0	0	0	1	0	0	0	0	0	2	1	0	0	0.33
Vicia tetrasperma	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0.11
Native Tree and Shrub Species																			
species-latin name																			
Alnus rubra	0	0	0	0	0	8	0	10	20	0	90	0	0	2	0	0	0	0	7.22
Cornus sericea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Corylus cornuta	0	0	0	0	0	0	0	0	0	0	0	30	0	0	0	0	0	0	1.67
Fraxinus latifolia	0	0	0	10	0	0	0	0	0	5	6	0	0	0	0	0	2	2	1.39
Lonicera involucrata	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0.83
Philadelphus lewisii	0	0	0	0	0	0	0	0	0	2	0	0	0	26	0	0	0	0	1.56
Populus balsamifera trichocarpa	30	0	0	0	0	0	1	0	0	0	0	10	38	0	0	0	10	0	4.94
Prunus sp.	0	0	0	0	0	1	80	0	0	0	0	0	0	0	0	0	0	0	4.50
Ribes sanguineun	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0	0	0.83
Rosa nutkana	0	0	0	0	0	0	0	0	0	60	8	0	0	0	0	10	0	0	4.33
Rubus ursinus	0	0	0	0	0	0	95	0	0	8	0	0	0	0	0	0	0	0	5.72
Salix lucida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	1.11
Salix sitchensis	0	0	50	0	0	0	0	0	0	0	0	0	0	0	60	0	10	28	8.22
Salix hookeriana	0	90	20	0	0	0	0	0	0	0	0	0	0	0	12	60	30	0	11.78
Sambucus racemosa	0	0	0	27	0	0	0	0	8	2	0	0	0	0	0	0	0	0	2.06
Spiraea douglasii	0	0	0	0	68	0	0	0	0	0	0	0	0	0	0	0	0	0	3.78
Symphoricarpos albus	0	0	0	0	0	0	0	0	0	0	0	58	30	0	0	0	0	0	4.89
Invasive Shrub and Tree Species																			
species-latin name																			
Ilex aquifolium	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0.11
Rubus armeniacus	0	0	18	15	0	0	0	0	14	38	8	50	25	14	0	50	0	8	13.33
Bare Substrate																			
thatch/bare ground	15	50	60	90	98	94	94	89	57	88	95	10	55	78	22	99	48	66	67

Routine Performance Standards	RFR1	RFR2	RFR3	RFR4	RFR5	RFR6	RFR7	RFR8	RFR9	RFR10	RFR11	RFR12	RFR13	RFR14	RFR15	RFR16	RFR17	RFR18	Habitat Average	Standard Error	Standard Met?
Cover of Invasive Herbaceous Species <=30%	11	4	11	2	0	5	4	7	0	8	5	88	45	15	75	0	48	1	18	6.4	YES
Lower CI (80%)																			10		
Upper CI (80%)																			26		
Cover of Native Herbaceous Species	0	4	0	3	0	0	0	2	7	2	0	0	0	1	0	0	0	0	1	0.5	N/A
Lower CI (80%)																			0		
Upper CI (80%)																			2		
Cover of Native Shrubs and Trees	30	90	70	37	68	9	176	25	28	92	104	98	68	28	72	70	72	30	65	9.4	N/A
Lower CI (80%)																			53		
Upper CI (80%)																			77		

Appendix D

Fish Monitoring Data

SITE 1 - Near creek on north side of PA.
Sample collected June 17, 2024
Site Coordinates: 45.379549, -122.611215

TestId	ESVId	sequence	Kingdom	Phylum	Class	Order	Family	Genus	Species	% match	# species	Q7CLSN69.1	M4T7I19Q.1	DWNWSAOT.1
23S	ESV_063675	GGGCAGTTTGACT	Eukaryota	Bacillariophyta	Bacillariophyceae					96.4	6	3392	2063	0
23S	ESV_033410	GGGCAGTTTGACT	Eukaryota	Bacillariophyta	Bacillariophyceae					95.5	6	457	3639	8
23S	ESV_074351	GGGCAGTTTCTCT	Eukaryota	Chlorophyta	Mamiellophyceae	Monomastigales	Monomastigaceae	Monomastix		94	3	1831	558	0
23S	ESV_031096	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			95.8	5	1040	151	0
23S	ESV_064878	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			96.4	5	914	94	0
23S	ESV_141823	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			96.7	5	727	194	0
23S	ESV_059531	GTAGACAGTTTCT	Eukaryota	Streptophyta	Zygnemophyceae	Zygnematales	Zygnemataceae	Spirogyra		96.4	3	807	0	0
23S	ESV_031762	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae	Cryptomonadales	Cryptomonadaceae	Cryptomonas		99.7	3	281	58	150
23S	ESV_000261	GTGGGCAGTTTGA	Eukaryota	unk_phylum	Xanthophyceae	Vaucheriales	Vaucheriaceae	Vaucheria	Vaucheria sp. 1 AS-2014	99.4	1	0	0	464
23S	ESV_031736	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			95.5	5	317	45	0
23S	ESV_238462	GGGCAGTTTGACT	Eukaryota	Bacillariophyta	Bacillariophyceae					91.3	16	325	15	0
23S	ESV_000035	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida	Malpighiales	Salicaceae			100	93	0	0	315
23S	ESV_034000	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae	Pyrenomonadales	Chroomonadaceae	Chroomonas		99.4	5	163	55	83
23S	ESV_101980	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			95.2	6	269	22	0
23S	ESV_070417	GTAGACAGTTTCT	Eukaryota	Streptophyta	Zygnemophyceae	Zygnematales	Zygnemataceae	Spirogyra	Spirogyra sp. M1843	99.4	1	288	0	0
23S	ESV_100700	GTAGACAGTTTCT	Eukaryota	Streptophyta	Zygnemophyceae	Zygnematales	Zygnemataceae	Spirogyra		96.7	3	288	0	0
23S	ESV_003190	GGGCAGTTTTACT	Eukaryota	Euglenozoa	Euglenida	Euglenales	unk_family	Colacium		100	2	255	23	0
23S	ESV_032195	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae	Pyrenomonadales	Chroomonadaceae	Chroomonas		99.7	2	186	70	0
23S	ESV_113094	GGGCAGTTTTACT	Eukaryota	Euglenozoa	Euglenida	Euglenales	unk_family	Colacium		99.7	2	227	13	0
23S	ESV_000096	GGGCAGTTTGACTGGGGCGGTCGCCTCCTAAATGGTAACGGAGGCGTACAAAGGTTTCCTCTGAACGTGTAGAAATCGTATCTAGAGTATAAAGGCATAAGGAAGCTTGACTGTGAGACTTACAAGTCGAGCAGGGACC										112	27	100
23S	ESV_031890	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			94.9	5	224	10	0
23S	ESV_063124	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida	Rosales	Rosaceae	Rosa		100	13	0	0	222
23S	ESV_062131	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae	Pyrenomonadales	Chroomonadaceae	Chroomonas		99.4	2	54	76	88
23S	ESV_035270	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida	Rosales	Rosaceae			100	91	0	0	218
23S	ESV_114604	GTGGGCAGTTTAT	Eukaryota	Chlorophyta	Chlorophyceae	Chlamydomonadales				97	8	209	8	0
23S	ESV_104223	GGGCAGTTTGACT	Eukaryota	Bacillariophyta	Bacillariophyceae					95.8	6	0	203	0
23S	ESV_032268	GGGCAGTTTGAC	Eukaryota	Bacillariophyta						96.4	4	125	0	74
23S	ESV_031150	GGGCAGTTTGACT	Eukaryota	Bacillariophyta						98.2	8	51	73	72
23S	ESV_070986	GGGTAGTTTGAC	Bacteria	Cyanobacteriota	Cyanophyceae	Chroococcales	Chroococcaceae	Chondrocystis	Chondrocystis sp. NIES-4102	93.1	1	0	0	191
23S	ESV_073642	GCGGACCTTTTTTC	Eukaryota	Chlorophyta	Ulvophyceae	Ulotrichales				98.8	2	172	0	0
23S	ESV_073045	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida					99.7	98	166	0	0
23S	ESV_209850	GGGCAGTTTCTCT	Eukaryota	Chlorophyta	Mamiellophyceae	Monomastigales	Monomastigaceae	Monomastix		93.7	3	0	166	0
23S	ESV_001454	GGCAGTTTGACTC	Eukaryota	Bacillariophyta	Fragilariophyceae					99.7	3	93	0	72
23S	ESV_080515	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			91	5	161	0	0
23S	ESV_088901	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			96.1	5	140	16	0
23S	ESV_061038	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae	Cryptomonadales	Cryptomonadaceae	Cryptomonas	Cryptomonas curvata	100	1	113	10	32
23S	ESV_032402	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae	Cryptomonadales	Cryptomonadaceae	Cryptomonas		99.4	3	110	28	14
23S	ESV_238456	GGGCAGTTTGACT	Eukaryota	Bacillariophyta	Bacillariophyceae					96.1	6	0	152	0
23S	ESV_061969	GACAGTTTCTCTGC	Eukaryota	Streptophyta	Klebsormidiophyceae	Klebsormidiales	Klebsormidiaceae	Interfilum		100	3	0	0	146
23S	ESV_245789	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			95.8	6	143	0	0
23S	ESV_002114	GGGCAGTTTGACTGGGGCGGTCGCCTCCTAAATGGTAACGGAGGCGTACAAAGGTTTCCTCTGAACGTGTAGAAATCGTATCTAGAGTGTAAAGGCATAAGGAAGCTTGACTGTGAGACCTACAAGTCGAGCAGGGACC										109	0	34
23S	ESV_000067	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida					100	93	0	0	138
23S	ESV_076594	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			96.7	6	108	27	0
23S	ESV_061752	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			95.8	6	115	17	0
23S	ESV_064451	GGGCAGTTTGACT	Eukaryota	Bacillariophyta	Bacillariophyceae	Naviculales	Naviculaceae			99.4	4	130	0	0
23S	ESV_034898	GGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			95.8	6	119	10	0
23S	ESV_001035	GGGCAGTTTGACT	Eukaryota	Bacillariophyta						97.6	9	84	44	0
23S	ESV_001125	GGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			97.3	6	127	0	0
23S	ESV_071169	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			96.7	6	112	13	0
23S	ESV_031688	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			94.9	6	108	16	0
23S	ESV_000137	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida	Lamiales	Oleaceae			100	87	0	0	124
23S	ESV_069836	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae					98.8	5	19	23	78
23S	ESV_206288	GGGCAGTTTATCT	Eukaryota	Chlorophyta	Chlorophyceae	Chlamydomonadales	Chlamydomonadaceae	Chlamydomonas	Chlamydomonas agloeformis	99.1	1	108	12	0
23S	ESV_237894	GGGCAGTTTTACT	Eukaryota	Euglenozoa	Euglenida	Euglenales	Phacaceae	Lepocinclis	Lepocinclis spirogyroides	97	1	0	0	120
23S	ESV_061389	GGGCAGTTTGAC	Eukaryota							92.5	3	84	32	0
23S	ESV_061393	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae					97.3	18	66	28	21
23S	ESV_031665	GGGCAGTTTGACT	Eukaryota	Bacillariophyta	Bacillariophyceae					98.5	6	113	0	0
23S	ESV_063389	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida	Lamiales	Plantaginaceae			100	4	0	0	113
23S	ESV_031389	GGGCAGTTTGACT	Eukaryota	Bacillariophyta	Bacillariophyceae	Naviculales	Naviculaceae			99.4	4	0	28	84
23S	ESV_000619	GGTAGACAGTTTC	Eukaryota	Streptophyta	Pinopsida	Pinales	Pinaceae	Pseudotsuga		100	2	0	0	112
23S	ESV_031451	GGGCAGTTTGACT	Eukaryota	Bacillariophyta	Bacillariophyceae	Naviculales				98.8	4	107	0	0
23S	ESV_238476	GGGCAGTTTGACT	Eukaryota	Bacillariophyta	Bacillariophyceae					94.9	6	98	8	0
23S	ESV_071304	GCGGACCTTTTTTC	Eukaryota	Chlorophyta	Ulvophyceae	Ulotrichales				97.9	2	106	0	0
23S	ESV_061569	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae	Pyrenomonadales	Chroomonadaceae	Chroomonas		100	2	61	15	30
23S	ESV_238466	GGGCAGTTTCTCT	Eukaryota	Chlorophyta	Mamiellophyceae	Monomastigales	Monomastigaceae	Monomastix		93.4	3	93	12	0
23S	ESV_033601	GCGGACCTTTTTTC	Eukaryota	Chlorophyta	Ulvophyceae	Ulotrichales				98.5	2	37	0	64
23S	ESV_031183	GGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			96.4	6	100	0	0
23S	ESV_136938	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			95.5	6	98	0	0
23S	ESV_104275	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			97	6	96	0	0
23S	ESV_083019	GGGCAGTTTGACT	Eukaryota	Bacillariophyta	Bacillariophyceae					95.8	6	0	96	0
23S	ESV_062787	GGGCAGTTTGACT	Eukaryota	Bacillariophyta	Bacillariophyceae	Naviculales				98.5	9	93	0	0
23S	ESV_188179	TGGGTAGTTTGAC	Bacteria	Cyanobacteriota	Cyanophyceae					91.9	2	0	0	92
23S	ESV_141478	GTAGACAGTTTCT	Eukaryota	Streptophyta	Zygnemophyceae	Zygnematales	Zygnemataceae	Spirogyra		95.5	3	89	0	0
23S	ESV_107517	GGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			95.2	6	83	0	0
23S	ESV_103228	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			96.1	6	81	0	0
23S	ESV_080958	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			94.9	6	66	13	0
23S	ESV_238457	GGGCAGTTTGACT	Eukaryota	Bacillariophyta	Bacillariophyceae					96.1	6	0	77	0
23S	ESV_000351	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida	Solanales	Solanaceae			100	95	0	0	77
23S	ESV_071029	GGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae	Cryptomonadales	Cryptomonadaceae	Cryptomonas	Cryptomonas paramecium	93.4	1	0	0	75
23S	ESV_244932	GGGCAGTTTGACT	Eukaryota	Bacillariophyta	Bacillariophyceae	Naviculales				95.8	8	73	0	0
23S	ESV_237892	TGGGTAGTTTGAC	Bacteria	Cyanobacteriota	Cyanophyceae	Pleurocapsales	Hyellaceae	Pleurocapsa	Pleurocapsa sp. PCC 7319	95.2	1	0	0	73
23S	ESV_001481	GGGCAGTTTGAC	Eukaryota	Bacillariophyta	Bacillariophyceae	Bacillariales	Bacillariaceae			99.4	4	71	0	0
23S	ESV_244455	AGACAGTTTCTATC	Eukaryota	Streptophyta	Charophyceae	Charales	Characeae	Nitella		96.4	2	71	0	0
23S	ESV_001093	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida	Cornales	Cornaceae	Cornus		100	8	0	0	69
23S	ESV_000101	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida	Fagales	Fagaceae			100	95	0	0	68
23S	ESV_103041	GTAGACAGTTTCTA	Eukaryota	Streptophyta	Zygnemophyceae	Zygnematales	Zygnemataceae	Spirogyra		96.7	3	66	0	0
23S	ESV_032596	GGGCAGTTTGACT	Eukaryota	Bacillariophyta						98.2	13	62	0	0
23S	ESV_245790	GGGCAGTTTGAC	Eukaryota	Bacillariophyta						96.4	6	59	0	0
23S	ESV_112769	GGGCAGTTTTACT	Eukaryota	Euglenozoa	Euglenida	Euglenales	unk_family	Colacium		94.9	3	32	26	0
23S	ESV_000511	GGGCAGTTTGACT	Eukaryota	Bacillariophyta	Bacillariophyceae					97.6	16	42	0	15
23S	ESV_036887	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae	Cryptomonadales	Cryptomonadaceae	Cryptomonas	Cryptomonas obovoidea	100	1	41	16	0
23S	ESV_032765	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			95.2	6	54	0	0
23S	ESV_000076	GGGCAGTTTGACTGGGGCGGTCGCCTCCTAAATGGTAACGGAGGCGTACAAAGGTTTCCTCTGAACGTGTAGAAATCGTATCTAGAGTATAAAGGCATAAGGAAGCTTGACTGTGAGACTTACAAGTCGAGCAGGGACC										36	9	9
23S	ESV_105398	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae					98.2	5	0	52	0
23S	ESV_071343	GCGGACCTTTTTTC	Eukaryota	Chlorophyta	Ulvophyceae	Ulotrichales	Hazeniaceae	Hazenia	Hazenia capsulata	99.4	1	0	0	51
23S	ESV_122633	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida	Poales	Poaceae	Poa	Poa annua	100	1	0	0	51

23S	ESV_000419	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida	Apiales	Apiaceae			100	88	0	0	51
23S	ESV_001986	GCGGGCAGTTTGA	Eukaryota	unk_phylum	Xanthophyceae	Vaucheriales	Vaucheriaceae	Vaucheria	Vaucheria sp. 1 AS-2014	97.9	1	0	0	51
23S	ESV_237901	CGGGCAGTTTGAC	Eukaryota	Bacillariophyta	Bacillariophyceae	Naviculales	Amphipleuraceae	Halamphora	Halamphora coffeaeformis	96.1	1	50	0	0
23S	ESV_064440	GGGCAGTTTGAC	Eukaryota	Bacillariophyta	Bacillariophyceae	Naviculales	Naviculaceae			98.5	4	50	0	0
23S	ESV_000064	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida	Rosales	Rosaceae			100	86	0	0	50
23S	ESV_095808	GGGCAGTTTGACT	Eukaryota	Bacillariophyta	Bacillariophyceae					98.2	15	47	0	0
23S	ESV_072501	TGGGCAGTTTGAC	Eukaryota	Chlorophyta	Trebouxiophyceae	Trebouxiales	Trebouxiaceae	Lobosphaera	Lobosphaera incisa	100	1	0	0	47
23S	ESV_033420	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae	Pyrenomonadales	Chroomonadaceae	Chroomonas		99.7	3	0	0	45
23S	ESV_059585	GGGCAGTTTGACT	Eukaryota	Bacillariophyta	Bacillariophyceae					98.8	7	0	0	43
23S	ESV_000413	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida	Fagales				100	93	0	0	42
23S	ESV_245792	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			95.8	5	41	0	0
23S	ESV_122652	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida	Gentianales	Rubiaceae	Galium	Galium odoratum	100	1	0	0	41
23S	ESV_031528	GTGGGCAGTTTGA	Eukaryota	Rhodophyta	Florideophyceae	Batrachospermales	Batrachospermaceae			98.8	4	0	0	41
23S	ESV_103235	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae					98.8	14	40	0	0
23S	ESV_103880	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae					98.8	20	30	0	10
23S	ESV_238437	TGGGTAGTTTGAC	Bacteria	Cyanobacteriota	Cyanophyceae	Pleurocapsales	Hyellaceae	Pleurocapsa	Pleurocapsa sp. PCC 7319	95.5	1	0	0	40
23S	ESV_000631	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida					100	19	0	0	39
23S	ESV_030996	CGGGCAGTTTGAC	Eukaryota	Bacillariophyta	Bacillariophyceae	Naviculales	Amphipleuraceae	Halamphora	Halamphora coffeaeformis	96.4	1	0	0	39
23S	ESV_104281	GTAGACAGTTTCT	Eukaryota	Streptophyta	Zygnemophyceae	Zygnematales	Zygnemataceae	Spirogyra		97.6	2	38	0	0
23S	ESV_244910	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae	Pyrenomonadales	Chroomonadaceae	Chroomonas		98.5	3	36	0	0
23S	ESV_061134	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae	Pyrenomonadales	Chroomonadaceae	Chroomonas		99.1	2	36	0	0
23S	ESV_237898	GGGCAGTTTGAC	Eukaryota	Bacillariophyta						97.6	8	0	0	36
23S	ESV_061991	GGGCAGTTTGACT	Eukaryota	Bacillariophyta	Bacillariophyceae	Naviculales	Amphipleuraceae	Halamphora	Halamphora coffeaeformis	98.5	1	0	0	36
23S	ESV_031134	GGGCAGTTTGACT	Eukaryota	Bacillariophyta	Bacillariophyceae	Naviculales				98.5	1	0	0	36
23S	ESV_245791	GTAGACAGTTTCT	Eukaryota	Streptophyta	Zygnemophyceae	Zygnematales	Zygnemataceae	Spirogyra		96.4	3	35	0	0
23S	ESV_198576	GGGCAGTTTGAC	Eukaryota	Bacillariophyta	Bacillariophyceae	Naviculales				98.5	4	0	35	0
23S	ESV_237890	GGCAGTTTTACTG	Eukaryota	Euglenozoa	Euglenida	Euglenales	Euglenaceae	Euglena		91	2	0	0	35
23S	ESV_000020	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida	Poales	Poaceae			100	97	0	0	34
23S	ESV_245793	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			96.1	5	33	0	0
23S	ESV_062933	GGGCAGTTTGACT	Eukaryota							83.9	2	21	0	12
23S	ESV_061364	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			95.8	6	0	0	33
23S	ESV_005511	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida					100	52	0	0	33
23S	ESV_000318	GGGCAGTTTGACT	Eukaryota	Bacillariophyta	Bacillariophyceae					96.1	6	0	8	24
23S	ESV_063756	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida					99.7	100	0	0	32
23S	ESV_031530	CGGGCAGTTTGACTGGGGCGGTCGCCTCCTAAATGGTAACGGAGGCGTACAAAGGTTTCCTCTGAACGTGTAGAAATCGTATCTAGAGTATAAAGGCATAAGGAAGCTTGACTGTGAGACTTACAAGTCGAGCAGGGACG											29	0	0
23S	ESV_060633	CGGGCAGTTTGA	Eukaryota	unk_phylum	Xanthophyceae	Tribonematales	Tribonemataceae	Tribonema		97	4	0	0	28
23S	ESV_031107	TGGGCAGTTTGAC	Bacteria	Cyanobacteriota	Cyanophyceae					84.4	10	0	0	27
23S	ESV_193931	TGGACAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae					93.1	7	0	0	26
23S	ESV_034983	GGGCAGTTTGACT	Eukaryota	Bacillariophyta	Bacillariophyceae	Naviculales				97.9	12	25	0	0
23S	ESV_005092	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			95.2	5	0	0	24
23S	ESV_071911	TGGGCAGTTTACC	Eukaryota	Chlorophyta	Chlorophyceae	Chlamydomonadales				91.3	4	0	0	23
23S	ESV_115747	GTAGACAGTTTC	Eukaryota	Streptophyta	Pinopsida	Pinales	Pinaceae			99.4	90	0	0	23
23S	ESV_035137	GGGCAGTTTGACTGGGGCGGTCGCCTCCTAAATGGTAACGGAGGCGTACAAAGGTTTCCTCTGAACGTGTAGAAATCGTATCTAGAGTATAAAGGCATAAGGAAGCTTGACTGTGAGACTTACAAGTCGAGCAGGGACG											0	0	23
23S	ESV_237895	TGGGCAGTTTATC	Eukaryota	Chlorophyta	Chlorophyceae	Chlamydomonadales	Chlamydomonadaceae	Chlamydomonas		99.4	2	0	0	22
23S	ESV_032217	TGGGCAGTTTGA	Bacteria	Cyanobacteriota	Cyanophyceae					83.8	23	0	0	22
23S	ESV_035009	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			97	5	0	10	11
23S	ESV_112100	GGGCAGTTTGAC	Eukaryota	Bacillariophyta						97.9	7	0	21	0
23S	ESV_005107	GCGGGCAGTTTGA	Eukaryota	unk_phylum	Xanthophyceae	Vaucheriales	Vaucheriaceae	Vaucheria	Vaucheria sp. 1 AS-2014	98.2	1	0	0	21
23S	ESV_064227	GGGCAGTTTTAC	Eukaryota	Euglenozoa	Euglenida	Euglenales	Euglenaceae			93.1	8	0	0	20
23S	ESV_136926	GCGGACCTTTTTTC	Eukaryota	Chlorophyta	Ulvophyceae	Ulotrichales				97.6	2	19	0	0
23S	ESV_109862	GCGGACCTTTTTTC	Eukaryota	Chlorophyta	Ulvophyceae	Ulotrichales				99.1	2	0	0	19
23S	ESV_061414	GGGCAGTTTGACT	Eukaryota	Bacillariophyta						98.5	5	0	0	19
23S	ESV_004191	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida	Myrtales				100	40	0	0	19
23S	ESV_063297	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae					98.2	17	0	0	19
23S	ESV_031077	GGGCAGTTTGACT	Eukaryota	Bacillariophyta						97.6	10	0	0	19
23S	ESV_236697	TGGGCAGTTTTAC	Eukaryota	Euglenozoa	Euglenida	Euglenales	Phacaceae	Lepocinclis	Lepocinclis spirogyroides	96.7	1	0	0	18
23S	ESV_238459	GGGCAGTTTGACT	Eukaryota							90.1	11	0	18	0
23S	ESV_061541	GGGCAGTTTGACT	Eukaryota							96.1	7	0	18	0
23S	ESV_238458	GGGCAGTTTGACT	Eukaryota	Bacillariophyta	Bacillariophyceae					90.4	16	0	18	0
23S	ESV_037041	GGGCAGTTTGACT	Eukaryota	Bacillariophyta						97.9	14	0	0	18
23S	ESV_005392	GGGCAGTTTGACT	Eukaryota	Bacillariophyta	Bacillariophyceae	Bacillariales	Bacillariaceae			99.7	4	0	0	18
23S	ESV_031949	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida	Malpighiales	Salicaceae			99.7	93	0	0	18
23S	ESV_070136	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae	Pyrenomonadales	Chroomonadaceae	Chroomonas		99.7	3	0	17	0
23S	ESV_238460	GGGCAGTTTGACT	Eukaryota							90.4	11	0	17	0
23S	ESV_127256	GCAGTTTTACTGG	Eukaryota	Euglenozoa	Euglenida	Euglenales	Euglenaceae	Euglena	Euglena mutabilis	99.7	1	0	0	17
23S	ESV_000514	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida	Asterales	Asteraceae			100	76	0	0	17
23S	ESV_031852	GGGCAGTTTGACT	Eukaryota	Bacillariophyta	Bacillariophyceae	Naviculales				99.1	1	0	0	17
23S	ESV_002583	GGGCAGTTTGACT	Eukaryota	Bacillariophyta						97.6	7	0	0	17
23S	ESV_122782	CGGACCTTTTTTC	Eukaryota	Chlorophyta	Ulvophyceae					96.7	5	0	0	16
23S	ESV_122961	GGGCAGTTTGACT	Eukaryota	unk_phylum	Synurophyceae	Synurales	Mallomonadaceae			89.3	9	0	0	16
23S	ESV_238461	GGGCAGTTTGACT	Eukaryota	unk_phylum	Synurophyceae	Synurales	Mallomonadaceae	Mallomonas		95.8	9	0	16	0
23S	ESV_034927	CGGACCTTTTTTC	Eukaryota	Chlorophyta	Ulvophyceae	Ulotrichales	Tupiellaceae	Tupiella	Tupiella akineta	100	1	0	0	16
23S	ESV_032308	GGCAGTTTGACTC	Eukaryota	Bacillariophyta	Fragilariophyceae					99.4	3	0	0	16
23S	ESV_061062	TGGGCAGTTTATC	Eukaryota	Chlorophyta	Chlorophyceae	Chlamydomonadales	Chlorococcaceae	Chlorococcum	Chlorococcum echinozygotum	99.7	1	0	0	16
23S	ESV_238463	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			95.8	5	0	15	0
23S	ESV_238464	GGGCAGTTTGACT	Eukaryota	Bacillariophyta	Bacillariophyceae					95.5	6	0	15	0
23S	ESV_059519	GGGCAGTTTGACT	Eukaryota	Bacillariophyta						98.8	2	0	0	15
23S	ESV_031090	GGGCAGTTTGACT	Eukaryota	Bacillariophyta						97.6	8	0	0	15
23S	ESV_030994	GGGCAGTTTGACTGGGGCGGTCGCCTCCTAAATGGTAACGGAGGCGTACAAAGGTTTCCTCTGAACGTGTAGAAATCGTATCTAGAGTGTAAAGGCATAAGGAAGCTTGACTGTGAGACCTACAAGTCGAGCAGGGACG											14	0	0
23S	ESV_176300	GCGGGCAGTTTGA	Eukaryota	Rhodophyta	Florideophyceae	Batrachospermales	Batrachospermaceae	Kumanoa		94.3	4	0	0	14
23S	ESV_139243	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae	Cryptomonadales	Cryptomonadaceae	Cryptomonas		99.4	3	0	0	14
23S	ESV_002450	GGGCAGTTTGACT	Eukaryota	Bacillariophyta						97.3	7	0	0	14
23S	ESV_031271	GGGCAGTTTGACT	Eukaryota	Bacillariophyta	Bacillariophyceae	Bacillariales	Bacillariaceae	Nitzschia	Nitzschia palea	100	1	0	0	14
23S	ESV_067743	GGGCAGTTTGACT	Eukaryota	Bacillariophyta	Bacillariophyceae	Naviculales				98.8	1	0	0	14
23S	ESV_061834	GTGGGTAGTTTGA	Bacteria	Cyanobacteriota	Cyanophyceae	Gomontiellales	Chamaesiphonaceae	Chamaesiphon		98.8	2	0	0	14
23S	ESV_034117	GGCAGTTTTACTG	Eukaryota	Euglenozoa	Euglenida	Euglenales	Euglenaceae			88.9	12	0	0	14
23S	ESV_238438	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae	Pyrenomonadales	Chroomonadaceae	Chroomonas		99.1	5	0	0	13
23S	ESV_115936	GGTAGACAGTTTC	Eukaryota	Streptophyta	Pinopsida	Pinales	Pinaceae			99.1	90	0	0	13
23S	ESV_238465	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			92.8	5	0	13	0
23S	ESV_107770	GTAGACAGTTTCT	Eukaryota	Streptophyta	Zygnemophyceae	Zygnematales	Zygnemataceae	Spirogyra		97	3	0	0	13
23S	ESV_092149	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida	Malpighiales	Salicaceae			99.7	93	0	0	13
23S	ESV_101269	TGGGCAGTTTACT	Eukaryota	Chlorophyta	Chlorophyceae	Sphaeropleales	Neochloridaceae			95.5	2	0	0	13
23S	ESV_062571	GTGGGCAGTTTTT	Eukaryota	Chlorophyta	Chlorophyceae					91.9	4	0	0	13
23S	ESV_000753	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida	Poales	Poaceae	Triticum	Triticum aestivum	100	1	0	0	13
23S	ESV_000019	GGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			100	3	0	0	13
23S	ESV_238439	TGGGCAGTTTACC	Eukaryota	Chlorophyta	Chlorophyceae	Chlamydomonadales				90.7	2	0	0	12

23S	ESV_238440	GTGGGCAGTTTGA	Bacteria	Cyanobacteriota	Cyanophyceae					80.5	4	0	0	12
23S	ESV_001141	TGGGCAGTTTGA	Bacteria	Cyanobacteriota	Cyanophyceae	Synechococcales	Prochlorococcaceae	Cyanobium		100	3	0	12	0
23S	ESV_032682	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			91.9	5	0	12	0
23S	ESV_071938	GTGGGCAGTTTTT	Eukaryota	Chlorophyta	Trebouxiophyceae	Trebouxiales	Trebouxiaceae	Parietochloris	Parietochloris pseudoalveolaris	100	1	0	0	12
23S	ESV_234416	GTGGGCAGTTTGA	Bacteria	Cyanobacteriota	Cyanophyceae	Synechococcales	Merismopediaceae	Synechocystis	Synechocystis sp. PCC 7509	99.1	1	0	0	12
23S	ESV_031392	TGGGTAGTTTGA	Bacteria	Cyanobacteriota	Cyanophyceae	Gomontiellales	Chamaesiphonaceae	Chamaesiphon		97.3	2	0	0	12
23S	ESV_063280	GGGCAGTTTGACT	Eukaryota	Bacillariophyta	Bacillariophyceae	Naviculales	Amphipleuraceae	Halamphora	Halamphora coffeaeformis	98.8	1	0	0	12
23S	ESV_031443	GGGCAGTTTGACT	Eukaryota	Bacillariophyta						97.6	5	0	0	12
23S	ESV_034222	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae	Cryptomonadales	Cryptomonadaceae	Cryptomonas		98.5	4	0	0	12
23S	ESV_064228	GGCAGTTTGACT	Eukaryota							83.8	7	0	0	12
23S	ESV_238469	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			96.4	5	0	11	0
23S	ESV_238468	GGGCAGTTTCTCT	Eukaryota	Chlorophyta	Mamiellophyceae	Monomastigales	Monomastigaceae	Monomastix		93.4	3	0	11	0
23S	ESV_107727	GACAGTTTGACT	Eukaryota	unk_phylum	Synurophyceae	Synurales	Mallomonadaceae	Mallomonas		91.9	15	0	0	11
23S	ESV_238442	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida	Poales	Poaceae			99.7	97	0	0	11
23S	ESV_101069	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae					97.3	5	0	11	0
23S	ESV_238467	TGGGCAGTTTGAC	Eukaryota							91.3	4	0	11	0
23S	ESV_089655	GGGCAGTTTGACT	Eukaryota	Bacillariophyta	Bacillariophyceae	Naviculales				98.2	8	0	11	0
23S	ESV_238441	TGGGCAGTTTGAC	Bacteria	Cyanobacteriota	Cyanophyceae	Nostocales				94	19	0	0	11
23S	ESV_000070	GGGCAGTTTGACT	Eukaryota	Bacillariophyta	Bacillariophyceae	Naviculales	Naviculaceae			99.4	4	0	11	0
23S	ESV_237089	GTGGGCAGTTTGA	Eukaryota	unk_phylum	Xanthophyceae	Vaucheriales	Vaucheriaceae	Vaucheria	Vaucheria sp. 1 AS-2014	98.2	1	0	0	11
23S	ESV_025750	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida					100	98	0	0	11
23S	ESV_070005	CGGGCAGTTTTCC	Eukaryota	Chlorophyta	Chlorophyceae	unk_order	Microsporaceae	Microspora	Microspora sp. UTEX LB472	95.5	1	0	0	11
23S	ESV_035866	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			96.1	6	0	0	11
23S	ESV_061225	TGGGCAGTTTGAC	Eukaryota	Chlorophyta	Trebouxiophyceae	Trebouxiales	Trebouxiaceae	Lobosphaera	Lobosphaera incisa	100	1	0	0	11
23S	ESV_238471	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae					97.6	18	0	10	0
23S	ESV_238470	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae	Pyrenomonadales	Chroomonadaceae	Chroomonas		91.9	2	0	10	0
23S	ESV_032132	GTGGGCAGTTTGA	Bacteria	Cyanobacteriota	Cyanophyceae	Oscillatoriales				90.7	4	0	10	0
23S	ESV_209624	GGGCAGTTTGACT	Eukaryota	Bacillariophyta	Bacillariophyceae					94.6	6	0	10	0
23S	ESV_064599	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			97.6	6	0	10	0
23S	ESV_238443	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida	Lamiales	Lamiaceae	Clerodendrum		100	11	0	0	10
23S	ESV_061342	GGGCAGTTTGACTGGGGCGGTCGCCTCCTAAAGGGTAACGGAGGCGCACAAAGGTTTCCTCTGAACGGGTAGAAATCGTATCTAGAGTGTAAAGGCATAAGGAAGCTTGACTGTGAGACCTACAAGTCGAGCAGGGAC										0	10	0
23S	ESV_115115	GGGCAGTTTGAC	Eukaryota	Bacillariophyta	Bacillariophyceae	Naviculales				98.2	1	0	0	10
23S	ESV_070842	CGGGCAGTTTGAC	Eukaryota	Chlorophyta	Chlorophyceae	Chaetophorales	Chaetophoraceae	Uvulifera	Uvulifera verrucariae	100	1	0	0	10
23S	ESV_076677	GGGCAGTTTGACT	Eukaryota	unk_phylum	Synurophyceae	Synurales	Mallomonadaceae	Mallomonas	Mallomonas mangofera	99.1	1	0	10	0
23S	ESV_070452	GTGGGTAGTTTGA	Bacteria	Cyanobacteriota	Cyanophyceae	Gomontiellales	Chamaesiphonaceae	Chamaesiphon		99.1	2	0	0	10
23S	ESV_103007	TGGGCAGTTTACT	Eukaryota	Chlorophyta	Chlorophyceae	Sphaeropleales	Neochloridaceae			95	2	0	0	10
23S	ESV_106250	GGGCAGTTTGACT	Eukaryota	Bacillariophyta	Bacillariophyceae	Naviculales				98.5	4	0	10	0
23S	ESV_237896	GGGCAGTTTTACT	Eukaryota	Euglenozoa	Euglenida	Euglenales	unk_family	Colacium		94.3	2	0	0	10
23S	ESV_229331	GGGCAGTTTGACT	Eukaryota	unk_phylum	Synurophyceae	Synurales	Mallomonadaceae	Mallomonas	Mallomonas papillosa	100	1	0	0	10
23S	ESV_031082	GGGCAGTTTGACT	Eukaryota	Bacillariophyta	Bacillariophyceae	Naviculales	Naviculaceae			98.8	4	0	0	10
23S	ESV_001708	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida					99.7	95	0	0	10
23S	ESV_033064	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae	Cryptomonadales	Cryptomonadaceae	Cryptomonas	Cryptomonas ovata	100	1	0	0	10
23S	ESV_061370	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae	Pyrenomonadales	Chroomonadaceae	Chroomonas		98.8	5	0	0	10
23S	ESV_031308	CGGACCTTTTTTC	Eukaryota	Chlorophyta	Ulvophyceae	Ulotrichales				99.4	2	0	0	10
23S	ESV_060105	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae	Cryptomonadales	Cryptomonadaceae	Cryptomonas		99.4	6	0	0	10
23S	ESV_238472	GGGCAGTTTGACT	Eukaryota	unk_phylum	Cryptophyceae					90.4	18	0	9	0
23S	ESV_238473	GGGCAGTTTGACTGGGGCGGTCGCCTCCTAAATGGTAACGGAGGCGTACAAAGGTTTCCTCTGAACGTGTAGAAATCGTATCTAGAGTATAAAGGCATAAGGAAGCTTGACTGTGAGACTTACAAGTCGAGCAGGGACC										0	9	0
23S	ESV_238474	CGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae	Pyrenomonadales	Chroomonadaceae	Chroomonas		91.9	2	0	9	0
23S	ESV_237087	GTGGGCAGTTTGA	Eukaryota	unk_phylum	Xanthophyceae	Vaucheriales	Vaucheriaceae	Vaucheria	Vaucheria sp. 1 AS-2014	97.6	1	0	0	9
23S	ESV_238448	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida	Fabales	Fabaceae			99.7	99	0	0	9
23S	ESV_192804	GTAGACAGTTTCTA	Eukaryota	Streptophyta	Zygnemophyceae	Zygnematales	Zygnemataceae	Spirogyra		98.8	6	0	0	9
23S	ESV_238446	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida					99.4	96	0	0	9
23S	ESV_238445	GGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae	Cryptomonadales	Cryptomonadaceae	Cryptomonas	Cryptomonas paramecium	93.1	1	0	0	9
23S	ESV_233030	GCAGTTTTACTGG	Eukaryota	Euglenozoa	Euglenida	Euglenales	Euglenaceae	Euglena	Euglena adhaerens	96.4	1	0	0	9
23S	ESV_238447	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida					99.7	91	0	0	9
23S	ESV_122576	GGCAGTTTTACTC	Eukaryota	Euglenozoa	Euglenida	Euglenales	Euglenaceae	Euglena	Euglena deses	90.4	1	0	0	9
23S	ESV_238449	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae					98.5	5	0	0	9
23S	ESV_136841	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida	Malpighiales	Salicaceae			99.7	93	0	0	9
23S	ESV_238444	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae	Pyrenomonadales	Chroomonadaceae	Chroomonas		99.1	2	0	0	9
23S	ESV_124061	GGCAGTTTTACTC	Eukaryota	Euglenozoa	Euglenida	Euglenales	Euglenaceae			92.5	4	0	0	9
23S	ESV_003051	GGGCAGTTTGAC	Eukaryota	Bacillariophyta						96.1	19	0	0	9
23S	ESV_003701	GGGCAGTTTGACTGGGGCGGTCGCCTCCTAAATGGTAACGGAGGCGTACAAAGGTTTCCTCTGAACGTGTAGAAATCGTATCTAGAGTGTAAAGGCATAAGGAAGCTTGACTGTGAGACCTACAAGTCGAGCAGGGACC										0	0	9
23S	ESV_031240	GGGCAGTTTGACT	Eukaryota	Bacillariophyta						97.6	9	0	0	9
23S	ESV_000044	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida					100	89	0	0	9
23S	ESV_059658	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae	Cryptomonadales	Cryptomonadaceae	Cryptomonas		98.8	7	0	0	9
23S	ESV_238475	GGGCAGTTTGACT	Eukaryota	Bacillariophyta	Bacillariophyceae					95.8	6	0	8	0
23S	ESV_238477	GGGCAGTTTCTCT	Eukaryota	Chlorophyta	Mamiellophyceae	Monomastigales	Monomastigaceae	Monomastix		92.8	3	0	8	0
23S	ESV_238480	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			96.1	5	0	8	0
23S	ESV_238479	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			91.3	5	0	8	0
23S	ESV_238478	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			96.4	5	0	8	0
23S	ESV_107708	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae	Pyrenomonadales	Chroomonadaceae	Chroomonas		99.1	2	8	0	0
23S	ESV_100232	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida	Ericales	Balsaminaceae	Impatiens		100	8	0	0	8
23S	ESV_238451	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida	Lamiales				99.4	91	0	0	8
23S	ESV_237893	CGGGCAGTTTGAC	Eukaryota	unk_phylum	Xanthophyceae	Tribonematales	Tribonemataceae	Tribonema		92.5	4	0	0	8
23S	ESV_237889	CTAGACAGTTTTTC	Eukaryota	Chlorophyta	Chlorophyceae	Sphaeropleales	Bracteacoccaceae	Bracteacoccus		99.7	3	0	0	8
23S	ESV_238452	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida					99.7	98	0	0	8
23S	ESV_001152	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae	Cryptomonadales	Cryptomonadaceae	Cryptomonas		99.7	4	0	8	0
23S	ESV_238455	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida	Rosales	Rosaceae			99.7	91	0	0	8
23S	ESV_238454	TGGGTAGTTTGAC	Bacteria	Cyanobacteriota	Cyanophyceae	Pleurocapsales	Hyellaceae	Pleurocapsa	Pleurocapsa sp. PCC 7319	94.9	1	0	0	8
23S	ESV_238453	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida					99.4	100	0	0	8
23S	ESV_033121	GGGCAGTTTGACTGGGGCGGTCGCCTCCCAAACGGTAACGGAGGCGCACAAAGGTTTCCTCTGAACGGGTAGAAATCGTATCTAGAGTGTAAAGGCATAAGGAAGCTTGACTGTGAGACCTACAAGTCGAGCAGGGAC										0	8	0
23S	ESV_100614	GGGCAGTTTCTCT	Eukaryota	Chlorophyta	Mamiellophyceae	Monomastigales	Monomastigaceae	Monomastix		99.7	2	0	8	0
23S	ESV_238450	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae	Pyrenomonadales	Chroomonadaceae	Chroomonas		99.4	3	0	0	8
23S	ESV_032799	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae	Cryptomonadales	Cryptomonadaceae	Cryptomonas		98.8	5	0	0	8
23S	ESV_061409	TGGGCAGTTTGAC	Eukaryota	unk_phylum	Cryptophyceae	Cryptomonadales	Cryptomonadaceae	Cryptomonas	Cryptomonas curvata	99.1	1	0	0	8
23S	ESV_034204	GTGGGTAGTTTGA	Bacteria	Cyanobacteriota	Cyanophyceae	Gomontiellales	Chamaesiphonaceae	Chamaesiphon		99.7	2	0	0	8
23S	ESV_002595	GGTAGACAGTTTC	Eukaryota	Streptophyta	Pinopsida	Pinales	Pinaceae			99.1	90	0	0	8
23S	ESV_063455	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida					99.7	98	0	0	8
23S	ESV_036787	TGGGCAGTTTATT	Eukaryota	Chlorophyta	Chlorophyceae	Chlamydomonadales				99.7	9	0	0	8
23S	ESV_001239	TGGGTAGTTTGAC	Bacteria	Cyanobacteriota						92.5	1	0	0	8
23S	ESV_000555	TGGGTAGTTTGACTGGGGCGGTCGCCTCCTAAAGTGTAACGGAGGCGCGCGATGGTGGGCTCAGACCGGTCGGAAATCGGTCGTCGAGTGCAATGGCATAAGCCCGCCTGACTGCGAGACTGACAAGTCGAGCAGAGA										0	0	8
23S	ESV_000311	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida	Lamiales	Scrophulariaceae	Eremophila		100	87	0	0	8
23S	ESV_000312	GGTAGACAGTTTC	Eukaryota	Streptophyta	Magnoliopsida					100	98	0	0	8

Site 2 - Lower Beaver Pond, above artificial dam
Sample collected June 17, 2024
Site Coordinates: 43.380469, -122.614731

TestId	ESVId	sequence	Kingdom	Phylum	Class	Order	Family	Genus	Species	% match	# species	Q7CLSN69.1	M4T7I19Q.1	DWNWSAOT.1
MiFishU	ESV_091381	GACCTCTTGGCTG	Eukaryota	Chordata	Actinopteri	Cypriniformes	Cobitidae	Misgurnus		100	2	9481	9902	0
MiFishU	ESV_133553	TGGCCCTTTGGCTC	Eukaryota	Chordata	Actinopteri	Cypriniformes	Leuciscidae	Rhinichthys		99.4	3	0	2115	12161
MiFishU	ESV_010759	AACATCTTCAAGA	Eukaryota	Chordata	Actinopteri	Perciformes	Cottidae			100	6	0	1329	8793
MiFishU	ESV_088003	GACCTCTTGGCTG	Eukaryota	Chordata	Actinopteri	Cypriniformes	Cobitidae	Misgurnus	Misgurnus anguillicaudatus	100	1	4915	865	0
MiFishU	ESV_039589	ACCCAGCTCCGCT	Eukaryota	Chordata	Amphibia	Caudata	Salamandridae	Taricha	Taricha granulosa	100	1	744	321	2094
MiFishU	ESV_018570	TGGCCCTTTGGCTC	Eukaryota	Chordata	Actinopteri	Cypriniformes	Leuciscidae	Rhinichthys		100	2	0	683	1926
MiFishU	ESV_001615	ATTTTCTCATGGC	Eukaryota	Chordata	Actinopteri	Cyprinodontiformes	Fundulidae	Fundulus	Fundulus diaphanus	100	1	1514	755	0
MiFishU	ESV_009957	GGCCCTTTGGCTC	Eukaryota	Chordata	Actinopteri	Cypriniformes	Leuciscidae	Notemigonus	Notemigonus crysoleucas	100	1	1646	155	0
MiFishU	ESV_008617	AACACCCCCAAAG	Eukaryota	Chordata	Actinopteri	Perciformes	Gasterosteidae	Gasterosteus	Gasterosteus aculeatus	100	1	176	532	909
MiFishU	ESV_133848	GACCTCTTGGCTG	Eukaryota	Chordata	Actinopteri	Cypriniformes	Cobitidae	Misgurnus		99.4	4	1312	293	0
MiFishU	ESV_007577	AATGCTTTCAAAG	Eukaryota	Chordata	Actinopteri	Centrarchiformes	Centrarchidae	Lepomis		100	3	0	1586	0
MiFishU	ESV_133849	GACCTCTTGGCTG	Eukaryota	Chordata	Actinopteri	Cypriniformes	Cobitidae	Misgurnus		99.4	4	1222	260	0
MiFishU	ESV_094437	ACATCTTCAAAGC	Eukaryota	Chordata	Actinopteri	Gobiiformes	Gobiidae	Rhinogobius		100	10	1043	0	0
MiFishU	ESV_009942	AATGCTTTCAAAG	Eukaryota	Chordata	Actinopteri	Centrarchiformes	Centrarchidae	Lepomis		100	3	310	342	0
MiFishU	ESV_017510	TGGCCCCTTGGCC	Eukaryota	Chordata	Actinopteri	Cypriniformes	Cyprinidae	Carassius		100	5	119	502	0
MiFishU	ESV_009594	AACCTTTCCAAAGC	Eukaryota	Chordata	Actinopteri	Cyprinodontiformes	Poeciliidae	Gambusia	Gambusia affinis	100	1	155	357	104
MiFishU	ESV_140777	ATTTTCTCATGGC	Eukaryota	Chordata	Actinopteri	Cyprinodontiformes	Fundulidae	Fundulus		99.4	2	504	0	0
MiFishU	ESV_002938	AATGCTTTCAAAG	Eukaryota	Chordata	Actinopteri	Centrarchiformes	Centrarchidae	Lepomis	Lepomis macrochirus	100	1	0	400	0
MiFishU	ESV_007586	AATGCTTTCAAAG	Eukaryota	Chordata	Actinopteri	Centrarchiformes	Centrarchidae	Lepomis		100	2	0	355	0
MiFishU	ESV_000073	AATGCTTTCAAAG	Eukaryota	Chordata	Actinopteri	Centrarchiformes	Centrarchidae	Lepomis	Lepomis macrochirus	100	1	0	280	0
MiFishU	ESV_133850	AACACCCCCAAAG	Eukaryota	Chordata	Actinopteri	Perciformes	Gasterosteidae	Gasterosteus	Gasterosteus aculeatus	99.4	1	0	246	0
MiFishU	ESV_007666	ATCCCCTAAGCCGT	Eukaryota	Chordata	Actinopteri	Siluriformes	Ictaluridae	Ameiurus		100	2	195	23	0
MiFishU	ESV_133843	TGGCCCTTTGGCTC	Eukaryota	Chordata	Actinopteri	Cypriniformes	Leuciscidae	Rhinichthys		98.9	3	0	0	206
MiFishU	ESV_018574	GGCCCTTTGGCTG	Eukaryota	Chordata	Actinopteri	Cypriniformes	Leuciscidae	Ptychocheilus		100	2	0	42	150
MiFishU	ESV_009939	ACACCCCCTCAGC	Eukaryota	Chordata	Actinopteri	Salmoniformes	Salmonidae	Oncorhynchus	Oncorhynchus kisutch	100	1	0	40	144
MiFishU	ESV_140776	ACATCTTCAAAGC	Eukaryota	Chordata	Actinopteri	Gobiiformes	Gobiidae	Rhinogobius		99.4	11	183	0	0
MiFishU	ESV_038161	ATTTCATCTGGGTC	Eukaryota	Chordata	Mammalia	Rodentia	Myocastoridae	Myocastor	Myocastor coypus	100	1	29	72	21
MiFishU	ESV_040194	AACATCTTCAAGA	Eukaryota	Chordata	Actinopteri	Perciformes	Cottidae			99.4	26	0	0	122
MiFishU	ESV_010720	GGCCCTTTGGCCG	Eukaryota	Chordata	Actinopteri	Cypriniformes	Catostomidae	Catostomus		100	4	0	100	0
MiFishU	ESV_019354	AACATCTTCAAGA	Eukaryota	Chordata	Actinopteri	Perciformes	Cottidae			98.8	26	0	10	67
MiFishU	ESV_067706	AATGCTTTCAAAG	Eukaryota	Chordata	Actinopteri	Centrarchiformes	Centrarchidae	Lepomis		99.4	2	0	75	0
MiFishU	ESV_000067	AATGCAACTAAGC	Eukaryota	Chordata	Aves	Anseriformes	Anatidae			100	4	36	15	21
MiFishU	ESV_018592	GGCCCTTTGGCTC	Eukaryota	Chordata	Actinopteri	Cypriniformes	Leuciscidae	Ptychocheilus		99.4	2	0	8	63
MiFishU	ESV_038173	AATGCTTTCAAAG	Eukaryota	Chordata	Actinopteri	Centrarchiformes	Centrarchidae	Lepomis		99.4	4	0	63	0
MiFishU	ESV_017176	AATGCTTTCAAAG	Eukaryota	Chordata	Actinopteri	Centrarchiformes	Centrarchidae	Lepomis		99.4	4	0	61	0
MiFishU	ESV_000055	AACACCCCCAAAG	Eukaryota	Chordata	Actinopteri	Perciformes	Gasterosteidae	Gasterosteus	Gasterosteus aculeatus	99.4	1	0	53	0
MiFishU	ESV_011684	ATCCCCTAGGCCG	Eukaryota	Chordata	Actinopteri	Siluriformes	Ictaluridae	Ameiurus	Ameiurus natalis	100	1	44	0	0
MiFishU	ESV_133844	TGGCCCTTTGGCTC	Eukaryota	Chordata	Actinopteri	Cypriniformes	Leuciscidae	Rhinichthys		98.3	3	0	0	43
MiFishU	ESV_133851	TGGCCCTTTGGCTC	Eukaryota	Chordata	Actinopteri	Cypriniformes	Leuciscidae	Rhinichthys		98.9	3	0	36	0
MiFishU	ESV_133852	TGGCCCTTTGGCTC	Eukaryota	Chordata	Actinopteri	Cypriniformes	Leuciscidae	Rhinichthys		98.9	3	0	32	0
MiFishU	ESV_014663	GCAACTGAGCTGT	Eukaryota	Chordata	Aves	Passeriformes	Corvidae	Corvus		100	5	0	0	29
MiFishU	ESV_133853	TGGCCCCTTGGCC	Eukaryota	Chordata	Actinopteri	Cypriniformes	Cyprinidae			99.4	14	0	27	0
MiFishU	ESV_066969	AATGCTTTCAAAG	Eukaryota	Chordata	Actinopteri	Centrarchiformes	Centrarchidae	Lepomis		97.6	3	0	21	0
MiFishU	ESV_133845	TGGCCCTTTGGCTC	Eukaryota	Chordata	Actinopteri	Cypriniformes	Leuciscidae	Rhinichthys		98.3	3	0	0	18
MiFishU	ESV_133854	GACCTCTTGGCTG	Eukaryota	Chordata	Actinopteri	Cypriniformes	Cobitidae	Misgurnus		99.4	3	0	17	0
MiFishU	ESV_103435	ATCCCCTAAGCCGT	Eukaryota	Chordata	Actinopteri	Siluriformes	Ictaluridae	Ameiurus		99.4	3	0	17	0
MiFishU	ESV_133846	GGCCCTTTGGCTG	Eukaryota	Chordata	Actinopteri	Cypriniformes	Leuciscidae	Ptychocheilus		98.9	2	0	0	17
MiFishU	ESV_000075	AATTCTAACTAAG	Eukaryota	Chordata	Mammalia	Artiodactyla	Bovidae			100	6	0	0	17
MiFishU	ESV_017334	ATCCCCTAAGCCGT	Eukaryota	Chordata	Actinopteri	Siluriformes	Ictaluridae	Ameiurus		99.4	3	16	0	0
MiFishU	ESV_066701	AACACCCCCAAAG	Eukaryota	Chordata	Actinopteri	Perciformes	Gasterosteidae	Gasterosteus	Gasterosteus aculeatus	99.4	1	0	0	16
MiFishU	ESV_009694	AAACCATCCAATA	Eukaryota	Chordata	Mammalia					100	2	0	16	0
MiFishU	ESV_133855	TGGCCCTTTGGCTC	Eukaryota	Chordata	Actinopteri	Cypriniformes	Leuciscidae	Rhinichthys		99.4	3	0	15	0
MiFishU	ESV_025961	AACACCCCCAAAG	Eukaryota	Chordata	Actinopteri	Perciformes	Gasterosteidae	Gasterosteus	Gasterosteus aculeatus	99.4	1	0	0	14
MiFishU	ESV_116173	ATTTTCTCATGGC	Eukaryota	Chordata	Actinopteri	Cyprinodontiformes	Fundulidae	Fundulus		99.4	2	0	13	0
MiFishU	ESV_042835	AACACCCCCAAAG	Eukaryota	Chordata	Actinopteri	Perciformes	Gasterosteidae	Gasterosteus	Gasterosteus aculeatus	97.6	1	0	0	12
MiFishU	ESV_133856	TGGCCCTTTGGCTC	Eukaryota	Chordata	Actinopteri	Cypriniformes	Leuciscidae	Rhinichthys		99.4	3	0	12	0
MiFishU	ESV_010218	AACACCCCCAAAG	Eukaryota	Chordata	Actinopteri	Perciformes	Gasterosteidae	Gasterosteus	Gasterosteus aculeatus	99.4	1	0	12	0
MiFishU	ESV_133858	TGGCCCCTTGGCC	Eukaryota	Chordata	Actinopteri	Cypriniformes	Cyprinidae			99.4	14	0	11	0
MiFishU	ESV_133857	GACCTCTTGGCTG	Eukaryota	Chordata	Actinopteri	Cypriniformes	Cobitidae	Misgurnus		97.7	2	0	11	0
MiFishU	ESV_076001	AACCTTTCCAAAGC	Eukaryota	Chordata	Actinopteri	Cyprinodontiformes	Poeciliidae	Gambusia		99.4	2	0	11	0
MiFishU	ESV_039914	GGCCCTTTGGCTG	Eukaryota	Chordata	Actinopteri	Cypriniformes	Leuciscidae			99.4	4	0	0	10
MiFishU	ESV_133859	GACCTCTTGGCTG	Eukaryota	Chordata	Actinopteri	Cypriniformes	Cobitidae	Misgurnus		98.8	2	0	10	0
MiFishU	ESV_024690	AACACCCCCAAAG	Eukaryota	Chordata	Actinopteri	Perciformes	Gasterosteidae	Gasterosteus	Gasterosteus aculeatus	98.8	1	0	0	10
MiFishU	ESV_056188	TGGCCCCTTGGCC	Eukaryota	Chordata	Actinopteri	Cypriniformes	Cyprinidae			99.4	14	0	9	0
MiFishU	ESV_042831	AACATCTTCAAGA	Eukaryota	Chordata	Actinopteri	Perciformes	Cottidae			98.8	26	0	0	9
MiFishU	ESV_140775	CTTTGCCAGGGTTGGCCTTGGCCCAATCCACAAACTCCTTGAGTGTCTTGGCAGGCGTACCCGGCCCTGCCCCCAAAG										8	0	0
MiFishU	ESV_133860	TGGCCCCTTGGCC	Eukaryota	Chordata	Actinopteri	Cypriniformes	Cyprinidae			99.4	14	0	8	0
MiFishU	ESV_133847	ACCCAGCTCCGCT	Eukaryota	Chordata	Amphibia	Caudata	Salamandridae	Taricha	Taricha granulosa	98.2	1	0	0	8
MiFishU	ESV_133861	GACCTCTTGGCTG	Eukaryota	Chordata	Actinopteri	Cypriniformes	Cobitidae	Misgurnus		98.8	2	0	8	0

SITE 3 - Near upstream side of beaver pond
Sample collected June 17, 2024
Site Coordinates: 45.380451, -122.614676

TestId	ESVId	Sequence	Kingdom	Phylum	Class	Order	Family	Genus	Species	% match	# species	M4T7I19Q.1	DWNWSAOT.1
23S	ESV_033410	GCGGGCAGTTTG	Eukaryota	Bacillariophyta	Bacillariophyceae					95.5	6	3639	8
23S	ESV_063675	GCGGGCAGTTTG	Eukaryota	Bacillariophyta	Bacillariophyceae					96.4	6	2063	0
23S	ESV_074351	GCGGGCAGTTTC	Eukaryota	Chlorophyta	Mamiellophyceae	Monomastigales	Monomastigaceae	Monomastix		94	3	558	0
23S	ESV_000261	GGTGGGCAGTTT	Eukaryota	unk_phylum	Xanthophyceae	Vaucheriales	Vaucheriaceae	Vaucheria	Vaucheria sp. 1 AS-2014	99.4	1	0	464
23S	ESV_000035	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida	Malpighiales	Salicaceae			100	93	0	315
23S	ESV_063124	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida	Rosales	Rosaceae	Rosa		100	13	0	222
23S	ESV_035270	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida	Rosales	Rosaceae			100	91	0	218
23S	ESV_031762	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Cryptophyceae	Cryptomonadales	Cryptomonadaceae	Cryptomonas		99.7	3	58	150
23S	ESV_104223	GCGGGCAGTTTG	Eukaryota	Bacillariophyta	Bacillariophyceae					95.8	6	203	0
23S	ESV_141823	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			96.7	5	194	0
23S	ESV_070986	GTGGGTAGTTTG	Bacteria	Cyanobacteriota	Cyanophyceae	Chroococcales	Chroococcaceae	Chondrocystis	Chondrocystis sp. NIES-4102	93.1	1	0	191
23S	ESV_209850	GCGGGCAGTTTC	Eukaryota	Chlorophyta	Mamiellophyceae	Monomastigales	Monomastigaceae	Monomastix		93.7	3	166	0
23S	ESV_062131	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Cryptophyceae	Pyrenomonadales	Chroomonadaceae	Chroomonas		99.4	2	76	88
23S	ESV_238456	GCGGGCAGTTTG	Eukaryota	Bacillariophyta	Bacillariophyceae					96.1	6	152	0
23S	ESV_031096	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			95.8	5	151	0
23S	ESV_061969	AGACAGTTTCTCT	Eukaryota	Streptophyta	Klebsormidiophyceae	Klebsormidiales	Klebsormidiaceae	Interfilum		100	3	0	146
23S	ESV_031150	GCGGGCAGTTTG	Eukaryota	Bacillariophyta						98.2	8	73	72
23S	ESV_034000	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Cryptophyceae	Pyrenomonadales	Chroomonadaceae	Chroomonas		99.4	5	55	83
23S	ESV_000067	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida					100	93	0	138
23S	ESV_000096	GCGGGCAGTTTGACTGGGGCGGTCGCCTCCTAAATGGTAACGGAGGCGTACAAAGGTTTCCTCTGAACGTGTAGAAATCGTATCTAGAGTATAAAGGCATAAGGAAGCTTGACTGTGAGACTTACAAGTCGAGCAGGGACGAA											27	100
23S	ESV_000137	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida	Lamiales	Oleaceae			100	87	0	124
23S	ESV_237894	GATGGGCAGTTTT	Eukaryota	Euglenozoa	Euglenida	Euglenales	Phacaceae	Lepocinclis	Lepocinclis spirogyroides	97	1	0	120
23S	ESV_063389	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida	Lamiales	Plantaginaceae			100	4	0	113
23S	ESV_031389	GCGGGCAGTTTG	Eukaryota	Bacillariophyta	Bacillariophyceae	Naviculales	Naviculaceae			99.4	4	28	84
23S	ESV_000619	AGGTAGACAGTT	Eukaryota	Streptophyta	Pinopsida	Pinales	Pinaceae	Pseudotsuga		100	2	0	112
23S	ESV_069836	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Cryptophyceae					98.8	5	23	78
23S	ESV_083019	GCGGGCAGTTTG	Eukaryota	Bacillariophyta	Bacillariophyceae					95.8	6	96	0
23S	ESV_064878	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			96.4	5	94	0
23S	ESV_188179	GGTGGGTAGTTTC	Bacteria	Cyanobacteriota	Cyanophyceae					91.9	2	0	92
23S	ESV_238457	GCGGGCAGTTTG	Eukaryota	Bacillariophyta	Bacillariophyceae					96.1	6	77	0
23S	ESV_000351	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida	Solanales	Solanaceae			100	95	0	77
23S	ESV_071029	AGTGGGCAGTTTC	Eukaryota	unk_phylum	Cryptophyceae	Cryptomonadales	Cryptomonadaceae	Cryptomonas	Cryptomonas paramecium	93.4	1	0	75
23S	ESV_032268	GGCGGGCAGTTTC	Eukaryota	Bacillariophyta						96.4	4	0	74
23S	ESV_237892	GGTGGGTAGTTTC	Bacteria	Cyanobacteriota	Cyanophyceae	Pleurocapsales	Hyellaceae	Pleurocapsa	Pleurocapsa sp. PCC 7319	95.2	1	0	73
23S	ESV_001454	CGGGCAGTTTGA	Eukaryota	Bacillariophyta	Fragilariophyceae					99.7	3	0	72
23S	ESV_032195	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Cryptophyceae	Pyrenomonadales	Chroomonadaceae	Chroomonas		99.7	2	70	0
23S	ESV_001093	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida	Cornales	Cornaceae	Cornus		100	8	0	69
23S	ESV_000101	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida	Fagales	Fagaceae			100	95	0	68
23S	ESV_033601	GGCGGACCTTTT	Eukaryota	Chlorophyta	Ulvophyceae	Ulotrichales				98.5	2	0	64
23S	ESV_105398	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Cryptophyceae					98.2	5	52	0
23S	ESV_071343	GGCGGACCTTTT	Eukaryota	Chlorophyta	Ulvophyceae	Ulotrichales	Hazeniaceae	Hazenia	Hazenia capsulata	99.4	1	0	51
23S	ESV_122633	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida	Poales	Poaceae	Poa	Poa annua	100	1	0	51
23S	ESV_000419	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida	Apiales	Apiaceae			100	88	0	51
23S	ESV_001986	GGCGGGCAGTTT	Eukaryota	unk_phylum	Xanthophyceae	Vaucheriales	Vaucheriaceae	Vaucheria	Vaucheria sp. 1 AS-2014	97.9	1	0	51
23S	ESV_000064	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida	Rosales	Rosaceae			100	86	0	50
23S	ESV_061393	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Cryptophyceae					97.3	18	28	21
23S	ESV_072501	GGTGGGCAGTTTC	Eukaryota	Chlorophyta	Trebouxiophyceae	Trebouxiales	Trebouxiaceae	Lobosphaera	Lobosphaera incisa	100	1	0	47
23S	ESV_031736	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			95.5	5	45	0
23S	ESV_061569	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Cryptophyceae	Pyrenomonadales	Chroomonadaceae	Chroomonas		100	2	15	30
23S	ESV_033420	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Cryptophyceae	Pyrenomonadales	Chroomonadaceae	Chroomonas		99.7	3	0	45
23S	ESV_001035	GCGGGCAGTTTG	Eukaryota	Bacillariophyta						97.6	9	44	0
23S	ESV_059585	GCGGGCAGTTTG	Eukaryota	Bacillariophyta	Bacillariophyceae					98.8	7	0	43
23S	ESV_061038	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Cryptophyceae	Cryptomonadales	Cryptomonadaceae	Cryptomonas	Cryptomonas curvata	100	1	10	32
23S	ESV_032402	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Cryptophyceae	Cryptomonadales	Cryptomonadaceae	Cryptomonas		99.4	3	28	14
23S	ESV_000413	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida	Fagales				100	93	0	42
23S	ESV_031528	GGTGGGCAGTTT	Eukaryota	Rhodophyta	Florideophyceae	Batrachospermales	Batrachospermaceae			98.8	4	0	41
23S	ESV_122652	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida	Gentianales	Rubiaceae	Galium	Galium odoratum	100	1	0	41
23S	ESV_238437	GGTGGGTAGTTTC	Bacteria	Cyanobacteriota	Cyanophyceae	Pleurocapsales	Hyellaceae	Pleurocapsa	Pleurocapsa sp. PCC 7319	95.5	1	0	40
23S	ESV_000631	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida					100	19	0	39
23S	ESV_030996	GGCGGGCAGTTTC	Eukaryota	Bacillariophyta	Bacillariophyceae	Naviculales	Amphipleuraceae	Halamphora	Halamphora coffeaeformis	96.4	1	0	39
23S	ESV_237898	GCGGGCAGTTTC	Eukaryota	Bacillariophyta						97.6	8	0	36
23S	ESV_061991	GCGGGCAGTTTG	Eukaryota	Bacillariophyta	Bacillariophyceae	Naviculales	Amphipleuraceae	Halamphora	Halamphora coffeaeformis	98.5	1	0	36
23S	ESV_031134	GCGGGCAGTTTG	Eukaryota	Bacillariophyta	Bacillariophyceae	Naviculales				98.5	1	0	36
23S	ESV_198576	GCGGGCAGTTTG	Eukaryota	Bacillariophyta	Bacillariophyceae	Naviculales				98.5	4	35	0
23S	ESV_237890	CGGGCAGTTTTA	Eukaryota	Euglenozoa	Euglenida	Euglenales	Euglenaceae	Euglena		91	2	0	35
23S	ESV_000020	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida	Poales	Poaceae			100	97	0	34
23S	ESV_002114	GCGGGCAGTTTGACTGGGGCGGTCGCCTCCTAAATGGTAACGGAGGCGTACAAAGGTTTCCTCTGAACGTGTAGAAATCGTATCTAGAGTGTAAAGGCATAAGGAAGCTTGACTGTGAGACCTACAAGTCGAGCAGGGACGAA											0	34
23S	ESV_061364	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			95.8	6	0	33
23S	ESV_005511	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida					100	52	0	33
23S	ESV_000318	GCGGGCAGTTTG	Eukaryota	Bacillariophyta	Bacillariophyceae					96.1	6	8	24
23S	ESV_061389	GTGGGCAGTTTG	Eukaryota							92.5	3	32	0
23S	ESV_063756	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida					99.7	100	0	32
23S	ESV_060633	GGCGGGCAGTTT	Eukaryota	unk_phylum	Xanthophyceae	Tribonematales	Tribonemataceae	Tribonema		97	4	0	28
23S	ESV_076594	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			96.7	6	27	0
23S	ESV_031107	GGTGGGCAGTTTC	Bacteria	Cyanobacteriota	Cyanophyceae					84.4	10	0	27
23S	ESV_112769	ATGGGCAGTTTTA	Eukaryota	Euglenozoa	Euglenida	Euglenales	unk_family	Colacium		94.9	3	26	0
23S	ESV_193931	GGTGGACAGTTTC	Eukaryota	unk_phylum	Cryptophyceae					93.1	7	0	26
23S	ESV_005092	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			95.2	5	0	24
23S	ESV_003190	GCGGGCAGTTTT	Eukaryota	Euglenozoa	Euglenida	Euglenales	unk_family	Colacium		100	2	23	0
23S	ESV_035137	GCGGGCAGTTTGACTGGGGCGGTCGCCTCCTAAATGGTAACGGAGGCGTACAAAGGTTTCCTCTGAACGTGTAGAAATCGTATCTAGAGTATAAAGGCATAAGGAAGCTTGACTGTGAGACTTACAAGTCGAGCAGGGACGAA											0	23
23S	ESV_115747	AGGTAGACAGTT	Eukaryota	Streptophyta	Pinopsida	Pinales	Pinaceae			99.4	90	0	23
23S	ESV_071911	GGTGGGCAGTTTA	Eukaryota	Chlorophyta	Chlorophyceae	Chlamydomonadales				91.3	4	0	23
23S	ESV_101980	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			95.2	6	22	0
23S	ESV_237895	GGTGGGCAGTTTA	Eukaryota	Chlorophyta	Chlorophyceae	Chlamydomonadales	Chlamydomonadaceae	Chlamydomonas		99.4	2	0	22
23S	ESV_032217	GGTGGGCAGTTT	Bacteria	Cyanobacteriota	Cyanophyceae					83.8	23	0	22
23S	ESV_112100	GCGGGCAGTTTG	Eukaryota	Bacillariophyta						97.9	7	21	0
23S	ESV_035009	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			97	5	10	11
23S	ESV_005107	GGCGGGCAGTTT	Eukaryota	unk_phylum	Xanthophyceae	Vaucheriales	Vaucheriaceae	Vaucheria	Vaucheria sp. 1 AS-2014	98.2	1	0	21
23S	ESV_064227	GCGGGCAGTTTT	Eukaryota	Euglenozoa	Euglenida	Euglenales	Euglenaceae			93.1	8	0	20
23S	ESV_109862	GGCGGACCTTTT	Eukaryota	Chlorophyta	Ulvophyceae	Ulotrichales				99.1	2	0	19

23S	ESV_061414	GCGGGCAGTTTG	Eukaryota	Bacillariophyta						98.5	5	0	19
23S	ESV_063297	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Cryptophyceae					98.2	17	0	19
23S	ESV_031077	GCGGGCAGTTTG	Eukaryota	Bacillariophyta						97.6	10	0	19
23S	ESV_004191	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida	Myrtales				100	40	0	19
23S	ESV_061541	GTGGGCAGTTTG	Eukaryota							96.1	7	18	0
23S	ESV_000076	GCGGGCAGTTTGACTGGGGCGGTCGCCTCCTAAATGGTAACGGAGGCGTACAAAGGTTTCCTCTGAACGTGTAGAAATCGTATCTAGAGTATAAAGGCATAAGGAAGCTTGACTGTGAGACTTACAAGTCGAGCAGGGACGAA										9	9
23S	ESV_238459	GCGGGCAGTTTG	Eukaryota							90.1	11	18	0
23S	ESV_238458	GCGGGCAGTTTG	Eukaryota	Bacillariophyta	Bacillariophyceae					90.4	16	18	0
23S	ESV_031949	AAGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida	Malpighiales	Salicaceae			99.7	93	0	18
23S	ESV_037041	GCGGGCAGTTTG	Eukaryota	Bacillariophyta						97.9	14	0	18
23S	ESV_236697	GATGGGCAGTTT	Eukaryota	Euglenozoa	Euglenida	Euglenales	Phacaceae	Lepocinclis	Lepocinclis spirogyroides	96.7	1	0	18
23S	ESV_005392	GCGGGCAGTTTG	Eukaryota	Bacillariophyta	Bacillariophyceae	Bacillariales	Bacillariaceae			99.7	4	0	18
23S	ESV_070136	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Cryptophyceae	Pyrenomonadales	Chroomonadaceae	Chroomonas		99.7	3	17	0
23S	ESV_061752	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			95.8	6	17	0
23S	ESV_238460	GTGGGCAGTTTGA	Eukaryota							90.4	11	17	0
23S	ESV_031852	GCGGGCAGTTTG	Eukaryota	Bacillariophyta	Bacillariophyceae	Naviculales				99.1	1	0	17
23S	ESV_127256	GGGCAGTTTTACT	Eukaryota	Euglenozoa	Euglenida	Euglenales	Euglenaceae	Euglena	Euglena mutabilis	99.7	1	0	17
23S	ESV_000514	AAGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida	Asterales	Asteraceae			100	76	0	17
23S	ESV_002583	GCGGGCAGTTTG	Eukaryota	Bacillariophyta						97.6	7	0	17
23S	ESV_031688	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			94.9	6	16	0
23S	ESV_036887	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Cryptophyceae	Cryptomonadales	Cryptomonadaceae	Cryptomonas	Cryptomonas obovoidea	100	1	16	0
23S	ESV_238461	GTGGGCAGTTTG	Eukaryota	unk_phylum	Synurophyceae	Synurales	Mallomonadaceae	Mallomonas		95.8	9	16	0
23S	ESV_088901	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			96.1	5	16	0
23S	ESV_122782	GGCGGACCTTTTT	Eukaryota	Chlorophyta	Ulvophyceae					96.7	5	0	16
23S	ESV_034927	GGCGGACCTTTTT	Eukaryota	Chlorophyta	Ulvophyceae	Ulotrichales	Tupiellaceae	Tupiella	Tupiella akineta	100	1	0	16
23S	ESV_032308	CGGGCAGTTTGA	Eukaryota	Bacillariophyta	Fragilariophyceae					99.4	3	0	16
23S	ESV_122961	GTGGGCAGTTTG	Eukaryota	unk_phylum	Synurophyceae	Synurales	Mallomonadaceae			89.3	9	0	16
23S	ESV_061062	GGTGGGCAGTTT	Eukaryota	Chlorophyta	Chlorophyceae	Chlamydomonadales	Chlorococcaceae	Chlorococcum	Chlorococcum echinozygotum	99.7	1	0	16
23S	ESV_238463	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			95.8	5	15	0
23S	ESV_238462	GCGGGCAGTTTGA	Eukaryota	Bacillariophyta	Bacillariophyceae					91.3	16	15	0
23S	ESV_238464	GCGGGCAGTTTG	Eukaryota	Bacillariophyta	Bacillariophyceae					95.5	6	15	0
23S	ESV_059519	GCGGGCAGTTTG	Eukaryota	Bacillariophyta						98.8	2	0	15
23S	ESV_031090	GCGGGCAGTTTG	Eukaryota	Bacillariophyta						97.6	8	0	15
23S	ESV_000511	GCGGGCAGTTTG	Eukaryota	Bacillariophyta	Bacillariophyceae					97.6	16	0	15
23S	ESV_034117	GTGGGCAGTTTTA	Eukaryota	Euglenozoa	Euglenida	Euglenales	Euglenaceae			88.9	12	0	14
23S	ESV_061834	GGGTGGGTAGTTT	Bacteria	Cyanobacteriota	Cyanophyceae	Gomontiellales	Chamaesiphonaceae	Chamaesiphon		98.8	2	0	14
23S	ESV_139243	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Cryptophyceae	Cryptomonadales	Cryptomonadaceae	Cryptomonas		99.4	3	0	14
23S	ESV_067743	GCGGGCAGTTTG	Eukaryota	Bacillariophyta	Bacillariophyceae	Naviculales				98.8	1	0	14
23S	ESV_176300	AGGCGGGCAGTT	Eukaryota	Rhodophyta	Florideophyceae	Batrachospermales	Batrachospermaceae	Kumanoa		94.3	4	0	14
23S	ESV_002450	GCGGGCAGTTTG	Eukaryota	Bacillariophyta						97.3	7	0	14
23S	ESV_031271	GCGGGCAGTTTG	Eukaryota	Bacillariophyta	Bacillariophyceae	Bacillariales	Bacillariaceae	Nitzschia	Nitzschia palea	100	1	0	14
23S	ESV_238465	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			92.8	5	13	0
23S	ESV_113094	GGCGGGCAGTTTT	Eukaryota	Euglenozoa	Euglenida	Euglenales	unk_family	Colacium		99.7	2	13	0
23S	ESV_071169	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			96.7	6	13	0
23S	ESV_080958	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			94.9	6	13	0
23S	ESV_092149	AAGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida	Malpighiales	Salicaceae			99.7	93	0	13
23S	ESV_101269	GGTGGGCAGTTTA	Eukaryota	Chlorophyta	Chlorophyceae	Sphaeropleales	Neochloridaceae			95.5	2	0	13
23S	ESV_107770	GGTAGACAGTTT	Eukaryota	Streptophyta	Zygnemophyceae	Zygnematales	Zygnemataceae	Spirogyra		97	3	0	13
23S	ESV_062571	GGTGGGCAGTTT	Eukaryota	Chlorophyta	Chlorophyceae					91.9	4	0	13
23S	ESV_238438	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Cryptophyceae	Pyrenomonadales	Chroomonadaceae	Chroomonas		99.1	5	0	13
23S	ESV_115936	AGGTAGACAGTT	Eukaryota	Streptophyta	Pinopsida	Pinales	Pinaceae			99.1	90	0	13
23S	ESV_000753	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida	Poales	Poaceae	Triticum	Triticum aestivum	100	1	0	13
23S	ESV_000019	GGTGGGCAGTTTG	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			100	3	0	13
23S	ESV_001141	GGTGGGCAGTTTC	Bacteria	Cyanobacteriota	Cyanophyceae	Synechococcales	Prochlorococcaceae	Cyanobium		100	3	12	0
23S	ESV_238466	GCGGGCAGTTTC	Eukaryota	Chlorophyta	Mamiellophyceae	Monomastigales	Monomastigaceae	Monomastix		93.4	3	12	0
23S	ESV_032682	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			91.9	5	12	0
23S	ESV_206288	GTGGGCAGTTTA	Eukaryota	Chlorophyta	Chlorophyceae	Chlamydomonadales	Chlamydomonadaceae	Chlamydomonas	Chlamydomonas agloeformis	99.1	1	12	0
23S	ESV_063280	GCGGGCAGTTTG	Eukaryota	Bacillariophyta	Bacillariophyceae	Naviculales	Amphipleuraceae	Halamphora	Halamphora coffeaeformis	98.8	1	0	12
23S	ESV_238439	GGTGGGCAGTTT	Eukaryota	Chlorophyta	Chlorophyceae	Chlamydomonadales				90.7	2	0	12
23S	ESV_238440	GGTGGGCAGTTT	Bacteria	Cyanobacteriota	Cyanophyceae					80.5	4	0	12
23S	ESV_031392	GGTGGGTAGTTT	Bacteria	Cyanobacteriota	Cyanophyceae	Gomontiellales	Chamaesiphonaceae	Chamaesiphon		97.3	2	0	12
23S	ESV_064228	GTGGGCAGTTTGA	Eukaryota							83.8	7	0	12
23S	ESV_062933	GTGGGCAGTTTG	Eukaryota							83.9	2	0	12
23S	ESV_031443	GCGGGCAGTTTG	Eukaryota	Bacillariophyta						97.6	5	0	12
23S	ESV_071938	GGTGGGCAGTTT	Eukaryota	Chlorophyta	Trebouxiophyceae	Trebouxiales	Trebouxiaceae	Parietochloris	Parietochloris pseudoalveolaris	100	1	0	12
23S	ESV_234416	GGTGGGCAGTTT	Bacteria	Cyanobacteriota	Cyanophyceae	Synechococcales	Merismopediaceae	Synechocystis	Synechocystis sp. PCC 7509	99.1	1	0	12
23S	ESV_034222	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Cryptophyceae	Cryptomonadales	Cryptomonadaceae	Cryptomonas		98.5	4	0	12
23S	ESV_238468	GCGGGCAGTTTC	Eukaryota	Chlorophyta	Mamiellophyceae	Monomastigales	Monomastigaceae	Monomastix		93.4	3	11	0
23S	ESV_238469	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			96.4	5	11	0
23S	ESV_089655	GCGGGCAGTTTG	Eukaryota	Bacillariophyta	Bacillariophyceae	Naviculales				98.2	8	11	0
23S	ESV_101069	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Cryptophyceae					97.3	5	11	0
23S	ESV_238467	GGTGGGCAGTTTC	Eukaryota							91.3	4	11	0
23S	ESV_000070	GCGGGCAGTTTG	Eukaryota	Bacillariophyta	Bacillariophyceae	Naviculales	Naviculaceae			99.4	4	11	0
23S	ESV_238441	GGTGGGCAGTTTG	Bacteria	Cyanobacteriota	Cyanophyceae	Nostocales				94	19	0	11
23S	ESV_107727	TTGGACAGTTTGA	Eukaryota	unk_phylum	Synurophyceae	Synurales	Mallomonadaceae	Mallomonas		91.9	15	0	11
23S	ESV_035866	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			96.1	6	0	11
23S	ESV_238442	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida	Poales	Poaceae			99.7	97	0	11
23S	ESV_070005	GGCGGGCAGTTT	Eukaryota	Chlorophyta	Chlorophyceae	unk_order	Microsporaceae	Microspora	Microspora sp. UTEX LB472	95.5	1	0	11
23S	ESV_061225	GGTGGGCAGTTTC	Eukaryota	Chlorophyta	Trebouxiophyceae	Trebouxiales	Trebouxiaceae	Lobosphaera	Lobosphaera incisa	100	1	0	11
23S	ESV_237089	GGTGGGCAGTTT	Eukaryota	unk_phylum	Xanthophyceae	Vaucheriales	Vaucheriaceae	Vaucheria	Vaucheria sp. 1 AS-2014	98.2	1	0	11
23S	ESV_025750	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida					100	98	0	11
23S	ESV_064599	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			97.6	6	10	0
23S	ESV_238443	AAGGTAGACAGT	Eukaryota	Streptophyta	Magnoliopsida	Lamiales	Lamiaceae	Clerodendrum		100	11	0	10
23S	ESV_209624	GCGGGCAGTTTG	Eukaryota	Bacillariophyta	Bacillariophyceae					94.6	6	10	0
23S	ESV_076677	GTGGGCAGTTTG	Eukaryota	unk_phylum	Synurophyceae	Synurales	Mallomonadaceae	Mallomonas	Mallomonas mangofera	99.1	1	10	0
23S	ESV_061342	GCGGGCAGTTTGACTGGGGCGGTCGCCTCCTAAAGGGTAACGGAGGCGCACAAAGGTTTCCTCTGAACGGGTAGAAATCGTATCTAGAGTGTAAAGGCATAAGGAAGCTTGACTGTGAGACCTACAAGTCGAGCAGGGACGA											10	0
23S	ESV_032132	GGTGGGCAGTTT	Bacteria	Cyanobacteriota	Cyanophyceae	Oscillatoriales				90.7	4	10	0
23S	ESV_031890	GGTGGGCAGTTTG	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			94.9	5	10	0
23S	ESV_106250	GCGGGCAGTTTG	Eukaryota	Bacillariophyta	Bacillariophyceae	Naviculales				98.5	4	10	0
23S	ESV_238471	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Cryptophyceae					97.6	18	10	0
23S	ESV_238470	GGTGGGCAGTTT	Eukaryota	unk_phylum	Cryptophyceae	Pyrenomonadales	Chroomonadaceae	Chroomonas		91.9	2	10	0
23S	ESV_034898	GTGGGCAGTTTG	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			95.8	6	10	0
23S	ESV_061370	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Cryptophyceae	Pyrenomonadales	Chroomonadaceae	Chroomonas		98.8	5	0	10
23S	ESV_237896	ATGGGCAGTTTT	Eukaryota	Euglenozoa	Euglenida	Euglenales	unk_family	Colacium		94.3	2	0	10
23S	ESV_060105	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Cryptophyceae	Cryptomonadales	Cryptomonadaceae	Cryptomonas		99.4	6	0	10

23S	ESV_033064	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Cryptophyceae	Cryptomonadales	Cryptomonadaceae	Cryptomonas	Cryptomonas ovata	100	1	0	10
23S	ESV_115115	GCGGGCAGTTTC	Eukaryota	Bacillariophyta	Bacillariophyceae	Naviculales				98.2	1	0	10
23S	ESV_229331	GTGGGCAGTTTG	Eukaryota	unk_phylum	Synurophyceae	Synurales	Mallomonadaceae	Mallomonas	Mallomonas papillosa	100	1	0	10
23S	ESV_070842	GCGGGCAGTTTC	Eukaryota	Chlorophyta	Chlorophyceae	Chaetophorales	Chaetophoraceae	Uvulifera	Uvulifera verrucariae	100	1	0	10
23S	ESV_103007	GGTGGGCAGTTT	Eukaryota	Chlorophyta	Chlorophyceae	Sphaeropleales	Neochloridaceae			95	2	0	10
23S	ESV_070452	AGGTGGGTAGTTT	Bacteria	Cyanobacteriota	Cyanophyceae	Gomontiellales	Chamaesiphonaceae	Chamaesiphon		99.1	2	0	10
23S	ESV_103880	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Cryptophyceae					98.8	20	0	10
23S	ESV_031082	GCGGGCAGTTTG	Eukaryota	Bacillariophyta	Bacillariophyceae	Naviculales	Naviculaceae			98.8	4	0	10
23S	ESV_001708	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida					99.7	95	0	10
23S	ESV_031308	GGCGGACCTTTT	Eukaryota	Chlorophyta	Ulvophyceae	Ulotrichales				99.4	2	0	10
23S	ESV_238446	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida					99.4	96	0	9
23S	ESV_238449	GTGGGCAGTTTC	Eukaryota	unk_phylum	Cryptophyceae					98.5	5	0	9
23S	ESV_238474	GGCGGGCAGTTT	Eukaryota	unk_phylum	Cryptophyceae	Pyrenomonadales	Chroomonadaceae	Chroomonas		91.9	2	9	0
23S	ESV_238473	GCGGGCAGTTTGACTGGGGCGGTCGCCTCCTAAATGGTAACGGAGGCGTACAAAGGTTTCCTCTGAACGTGTAGAAATCGTATCTAGAGTATAAAGGCATAAGGAAGCTTGACTGTGAGACTTACAAGTCGAGCAGGGACGAA										9	0
23S	ESV_238448	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida	Fabales	Fabaceae			99.7	99	0	9
23S	ESV_238444	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Cryptophyceae	Pyrenomonadales	Chroomonadaceae	Chroomonas		99.1	2	0	9
23S	ESV_238445	GTGGGCAGTTTC	Eukaryota	unk_phylum	Cryptophyceae	Cryptomonadales	Cryptomonadaceae	Cryptomonas	Cryptomonas paramecium	93.1	1	0	9
23S	ESV_238472	GTGGGCAGTTTGA	Eukaryota	unk_phylum	Cryptophyceae					90.4	18	9	0
23S	ESV_238447	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida					99.7	91	0	9
23S	ESV_059658	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Cryptophyceae	Cryptomonadales	Cryptomonadaceae	Cryptomonas		98.8	7	0	9
23S	ESV_192804	GGTAGACAGTTT	Eukaryota	Streptophyta	Zygnemophyceae	Zygnematales	Zygnemataceae	Spirogyra		98.8	6	0	9
23S	ESV_136841	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida	Malpighiales	Salicaceae			99.7	93	0	9
23S	ESV_233030	GGGCAGTTTTAC	Eukaryota	Euglenozoa	Euglenida	Euglenales	Euglenaceae	Euglena	Euglena adhaerens	96.4	1	0	9
23S	ESV_237087	GGTGGGCAGTTT	Eukaryota	unk_phylum	Xanthophyceae	Vaucheriales	Vaucheriaceae	Vaucheria	Vaucheria sp. 1 AS-2014	97.6	1	0	9
23S	ESV_122576	GTGGGCAGTTTTA	Eukaryota	Euglenozoa	Euglenida	Euglenales	Euglenaceae	Euglena	Euglena deses	90.4	1	0	9
23S	ESV_124061	CGGGCAGTTTTA	Eukaryota	Euglenozoa	Euglenida	Euglenales	Euglenaceae			92.5	4	0	9
23S	ESV_031240	GCGGGCAGTTTG	Eukaryota	Bacillariophyta						97.6	9	0	9
23S	ESV_003051	GCGGGCAGTTTG	Eukaryota	Bacillariophyta						96.1	19	0	9
23S	ESV_003701	GCGGGCAGTTTGACTGGGGCGGTCGCCTCCTAAATGGTAACGGAGGCGTACAAAGGTTTCCTCTGAACGTGTAGAAATCGTATCTAGAGTGTAAAGGCATAAGGAAGCTTGACTGTGAGACCTACAAGTCGAGCAGGGACGAA										0	9
23S	ESV_000044	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida					100	89	0	9
23S	ESV_238450	GTGGGCAGTTTC	Eukaryota	unk_phylum	Cryptophyceae	Pyrenomonadales	Chroomonadaceae	Chroomonas		99.4	3	0	8
23S	ESV_100614	GCGGGCAGTTTC	Eukaryota	Chlorophyta	Mamiellophyceae	Monomastigales	Monomastigaceae	Monomastix		99.7	2	8	0
23S	ESV_238479	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			91.3	5	8	0
23S	ESV_238451	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida	Lamiales				99.4	91	0	8
23S	ESV_114604	GGTGGGCAGTTT	Eukaryota	Chlorophyta	Chlorophyceae	Chlamydomonadales				97	8	8	0
23S	ESV_033121	GCGGGCAGTTTGACTGGGGCGGTCGCCTCCCAAACGGTAACGGAGGCGCACAAAGGTTTCCTCTGAACGGGTAGAAATCGTATCTAGAGTGTAAAGGCATAAGGAAGCTTGACTGTGAGACCTACAAGTCGAGCAGGGACGA										8	0
23S	ESV_238478	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			96.4	5	8	0
23S	ESV_238454	GGTGGGTAGTTTC	Bacteria	Cyanobacteriota	Cyanophyceae	Pleurocapsales	Hyellaceae	Pleurocapsa	Pleurocapsa sp. PCC 7319	94.9	1	0	8
23S	ESV_238452	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida					99.7	98	0	8
23S	ESV_238453	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida					99.4	100	0	8
23S	ESV_238480	GTGGGCAGTTTC	Eukaryota	unk_phylum	Eustigmatophyceae	Eustigmatales	Monodopsidaceae			96.1	5	8	0
23S	ESV_238476	GCGGGCAGTTTG	Eukaryota	Bacillariophyta	Bacillariophyceae					94.9	6	8	0
23S	ESV_238477	GCGGGCAGTTTC	Eukaryota	Chlorophyta	Mamiellophyceae	Monomastigales	Monomastigaceae	Monomastix		92.8	3	8	0
23S	ESV_001152	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Cryptophyceae	Cryptomonadales	Cryptomonadaceae	Cryptomonas		99.7	4	8	0
23S	ESV_238455	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida	Rosales	Rosaceae			99.7	91	0	8
23S	ESV_238475	GCGGGCAGTTTG	Eukaryota	Bacillariophyta	Bacillariophyceae					95.8	6	8	0
23S	ESV_237893	GGCGGGCAGTTTC	Eukaryota	unk_phylum	Xanthophyceae	Tribonematales	Tribonemataceae	Tribonema		92.5	4	0	8
23S	ESV_100232	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida	Ericales	Balsaminaceae	Impatiens		100	8	0	8
23S	ESV_034204	GGTGGGTAGTTT	Bacteria	Cyanobacteriota	Cyanophyceae	Gomontiellales	Chamaesiphonaceae	Chamaesiphon		99.7	2	0	8
23S	ESV_061409	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Cryptophyceae	Cryptomonadales	Cryptomonadaceae	Cryptomonas	Cryptomonas curvata	99.1	1	0	8
23S	ESV_032799	GGTGGGCAGTTTC	Eukaryota	unk_phylum	Cryptophyceae	Cryptomonadales	Cryptomonadaceae	Cryptomonas		98.8	5	0	8
23S	ESV_237889	GCTAGACAGTTT	Eukaryota	Chlorophyta	Chlorophyceae	Sphaeropleales	Bracteacoccaceae	Bracteacoccus		99.7	3	0	8
23S	ESV_063455	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida					99.7	98	0	8
23S	ESV_036787	GGTGGGCAGTTT	Eukaryota	Chlorophyta	Chlorophyceae	Chlamydomonadales				99.7	9	0	8
23S	ESV_000555	GGTGGGTAGTTTGACTGGGGCGGTCGCCTCCTAAAGTGTAACGGAGGCGCGCGATGGTGGGCTCAGACCGGTCGGAAATCGGTCGTCGAGTGCAATGGCATAAGCCCGCCTGACTGCGAGACTGACAAGTCGAGCAGAGACG										0	8
23S	ESV_000311	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida	Lamiales	Scrophulariaceae	Eremophila		100	87	0	8
23S	ESV_002595	AGGTAGACAGTT	Eukaryota	Streptophyta	Pinopsida	Pinales	Pinaceae			99.1	90	0	8
23S	ESV_000312	AGGTAGACAGTT	Eukaryota	Streptophyta	Magnoliopsida					100	98	0	8
23S	ESV_001239	GTGGGTAGTTTG	Bacteria	Cyanobacteriota						92.5	1	0	8

Site 4 - Near Creek on north side of PA, near where creek enters PEM area.
Sample collected June 17, 2024
Site Coordinates: 45.379549, -122.611215

TestId	ESVId	sequence	Kingdom	Phylum	Class	Order	Family	Genus	Species	% match	# species	M4T7I19Q.1	DWNWSAOT.1
MiFishU	ESV_133553	TGGCCCTTTGGCTC	Eukaryota	Chordata	Actinopteri	Cypriniformes	Leuciscidae	Rhinichthys		99.4	3	2115	12161
MiFishU	ESV_010759	AACATCTTCAAGAC	Eukaryota	Chordata	Actinopteri	Perciformes	Cottidae			100	6	1329	8793
MiFishU	ESV_091381	GACCTCTTGGCTG	Eukaryota	Chordata	Actinopteri	Cypriniformes	Cobitidae	Misgurnus		100	2	9902	0
MiFishU	ESV_018570	TGGCCCTTTGGCTC	Eukaryota	Chordata	Actinopteri	Cypriniformes	Leuciscidae	Rhinichthys		100	2	683	1926
MiFishU	ESV_039589	ACCCAGCTCCGCT	Eukaryota	Chordata	Amphibia	Caudata	Salamandridae	Taricha	Taricha granulosa	100	1	321	2094
MiFishU	ESV_007577	AATGCTTTCAAAG	Eukaryota	Chordata	Actinopteri	Centrarchiformes	Centrarchidae	Lepomis		100	3	1586	0
MiFishU	ESV_008617	AACACCCCCAAAG	Eukaryota	Chordata	Actinopteri	Perciformes	Gasterosteidae	Gasterosteus	Gasterosteus aculeatus	100	1	532	909
MiFishU	ESV_088003	GACCTCTTGGCTG	Eukaryota	Chordata	Actinopteri	Cypriniformes	Cobitidae	Misgurnus	Misgurnus anguillicaudatus	100	1	865	0
MiFishU	ESV_001615	ATTTTCTCATGGC	Eukaryota	Chordata	Actinopteri	Cyprinodontiformes	Fundulidae	Fundulus	Fundulus diaphanus	100	1	755	0
MiFishU	ESV_017510	TGGCCCCTTGGCC	Eukaryota	Chordata	Actinopteri	Cypriniformes	Cyprinidae	Carassius		100	5	502	0
MiFishU	ESV_009594	AACCTTTCCAAAGC	Eukaryota	Chordata	Actinopteri	Cyprinodontiformes	Poeciliidae	Gambusia	Gambusia affinis	100	1	357	104
MiFishU	ESV_002938	AATGCTTTCAAAG	Eukaryota	Chordata	Actinopteri	Centrarchiformes	Centrarchidae	Lepomis	Lepomis macrochirus	100	1	400	0
MiFishU	ESV_007586	AATGCTTTCAAAG	Eukaryota	Chordata	Actinopteri	Centrarchiformes	Centrarchidae	Lepomis		100	2	355	0
MiFishU	ESV_009942	AATGCTTTCAAAG	Eukaryota	Chordata	Actinopteri	Centrarchiformes	Centrarchidae	Lepomis		100	3	342	0
MiFishU	ESV_133848	GACCTCTTGGCTG	Eukaryota	Chordata	Actinopteri	Cypriniformes	Cobitidae	Misgurnus		99.4	4	293	0
MiFishU	ESV_000073	AATGCTTTCAAAG	Eukaryota	Chordata	Actinopteri	Centrarchiformes	Centrarchidae	Lepomis	Lepomis macrochirus	100	1	280	0
MiFishU	ESV_133849	GACCTCTTGGCTG	Eukaryota	Chordata	Actinopteri	Cypriniformes	Cobitidae	Misgurnus		99.4	4	260	0
MiFishU	ESV_133850	AACACCCCCAAAG	Eukaryota	Chordata	Actinopteri	Perciformes	Gasterosteidae	Gasterosteus	Gasterosteus aculeatus	99.4	1	246	0
MiFishU	ESV_133843	TGGCCCTTTGGCTC	Eukaryota	Chordata	Actinopteri	Cypriniformes	Leuciscidae	Rhinichthys		98.9	3	0	206
MiFishU	ESV_018574	GGCCCTTTGGCTC	Eukaryota	Chordata	Actinopteri	Cypriniformes	Leuciscidae	Ptychocheilus		100	2	42	150
MiFishU	ESV_009939	ACACCCCCTCAGC	Eukaryota	Chordata	Actinopteri	Salmoniformes	Salmonidae	Oncorhynchus	Oncorhynchus kisutch	100	1	40	144
MiFishU	ESV_009957	GGCCCTTTGGCTC	Eukaryota	Chordata	Actinopteri	Cypriniformes	Leuciscidae	Notemigonus	Notemigonus crysoleucas	100	1	155	0
MiFishU	ESV_040194	AACATCTTCAAGA	Eukaryota	Chordata	Actinopteri	Perciformes	Cottidae			99.4	26	0	122
MiFishU	ESV_010720	GGCCCTTTGGCCG	Eukaryota	Chordata	Actinopteri	Cypriniformes	Catostomidae	Catostomus		100	4	100	0
MiFishU	ESV_038161	ATTTCATCTGGGTC	Eukaryota	Chordata	Mammalia	Rodentia	Myocastoridae	Myocastor	Myocastor coypus	100	1	72	21
MiFishU	ESV_019354	AACATCTTCAAGAC	Eukaryota	Chordata	Actinopteri	Perciformes	Cottidae			98.8	26	10	67
MiFishU	ESV_067706	AATGCTTTCAAAG	Eukaryota	Chordata	Actinopteri	Centrarchiformes	Centrarchidae	Lepomis		99.4	2	75	0
MiFishU	ESV_018592	GGCCCTTTGGCTG	Eukaryota	Chordata	Actinopteri	Cypriniformes	Leuciscidae	Ptychocheilus		99.4	2	8	63
MiFishU	ESV_038173	AATGCTTTCAAAG	Eukaryota	Chordata	Actinopteri	Centrarchiformes	Centrarchidae	Lepomis		99.4	4	63	0
MiFishU	ESV_017176	AATGCTTTCAAAG	Eukaryota	Chordata	Actinopteri	Centrarchiformes	Centrarchidae	Lepomis		99.4	4	61	0
MiFishU	ESV_000055	AACACCCCCAAAG	Eukaryota	Chordata	Actinopteri	Perciformes	Gasterosteidae	Gasterosteus	Gasterosteus aculeatus	99.4	1	53	0
MiFishU	ESV_133844	TGGCCCTTTGGCTC	Eukaryota	Chordata	Actinopteri	Cypriniformes	Leuciscidae	Rhinichthys		98.3	3	0	43
MiFishU	ESV_133851	TGGCCCTTTGGCTC	Eukaryota	Chordata	Actinopteri	Cypriniformes	Leuciscidae	Rhinichthys		98.9	3	36	0
MiFishU	ESV_000067	AATGCAACTAAGC	Eukaryota	Chordata	Aves	Anseriformes	Anatidae			100	4	15	21
MiFishU	ESV_133852	GGCCCTTTGGCTC	Eukaryota	Chordata	Actinopteri	Cypriniformes	Leuciscidae	Rhinichthys		98.9	3	32	0
MiFishU	ESV_014663	GCAACTGAGCTG	Eukaryota	Chordata	Aves	Passeriformes	Corvidae	Corvus		100	5	0	29
MiFishU	ESV_133853	TGGCCCCTTGGCC	Eukaryota	Chordata	Actinopteri	Cypriniformes	Cyprinidae			99.4	14	27	0
MiFishU	ESV_007666	TCCCCTAAGCCGT	Eukaryota	Chordata	Actinopteri	Siluriformes	Ictaluridae	Ameiurus		100	2	23	0
MiFishU	ESV_066969	AATGCTTTCAAAG	Eukaryota	Chordata	Actinopteri	Centrarchiformes	Centrarchidae	Lepomis		97.6	3	21	0
MiFishU	ESV_133845	TGGCCCTTTGGCTC	Eukaryota	Chordata	Actinopteri	Cypriniformes	Leuciscidae	Rhinichthys		98.3	3	0	18
MiFishU	ESV_000075	AATTCTAACTAAG	Eukaryota	Chordata	Mammalia	Artiodactyla	Bovidae			100	6	0	17
MiFishU	ESV_133846	GGCCCTTTGGCTG	Eukaryota	Chordata	Actinopteri	Cypriniformes	Leuciscidae	Ptychocheilus		98.9	2	0	17
MiFishU	ESV_133854	GACCTCTTGGCTG	Eukaryota	Chordata	Actinopteri	Cypriniformes	Cobitidae	Misgurnus		99.4	3	17	0
MiFishU	ESV_103435	ATCCCCTAAGCCGT	Eukaryota	Chordata	Actinopteri	Siluriformes	Ictaluridae	Ameiurus		99.4	3	17	0
MiFishU	ESV_009694	AAACCATCCAATA	Eukaryota	Chordata	Mammalia					100	2	16	0
MiFishU	ESV_066701	AACACCCCCAAAG	Eukaryota	Chordata	Actinopteri	Perciformes	Gasterosteidae	Gasterosteus	Gasterosteus aculeatus	99.4	1	0	16
MiFishU	ESV_133855	TGGCCCTTTGGCTC	Eukaryota	Chordata	Actinopteri	Cypriniformes	Leuciscidae	Rhinichthys		99.4	3	15	0
MiFishU	ESV_025961	AACACCCCCAAAG	Eukaryota	Chordata	Actinopteri	Perciformes	Gasterosteidae	Gasterosteus	Gasterosteus aculeatus	99.4	1	0	14
MiFishU	ESV_116173	ATTTTCTCATGGC	Eukaryota	Chordata	Actinopteri	Cyprinodontiformes	Fundulidae	Fundulus		99.4	2	13	0
MiFishU	ESV_133856	TGGCCCTTTGGCTC	Eukaryota	Chordata	Actinopteri	Cypriniformes	Leuciscidae	Rhinichthys		99.4	3	12	0
MiFishU	ESV_010218	AACACCCCCAAAG	Eukaryota	Chordata	Actinopteri	Perciformes	Gasterosteidae	Gasterosteus	Gasterosteus aculeatus	99.4	1	12	0
MiFishU	ESV_042835	AACACCCCCAAAG	Eukaryota	Chordata	Actinopteri	Perciformes	Gasterosteidae	Gasterosteus	Gasterosteus aculeatus	97.6	1	0	12
MiFishU	ESV_133858	TGGCCCCTTGGCC	Eukaryota	Chordata	Actinopteri	Cypriniformes	Cyprinidae			99.4	14	11	0
MiFishU	ESV_133857	GACCTCTTGGCTG	Eukaryota	Chordata	Actinopteri	Cypriniformes	Cobitidae	Misgurnus		97.7	2	11	0
MiFishU	ESV_076001	AACCTTTCCAAAGC	Eukaryota	Chordata	Actinopteri	Cyprinodontiformes	Poeciliidae	Gambusia		99.4	2	11	0
MiFishU	ESV_024690	AACACCCCCAAAG	Eukaryota	Chordata	Actinopteri	Perciformes	Gasterosteidae	Gasterosteus	Gasterosteus aculeatus	98.8	1	0	10
MiFishU	ESV_039914	GGCCCTTTGGCTG	Eukaryota	Chordata	Actinopteri	Cypriniformes	Leuciscidae			99.4	4	0	10
MiFishU	ESV_133859	GACCTCTTGGCTG	Eukaryota	Chordata	Actinopteri	Cypriniformes	Cobitidae	Misgurnus		98.8	2	10	0
MiFishU	ESV_056188	TGGCCCCTTGGCC	Eukaryota	Chordata	Actinopteri	Cypriniformes	Cyprinidae			99.4	14	9	0
MiFishU	ESV_042831	AACATCTTCAAGAC	Eukaryota	Chordata	Actinopteri	Perciformes	Cottidae			98.8	26	0	9
MiFishU	ESV_133860	TGGCCCCTTGGCC	Eukaryota	Chordata	Actinopteri	Cypriniformes	Cyprinidae			99.4	14	8	0
MiFishU	ESV_133861	GACCTCTTGGCTG	Eukaryota	Chordata	Actinopteri	Cypriniformes	Cobitidae	Misgurnus		98.8	2	8	0
MiFishU	ESV_133847	ACCCAGCTCCGCT	Eukaryota	Chordata	Amphibia	Caudata	Salamandridae	Taricha	Taricha granulosa	98.2	1	0	8

Appendix E

Benthic Invertebrate Survey Data

Aquatic Biology Associates, Inc
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aquaticbio.com

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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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Client

Pacific Habitat Services

Client contact: Craig Tumer ct@pacifichabitat.com

Project: Rinearson Creek Restoration Monitoring

Project location: Meldrum Bar Park, Rinearson Creek Natural Area, Clackamas County, in Gladstone, near confluence Willamette River, 45.37958 N, -122.61722 W, <10 m elevation.

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	digiulio@peak.org	jlee@humboldt1.com

Sampling protocol

Sampling gear	D-frame net
Mesh size	500 micron
Square area sampled	qualitative dip-net samples
Habitat sampled	Includes engineered riffle, low gradient stream below remnant beaver pond, beaver pond, and emergent wetland.

Laboratory protocol

Mesh size	500 micron
Subsampling target count	500 organism minimum
Subsampling device	Caton tray
Sorting efficacy	95+%
Taxa abundances	relative abundance

Identification protocol

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

Life stages:

U	unknown (for non-insects)
L	larvae
LE	Larval exuvia
P	pupae
PE	pupal exuvia
A	adult
E	egg

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

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.

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

metrics thought to have the most interpretive value are highlighted 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	Rinearson Creek	Rinearson Creek	Rinearson Creek	Rinearson Creek
Site	beaver pond	beaver pond	beaver pond	beaver pond	emergent marsh	emergent marsh	emergent marsh	emergent marsh	engineered riffle	engineered riffle	engineered riffle	engineered riffle	upper control	upper control	upper control	upper control
Date	2020-05-19	2021-05-04	2023-08-16	2024-06-14	2020-05-19	2021-05-04	2023-08-16	2024-06-14	2020-05-19	2021-05-04	2023-08-16	2024-06-14	2020-05-19	2021-05-04	2023-08-16	2024-06-14
Subsample count	623	599	518	565	505	571	525	250	588	604	562	581	509	196	426	545
Subsample correction factor to full sample	2	1.45	7.06	5.33	1.58	1	2	1	13.33	2.29	2.13	1.43	2.791	1	1	1.25
Area correction factor to square meter	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SUMMARY METRICS																
Total taxa richness	36	32	34	36	47	14	39	27	30	33	23	33	33	15	34	35
Total abundance	1246	868.55	3657.08	3011.45	797.9	571	1050	250	7838.04	1383.16	1197.06	830.83	1420.62	196	426	681.25
EPT taxa richness	1	1	2	1	1	0	1	2	3	2	2	2	2	1	0	1
EPT abundance	2	1.45	190.62	26.65	6.32	0	10	5	173.29	16.03	14.91	8.58	27.91	1	0	1.25
Hilsenhoff Biotic Index (WY DEQ version)	7.44	6.66	6.72	7.78	6.7	6.37	7.25	7.11	6.34	7.06	6.2	7.58	7.08	4.61	6.99	7.3
DOMINANCE AND DIVERSITY																
% Dominant taxa	22.79	20.87	19.88	38.23	23.37	26.44	38.86	30	60.88	28.64	54.09	72.63	53.44	63.78	29.81	20.73
% Subdominant taxa	18.14	14.36	19.11	23.89	11.29	25.22	7.43	14	9.69	14.74	13.17	4.65	6.68	18.88	18.08	20.55
% Top 3 taxa	54.57	46.91	51.54	65.84	45.15	70.23	52.57	52.4	77.55	51.99	73.13	81.76	66.8	86.73	60.8	49.54
% Top 5 taxa	65.65	64.44	65.64	72.92	56.63	89.67	64	66	84.35	64.24	81.14	89.16	75.44	90.82	74.65	63.3
% Top 10 taxa	80.58	81.3	83.78	84.78	72.08	97.55	81.14	86	90.99	83.11	91.46	93.63	87.82	96.43	88.73	83.49
Shannon-Weaver Diversity (loge)	2.67	2.7	2.62	2.25	2.97	1.87	2.53	2.48	1.7	2.58	1.84	1.34	2.03	1.32	2.39	2.65
Shannon-Weaver Diversity (log2)	3.85	3.89	3.78	3.24	4.28	2.7	3.65	3.58	2.45	3.73	2.65	1.93	2.93	1.91	3.45	3.82
Shannon Evenness Index	0.74	0.78	0.74	0.63	0.77	0.71	0.69	0.75	0.5	0.74	0.59	0.38	0.58	0.49	0.68	0.74
TOLERANT AND INTOLERANT TAXA																
Total tolerant taxa richness	21	19	19	28	25	7	22	11	13	12	9	18	11	6	18	21
Total tolerant abundance	654	569.85	2181.54	2627.69	380.78	295	748	177	1093.06	810.66	123.54	713.57	893.12	47	210	507.5
% Total tolerant by abundance	52.49	65.61	59.65	87.26	47.72	51.66	71.24	70.8	13.95	58.61	10.32	85.89	62.87	23.98	49.3	74.5
Highly tolerant taxa richness	8	9	9	10	9	4	10	4	4	5	3	9	5	3	5	9
Highly tolerant abundance	370	127.6	1200.2	2206.62	259.12	164	516	86	119.97	329.76	40.47	659.23	781.48	41	142	266.25
% Highly tolerant by abundance	29.7	14.69	32.82	73.27	32.48	28.72	49.14	34.4	1.531	23.84	3.381	79.35	55.01	20.92	33.33	39.08
Moderately tolerant taxa richness	13	10	10	18	16	3	12	7	9	7	6	9	6	3	13	12
Moderately tolerant abundance	284	442.25	981.34	421.07	121.66	131	232	91	973.09	480.9	83.07	54.34	111.64	6	68	241.25
% Moderately tolerant by abundance	22.79	50.92	26.83	13.98	15.25	22.94	22.1	36.4	12.41	34.77	6.94	6.54	7.859	3.061	15.96	35.41
Total intolerant taxa richness	1	1	0	0	2	1	1	2	0	1	0	1	2	1	1	0
Total intolerant abundance	4	14.5	0	0	86.9	151	6	13	0	16.03	0	1.43	50.24	125	4	0
% Total intolerant by abundance	0.321	1.669	0	0	10.89	26.44	0.5714	5.2	0	1.159	0	0.1721	3.536	63.78	0.939	0
Highly intolerant taxa richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Highly intolerant abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Highly intolerant by abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moderately intolerant taxa richness	1	1	0	0	2	1	1	2	0	1	0	1	2	1	1	0
Moderately intolerant abundance	4	14.5	0	0	86.9	151	6	13	0	16.03	0	1.43	50.24	125	4	0
% Moderately intolerant by abundance	0.321	1.669	0	0	10.89	26.44	0.5714	5.2	0	1.159	0	0.1721	3.536	63.78	0.939	0
VOLTINISM (length of life cycle)																
TAXA RICHNESS																
Semivoltine (> 1 year life cycle) taxa richness	3	4	3	3	5	1	3	3	4	4	2	5	5	2	3	6
Univoltine (1 year life cycle) taxa richness	6	4	7	9	10	3	7	6	2	5	9	8	6	2	8	11
Multivoltine (< 1 year life cycle) taxa richness	27	24	24	24	32	10	29	18	24	24	12	20	22	11	23	18
ABUNDANCE																
Semivoltine (> 1 year life cycle) abundance	28	14.5	148.26	122.59	126.4	3	126	65	93.31	9.16	25.56	15.73	33.49	4	108	203.75
Univoltine (1 year life cycle) abundance	272	131.95	1228.44	202.54	104.28	8	118	19	173.29	75.57	144.84	78.65	136.76	8	65	66.25
Multivoltine (< 1 year life cycle) abundance	946	722.1	2280.38	2686.32	567.22	560	806	166	7571.44	1298.43	1026.66	736.45	1250.37	184	253	411.25
PERCENTAGE BY ABUNDANCE																
% Semivoltine (> 1 year life cycle) by abundance	2.247	1.669	4.054	4.071	15.84	0.5254	12	26	1.19	0.6623	2.135	1.893	2.358	2.041	25.35	29.91
% Univoltine (1 year life cycle) by abundance	21.83	15.19	33.59	6.726	13.07	1.401	11.24	7.6	2.211	5.464	12.1	9.466	9.627	4.082	15.26	9.725
% Multivoltine (< 1 year life cycle) by abundance	75.92	83.14	62.36	89.2	71.09	98.07	76.76	66.4	96.6	93.87	85.77	88.64	88.02	93.88	59.39	60.37
GROWTH AND DEVELOPMENT																
% Fast seasonal life cycle by abundance	75.92	70.62	41.7	18.94	41.39	68.48	31.24	28.8	92.01	49.83	80.43	5.508	30.26	77.04	25.82	28.81
% Slow seasonal life cycle by abundance	23.76	28.71	57.34	76.64	47.13	31.52	63.43	67.6	6.122	49.67	16.9	92.77	67.78	21.94	56.1	63.67
% Nonseasonal life cycle by abundance	0.321	0.6678	0.9653	4.425	11.49	0	5.333	3.6	1.871	0.4967	2.669	1.721	1.965	1.02	18.08	7.523
OCCURRENCE IN DRIFT																
% Rare in drift by abundance	30.5	40.73	67.18	23.19	59.21	32.4	69.71	70.8	6.803	50.83	19.04	92.94	71.32	25.51	73.24	68.99
% Common in drift by abundance	0.1605	1.503	17.76	62.48	1.584	0	2.286	1.6	2.381	0.9934	1.779	2.065	0	0	1.174	4.037
% Abundant in drift by abundance	69.34	57.76	15.06	14.34	39.21	67.6	28	27.6	90.82	48.18	79.18	4.991	28.68	74.49	25.59	26.97
SIZE AT MATURITY																
TAXA RICHNESS																
Small size at maturity taxa richness	23	20	22	20	30	6	26	18	20	19	10	17	21	9	22	19
Medium size at maturity taxa richness	11	10	10	14	14	7	12	7	7	10	12	13	9	5	11	14
Large size at maturity taxa richness	3	2	3	2	3	1	1	2	3	4	1	3	3	1	1	3
ABUNDANCE																
Small size at maturity abundance	638	524.9	2068.58	1860.17	470.84	379	470	116	7278.18	574.79	990.45	65.78	454.93	146	203	438.75
Medium size at maturity abundance	580	334.95	1461.42	1140.62	306.52	189	576	109	506.54	799.21	204.48	760.76	957.31	48	202	230
Large size at maturity abundance	28	8.7	127.08	10.66	20.54	3	4	25	53.32	9.16	2.13	4.29	8.37	2	21	12.5
PERCENTAGE BY ABUNDANCE																
% Small size at maturity by abundance	51.2	60.43	56.56	61.77	59.01	66.37	44.76	46.4	92.86	41.56	82.74	7.917	32.02	74.49	47.65	64.4
% Medium size at maturity by abundance	46.55	38.56	39.96	37.88	38.42	33.1	54.86	43.6	6.463	57.78	17.08	91.57	67.39	24.49	47.42	33.76
% Large size at maturity by abundance	2.247	1.002	3.475	0.354	2.574	0.5254	0.381	10	0.6803	0.6623	0.1779	0.5164	0.5894	1.02	4.93	1.835
RHEOPHILY AND HABITAT AFFINITY																
% Depositional only by abundance	34.03	18.2	38.61	9.027	5.941	19.79	13.33	8	0.5102	16.39	0.7117	0.8606	0.9823	3.061	2.817	3.67
% Depositional and erosional by abundance	63.88	81.8	61.39	90.97	94.06	80.21	86.67	92	37.41	82.12	95.91	98.45	98.62	96.94	97.18	96.33
% Erosional by abundance	2.087	0	0	0	0	0	0	0	62.07	1.49	3.381	0.6885	0.3929	0	0	0
THERMAL PREFERENCE																
% Cold stenothermal and cool eurythermal by abundance	0.321	3.506	0.7722	0.177	12.08	26.44	5.143	4	0	1.821	0	0.1721	3.536	63.78	1.878	8.44
% Cool/warm eurythermal by abundance	98.88	95.83	83.98	71.33	83.56	73.56	90.1	94.4	98.81	98.18	97.69	98.45	96.46	36.22	96.95	86.79
% Warm eurythermal by abundance	0.8026	0.6678	15.25	28.5	4.356	0	4.762	1.6	1.19	0	2.313	1.377	0	0	1.174	4.771
NON-INSECT AND INSECT ORDERS																
TAXA RICHNESS																
Non-insect invertebrates taxa richness	5	12	13	11	12	6	13	11	11	11	9	15	9	5	13	15
Ephemeroptera (mayflies) taxa richness	1	1	1	1	1	0	1	0	1	1	0	0	1	1	0	0

Odonata (damsel- and dragonflies) taxa richness	1	2	3	2	1	0	1	0	0	1	2	2	0	0	1	2
Plecoptera (stoneflies) taxa richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hemiptera (true bugs taxa richness	2	1	2	1	1	0	1	0	0	0	0	0	0	0	0	1
Megaloptera (alderflies and hellgramites) taxa richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trichoptera (caddisflies) taxa richness	0	0	1	0	0	0	0	2	2	1	2	2	1	0	0	1
Lepidoptera (moths) taxa richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Coleoptera (beetles) taxa richness	3	0	2	4	2	0	1	0	0	0	0	1	1	0	0	4
Diptera (total)(true flies) taxa richness	24	16	12	17	30	8	22	14	16	19	10	13	21	9	20	12
Chironomidae (midges) taxa richness	19	15	11	15	24	7	20	13	13	16	5	11	16	8	16	10
Chironomidae (midges -Nostoc midge) taxa richness	19	15	11	15	24	7	20	13	13	16	5	11	16	8	16	10
ABUNDANCE																
Non-insect invertebrates abundance	266	252.3	1623.8	2339.87	448.72	180	702	173	493.21	684.71	170.4	770.77	976.85	45	312	465
Ephemeroptera (mayflies) abundance	2	1.45	169.44	26.65	6.32	0	10	0	66.65	11.45	0	0	25.12	1	0	0
Odonata (damsel- and dragonflies) abundance	2	2.9	317.7	79.95	1.58	0	2	0	0	2.29	25.56	2.86	0	0	1	6.25
Plecoptera (stoneflies) abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hemiptera (true bugs abundance	46	13.05	734.24	106.6	14.22	0	20	0	0	0	0	0	0	0	0	10
Megaloptera (alderflies and hellgramites) abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trichoptera (caddisflies) abundance	0	0	21.18	0	0	0	0	5	106.64	4.58	14.91	8.58	2.79	0	0	1.25
Lepidoptera (moths) abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Coleoptera (beetles) abundance	10	0	169.44	21.32	6.32	0	18	0	0	0	0	2.86	2.79	0	0	12.5
Diptera (total)(true flies) abundance	920	598.85	621.28	437.06	320.74	391	298	72	7171.54	680.13	986.19	45.76	413.07	150	113	186.25
Chironomidae (midges) abundance	838	501.7	550.68	426.4	298.62	386	286	69	2279.43	638.91	915.9	37.18	376.78	145	106	178.75
Chironomidae (midges -Nostoc midge) abundance	838	501.7	550.68	426.4	298.62	386	286	69	2279.43	638.91	915.9	37.18	376.78	145	106	178.75
PERCENTAGE BY ABUNDANCE																
% Non-insect invertebrates by abundance	21.35	29.05	44.4	77.7	56.24	31.52	66.86	69.2	6.293	49.5	14.23	92.77	68.76	22.96	73.24	68.26
% Ephemeroptera (mayflies) by abundance	0.1605	0.1669	4.633	0.885	0.7921	0	0.9524	0	0.8503	0.8278	0	0	1.768	0.5102	0	0
% Odonata (damsel- and dragonflies) by abundance	0.1605	0.3339	8.687	2.655	0.198	0	0.1905	0	0	0.1656	2.135	0.3442	0	0	0.2347	0.9174
% Plecoptera (stoneflies) by abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Hemiptera (true bugs by abundance	3.692	1.503	20.08	3.54	1.782	0	1.905	0	0	0	0	0	0	0	0	1.468
% Megaloptera (alderflies and hellgramites) by abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Trichoptera (caddisflies) by abundance	0	0	0.5792	0	0	0	0	2	1.361	0.3311	1.246	1.033	0.1965	0	0	0.1835
% Lepidoptera (moths) by abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Coleoptera (beetles) by abundance	0.8026	0	4.633	0.708	0.7921	0	1.714	0	0	0	0	0.3442	0.1965	0	0	1.835
% Diptera (total)(true flies) by abundance	73.84	68.95	16.99	14.51	40.2	68.48	28.38	28.8	91.5	49.17	82.38	5.508	29.08	76.53	26.53	27.34
% Chironomidae (midges) by abundance	67.26	57.76	15.06	14.16	37.43	67.6	27.24	27.6	29.08	46.19	76.51	4.475	26.52	73.98	24.88	26.24
% Chironomidae (midges -Nostoc midge) by abundance	67.26	57.76	15.06	14.16	37.43	67.6	27.24	27.6	29.08	46.19	76.51	4.475	26.52	73.98	24.88	26.24

FAMILIES AND GROUPS

TAXA RICHNESS																
Oligochaeta (segmented worms) taxa richness	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mollusca (snails and bivalves) taxa richness	0	3	4	3	6	0	7	7	4	0	2	5	4	1	5	6
Crustacea taxa richness	3	5	3	5	3	3	3	2	4	5	2	5	3	2	2	5
Acari (mites) taxa richness	0	1	3	0	0	0	0	0	1	1	1	0	0	0	2	0
Baetidae (mayfly) taxa richness	1	1	1	1	1	0	1	0	1	1	0	0	1	1	0	0
Baetis tricaudatus complex (mayfly) taxa richness	0	0	0	0	1	0	0	0	1	1	0	0	1	1	0	0
Ephemerellidae (mayfly) taxa richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Heptageniidae (mayfly) taxa richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Leptohyphidae (mayfly) taxa richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Leptophlebiidae (mayfly) taxa richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chloroperlidae (stonefly) taxa richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nemouridae (stonefly) taxa richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Perlidae (stonefly) taxa richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Perlodidae (stonefly) taxa richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peltoperlidae (stonefly) taxa richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pteronarcyidae (stonefly) taxa richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brachycentridae (caddisfly) taxa richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glossosomatidae (caddisfly) taxa richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydropsychidae (caddisfly) taxa richness	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0
Lepidostomatidae (caddisfly) taxa richness	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1
Limnephilidae (caddisfly) taxa richness	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Philopotamidae (caddisfly) taxa richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rhyacophilidae (caddisfly) taxa richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Uenoidae (caddisfly) taxa richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Elmidae (riffle beetle) taxa richness	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Empididae (dance fly) taxa richness	0	0	0	0	2	0	0	0	0	0	1	0	2	0	2	0
Athericidae (higher flies) taxa richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Simuliidae (black fly) taxa richness	1	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0
Tipulidae (crane fly) taxa richness	1	0	0	0	2	0	0	0	1	1	2	0	1	0	0	0
Chironomidae: Chironominae taxa richness	8	9	5	10	9	4	9	6	6	6	2	6	5	6	7	4
Tanytarsini taxa richness	3	2	2	2	3	2	3	2	3	3	1	2	1	2	4	2
Chironomidae: Diamesinae taxa richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chironomidae: Orthocladiinae taxa richness	7	2	3	2	9	1	6	3	6	6	2	3	7	0	5	3
Chironomidae: Prodiamesinae taxa richness	1	2	0	0	2	1	1	1	0	2	0	1	1	1	1	1
Chironomidae: Tanypodinae taxa richness	3	2	3	3	4	1	4	2	1	2	1	1	3	1	3	2
Cricotopus (Nostococladius) taxa richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABUNDANCE																
Oligochaeta (segmented worms) abundance	226	11.6	698.94	21.32	23.7	2	44	9	79.98	38.93	63.9	37.18	94.89	3	55	7.5
Mollusca (snails and bivalves) abundance	0	10.15	197.68	884.78	164.32	0	174	72	133.3	0	25.56	21.45	50.24	2	111	248.75
Crustacea abundance	32	192.85	600.1	1353.82	219.62	174	460	91	253.27	620.59	57.51	679.25	828.93	38	137	202.5
Acari (mites) abundance	0	8.7	35.3	0	0	0	0	0	13.33	9.16	4.26	0	0	0	5	0
Baetidae (mayfly) abundance	2	1.45	169.44	26.65	6.32	0	10	0	66.65	11.45	0	0	25.12	1	0	0
Baetis tricaudatus complex (mayfly) abundance	0	0	0	0	6.32	0	0	0	66.65	11.45	0	0	25.12	1	0	0
Ephemerellidae (mayfly) abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Heptageniidae (mayfly) abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Leptohyphidae (mayfly) abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Leptophlebiidae (mayfly) abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chloroperlidae (stonefly) abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nemouridae (stonefly) abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Perlidae (stonefly) abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Perlodidae (stonefly) abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peltoperlidae (stonefly) abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Pteronarcyidae (stonefly) abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brachycentridae (caddisfly) abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glossosomatidae (caddisfly) abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydropsychidae (caddisfly) abundance	0	0	0	0	0	0	0	0	93.31	4.58	8.52	1.43	0	0	0	0
Lepidostomatidae (caddisfly) abundance	0	0	0	0	0	0	0	1	0	0	0	0	2.79	0	0	1.25
Limnephilidae (caddisfly) abundance	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0
Philopotamidae (caddisfly) abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rhyacophilidae (caddisfly) abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Uenoidae (caddisfly) abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Elmidae (riffle beetle) abundance	0	0	0	0	0	0	0	0	0	0	0	0	2.79	0	0	0
Empididae (dance fly) abundance	0	0	0	0	3.16	0	0	0	0	0	2.13	0	5.58	0	3	0
Athericidae (higher flies) abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Simuliidae (black fly) abundance	26	0	0	0	0	0	0	0	4772.14	16.03	31.95	4.29	5.58	0	0	0
Tipulidae (crane fly) abundance	18	0	0	0	7.9	0	0	0	26.66	2.29	21.3	0	2.79	0	0	0
Chironomidae: Chironominae abundance	468	375.55	458.9	213.2	101.12	121	164	28	493.21	384.72	658.17	12.87	111.64	11	59	41.25
Tanytarsini abundance	94	220.4	56.48	95.94	72.68	8	70	2	173.29	158.01	10.65	5.72	94.89	3	9	32.5
Chironomidae: Diamesinae abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chironomidae: Orthocladiinae abundance	264	17.4	42.36	95.94	63.2	10	30	7	1426.31	148.85	164.01	17.16	114.43	0	11	26.25
Chironomidae: Prodiamesinae abundance	4	29	0	0	93.22	151	48	9	0	22.9	0	1.43	44.66	125	4	56.25
Chironomidae: Tanypodinae abundance	60	24.65	42.36	58.63	41.08	91	30	24	253.27	22.9	23.43	2.86	72.57	8	31	50
Cricotopus (Nostococladius) abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PERCENTAGE BY ABUNDANCE																
% Oligochaeta (segmented worms) by abundance	18.14	1.336	19.11	0.708	2.97	0.3503	4.19	3.6	1.02	2.815	5.338	4.475	6.68	1.531	12.91	1.101
% Mollusca (snails and bivalves) by abundance	0	1.169	5.405	29.38	20.59	0	16.57	28.8	1.701	0	2.135	2.582	3.536	1.02	26.06	36.51
% Crustacea by abundance	2.568	22.2	16.41	44.96	27.52	30.47	43.81	36.4	3.231	44.87	4.804	81.76	58.35	19.39	32.16	29.72
% Acari (mites) by abundance	0	1.002	0.9653	0	0	0	0	0	0.1701	0.6623	0.3559	0	0	0	1.174	0
% Baetidae (mayfly) by abundance	0.1605	0.1669	4.633	0.885	0.7921	0	0.9524	0	0.8503	0.8278	0	0	1.768	0.5102	0	0
% Baetis tricaudatus complex (mayfly) by abundance	0	0	0	0	0.7921	0	0	0	0.8503	0.8278	0	0	1.768	0.5102	0	0
% Ephemerellidae (mayfly) by abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Heptageniidae (mayfly) by abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Leptohyphidae (mayfly) by abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Leptophlebiidae (mayfly) by abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Chloroperlidae (stonefly) by abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Nemouridae (stonefly) by abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Perlidae (stonefly) by abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Perlodidae (stonefly) by abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Peltoperlidae (stonefly) by abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pteronarcyidae (stonefly) by abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Brachycentridae (caddisfly) by abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Glossosomatidae (caddisfly) by abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Hydropsychidae (caddisfly) by abundance	0	0	0	0	0	0	0	0	1.19	0.3311	0.7117	0.1721	0	0	0	0
% Lepidostomatidae (caddisfly) by abundance	0	0	0	0	0	0	0	0.4	0	0	0	0	0.1965	0	0	0.1835
% Limnephilidae (caddisfly) by abundance	0	0	0	0	0	0	0	1.6	0	0	0	0	0	0	0	0
% Philopotamidae (caddisfly) by abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Rhyacophilidae (caddisfly) by abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Uenoidae (caddisfly) by abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Elmidae (riffle beetle) by abundance	0	0	0	0	0	0	0	0	0	0	0	0	0.1965	0	0	0
% Empididae (dance fly) by abundance	0	0	0	0	0.396	0	0	0	0	0	0.1779	0	0.3929	0	0.7042	0
% Athericidae (higher flies) by abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Simuliidae (black fly) by abundance	2.087	0	0	0	0	0	0	0	60.88	1.159	2.669	0.5164	0.3929	0	0	0
% Tipulidae (crane fly) by abundance	1.445	0	0	0	0.9901	0	0	0	0.3401	0.1656	1.779	0	0.1965	0	0	0
% Chironomidae: Chironominae by abundance	37.56	43.24	12.55	7.08	12.67	21.19	15.62	11.2	6.293	27.81	54.98	1.549	7.859	5.612	13.85	6.055
% Tanytarsini by abundance	7.544	25.38	1.544	3.186	9.109	1.401	6.667	0.8	2.211	11.42	0.8897	0.6885	6.68	1.531	2.113	4.771
% Chironomidae: Diamesinae by abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Chironomidae: Orthocladiinae by abundance	21.19	2.003	1.158	3.186	7.921	1.751	2.857	2.8	18.2	10.76	13.7	2.065	8.055	0	2.582	3.853
% Chironomidae: Prodiamesinae by abundance	0.321	3.339	0	0	11.68	26.44	4.571	3.6	0	1.656	0	0.1721	3.143	63.78	0.939	8.257
% Chironomidae: Tanypodinae by abundance	4.815	2.838	1.158	1.947	5.149	15.94	2.857	9.6	3.231	1.656	1.957	0.3442	5.108	4.082	7.277	7.339
% Cricotopus (Nostococladius) by abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FEEDING GROUPS																
TAXA RICHNESS																
Predator taxa richness	11	8	10	13	11	3	8	5	4	8	7	8	8	3	10	9
Parasite taxa richness	0	1	4	0	1	1	1	0	1	2	2	1	0	0	3	0
Collector-gatherer taxa richness	14	15	10	14	22	8	18	11	12	15	5	12	14	7	13	13
Collector-filterer taxa richness	4	4	3	3	3	1	3	2	5	4	4	5	2	2	3	3
Collector (total) taxa richness	18	19	13	17	25	9	21	13	17	19	9	17	16	9	16	16
Piercer herbivore taxa richness	1	1	2	1	1	0	1	0	1	0	1	1	0	0	0	1
Macrophyte herbivore taxa richness	3	1	3	2	2	0	2	1	1	0	1	2	1	1	1	3
Shredder taxa richness	1	0	0	0	1	0	0	2	1	1	2	0	3	0	0	1
Caddisfly shredder taxa richness	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	1
Stonefly shredder taxa richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wood-eating taxa richness	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Scraper taxa richness	1	1	2	1	3	0	4	4	3	1	0	2	3	1	2	2
Omnivore taxa richness	1	1	0	2	2	1	2	2	2	2	1	2	2	1	2	3
Unknown feeding group taxa richness	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
ABUNDANCE																
Predator abundance	156	255.2	522.44	261.17	66.36	99	52	44	373.24	64.12	78.81	42.9	106.06	15	39	66.25
Parasite abundance	0	8.7	49.42	0	30.02	1	10	0	13.33	13.74	10.65	1.43	0	0	7	0
Collector-gatherer abundance	850	291.45	1990.92	2259.92	336.54	322	336	49	1999.5	865.62	325.89	710.71	488.42	137	102	211.25
Collector-filterer abundance	120	226.2	84.72	207.87	105.86	5	122	10	5038.74	112.21	74.55	18.59	27.91	4	81	81.25
Collector (total) abundance	970	517.65	2075.64	2467.79	442.4	327	458	59	7038.24	977.83	400.44	729.3	516.33	141	183	292.5
Piercer herbivore abundance	44	13.05	748.36	106.6	14.22	0	20	0	13.33	0	6.39	7.15	0	0	0	10
Macrophyte herbivore abundance	40	11.6	247.1	10.66	6.32	0	20	7	279.93	0	647.52	5.72	2.79	2	38	17.5
Shredder abundance	18	0	0	0	6.32	0	0	5	26.66	2.29	21.3	0	8.37	0	0	1.25
Caddisfly shredder abundance	0	0	0	0	0	0	0	5	0	0	0	0	2.79	0	0	1.25
Stonefly shredder abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wood-eating taxa abundance	0	0	0	0	0	0	0	0	0	0	0	0	2.79	0	0	0
Scraper abundance	12	11.6	14.12	53.3	41.08	0	78	39	53.32	119.08	0	4.29	25.12	1	11	143.75
Omnivore abundance	6	50.75	0	111.93	189.6	144	412	96	39.99	206.1	31.95	40.04	761.94	37	148	150
Unknown feeding group abundance	0	0	0	0	1.58	0	0	0	0	0	0	0	0	0	0	0
PERCENTAGE BY ABUNDANCE																

% Predator by abundance	12.52	29.38	14.29	8.673	8.317	17.34	4.952	17.6	4.762	4.636	6.584	5.164	7.466	7.653	9.155	9.725
% Parasite by abundance	0	1.002	1.351	0	3.762	0.1751	0.9524	0	0.1701	0.9934	0.8897	0.1721	0	0	1.643	0
% Collector-gatherer by abundance	68.22	33.56	54.44	75.04	42.18	56.39	32	19.6	25.51	62.58	27.22	85.54	34.38	69.9	23.94	31.01
% Collector-filterer by abundance	9.631	26.04	2.317	6.903	13.27	0.8757	11.62	4	64.29	8.113	6.228	2.238	1.965	2.041	19.01	11.93
% Collector (total) by abundance	77.85	59.6	56.76	81.95	55.45	57.27	43.62	23.6	89.8	70.7	33.45	87.78	36.35	71.94	42.96	42.94
% Piercer herbivore by abundance	3.531	1.503	20.46	3.54	1.782	0	1.905	0	0.1701	0	0.5338	0.8606	0	0	0	1.468
% Macrophyte herbivore by abundance	3.21	1.336	6.757	0.354	0.7921	0	1.905	2.8	3.571	0	54.09	0.6885	0.1965	1.02	8.92	2.569
% Shredder by abundance	1.445	0	0	0	0.7921	0	0	2	0.3401	0.1656	1.779	0	0.5894	0	0	0.1835
% Caddisfly shredder by abundance	0	0	0	0	0	0	0	2	0	0	0	0	0.1965	0	0	0.1835
% Stonefly shredder by abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Wood-eating taxa by abundance	0	0	0	0	0	0	0	0	0	0	0	0	0.1965	0	0	0
% Scraper by abundance	0.9631	1.336	0.3861	1.77	5.149	0	7.429	15.6	0.6803	8.609	0	0.5164	1.768	0.5102	2.582	21.1
% Omnivore by abundance	0.4815	5.843	0	3.717	23.76	25.22	39.24	38.4	0.5102	14.9	2.669	4.819	53.63	18.88	34.74	22.02
% Unknown feeding group by abundance	0	0	0	0	0.198	0	0	0	0	0	0	0	0	0	0	0
HABIT																
TAXA RICHNESS																
Skater taxa richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Planktonic taxa richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diver taxa richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Swimmer taxa richness	5	5	9	5	4	1	4	1	3	3	2	2	1	1	4	6
Clinger taxa richness	9	8	8	8	14	4	13	12	14	11	8	13	11	6	10	11
Sprawler taxa richness	13	7	9	10	14	1	12	7	9	11	5	6	13	1	14	8
Climber taxa richness	5	3	5	6	4	2	3	2	1	2	3	5	2	1	2	8
Burrower taxa richness	5	9	4	7	11	6	7	5	3	6	5	7	6	6	4	3
Unknown habit taxa richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABUNDANCE																
Skater abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Planktonic abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diver abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Swimmer abundance	76	158.05	1468.48	1353.82	58.46	20	80	16	226.61	407.62	29.82	35.75	66.98	1	18	76.25
Clinger abundance	344	282.75	388.3	1044.68	197.5	21	210	76	6291.76	364.11	869.04	72.93	173.04	9	82	268.75
Sprawler abundance	236	246.5	353	127.92	94.8	5	120	53	1039.74	160.3	55.38	17.16	206.53	5	52	113.75
Climber abundance	14	58	381.24	202.54	191.18	154	428	76	26.66	219.84	57.51	647.79	761.94	37	128	160
Burrower abundance	576	123.25	1066.06	282.49	255.96	371	212	29	253.27	231.29	185.31	57.2	212.12	144	146	62.5
Unknown habit abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PERCENTAGE BY ABUNDANCE																
% Skater by abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Planktonic by abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Diver by abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Swimmer by abundance	6.1	18.2	40.15	44.96	7.327	3.503	7.619	6.4	2.891	29.47	2.491	4.303	4.715	0.5102	4.225	11.19
% Clinger by abundance	27.61	32.55	10.62	34.69	24.75	3.678	20	30.4	80.27	26.32	72.6	8.778	12.18	4.592	19.25	39.45
% Sprawler by abundance	18.94	28.38	9.653	4.248	11.88	0.8757	11.43	21.2	13.27	11.59	4.626	2.065	14.54	2.551	12.21	16.7
% Climber by abundance	1.124	6.678	10.42	6.726	23.96	26.97	40.76	30.4	0.3401	15.89	4.804	77.97	53.63	18.88	30.05	23.49
% Burrower by abundance	46.23	14.19	29.15	9.381	32.08	64.97	20.19	11.6	3.231	16.72	15.48	6.885	14.93	73.47	34.27	9.174
% Unknown habit by abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STATE OF CALIFORNIA DESIGNATIONS																
CA % Sensitive EPT	0	0	0.5792	0	0	0	0	2	0	0	0	0	0.1965	0	0	0.1835
CA % Intolerant individuals	0	0	0	0.177	1.386	0	1.333	2	0	0	0	0	0.5894	0	1.643	0.9174
CA % Tolerant individuals	41.73	27.55	50.97	83.36	47.72	47.29	62.86	44.8	10.2	26.16	6.406	80.9	58.55	23.47	55.87	46.42
CA weighted tolerance value	7.24	6.28	6.73	7.71	6.57	6.29	7.1	6.64	6.25	6.18	6.15	7.44	6.91	4.6	6.94	6.85
CA % Predators	12.52	30.38	15.64	8.673	12.08	17.51	5.905	17.6	4.932	5.629	7.473	5.336	7.466	7.653	10.8	9.725
CA % Collector-gatherers	67.74	38.9	50.19	54.69	56.44	81.61	66.86	45.6	18.03	75.5	29.72	88.98	83.1	88.78	52.82	44.4
CA % Filterers	9.631	26.04	2.317	6.903	13.27	0.8757	11.62	4	64.29	8.113	6.228	2.238	1.965	2.041	19.01	11.93
CA % Scrapers	0.9631	1.836	4.633	25.66	11.29	0	11.62	26	1.531	8.609	0.1779	1.205	2.554	0.5102	7.981	29.36
CA % Shredders	1.766	0	0	0	3.564	0	0	4	0.3401	0.1656	1.779	0	3.34	0	0.4695	0.367
BIOTIC CONDITION INDEX																
CTQa- Community Tolerance Quotient actual	97.5	104.62	100.06	100.5	101.7	108	104.77	101.56	104.4	103.64	100.86	105.27	101.09	105.6	106.18	99
CTQd-Community Tolerance Quotient dominance	102.89	107.49	99.38	102.75	104.26	108	104.98	104.75	104.89	106.04	104.18	106.52	104.2	108	107.8	104.47
BIOLOGICAL CONDITION GRADIENT (BCG) ATTRIBUTES																
TAXA RICHNESS																
Attribute 1 taxa richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Attribute 2 taxa richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
intermediate sensitive taxa (III)	0	1	0	0	2	0	2	2	0	1	0	0	2	0	3	1
intermediate tolerant taxa (IV)	22	18	22	22	32	9	24	19	21	25	17	22	24	11	23	22
tolerant native taxa (V)	11	11	9	12	11	5	11	5	8	7	6	10	6	4	7	10
tolerant non-native taxa (VI)	0	0	0	0	1	0	1	1	0	0	0	1	1	0	1	1
Unknown attribute taxa richness	3	2	3	2	1	0	1	0	1	0	0	0	0	0	0	1
% TAXA RICHNESS BY ATTRIBUTE OF TOTAL RICHNESS																
Attribute 1 % of total taxa richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Attribute 2 % of total taxa richness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Attribute 3 % of total taxa richness	0	3.03	0	0	4.255	0	5	7.407	0	2.941	0	0	5.882	0	8.571	2.778
Attribute 4 % of total taxa richness	59.46	54.55	62.86	59.46	68.09	60	60	70.37	67.74	73.53	70.83	64.71	70.59	68.75	65.71	61.11
Attribute 5 % of total taxa richness	29.73	33.33	25.71	32.43	23.4	33.33	27.5	18.52	25.81	20.59	25	29.41	17.65	25	20	27.78
Attribute 6 % of total taxa richness	0	0	0	0	2.128	0	2.5	3.704	0	0	0	2.941	2.941	0	2.857	2.778
Unknown attribute % of total taxa richness	8.108	6.061	8.571	5.405	2.128	0	2.5	0	3.226	0	0	0	0	0	0	2.778
ABUNDANCE																
Attribute 1 abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Attribute 2 abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Attribute 3 abundance	0	11.6	0	0	4.74	0	8	5	0	66.41	0	0	8.37	0	6	1.25
Attribute 4 abundance	758	487.2	2118	1705.6	474	387	468	127	7384.82	586.24	1113.99	138.71	560.99	154	266	372.5
Attribute 5 abundance	434	353.8	748.36	1151.28	270.18	184	528	117	373.24	730.51	83.07	690.69	840.09	42	152	263.75
Attribute 6 abundance	0	0	0	0	34.76	0	26	1	0	0	0	1.43	11.16	0	2	33.75
Unknown attribute abundance	54	15.95	790.72	154.57	14.22	0	20	0	79.98	0	0	0	0	0	0	10
PERCENTAGE BY ABUNDANCE																
% Attribute 1 by abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Attribute 2 by abundance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
intermediate sensitive taxa (III)	0	1.336	0	0	0.5941	0	0.7619	2	0	4.801	0	0	0.5894	0	1.408	0.1835
intermediate tolerant taxa (IV)	60.83	56.09	57.92	56.64	59.41	67.78	44.57	50.8	94.22	42.38	93.06	16.7	39.49	78.57	62.44	54.68
tolerant native taxa (V)	34.83	40.73	20.46	38.23	33.86	32.22	50.29	46.8	4.762	52.81	6.94	83.13	59.14	21.43	35.68	38.72

tolerant non-native taxa (VI)	0	0	0	0	4.356	0	2.476	0.4	0	0	0	0.1721	0.7859	0	0.4695	4.954
% Unknown attribute by abundance	4.334	1.836	21.62	5.133	1.782	0	1.905	0	1.02	0	0	0	0	0	0	1.468
METALS TOLERANCE INDEX																
Metals Tolerance Index (HBI)	6.56	4.1	3.54	3.76	3.95	5.01	4.53	4.3	6.38	4.68	4.96	4.95	4.35	3.7	4.09	4.7
% of taxa utilized in index calculation	45.95	60.61	42.86	51.35	51.06	66.67	52.5	66.67	54.84	52.94	37.5	55.88	58.82	68.75	48.57	52.78
% of individuals utilized in index calculation	59.71	71.29	34.56	82.48	71.49	75.13	64.57	65.6	22.11	52.81	77.4	84.68	79.17	95.41	69.25	59.08

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

							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	Rinearson Creek	Rinearson Creek	Rinearson Creek	Rinearson Creek
							Site	beaver pond	beaver pond	beaver pond	beaver pond	emergent marsh	emergent marsh	emergent marsh	emergent marsh	engineered riffle	engineered riffle	engineered riffle	engineered riffle	upper control	upper control	upper control	upper control
							Date	2020-05-19	2021-05-04	2023-08-16	2024-06-14	2020-05-19	2021-05-04	2023-08-16	2024-06-14	2020-05-19	2021-05-04	2023-08-16	2024-06-14	2020-05-19	2021-05-04	2023-08-16	2024-06-14
Taxon	Stage	Insect?	Origin	Higher classification	Order	Family	Common name	Abundance	Abundance	Abundance	Abundance	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	77.66	58.63	0	0	14	1	0	4.58	4.26	28.6	0	0	1	2.5
Nemata	U	non-insect	Aquatic	Nemata	miscellaneous non-insect	x	round worms	0	0	14.12	0	30.02	1	10	0	0	4.58	6.39	1.43	0	0	2	0
Prostoma	U	non-insect	Aquatic	Annelida: Nemertea	miscellaneous non-insect	Tetrastemmatidae	nemerteans	0	0	0	0	0	0	0	0	0	0	8.52	0	0	0	0	1.25
Oligochaeta	U	non-insect	Aquatic	Annelida: Oligochaeta	miscellaneous non-insect	x	segmented worms	226	11.6	698.94	21.32	23.7	2	44	9	79.98	38.93	63.9	37.18	94.89	3	55	7.5
Erpobdella	U	non-insect	Aquatic	Annelida: Hirudinea	miscellaneous non-insect	Erpobdellidae	leeches	8	7.25	0	0	11.06	3	0	0	13.33	2.29	0	1.43	2.79	2	0	0
Helobdella stagnalis complex	U	non-insect	Aquatic	Annelida: Hirudinea	miscellaneous non-insect	Glossiphoniidae	leeches	0	21.75	0	21.32	0	0	0	0	0	4.58	0	1.43	0	0	1	2.5
Fluminicola	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Hydrobiidae	snails	0	0	0	0	15.8	0	66	35	0	0	0	1.43	0	0	10	141.25
Potamopyrgus antipodarum	U	non-insect	Aquatic	Mollusca: Gastropoda	x	uncertain status	snails	0	0	0	0	34.76	0	26	1	0	0	0	0	11.16	0	2	33.75
Lymnaeidae	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Lymnaeidae	snails	0	0	7.06	0	9.48	0	4	0	13.33	0	0	0	0	0	1	0
Physa/Physella	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Physidae	snails	0	4.35	155.32	719.55	11.06	0	14	4	66.65	0	2.13	5.72	0	0	0	13.75
Ferrissia	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Planorbidae	snails	0	0	0	0	0	0	0	1	0	0	0	0	2.79	0	0	0
Gyraulus	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Planorbidae	snails	0	0	7.06	53.3	0	0	4	0	13.33	0	0	0	0	0	0	0
Menetus	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Planorbidae	snails	0	0	0	0	0	0	0	1	0	0	0	2.86	13.96	0	0	2.5
Juga	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Pleuroceridae	snails	0	0	0	0	3.16	0	4	21	0	0	0	0	0	0	21	8.75
Corbicula	U	non-insect	Aquatic	Mollusca: Bivalvia	x	Corbiculidae	asiatic clam	0	0	0	0	0	0	0	0	0	0	0	1.43	0	0	0	0
Sphaeriidae	U	non-insect	Aquatic	Mollusca: Bivalvia	x	Sphaeriidae	pea clams	0	2.9	28.24	111.93	90.06	0	56	9	39.99	0	23.43	10.01	22.33	2	77	48.75
Musculium	U	non-insect	Aquatic	Mollusca: Bivalvia	x	Sphaeriidae	pea clams	0	2.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chydoridae	U	non-insect	Aquatic	Crustacea: Cladocera	x	Chydoridae	water fleas	8	2.9	56.48	47.97	0	0	0	0	79.98	0	0	0	0	0	0	0
Ostracoda	U	non-insect	Aquatic	Crustacea: Ostracoda	x	x	seed shrimp	0	8.7	84.72	0	0	0	0	0	0	2.29	0	0	0	0	0	0
Crangonyx	U	non-insect	Aquatic	Crustacea: Amphipoda	x	Crangonyctidae	scuds	18	124.7	0	42.64	31.6	20	42	16	133.3	396.17	25.56	32.89	66.98	1	10	42.5
Hyalella	U	non-insect	Aquatic	Crustacea: Amphipoda	x	Talitridae	scuds	0	0	458.9	1151.28	0	0	10	0	0	0	0	2.86	0	0	0	13.75
Caecidotea	U	non-insect	Aquatic	Crustacea: Isopoda	x	Asellidae	aquatic sow bugs	6	50.75	0	106.6	186.44	144	408	75	26.66	203.81	31.95	38.61	759.15	37	127	140
Lirceus	U	non-insect	Aquatic	Crustacea: Isopoda	x	Asellidae	aquatic sow bugs	0	5.8	0	0	1.58	10	0	0	0	16.03	0	603.46	0	0	0	5
Pacifastacus	U	non-insect	Aquatic	Crustacea: Decapoda	x	Astacidae	crayfish	0	0	0	5.33	0	0	0	0	13.33	2.29	0	1.43	2.79	0	0	1.25
Trombidiformes	U	non-insect	Aquatic	Arachnida: Acari	Trombidiformes	x	mites	0	8.7	14.12	0	0	0	0	0	0	9.16	0	0	0	0	0	0
Hygrobates	U	non-insect	Aquatic	Arachnida: Acari	x	x	mites	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Oribatida	U	non-insect	Terrestrial	Arachnida: Acari	x	x	mites	0	0	7.06	0	0	0	0	0	0	0	0	0	0	0	0	0
Sperchon	U	non-insect	Aquatic	Arachnida: Acari	x	x	mites	0	0	14.12	0	0	0	0	0	13.33	0	4.26	0	0	0	0	0
Sperchonopsis	U	non-insect	Aquatic	Arachnida: Acari	x	x	mites	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0
Aeshnidae	L	insect	Aquatic	Arthropoda: Insecta	Odonata	Aeshnidae	dragonflies	2	0	91.78	0	0	0	0	0	0	0	0	0	0	0	0	2.5
Libellulidae	L	insect	Aquatic	Arthropoda: Insecta	Odonata	Libellulidae	dragonflies	0	1.45	28.24	5.33	0	0	0	0	0	2.29	0	0	0	0	0	0
Argia	L	insect	Aquatic	Arthropoda: Insecta	Odonata	Coenagrionidae	damselflies	0	0	0	0	0	0	0	0	0	0	19.17	1.43	0	0	0	0
Coenagrion/Enallagma	L	insect	Aquatic	Arthropoda: Insecta	Odonata	Coenagrionidae	damselflies	0	1.45	197.68	74.62	1.58	0	2	0	0	0	6.39	1.43	0	0	1	3.75
Baetis tricaudatus complex	L	insect	Aquatic	Arthropoda: Insecta	Ephemeroptera	Baetidae	mayflies	0	0	0	0	6.32	0	0	0	66.65	11.45	0	0	25.12	1	0	0
Callibaetis	L	insect	Aquatic	Arthropoda: Insecta	Ephemeroptera	Baetidae	mayflies	2	1.45	169.44	26.65	0	0	10	0	0	0	0	0	0	0	0	0
Abedus	L	insect	Aquatic	Arthropoda: Insecta	Hemiptera: Heteroptera	Belostomatidae	giant water bugs	0	0	7.06	0	0	0	0	0	0	0	0	0	0	0	0	0
Corixidae	A	insect	Aquatic	Arthropoda: Insecta	Hemiptera: Heteroptera	Corixidae	water boatman	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Corixidae	L	insect	Aquatic	Arthropoda: Insecta	Hemiptera: Heteroptera	Corixidae	water boatman	22	13.05	727.18	106.6	14.22	0	20	0	0	0	0	0	0	0	0	10
Notonecta	L	insect	Aquatic	Arthropoda: Insecta	Hemiptera: Heteroptera	Notonectidae	back swimmers	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cheumatopsyche	L	insect	Aquatic	Arthropoda: Insecta	Trichoptera	Hydropsychidae	caddisflies	0	0	0	0	0	0	0	0	93.31	4.58	8.52	1.43	0	0	0	0
Hydroptila	L	insect	Aquatic	Arthropoda: Insecta	Trichoptera	Hydroptilidae	caddisflies	0	0	0	0	0	0	0	0	13.33	0	6.39	5.72	0	0	0	0
Hydroptila	P	insect	Aquatic	Arthropoda: Insecta	Trichoptera	Hydroptilidae	caddisflies	0	0	0	0	0	0	0	0	0	0	0	1.43	0	0	0	0
Oxyethira	L	insect	Aquatic	Arthropoda: Insecta	Trichoptera	Hydroptilidae	caddisflies	0	0	21.18	0	0	0	0	0	0	0	0	0	0	0	0	0
Lepidostoma	L	insect	Aquatic	Arthropoda: Insecta	Trichoptera	Lepidostomatidae	caddisflies	0	0	0	0	0	0	0	0	0	0	0	0	2.79	0	0	0
Lepidostoma unicolor group	L	insect	Aquatic	Arthropoda: Insecta	Trichoptera	Lepidostomatidae	caddisflies	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1.25
Psychoglypha	L	insect	Aquatic	Arthropoda: Insecta	Trichoptera	Limnephilidae	caddisflies	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0
Dytiscidae	L	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Dytiscidae	predaceous diving beetles	2	0	0	5.33	1.58	0	0	0	0	0	0	0	0	0	0	0
Hydroporinae	L	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Dytiscidae	predaceous diving beetles	0	0	0	5.33	0	0	0	0	0	0	0	0	0	0	0	0
Lara	L	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Elmidae	riffle beetles	0	0	0	0	0	0	0	0	0	0	0	0	2.79	0	0	0
Gyrinus	L	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Gyrinidae	whirligig beetles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.25
Haliplus	L	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Haliplidae	crawling water beetles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.25
Peltodytes	A	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Haliplidae	crawling water beetles	4	0	98.84	0	4.74	0	0	0	0	0	0	0	0	0	0	3.75
Peltodytes	L	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Haliplidae	crawling water beetles	2	0	63.54	5.33	0	0	18	0	0	0	0	2.86	0	0	0	5
Hydrophilidae	A	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Hydrophilidae	water scavenger beetles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.25
Hydrophilidae	L	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Hydrophilidae	water scavenger beetles	2	0	7.06	5.33	0	0	0	0	0	0	0	0	0	0	0	0
Ceratopogoninae	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Ceratopogonidae	no-see-um midges	32	95.7	70.6	5.33	3.16	5	4	3	79.98	22.9	14.91	4.29	22.33	5	1	2.5
Ceratopogoninae	P	insect	Aquatic	Arthropoda: Insecta	Diptera	Ceratopogonidae	no-see-um midges	2	1.45	0	0	0	0	0	0	13.33	0	0	0	0	0	0	0
Dixella	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Dixidae	dixid midges	0	0	0	5.33	7.9	0	8	0	0	0	0	0	0	0	3	5
Dolichopodidae	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Dolichopodidae	long-legged flies	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Clinocera	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Empididae	dance flies	0	0	0	0	1.58	0	0	0	0	0	0	0	2.79	0	0	0
Hemerodromia	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Empididae	dance flies	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Neoplasta	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Empididae	dance flies	0	0	0	0	1.58	0	0	0	0	0	2.13	0	2.79	0	2	0
Psychodini	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Psychodidae	moth flies	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Simulium	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Simuliidae	black flies	26	0	0	0	0	0	0	0	4772.14	11.45	31.95	4.29	5.58	0	0	0
Simulium	P	insect	Aquatic	Arthropoda: Insecta	Diptera	Simuliidae	black flies	0	0	0	0	0	0	0	0	0	4.58	0	0	0	0	0	0
Tipuloidea	P	insect	Aquatic	Arthropoda: Insecta	Diptera	Tipulidae	crane flies	0	0	0	0	1.58	0	0	0	0	0	0	0	0	0	0	0
Dicranomyia	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Tipulidae	crane flies	0	0	0	0	0	0	0	0	0	0	19.17	0	0	0	0	0
Tipula	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Tipulidae	crane flies	18	0	0	0	6.32	0	0	0	26.66	2.29	2.13	0	2.79	0	0	0
Chironomidae	P	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae	midges	42	55.1	7.06	58.63	0	13	14	1	106.64	59.54	70.29	2.86	33.49	1	1	5
Ablabesmyia	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	0	0	28.24	10.66	0	0	2	0	0	0	0	0	0	0	2	0
Alotanypus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	0	5.8	0	0	11.06	91	2	0	0	6.87	0	0	11.16	8	0	0
Brillia	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	4	0	0	0	22.12	0	0	5	0	0	0	0	39.07	0	2	1.25
Chironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	284	15.95	0	42.64	1.58	7	6	0	0	103.05	0	0	2.79	2	0	0
Cladopelma	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	0	2.9	0	5.33	0	0	0	0	0	0	0	0	0	0	0	0
Corynoneura	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	4	0	21.18	0	6.32	0	16	0	26.66	0	0	0	5.58	0	3	1.25
Cricotopus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	170	5.8	0	90.61	14.22	10	2	1	759.81	43.51	157.62	10.01	0	0	0	23.75
Cryptochironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	44	101.5	0	15.99	4.74	0	2	16	13.33	0	0	1.43	2.79	0	1	0
Dicrotendipes	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	0	5.8	0	26.65	1.58	0	0	0	0	0	0	0	0	0	0	0
Endochironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	22	0	21.18	5.33	0	0	0	0	0	0	0	0	0	0	0	0
Eukiefferiella claripennis group	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	8	0	0	0	4.74	0	2	0	546.53	25.19	0	4.29	16.75	0	0	0
Heterotrissocladius marcidus group	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	0	0	0	0	3.16	0	6	0	0	0	0	0	5.58	0	4	0
Limnophyes	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	4	0	0	0	6.32	0	2	0	0	4.58	0	0	8.37	0	1	0
Micropsectra	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	0	0	0	0	56.88	3	4	1	39.99	66.41	0	4.29	94.89	1	4	0
Nanocladius	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	0	0	7.06	0	0	0	0	0	0	4.58	6.39	0	0	0	0	0
Odontomesa	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Prodiamesinae	midges	0	14.5	0	0	9.48	0	48	0	0	6.87	0	0	0	0	4	56.25
Orthocladius	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	0	11.6	0	0	0	0	2	0	0	66.41	0	0	0	0	1	0
Parachironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	0	0	0	5.33	0	0	0	0	0	4.58	0	0	0	0	0	0
Parametriocnemus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	0	0	0	0	0	0	0	1	13.33	0	0	2.86	5.58	0	0	0
Paratanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	8	39.15	49.42	21.32	14.22	0	64	1	39.99	48.09	0	1.43	0	0	2	8.75
Paratendipes	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	0	5.8	0	0	3.16	106	78	0	0	0	0	0	0	3	11	0
Phaenopsectra	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	12	11.6	0	0	15.8	0	4	2	26.66	119.08	0	0	8.37	1	0	0
Polypedilum	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	12	11.6	63.54	0	1.58	0	2	7	279.93	0	647.52	2.86	2.79	2	38	7.5
Procladius	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	40	18.85	7.06	0	6.32	0	18	6	0	0	0	0	5.58	0	11	45
Prodiamesa	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Prodiamesinae	midges	4	14.5	0	0	83.74	151	0	9	0	16.03	0	1.43	44.66	125	0	0
Psectrocladius	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	56	0	14.12	5.33	1.58	0	0	0	66.65	0	0	0	0	0	0	0
Psectrotanypus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	12	0	0	10.66	11.06	0	0	0	0	0	0	0	0	0	0	0
Pseudochironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	0	0	317.7	10.66	0	0	2	0	0	0	0	1.43	0	0	0	0
Pseudosmittia	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rheotanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	4	0	0	0	0	0	0	0	93.31	0	10.65	0	0	0	0	0
Smittia	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	0	0	0	0	3.16	0	0	0	0	0	0	0	0	0	0	0
Stempellinella	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Stictochironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	0	0	0	5.33	0	0	0	1	0	0	0	1.43	0	0	0	1.25
Tanypus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	0	0	0	37.31	0	0	0	0	0	0	0	0	0	0	0	0
Tanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	82	181.25	7.06	74.62	1.58	5	2	0	0	43.51	0	0	0	2	2	23.75
Thienemannimyia complex	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	8	0	7.06	0	12.64	0	8	18	253.27	16.03	23.43	2.86	55.82	0	18	5
Tvetenia bavarica group	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	0	0	0	0	1.58	0	0	0	13.33	4.58	0	0	33.49	0	0	0

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

highly tolerant non-native taxa; including the New Zealand mud snail (Potamopyrgus antipodarum)

							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	Rinearson Creek	Rinearson Creek	Rinearson Creek	Rinearson Creek
							Site	beaver pond	beaver pond	beaver pond	beaver pond	emergent marsh	emergent marsh	emergent marsh	emergent marsh	engineered riffle	engineered riffle	engineered riffle	engineered riffle	upper control	upper control	upper control	upper control
							Date	2020-05-19	2021-05-04	2023-08-16	2024-06-14	2020-05-19	2021-05-04	2023-08-16	2024-06-14	2020-05-19	2021-05-04	2023-08-16	2024-06-14	2020-05-19	2021-05-04	2023-08-16	2024-06-14
Taxon	Stage	Insect?	Origin	Higher classification	Order	Family	Common name	% abundance	% abundance	% abundance	% abundance	% abundance	% abundance	% abundance	% abundance	% abundance	% abundance	% abundance	% abundance	% abundance	% abundance	% abundance	% abundance
Tricladida	U	non-insect	Aquatic	Turbellaria	miscellaneous non-insect	x	flat worms	0	0	2.124	1.947	0	0	1.333	0.4	0	0.3311	0.3559	3.442	0	0	0.2347	0.367
Nemata	U	non-insect	Aquatic	Nemata	miscellaneous non-insect	x	round worms	0	0	0.3861	0	3.762	0.1751	0.9524	0	0	0.3311	0.5338	0.1721	0	0	0.4695	0
Prostoma	U	non-insect	Aquatic	Annelida: Nemertea	miscellaneous non-insect	Tetrastemmatidae	nemerteans	0	0	0	0	0	0	0	0	0	0	0.7117	0	0	0	0	0.1835
Oligochaeta	U	non-insect	Aquatic	Annelida: Oligochaeta	miscellaneous non-insect	x	segmented worms	18.14	1.336	19.11	0.708	2.97	0.3503	4.19	3.6	1.02	2.815	5.338	4.475	6.68	1.531	12.91	1.101
Erpobdella	U	non-insect	Aquatic	Annelida: Hirudinea	miscellaneous non-insect	Erpobdellidae	leeches	0.6421	0.8347	0	0	1.386	0.5254	0	0	0.1701	0.1656	0	0.1721	0.1965	1.02	0	0
Helobdella stagnalis complex	U	non-insect	Aquatic	Annelida: Hirudinea	miscellaneous non-insect	Glossiphoniidae	leeches	0	2.504	0	0.708	0	0	0	0	0	0.3311	0	0.1721	0	0	0.2347	0.367
Fluminicola	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Hydrobiidae	snails	0	0	0	0	1.98	0	6.286	14	0	0	0	0.1721	0	0	2.347	20.73
Potamopyrgus antipodarum	U	non-insect	Aquatic	Mollusca: Gastropoda	x	uncertain status	snails	0	0	0	0	4.356	0	2.476	0.4	0	0	0	0	0.7859	0	0.4695	4.954
Lymnaeidae	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Lymnaeidae	snails	0	0	0.1931	0	1.188	0	0.381	0	0.1701	0	0	0	0	0	0.2347	0
Physa/Physella	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Physidae	snails	0	0.5008	4.247	23.89	1.386	0	1.333	1.6	0.8503	0	0.1779	0.6885	0	0	0	2.018
Ferrissia	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Planorbidae	snails	0	0	0	0	0	0	0	0.4	0	0	0	0	0.1965	0	0	0
Gyraulus	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Planorbidae	snails	0	0	0.1931	1.77	0	0	0.381	0	0.1701	0	0	0	0	0	0	0
Menetus	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Planorbidae	snails	0	0	0	0	0	0	0	0.4	0	0	0	0.3442	0.9823	0	0	0.367
Juga	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Pleuroceridae	snails	0	0	0	0	0.396	0	0.381	8.4	0	0	0	0	0	0	4.93	1.284
Corbicula	U	non-insect	Aquatic	Mollusca: Bivalvia	x	Corbiculidae	asiatic clam	0	0	0	0	0	0	0	0	0	0	0	0.1721	0	0	0	0
Sphaeriidae	U	non-insect	Aquatic	Mollusca: Bivalvia	x	Sphaeriidae	pea clams	0	0.3339	0.7722	3.717	11.29	0	5.333	3.6	0.5102	0	1.957	1.205	1.572	1.02	18.08	7.156
Musculium	U	non-insect	Aquatic	Mollusca: Bivalvia	x	Sphaeriidae	pea clams	0	0.3339	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chydoridae	U	non-insect	Aquatic	Crustacea: Cladocera	x	Chydoridae	water fleas	0.6421	0.3339	1.544	1.593	0	0	0	0	1.02	0	0	0	0	0	0	0
Ostracoda	U	non-insect	Aquatic	Crustacea: Ostracoda	x	x	seed shrimp	0	1.002	2.317	0	0	0	0	0	0	0.1656	0	0	0	0	0	0
Crangonyx	U	non-insect	Aquatic	Crustacea: Amphipoda	x	Crangonyctidae	scuds	1.445	14.36	0	1.416	3.96	3.503	4	6.4	1.701	28.64	2.135	3.959	4.715	0.5102	2.347	6.239
Hyalella	U	non-insect	Aquatic	Crustacea: Amphipoda	x	Talitridae	scuds	0	0	12.55	38.23	0	0	0.9524	0	0	0	0	0.3442	0	0	0	2.018
Caecidotea	U	non-insect	Aquatic	Crustacea: Isopoda	x	Asellidae	aquatic sow bugs	0.4815	5.843	0	3.54	23.37	25.22	38.86	30	0.3401	14.74	2.669	4.647	53.44	18.88	29.81	20.55
Lirceus	U	non-insect	Aquatic	Crustacea: Isopoda	x	Asellidae	aquatic sow bugs	0	0.6678	0	0	0.198	1.751	0	0	0	1.159	0	72.63	0	0	0	0.7339
Pacifastacus	U	non-insect	Aquatic	Crustacea: Decapoda	x	Astacidae	crayfish	0	0	0	0.177	0	0	0	0	0.1701	0.1656	0	0.1721	0.1965	0	0	0.1835
Trombidiformes	U	non-insect	Aquatic	Arachnida: Acari	Trombidiformes	x	mites	0	1.002	0.3861	0	0	0	0	0	0	0.6623	0	0	0	0	0	0
Hygrobates	U	non-insect	Aquatic	Arachnida: Acari	x	x	mites	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2347	0
Oribatida	U	non-insect	Terrestrial	Arachnida: Acari	x	x	mites	0	0	0.1931	0	0	0	0	0	0	0	0	0	0	0	0	0
Sperchon	U	non-insect	Aquatic	Arachnida: Acari	x	x	mites	0	0	0.3861	0	0	0	0	0	0.1701	0	0.3559	0	0	0	0	0
Sperchonopsis	U	non-insect	Aquatic	Arachnida: Acari	x	x	mites	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.939	0
Aeshnidae	L	insect	Aquatic	Arthropoda: Insecta	Odonata	Aeshnidae	dragonflies	0.1605	0	2.51	0	0	0	0	0	0	0	0	0	0	0	0	0.367
Libellulidae	L	insect	Aquatic	Arthropoda: Insecta	Odonata	Libellulidae	dragonflies	0	0.1669	0.7722	0.177	0	0	0	0	0	0.1656	0	0	0	0	0	0
Argia	L	insect	Aquatic	Arthropoda: Insecta	Odonata	Coenagrionidae	damselflies	0	0	0	0	0	0	0	0	0	0	1.601	0.1721	0	0	0	0
Coenagrion/Enallagma	L	insect	Aquatic	Arthropoda: Insecta	Odonata	Coenagrionidae	damselflies	0	0.1669	5.405	2.478	0.198	0	0.1905	0	0	0	0.5338	0.1721	0	0	0.2347	0.5505
Baetis tricaudatus complex	L	insect	Aquatic	Arthropoda: Insecta	Ephemeroptera	Baetidae	mayflies	0	0	0	0	0.7921	0	0	0	0.8503	0.8278	0	0	1.768	0.5102	0	0
Callibaetis	L	insect	Aquatic	Arthropoda: Insecta	Ephemeroptera	Baetidae	mayflies	0.1605	0.1669	4.633	0.885	0	0	0.9524	0	0	0	0	0	0	0	0	0
Abedus	L	insect	Aquatic	Arthropoda: Insecta	Hemiptera: Heteroptera	Belostomatidae	giant water bugs	0	0	0.1931	0	0	0	0	0	0	0	0	0	0	0	0	0
Corixidae	A	insect	Aquatic	Arthropoda: Insecta	Hemiptera: Heteroptera	Corixidae	water boatman	1.766	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Corixidae	L	insect	Aquatic	Arthropoda: Insecta	Hemiptera: Heteroptera	Corixidae	water boatman	1.766	1.503	19.88	3.54	1.782	0	1.905	0	0	0	0	0	0	0	0	1.468
Notonecta	L	insect	Aquatic	Arthropoda: Insecta	Hemiptera: Heteroptera	Notonectidae	back swimmers	0.1605	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cheumatopsyche	L	insect	Aquatic	Arthropoda: Insecta	Trichoptera	Hydropsychidae	caddisflies	0	0	0	0	0	0	0	0	1.19	0.3311	0.7117	0.1721	0	0	0	0
Hydroptila	L	insect	Aquatic	Arthropoda: Insecta	Trichoptera	Hydroptilidae	caddisflies	0	0	0	0	0	0	0	0	0.1701	0	0.5338	0.6885	0	0	0	0
Hydroptila	P	insect	Aquatic	Arthropoda: Insecta	Trichoptera	Hydroptilidae	caddisflies	0	0	0	0	0	0	0	0	0	0	0	0.1721	0	0	0	0
Oxyethira	L	insect	Aquatic	Arthropoda: Insecta	Trichoptera	Hydroptilidae	caddisflies	0	0	0.5792	0	0	0	0	0	0	0	0	0	0	0	0	0
Lepidostoma	L	insect	Aquatic	Arthropoda: Insecta	Trichoptera	Lepidostomatidae	caddisflies	0	0	0	0	0	0	0	0	0	0	0	0	0.1965	0	0	0
Lepidostoma unicolor group	L	insect	Aquatic	Arthropoda: Insecta	Trichoptera	Lepidostomatidae	caddisflies	0	0	0	0	0	0	0	0.4	0	0	0	0	0	0	0	0.1835
Psychoglypha	L	insect	Aquatic	Arthropoda: Insecta	Trichoptera	Limnephilidae	caddisflies	0	0	0	0	0	0	0	1.6	0	0	0	0	0	0	0	0
Dytiscidae	L	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Dytiscidae	predaceous diving beetles	0.1605	0	0	0.177	0.198	0	0	0	0	0	0	0	0	0	0	0
Hydroporinae	L	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Dytiscidae	predaceous diving beetles	0	0	0	0.177	0	0	0	0	0	0	0	0	0	0	0	0
Lara	L	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Elmidae	riffle beetles	0	0	0	0	0	0	0	0	0	0	0	0	0.1965	0	0	0
Gyrinus	L	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Gyrinidae	whirligig beetles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1835
Haliplus	L	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Haliplidae	crawling water beetles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1835
Peltodytes	A	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Haliplidae	crawling water beetles	0.321	0	2.703	0	0.5941	0	0	0	0	0	0	0	0	0	0	0.5505
Peltodytes	L	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Haliplidae	crawling water beetles	0.1605	0	1.737	0.177	0	0	1.714	0	0	0	0	0.3442	0	0	0	0.7339
Hydrophilidae	A	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Hydrophilidae	water scavenger beetles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1835
Hydrophilidae	L	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Hydrophilidae	water scavenger beetles	0.1605	0	0.1931	0.177	0	0	0	0	0	0	0	0	0	0	0	0
Ceratopogoninae	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Ceratopogonidae	no-see-um midges	2.568	11.02	1.931	0.177	0.396	0.8757	0.381	1.2	1.02	1.656	1.246	0.5164	1.572	2.551	0.2347	0.367
Ceratopogoninae	P	insect	Aquatic	Arthropoda: Insecta	Diptera	Ceratopogonidae	no-see-um midges	0.1605	0.1669	0	0	0	0	0	0	0.1701	0	0	0	0	0	0	0
Dixella	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Dixidae	dixid midges	0	0	0	0.177	0.9901	0	0.7619	0	0	0	0	0	0	0	0.7042	0.7339
Dolichopodidae	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Dolichopodidae	long-legged flies	0.1605	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Clinocera	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Empididae	dance flies	0	0	0	0	0.198	0	0	0	0	0	0	0	0.1965	0	0	0
Hemerodromia	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Empididae	dance flies	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2347	0
Neoplasta	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Empididae	dance flies	0	0	0	0	0.198	0	0	0	0	0	0.1779	0	0.1965	0	0.4695	0
Psychodini	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Psychodidae	moth flies	0.1605	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Simulium	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Simuliidae	black flies	2.087	0	0	0	0	0	0	0	60.88	0.8278	2.669	0.5164	0.3929	0	0	0
Simulium	P	insect	Aquatic	Arthropoda: Insecta	Diptera	Simuliidae	black flies	0	0	0	0	0	0	0	0	0	0.3311	0	0	0	0	0	0
Tipuloidea	P	insect	Aquatic	Arthropoda: Insecta	Diptera	Tipulidae	crane flies	0	0	0	0	0.198	0	0	0	0	0	0	0	0	0	0	0
Dicranomyia	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Tipulidae	crane flies	0	0	0	0	0	0	0	0	0	0	0.1601	0	0	0	0	0
Tipula	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Tipulidae	crane flies	1.445	0	0	0	0.7921	0	0	0	0.3401	0.1656	0.1779	0	0.1965	0	0	0
Chironomidae	P	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae	midges	3.371	6.344	0.1931	1.947	0	2.277	1.333	0.4	1.361	4.305	5.872	0.3442	2.358	0.5102	0.2347	0.7339
Ablabesmyia	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	0	0	0.7722	0.354	0	0	0.1905	0	0	0	0	0	0	0	0.4695	0
Alotanypus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	0	0.6678	0	0	1.386	15.94	0.1905	0	0	0.4967	0	0	0.7859	4.082	0	0
Brillia	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	0.321	0	0	0	2.772	0	0	2	0	0	0	0	2.75	0	0.4695	0.1835
Chironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	22.79	1.836	0	1.416	0.198	1.226	0.5714	0	0	7.45	0	0	0.1965	1.02	0	0
Cladopelma	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	0	0.3339	0	0.177	0	0	0	0	0	0	0	0	0	0	0	0
Corynoneura	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	0.321	0	0.5792	0	0.7921	0	1.524	0	0.3401	0	0	0	0.3929	0	0.7042	0.1835
Cricotopus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	13.64	0.6678	0	3.009	1.782	1.751	0.1905	0.4	9.694	3.146	13.17	1.205	0	0	0	3.486
Cryptochironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	3.531	11.69	0	0.531	0.5941	0	0.1905	6.4	0.1701	0	0	0.1721	0.1965	0	0.2347	0
Dicrotendipes	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	0	0.6678	0	0.885	0.198	0	0	0	0	0	0	0	0	0	0	0
Endochironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	1.766	0	0.5792	0.177	0	0	0	0	0	0	0	0	0	0	0	0
Eukiefferiella claripennis group	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	0.6421	0	0	0	0.5941	0	0.1905	0	6.973	1.821	0	0.5164	1.179	0	0	0
Heterotrissocladius marcidus group	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	0	0	0	0	0.396	0	0.5714	0	0	0	0	0	0.3929	0	0.939	0
Limnophyes	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	0.321	0	0	0	0.7921	0	0.1905	0	0	0.3311	0	0	0.5894	0	0.2347	0
Micropsectra	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	0	0	0	0	7.129	0.5254	0.381	0.4	0.5102	4.801	0	0.5164	6.68	0.5102	0.939	0
Nanocladius	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	0	0	0.1931	0	0	0	0	0	0	0.3311	0.5338	0	0	0	0	0
Odontomesa	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Prodiamesinae	midges	0	1.669	0	0	1.188	0	4.571	0	0	0.4967	0	0	0	0	0.939	8.257
Orthocladius	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	0	1.336	0	0	0	0	0.1905	0	0	4.801	0	0	0	0	0.2347	0
Parachironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	0	0	0	0.177	0	0	0	0	0	0.3311	0	0	0	0	0	0
Parametriocnemus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	0	0	0	0	0	0	0	0.4	0.1701	0	0	0.3442	0.3929	0	0	0
Paratanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	0.6421	4.508	1.351	0.708	1.782	0	6.095	0.4	0.5102	3.477	0	0.1721	0	0	0.4695	1.284
Paratendipes	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	0	0.6678	0	0	0.396	18.56	7.429	0	0	0	0	0	0	1.531	2.582	0
Phaenopsectra	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	0.9631	1.336	0	0	1.98	0	0.381	0.8	0.3401	8.609	0	0	0.5894	0.5102	0	0
Polypedilum	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	0.9631	1.336	1.737	0	0.198	0	0.1905	2.8	3.571	0	54.09	0.3442	0.1965	1.02	8.92	1.101
Procladius	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	3.21	2.17	0.1931	0	0.7921	0	1.714	2.4	0	0	0	0	0.3929	0	2.582	6.606
Prodiamesa	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Prodiamesinae	midges	0.321	1.669	0	0	10.5	28.44	0	3.6	0	1.159	0	0.1721	3.143	63.78	0	0
Psectrocladius	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	4.494	0	0.3861	0.177	0.198	0	0	0	0.8503	0	0	0	0	0	0	0
Psectrotanypus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	0.9631	0	0	0.354	1.386	0	0	0	0	0	0	0	0	0	0	0
Pseudochironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	0	0	8.687	0.354	0	0	0.1905	0	0	0	0	0.1721	0	0	0	0
Pseudosmittia	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	1.445	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rheotanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	0.321	0	0	0	0	0	0	0	1.19	0	0.8897	0	0	0	0	0
Smittia	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	0	0	0	0	0.396	0	0	0	0	0	0	0	0	0	0	0
Stempellinella	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2347	0
Stictochironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	0	0	0	0.177	0	0	0	0.4	0	0	0	0.1721	0	0	0	0.1835
Tanypus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	0	0	0	1.239	0	0	0	0	0	0	0	0	0	0	0	0
Tanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	6.581	20.87	0.1931	2.478	0.198	0.8757	0.1905	0	0	3.146	0	0	0	1.02	0.4695	3.486
Thienemannimyia complex	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	0.6421	0	0.1931	0	1.584	0	0.7619	7.2	3.231	1.159	1.957	0.3442	3.929	0	4.225	0.7339
Tvetenia bavarica group	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	0	0	0	0	0.198	0	0	0	0.1701	0.3311	0	0	2.358	0	0	0

Waterbody	Site	Date	Taxon	Stage	Insect	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	6
Rinearson Creek	beaver pond	2020-05-19	Notonecta	L	insect	Aquatic	Arthropoda: Insecta	Hemiptera: Heteroptera	Notonectidae	back swimmers	2
Rinearson Creek	beaver pond	2020-05-19	Simulium	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Simuliidae	black flies	26
Rinearson Creek	beaver pond	2020-05-19	Tipula	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Tipulidae	crane flies	18
Rinearson Creek	beaver pond	2020-05-19	Peltodytes	A	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Haliplidae	crawling water beetles	4
Rinearson Creek	beaver pond	2020-05-19	Peltodytes	L	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Haliplidae	crawling water beetles	2
Rinearson Creek	beaver pond	2020-05-19	Aeshnidae	L	insect	Aquatic	Arthropoda: Insecta	Odonata	Aeshnidae	dragonflies	2
Rinearson Creek	beaver pond	2020-05-19	Erpobdella	U	non-insect	Aquatic	Annelida: Hirudinea	miscellaneous non-insect	Erpobdellidae	leeches	8
Rinearson Creek	beaver pond	2020-05-19	Dolichopodidae	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Dolichopodidae	long-legged flies	2
Rinearson Creek	beaver pond	2020-05-19	Callibaetis	L	insect	Aquatic	Arthropoda: Insecta	Ephemeroptera	Baetidae	mayflies	2
Rinearson Creek	beaver pond	2020-05-19	Chironomidae	P	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae	midges	42
Rinearson Creek	beaver pond	2020-05-19	Chironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	284
Rinearson Creek	beaver pond	2020-05-19	Cryptochironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	44
Rinearson Creek	beaver pond	2020-05-19	Endochironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	22
Rinearson Creek	beaver pond	2020-05-19	Phaenopsectra	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	12
Rinearson Creek	beaver pond	2020-05-19	Polypedilum	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	12
Rinearson Creek	beaver pond	2020-05-19	Paratanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	8
Rinearson Creek	beaver pond	2020-05-19	Rheotanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	4
Rinearson Creek	beaver pond	2020-05-19	Tanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	82
Rinearson Creek	beaver pond	2020-05-19	Brillia	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	4
Rinearson Creek	beaver pond	2020-05-19	Corynoneura	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	4
Rinearson Creek	beaver pond	2020-05-19	Cricotopus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	170
Rinearson Creek	beaver pond	2020-05-19	Eukiefferiella claripennis group	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	8
Rinearson Creek	beaver pond	2020-05-19	Limnophyes	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	4
Rinearson Creek	beaver pond	2020-05-19	Psectrocladius	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	56
Rinearson Creek	beaver pond	2020-05-19	Pseudosmittia	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	18
Rinearson Creek	beaver pond	2020-05-19	Prodiamesa	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Prodiamesinae	midges	4
Rinearson Creek	beaver pond	2020-05-19	Procladius	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	40
Rinearson Creek	beaver pond	2020-05-19	Psectrotanypus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	12
Rinearson Creek	beaver pond	2020-05-19	Thienemannimyia complex	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	8
Rinearson Creek	beaver pond	2020-05-19	Psychodini	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Psychodidae	moth flies	2
Rinearson Creek	beaver pond	2020-05-19	Ceratopogoninae	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Ceratopogonidae	no-see-um midges	32
Rinearson Creek	beaver pond	2020-05-19	Ceratopogoninae	P	insect	Aquatic	Arthropoda: Insecta	Diptera	Ceratopogonidae	no-see-um midges	2
Rinearson Creek	beaver pond	2020-05-19	Dytiscidae	L	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Dytiscidae	predaceous diving beetles	2
Rinearson Creek	beaver pond	2020-05-19	Crangonyx	U	non-insect	Aquatic	Crustacea: Amphipoda	x	Crangonyctidae	scuds	18
Rinearson Creek	beaver pond	2020-05-19	Oligochaeta	U	non-insect	Aquatic	Annelida: Oligochaeta	miscellaneous non-insect	x	segmented worms	226
Rinearson Creek	beaver pond	2020-05-19	Corixidae	A	insect	Aquatic	Arthropoda: Insecta	Hemiptera: Heteroptera	Corixidae	water boatman	22
Rinearson Creek	beaver pond	2020-05-19	Corixidae	L	insect	Aquatic	Arthropoda: Insecta	Hemiptera: Heteroptera	Corixidae	water boatman	22
Rinearson Creek	beaver pond	2020-05-19	Chydoridae	U	non-insect	Aquatic	Crustacea: Cladocera	x	Chydoridae	water fleas	8
Rinearson Creek	beaver pond	2020-05-19	Hydrophilidae	L	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Hydrophilidae	water scavenger beetles	2
Rinearson Creek	emergent marsh	2020-05-19	Caecidotea	U	non-insect	Aquatic	Crustacea: Isopoda	x	Asellidae	aquatic sow bugs	186.44
Rinearson Creek	emergent marsh	2020-05-19	Lirceus	U	non-insect	Aquatic	Crustacea: Isopoda	x	Asellidae	aquatic sow bugs	1.58
Rinearson Creek	emergent marsh	2020-05-19	Tipula	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Tipulidae	crane flies	6.32
Rinearson Creek	emergent marsh	2020-05-19	Tipuloidea	P	insect	Aquatic	Arthropoda: Insecta	Diptera	Tipulidae	crane flies	1.58
Rinearson Creek	emergent marsh	2020-05-19	Peltodytes	A	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Haliplidae	crawling water beetles	4.74
Rinearson Creek	emergent marsh	2020-05-19	Coenagrion/Enallagma	L	insect	Aquatic	Arthropoda: Insecta	Odonata	Coenagrionidae	damselflies	1.58
Rinearson Creek	emergent marsh	2020-05-19	Clinocera	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Empididae	dance flies	1.58
Rinearson Creek	emergent marsh	2020-05-19	Neoplasta	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Empididae	dance flies	1.58
Rinearson Creek	emergent marsh	2020-05-19	Dixella	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Dixidae	dixid midges	7.9
Rinearson Creek	emergent marsh	2020-05-19	Erpobdella	U	non-insect	Aquatic	Annelida: Hirudinea	miscellaneous non-insect	Erpobdellidae	leeches	11.06
Rinearson Creek	emergent marsh	2020-05-19	Baetis tricaudatus complex	L	insect	Aquatic	Arthropoda: Insecta	Ephemeroptera	Baetidae	mayflies	6.32
Rinearson Creek	emergent marsh	2020-05-19	Chironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	1.58
Rinearson Creek	emergent marsh	2020-05-19	Cryptochironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	4.74
Rinearson Creek	emergent marsh	2020-05-19	Dicrotendipes	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	1.58
Rinearson Creek	emergent marsh	2020-05-19	Paratendipes	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	3.16
Rinearson Creek	emergent marsh	2020-05-19	Phaenopsectra	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	15.8
Rinearson Creek	emergent marsh	2020-05-19	Polypedilum	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	1.58
Rinearson Creek	emergent marsh	2020-05-19	Micropsectra	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	56.88
Rinearson Creek	emergent marsh	2020-05-19	Paratanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	14.22
Rinearson Creek	emergent marsh	2020-05-19	Tanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	1.58
Rinearson Creek	emergent marsh	2020-05-19	Brillia	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	22.12
Rinearson Creek	emergent marsh	2020-05-19	Corynoneura	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	6.32
Rinearson Creek	emergent marsh	2020-05-19	Cricotopus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	14.22
Rinearson Creek	emergent marsh	2020-05-19	Eukiefferiella claripennis group	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	4.74
Rinearson Creek	emergent marsh	2020-05-19	Heterotrissocladius marcidus group	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	3.16
Rinearson Creek	emergent marsh	2020-05-19	Limnophyes	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	6.32
Rinearson Creek	emergent marsh	2020-05-19	Psectrocladius	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	1.58
Rinearson Creek	emergent marsh	2020-05-19	Smittia	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	3.16
Rinearson Creek	emergent marsh	2020-05-19	Tvetenia bavarica group	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	1.58
Rinearson Creek	emergent marsh	2020-05-19	Odontomesa	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Prodiamesinae	midges	9.48
Rinearson Creek	emergent marsh	2020-05-19	Prodiamesa	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Prodiamesinae	midges	83.74
Rinearson Creek	emergent marsh	2020-05-19	Alotanypus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	11.06
Rinearson Creek	emergent marsh	2020-05-19	Procladius	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	6.32
Rinearson Creek	emergent marsh	2020-05-19	Psectrotanypus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	11.06
Rinearson Creek	emergent marsh	2020-05-19	Thienemannimyia complex	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	12.64
Rinearson Creek	emergent marsh	2020-05-19	Ceratopogoninae	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Ceratopogonidae	no-see-um midges	3.16
Rinearson Creek	emergent marsh	2020-05-19	Sphaeriidae	U	non-insect	Aquatic	Mollusca: Bivalvia	x	Sphaeriidae	pea clams	90.06
Rinearson Creek	emergent marsh	2020-05-19	Dytiscidae	L	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Dytiscidae	predaceous diving beetles	1.58
Rinearson Creek	emergent marsh	2020-05-19	Nemata	U	non-insect	Aquatic	Nemata	miscellaneous non-insect	x	round worms	30.02
Rinearson Creek	emergent marsh	2020-05-19	Crangonyx	U	non-insect	Aquatic	Crustacea: Amphipoda	x	Crangonyctidae	scuds	31.6
Rinearson Creek	emergent marsh	2020-05-19	Oligochaeta	U	non-insect	Aquatic	Annelida: Oligochaeta	miscellaneous non-insect	x	segmented worms	23.7
Rinearson Creek	emergent marsh	2020-05-19	Fluminicola	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Hydrobiidae	snails	15.8
Rinearson Creek	emergent marsh	2020-05-19	Lymnaeidae	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Lymnaeidae	snails	9.48
Rinearson Creek	emergent marsh	2020-05-19	Physa/Physella	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Physidae	snails	11.06
Rinearson Creek	emergent marsh	2020-05-19	Juga	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Pleuroceridae	snails	3.16
Rinearson Creek	emergent marsh	2020-05-19	Potamopyrgus antipodarum	U	non-insect	Aquatic	Mollusca: Gastropoda	x	uncertain status	snails	34.76
Rinearson Creek	emergent marsh	2020-05-19	Corixidae	L	insect	Aquatic	Arthropoda: Insecta	Hemiptera: Heteroptera	Corixidae	water boatman	14.22
Rinearson Creek	engineered riffle	2020-05-19	Caecidotea	U	non-insect	Aquatic	Crustacea: Isopoda	x	Asellidae	aquatic sow bugs	26.66
Rinearson Creek	engineered riffle	2020-05-19	Simulium	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Simuliidae	black flies	4772.14
Rinearson Creek	engineered riffle	2020-05-19	Cheumatopsyche	L	insect	Aquatic	Arthropoda: Insecta	Trichoptera	Hydropsychidae	caddisflies	93.31
Rinearson Creek	engineered riffle	2020-05-19	Hydroptila	L	insect	Aquatic	Arthropoda: Insecta	Trichoptera	Hydroptilidae	caddisflies	13.33
Rinearson Creek	engineered riffle	2020-05-19	Tipula	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Tipulidae	crane flies	26.66
Rinearson Creek	engineered riffle	2020-05-19	Pacifastacus	U	non-insect	Aquatic	Crustacea: Decapoda	x	Astacidae	crayfish	13.33
Rinearson Creek	engineered riffle	2020-05-19	Erpobdella	U	non-insect	Aquatic	Annelida: Hirudinea	miscellaneous non-insect	Erpobdellidae	leeches	13.33
Rinearson Creek	engineered riffle	2020-05-19	Baetis tricaudatus complex	L	insect	Aquatic	Arthropoda: Insecta	Ephemeroptera	Baetidae	mayflies	66.65
Rinearson Creek	engineered riffle	2020-05-19	Chironomidae	P	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae	midges	106.64
Rinearson Creek	engineered riffle	2020-05-19	Cryptochironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	13.33
Rinearson Creek	engineered riffle	2020-05-19	Phaenopsectra	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	26.66
Rinearson Creek	engineered riffle	2020-05-19	Polypedilum	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	279.93
Rinearson Creek	engineered riffle	2020-05-19	Micropsectra	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	39.99
Rinearson Creek	engineered riffle	2020-05-19	Paratanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	39.99
Rinearson Creek	engineered riffle	2020-05-19	Rheotanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	93.31
Rinearson Creek	engineered riffle	2020-05-19	Corynoneura	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	26.66
Rinearson Creek	engineered riffle	2020-05-19	Cricotopus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	759.81
Rinearson Creek	engineered riffle	2020-05-19	Eukiefferiella claripennis group	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	546.53
Rinearson Creek	engineered riffle	2020-05-19	Parametriocnemus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	13.33
Rinearson Creek	engineered riffle	2020-05-19	Psectrocladius	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	66.65
Rinearson Creek	engineered riffle	2020-05-19	Tvetenia bavarica group	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	13.33
Rinearson Creek	engineered riffle	2020-05-19	Thienemannimyia complex	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	253.27
Rinearson Creek	engineered riffle	2020-05-19	Sperchon	U	non-insect	Aquatic	Arachnida: Acari	x	x	mites	13.33
Rinearson Creek	engineered riffle	2020-05-19	Ceratopogoninae	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Ceratopogonidae	no-see-um midges	79.98
Rinearson Creek	engineered riffle	2020-05-19	Ceratopogoninae	P	insect	Aquatic	Arthropoda: Insecta	Diptera	Ceratopogonidae	no-see-um midges	13.33
Rinearson Creek	engineered riffle	2020-05-19	Sphaeriidae	U	non-insect	Aquatic	Mollusca: Bivalvia	x	Sphaeriidae	pea clams	39.99
Rinearson Creek	engineered riffle	2020-05-19	Crangonyx	U	non-insect	Aquatic	Crustacea: Amphipoda	x	Crangonyctidae	scuds	133.3
Rinearson Creek	engineered riffle	2020-05-19	Oligochaeta	U	non-insect	Aquatic	Annelida: Oligochaeta	miscellaneous non-insect	x	segmented worms	79.98
Rinearson Creek	engineered riffle	2020-05-19	Lymnaeidae	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Lymnaeidae	snails	13.33
Rinearson Creek	engineered riffle	2020-05-19	Physa/Physella	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Physidae	snails	66.65
Rinearson Creek	engineered riffle	2020-05-19	Gyraulus	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Planorbidae	snails	13.33
Rinearson Creek	engineered riffle	2020-05-19	Chydoridae	U	non-insect	Aquatic	Crustacea: Cladocera	x	Chydoridae	water fleas	79.98
Rinearson Creek	upper control	2020-05-19	Caecidotea	U	non-insect	Aquatic	Crustacea: Isopoda	x	Asellidae	aquatic sow bugs	759.152
Rinearson Creek	upper control	2020-05-19	Simulium	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Simuliidae	black flies	5.582
Rinearson Creek	upper control	2020-05-19	Lepidostoma	L	insect	Aquatic	Arthropoda: Insecta	Trichoptera	Lepidostomatidae	caddisflies	2.791
Rinearson Creek	upper control	2020-05-19	Tipula	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Tipulidae	crane flies	2.791
Rinearson Creek	upper control	2020-05-19	Pacifastacus	U	non-insect	Aquatic	Crustacea: Decapoda	x	Astacidae	crayfish	2.791
Rinearson Creek	upper control	2020-05-19	Clinocera	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Empididae	dance flies	2.791
Rinearson Creek	upper control	2020-05-19	Neoplasta	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Empididae	dance flies	2.791
Rinearson Creek	upper control	2020-05-19	Erpobdella	U	non-insect	Aquatic	Annelida: Hirudinea	miscellaneous non-insect	Erpobdellidae	leeches	2.791
Rinearson Creek	upper control	2020-05-19	Baetis tricaudatus complex	L	insect	Aquatic	Arthropoda: Insecta	Ephemeroptera	Baetidae	mayflies	25.119
Rinearson Creek	upper control	2020-05-19	Chironomidae	P	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae	midges	33.492
Rinearson Creek	upper control	2020-05-19	Chironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	2.791
Rinearson Creek	upper control	2020-05-19	Cryptochironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	2.791
Rinearson Creek	upper control	2020-05-19	Phaenopsectra	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	8.373
Rinearson Creek	upper control	2020-05-19	Polypedilum	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	2.791
Rinearson Creek	upper control	2020-05-19	Micropsectra	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	94.894

Rinearson Creek	upper control	2020-05-19	Brillia	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	39.074
Rinearson Creek	upper control	2020-05-19	Corynoneura	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	5.582
Rinearson Creek	upper control	2020-05-19	Eukiefferiella claripennis group	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	16.746
Rinearson Creek	upper control	2020-05-19	Heterotrissocladius marcidus group	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	5.582
Rinearson Creek	upper control	2020-05-19	Limnophyes	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	8.373
Rinearson Creek	upper control	2020-05-19	Parametriocnemus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	5.582
Rinearson Creek	upper control	2020-05-19	Tvetenia bavarica group	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	33.492
Rinearson Creek	upper control	2020-05-19	Prodiamesa	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Prodiamesinae	midges	44.656
Rinearson Creek	upper control	2020-05-19	Alotanypus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	11.164
Rinearson Creek	upper control	2020-05-19	Procladius	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	5.582
Rinearson Creek	upper control	2020-05-19	Thienemannimyia complex	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	55.82
Rinearson Creek	upper control	2020-05-19	Ceratopogoninae	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Ceratopogonidae	no-see-um midges	22.328
Rinearson Creek	upper control	2020-05-19	Sphaeriidae	U	non-insect	Aquatic	Mollusca: Bivalvia	x	Sphaeriidae	pea clams	22.328
Rinearson Creek	upper control	2020-05-19	Lara	L	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Elmidae	riffle beetles	2.791
Rinearson Creek	upper control	2020-05-19	Crangonyx	U	non-insect	Aquatic	Crustacea: Amphipoda	x	Crangonyctidae	scuds	66.984
Rinearson Creek	upper control	2020-05-19	Oligochaeta	U	non-insect	Aquatic	Annelida: Oligochaeta	miscellaneous non-insect	x	segmented worms	94.894
Rinearson Creek	upper control	2020-05-19	Ferrissia	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Planorbidae	snails	2.791
Rinearson Creek	upper control	2020-05-19	Menetus	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Planorbidae	snails	13.955
Rinearson Creek	upper control	2020-05-19	Potamopyrgus antipodarum	U	non-insect	Aquatic	Mollusca: Gastropoda	x	uncertain status	snails	11.164
Rinearson Creek	beaver pond	2021-05-04	Caecidotea	U	non-insect	Aquatic	Crustacea: Isopoda	x	Asellidae	aquatic sow bugs	50.75
Rinearson Creek	beaver pond	2021-05-04	Lirceus	U	non-insect	Aquatic	Crustacea: Isopoda	x	Asellidae	aquatic sow bugs	5.8
Rinearson Creek	beaver pond	2021-05-04	Coenagrion/Enallagma	L	insect	Aquatic	Arthropoda: Insecta	Odonata	Coenagrionidae	damselflies	1.45
Rinearson Creek	beaver pond	2021-05-04	Libellulidae	L	insect	Aquatic	Arthropoda: Insecta	Odonata	Libellulidae	dragonflies	1.45
Rinearson Creek	beaver pond	2021-05-04	Erpobdella	U	non-insect	Aquatic	Annelida: Hirudinea	miscellaneous non-insect	Erpobdellidae	leeches	7.25
Rinearson Creek	beaver pond	2021-05-04	Helobdella stagnalis complex	U	non-insect	Aquatic	Annelida: Hirudinea	miscellaneous non-insect	Glossiphoniidae	leeches	21.75
Rinearson Creek	beaver pond	2021-05-04	Callibaetis	L	insect	Aquatic	Arthropoda: Insecta	Ephemeroptera	Baetidae	mayflies	1.45
Rinearson Creek	beaver pond	2021-05-04	Chironomidae	P	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae	midges	55.1
Rinearson Creek	beaver pond	2021-05-04	Chironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	15.95
Rinearson Creek	beaver pond	2021-05-04	Cladopelma	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	2.9
Rinearson Creek	beaver pond	2021-05-04	Cryptochironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	101.5
Rinearson Creek	beaver pond	2021-05-04	Dicrotendipes	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	5.8
Rinearson Creek	beaver pond	2021-05-04	Paratendipes	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	5.8
Rinearson Creek	beaver pond	2021-05-04	Phaenopsectra	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	11.6
Rinearson Creek	beaver pond	2021-05-04	Polypedilum	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	11.6
Rinearson Creek	beaver pond	2021-05-04	Paratanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	39.15
Rinearson Creek	beaver pond	2021-05-04	Tanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	181.25
Rinearson Creek	beaver pond	2021-05-04	Cricotopus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	5.8
Rinearson Creek	beaver pond	2021-05-04	Orthocladius	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	11.6
Rinearson Creek	beaver pond	2021-05-04	Odontomesa	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Prodiamesinae	midges	14.5
Rinearson Creek	beaver pond	2021-05-04	Prodiamesa	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Prodiamesinae	midges	14.5
Rinearson Creek	beaver pond	2021-05-04	Alotanypus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	5.8
Rinearson Creek	beaver pond	2021-05-04	Procladius	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	18.85
Rinearson Creek	beaver pond	2021-05-04	Trombidiformes	U	non-insect	Aquatic	Arachnida: Acari	Trombidiformes	x	mites	8.7
Rinearson Creek	beaver pond	2021-05-04	Ceratopogoninae	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Ceratopogonidae	no-see-um midges	95.7
Rinearson Creek	beaver pond	2021-05-04	Ceratopogoninae	P	insect	Aquatic	Arthropoda: Insecta	Diptera	Ceratopogonidae	no-see-um midges	1.45
Rinearson Creek	beaver pond	2021-05-04	Musculium	U	non-insect	Aquatic	Mollusca: Bivalvia	x	Sphaeriidae	pea clams	2.9
Rinearson Creek	beaver pond	2021-05-04	Sphaeriidae	U	non-insect	Aquatic	Mollusca: Bivalvia	x	Sphaeriidae	pea clams	2.9
Rinearson Creek	beaver pond	2021-05-04	Crangonyx	U	non-insect	Aquatic	Crustacea: Amphipoda	x	Crangonyctidae	scuds	124.7
Rinearson Creek	beaver pond	2021-05-04	Ostracoda	U	non-insect	Aquatic	Crustacea: Ostracoda	x	x	seed shrimp	8.7
Rinearson Creek	beaver pond	2021-05-04	Oligochaeta	U	non-insect	Aquatic	Annelida: Oligochaeta	miscellaneous non-insect	x	segmented worms	11.6
Rinearson Creek	beaver pond	2021-05-04	Physa/Physella	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Physidae	snails	4.35
Rinearson Creek	beaver pond	2021-05-04	Corixidae	L	insect	Aquatic	Arthropoda: Insecta	Hemiptera: Heteroptera	Corixidae	water boatman	13.05
Rinearson Creek	beaver pond	2021-05-04	Chydoridae	U	non-insect	Aquatic	Crustacea: Cladocera	x	Chydoridae	water fleas	2.9
Rinearson Creek	emergent marsh	2021-05-04	Caecidotea	U	non-insect	Aquatic	Crustacea: Isopoda	x	Asellidae	aquatic sow bugs	144
Rinearson Creek	emergent marsh	2021-05-04	Lirceus	U	non-insect	Aquatic	Crustacea: Isopoda	x	Asellidae	aquatic sow bugs	10
Rinearson Creek	emergent marsh	2021-05-04	Erpobdella	U	non-insect	Aquatic	Annelida: Hirudinea	miscellaneous non-insect	Erpobdellidae	leeches	3
Rinearson Creek	emergent marsh	2021-05-04	Chironomidae	P	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae	midges	13
Rinearson Creek	emergent marsh	2021-05-04	Chironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	7
Rinearson Creek	emergent marsh	2021-05-04	Paratendipes	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	106
Rinearson Creek	emergent marsh	2021-05-04	Micropsectra	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	3
Rinearson Creek	emergent marsh	2021-05-04	Tanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	5
Rinearson Creek	emergent marsh	2021-05-04	Cricotopus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	10
Rinearson Creek	emergent marsh	2021-05-04	Prodiamesa	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Prodiamesinae	midges	151
Rinearson Creek	emergent marsh	2021-05-04	Alotanypus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	91
Rinearson Creek	emergent marsh	2021-05-04	Ceratopogoninae	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Ceratopogonidae	no-see-um midges	5
Rinearson Creek	emergent marsh	2021-05-04	Nemata	U	non-insect	Aquatic	Nemata	miscellaneous non-insect	x	round worms	1
Rinearson Creek	emergent marsh	2021-05-04	Crangonyx	U	non-insect	Aquatic	Crustacea: Amphipoda	x	Crangonyctidae	scuds	20
Rinearson Creek	emergent marsh	2021-05-04	Oligochaeta	U	non-insect	Aquatic	Annelida: Oligochaeta	miscellaneous non-insect	x	segmented worms	2
Rinearson Creek	engineered riffle	2021-05-04	Caecidotea	U	non-insect	Aquatic	Crustacea: Isopoda	x	Asellidae	aquatic sow bugs	203.81
Rinearson Creek	engineered riffle	2021-05-04	Lirceus	U	non-insect	Aquatic	Crustacea: Isopoda	x	Asellidae	aquatic sow bugs	16.03
Rinearson Creek	engineered riffle	2021-05-04	Simulium	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Simuliidae	black flies	11.45
Rinearson Creek	engineered riffle	2021-05-04	Simulium	P	insect	Aquatic	Arthropoda: Insecta	Diptera	Simuliidae	black flies	4.58
Rinearson Creek	engineered riffle	2021-05-04	Cheumatopsyche	L	insect	Aquatic	Arthropoda: Insecta	Trichoptera	Hydropsychidae	caddisflies	4.58
Rinearson Creek	engineered riffle	2021-05-04	Tipula	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Tipulidae	crane flies	2.29
Rinearson Creek	engineered riffle	2021-05-04	Pacifastacus	U	non-insect	Aquatic	Crustacea: Decapoda	x	Astacidae	crayfish	2.29
Rinearson Creek	engineered riffle	2021-05-04	Libellulidae	L	insect	Aquatic	Arthropoda: Insecta	Odonata	Libellulidae	dragonflies	2.29
Rinearson Creek	engineered riffle	2021-05-04	Trepaxonemata	U	non-insect	Aquatic	Turbellaria	miscellaneous non-insect	x	flat worms	4.58
Rinearson Creek	engineered riffle	2021-05-04	Erpobdella	U	non-insect	Aquatic	Annelida: Hirudinea	miscellaneous non-insect	Erpobdellidae	leeches	2.29
Rinearson Creek	engineered riffle	2021-05-04	Helobdella stagnalis complex	U	non-insect	Aquatic	Annelida: Hirudinea	miscellaneous non-insect	Glossiphoniidae	leeches	4.58
Rinearson Creek	engineered riffle	2021-05-04	Baetis tricaudatus complex	L	insect	Aquatic	Arthropoda: Insecta	Ephemeroptera	Baetidae	mayflies	11.45
Rinearson Creek	engineered riffle	2021-05-04	Chironomidae	P	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae	midges	59.54
Rinearson Creek	engineered riffle	2021-05-04	Chironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	103.05
Rinearson Creek	engineered riffle	2021-05-04	Parachironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	4.58
Rinearson Creek	engineered riffle	2021-05-04	Phaenopsectra	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	119.08
Rinearson Creek	engineered riffle	2021-05-04	Micropsectra	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	66.41
Rinearson Creek	engineered riffle	2021-05-04	Paratanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	48.09
Rinearson Creek	engineered riffle	2021-05-04	Tanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	43.51
Rinearson Creek	engineered riffle	2021-05-04	Cricotopus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	43.51
Rinearson Creek	engineered riffle	2021-05-04	Eukiefferiella claripennis group	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	25.19
Rinearson Creek	engineered riffle	2021-05-04	Limnophyes	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	4.58
Rinearson Creek	engineered riffle	2021-05-04	Nanocladius	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	4.58
Rinearson Creek	engineered riffle	2021-05-04	Orthocladius	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	66.41
Rinearson Creek	engineered riffle	2021-05-04	Tvetenia bavarica group	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	4.58
Rinearson Creek	engineered riffle	2021-05-04	Odontomesa	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Prodiamesinae	midges	6.87
Rinearson Creek	engineered riffle	2021-05-04	Prodiamesa	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Prodiamesinae	midges	16.03
Rinearson Creek	engineered riffle	2021-05-04	Alotanypus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	6.87
Rinearson Creek	engineered riffle	2021-05-04	Thienemannimyia complex	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	16.03
Rinearson Creek	engineered riffle	2021-05-04	Trombidiformes	U	non-insect	Aquatic	Arachnida: Acari	Trombidiformes	x	mites	9.16
Rinearson Creek	engineered riffle	2021-05-04	Ceratopogoninae	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Ceratopogonidae	no-see-um midges	22.9
Rinearson Creek	engineered riffle	2021-05-04	Nemata	U	non-insect	Aquatic	Nemata	miscellaneous non-insect	x	round worms	4.58
Rinearson Creek	engineered riffle	2021-05-04	Crangonyx	U	non-insect	Aquatic	Crustacea: Amphipoda	x	Crangonyctidae	scuds	396.17
Rinearson Creek	engineered riffle	2021-05-04	Ostracoda	U	non-insect	Aquatic	Crustacea: Ostracoda	x	x	seed shrimp	2.29
Rinearson Creek	engineered riffle	2021-05-04	Oligochaeta	U	non-insect	Aquatic	Annelida: Oligochaeta	miscellaneous non-insect	x	segmented worms	38.93
Rinearson Creek	upper control	2021-05-04	Caecidotea	U	non-insect	Aquatic	Crustacea: Isopoda	x	Asellidae	aquatic sow bugs	37
Rinearson Creek	upper control	2021-05-04	Erpobdella	U	non-insect	Aquatic	Annelida: Hirudinea	miscellaneous non-insect	Erpobdellidae	leeches	2
Rinearson Creek	upper control	2021-05-04	Baetis tricaudatus complex	L	insect	Aquatic	Arthropoda: Insecta	Ephemeroptera	Baetidae	mayflies	1
Rinearson Creek	upper control	2021-05-04	Chironomidae	P	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae	midges	1
Rinearson Creek	upper control	2021-05-04	Chironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	2
Rinearson Creek	upper control	2021-05-04	Paratendipes	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	3
Rinearson Creek	upper control	2021-05-04	Phaenopsectra	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	1
Rinearson Creek	upper control	2021-05-04	Polypedilum	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	2
Rinearson Creek	upper control	2021-05-04	Micropsectra	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	1
Rinearson Creek	upper control	2021-05-04	Tanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	2
Rinearson Creek	upper control	2021-05-04	Prodiamesa	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Prodiamesinae	midges	125
Rinearson Creek	upper control	2021-05-04	Alotanypus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	8
Rinearson Creek	upper control	2021-05-04	Ceratopogoninae	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Ceratopogonidae	no-see-um midges	5
Rinearson Creek	upper control	2021-05-04	Sphaeriidae	U	non-insect	Aquatic	Mollusca: Bivalvia	x	Sphaeriidae	pea clams	2
Rinearson Creek	upper control	2021-05-04	Crangonyx	U	non-insect	Aquatic	Crustacea: Amphipoda	x	Crangonyctidae	scuds	1
Rinearson Creek	upper control	2021-05-04	Oligochaeta	U	non-insect	Aquatic	Annelida: Oligochaeta	miscellaneous non-insect	x	segmented worms	3
Rinearson Creek	beaver pond	2023-08-16	Oxyethira	L	insect	Aquatic	Arthropoda: Insecta	Trichoptera	Hydroptilidae	caddisflies	21.18
Rinearson Creek	beaver pond	2023-08-16	Peltodytes	A	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Haliplidae	crawling water beetles	98.84
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	x	flat worms	77.66
Rinearson Creek	beaver pond	2023-08-16	Abedus	L	insect	Aquatic	Arthropoda: Insecta	Hemiptera: Heteroptera	Belostomatidae	giant water bugs	7.06
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	P	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	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	49.42
Rinearson Creek	beaver pond	2023-08-16	Tanytarsus	L	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	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	7.06
Rinearson Creek	beaver pond	2023-08-16	Thienemannimyia complex	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	7.06
Rinearson Creek	beaver pond	2023-08-16	Trombidiformes	U	non-insect	Aquatic	Arachnida: Acari	Trombidiformes	x	mites	14.12
Rinearson Creek	beaver pond	2023-08-16	Sperchon	U	non-insect	Aquatic	Arachnida: Acari	x	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	U	non-insect	Aquatic	Mollusca: Bivalvia	x	Sphaeriidae	pea clams	28.24
Rinearson Creek	beaver pond	2023-08-16	Nemata	U	non-insect	Aquatic	Nemata	miscellaneous non-insect	x	round worms	14.12
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	Physa/Physella	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Physidae	snails	155.32
Rinearson Creek	beaver pond	2023-08-16	Gyraulus	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Planorbidae	snails	7.06
Rinearson Creek	beaver pond	2023-08-16	Corixidae	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
Rinearson Creek	beaver pond	2023-08-16	Hydrophilidae	L	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Hydrophilidae	water scavenger beetles	7.06
Rinearson Creek	emergent marsh	2023-08-16	Caecidotea	U	non-insect	Aquatic	Crustacea: Isopoda	x	Asellidae	aquatic sow bugs	408
Rinearson Creek	emergent marsh	2023-08-16	Peltodytes	L	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Haliplidae	crawling water beetles	18
Rinearson Creek	emergent marsh	2023-08-16	Coenagrion/Enallagma	L	insect	Aquatic	Arthropoda: Insecta	Odonata	Coenagrionidae	damselflies	2
Rinearson Creek	emergent marsh	2023-08-16	Dixella	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Dixidae	dixid midges	8
Rinearson Creek	emergent marsh	2023-08-16	Trepaxonemata	U	non-insect	Aquatic	Turbellaria	miscellaneous non-insect	x	flat worms	14
Rinearson Creek	emergent marsh	2023-08-16	Callibaetis	L	insect	Aquatic	Arthropoda: Insecta	Ephemeroptera	Baetidae	mayflies	10
Rinearson Creek	emergent marsh	2023-08-16	Chironomidae	P	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae	midges	14
Rinearson Creek	emergent marsh	2023-08-16	Chironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	6
Rinearson Creek	emergent marsh	2023-08-16	Cryptochironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	2
Rinearson Creek	emergent marsh	2023-08-16	Paratendipes	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	78
Rinearson Creek	emergent marsh	2023-08-16	Phaenopsectra	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	4
Rinearson Creek	emergent marsh	2023-08-16	Polypedilum	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	2
Rinearson Creek	emergent marsh	2023-08-16	Pseudochironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	2
Rinearson Creek	emergent marsh	2023-08-16	Micropsectra	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	4
Rinearson Creek	emergent marsh	2023-08-16	Paratanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	64
Rinearson Creek	emergent marsh	2023-08-16	Tanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	2
Rinearson Creek	emergent marsh	2023-08-16	Corynoneura	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	16
Rinearson Creek	emergent marsh	2023-08-16	Cricotopus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	2
Rinearson Creek	emergent marsh	2023-08-16	Eukiefferiella claripennis group	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	2
Rinearson Creek	emergent marsh	2023-08-16	Heterotrissocladius marcidus group	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	6
Rinearson Creek	emergent marsh	2023-08-16	Limnophyes	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	2
Rinearson Creek	emergent marsh	2023-08-16	Orthocladius	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	2
Rinearson Creek	emergent marsh	2023-08-16	Odontomesa	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Prodiamesinae	midges	48
Rinearson Creek	emergent marsh	2023-08-16	Ablabesmyia	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	2
Rinearson Creek	emergent marsh	2023-08-16	Alotanypus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	2
Rinearson Creek	emergent marsh	2023-08-16	Procladius	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	Hyalella	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	Physa/Physella	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Physidae	snails	14
Rinearson Creek	emergent marsh	2023-08-16	Gyraulus	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Planorbidae	snails	4
Rinearson Creek	emergent marsh	2023-08-16	Juga	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	Simulium	L	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	engineered riffle	2023-08-16	Hydroptila	L	insect	Aquatic	Arthropoda: Insecta	Trichoptera	Hydroptilidae	caddisflies	6.39
Rinearson Creek	engineered riffle	2023-08-16	Dicranomyia	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Tipulidae	crane flies	19.17
Rinearson Creek	engineered riffle	2023-08-16	Tipula	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Tipulidae	crane flies	2.13
Rinearson Creek	engineered riffle	2023-08-16	Argia	L	insect	Aquatic	Arthropoda: Insecta	Odonata	Coenagrionidae	damselflies	19.17
Rinearson Creek	engineered riffle	2023-08-16	Coenagrion/Enallagma	L	insect	Aquatic	Arthropoda: Insecta	Odonata	Coenagrionidae	damselflies	6.39
Rinearson Creek	engineered riffle	2023-08-16	Neoplasta	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Empididae	dance flies	2.13
Rinearson Creek	engineered riffle	2023-08-16	Trepaxonemata	U	non-insect	Aquatic	Turbellaria	miscellaneous non-insect	x	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	Polypedilum	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	647.52
Rinearson Creek	engineered riffle	2023-08-16	Rheotanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	10.65
Rinearson Creek	engineered riffle	2023-08-16	Cricotopus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	157.62
Rinearson Creek	engineered riffle	2023-08-16	Nanocladius	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	6.39
Rinearson Creek	engineered riffle	2023-08-16	Thienemannimyia complex	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	23.43
Rinearson Creek	engineered riffle	2023-08-16	Sperchon	U	non-insect	Aquatic	Arachnida: Acari	x	x	mites	4.26
Rinearson Creek	engineered riffle	2023-08-16	Prostoma	U	non-insect	Aquatic	Annelida: Nemertea	miscellaneous non-insect	Tetrastemmatidae	nemerteans	8.52
Rinearson Creek	engineered riffle	2023-08-16	Ceratopogoninae	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Ceratopogonidae	no-see-um midges	14.91
Rinearson Creek	engineered riffle	2023-08-16	Sphaeriidae	U	non-insect	Aquatic	Mollusca: Bivalvia	x	Sphaeriidae	pea clams	23.43
Rinearson Creek	engineered riffle	2023-08-16	Nemata	U	non-insect	Aquatic	Nemata	miscellaneous non-insect	x	round worms	6.39
Rinearson Creek	engineered riffle	2023-08-16	Crangonyx	U	non-insect	Aquatic	Crustacea: Amphipoda	x	Crangonyctidae	scuds	25.56
Rinearson Creek	engineered riffle	2023-08-16	Oligochaeta	U	non-insect	Aquatic	Annelida: Oligochaeta	miscellaneous non-insect	x	segmented worms	63.9
Rinearson Creek	engineered riffle	2023-08-16	Physa/Physella	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Physidae	snails	2.13
Rinearson Creek	upper control	2023-08-16	Caecidotea	U	non-insect	Aquatic	Crustacea: Isopoda	x	Asellidae	aquatic sow bugs	127
Rinearson Creek	upper control	2023-08-16	Coenagrion/Enallagma	L	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	Trepaxonemata	U	non-insect	Aquatic	Turbellaria	miscellaneous non-insect	x	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
Rinearson Creek	upper control	2023-08-16	Chironomidae	P	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	Brilia	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
Rinearson Creek	beaver pond	2024-06-14	Caecidotea	U	non-insect	Aquatic	Crustacea: Isopoda	x	Asellidae	aquatic sow bugs	106.6
Rinearson Creek	beaver pond	2024-06-14	Peltodytes	L	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Haliplidae	crawling water beetles	5.33
Rinearson Creek	beaver pond	2024-06-14	Pacifastacus	U	non-insect	Aquatic	Crustacea: Decapoda	x	Astacidae	crayfish	5.33
Rinearson Creek	beaver pond	2024-06-14	Coenagrion/Enallagma	L	insect	Aquatic	Arthropoda: Insecta	Odonata	Coenagrionidae	damselflies	74.62
Rinearson Creek	beaver pond	2024-06-14	Dixella	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Dixidae	dixid midges	5.33
Rinearson Creek	beaver pond	2024-06-14	Libellulidae	L	insect	Aquatic	Arthropoda: Insecta	Odonata	Libellulidae	dragonflies	5.33
Rinearson Creek	beaver pond	2024-06-14	Trepaxonemata	U	non-insect	Aquatic	Turbellaria	miscellaneous non-insect	x	flat worms	58.63
Rinearson Creek	beaver pond	2024-06-14	Helobdella stagnalis complex	U	non-insect	Aquatic	Annelida: Hirudinea	miscellaneous non-insect	Glossiphoniidae	leeches	21.32
Rinearson Creek	beaver pond	2024-06-14	Callibaetis	L	insect	Aquatic	Arthropoda: Insecta	Ephemeroptera	Baetidae	mayflies	26.65
Rinearson Creek	beaver pond	2024-06-14	Chironomidae	P	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae	midges	58.63
Rinearson Creek	beaver pond	2024-06-14	Chironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	42.64
Rinearson Creek	beaver pond	2024-06-14	Cladopelma	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	5.33
Rinearson Creek	beaver pond	2024-06-14	Cryptochironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	15.99
Rinearson Creek	beaver pond	2024-06-14	Dicrotendipes	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	26.65
Rinearson Creek	beaver pond	2024-06-14	Endochironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	5.33
Rinearson Creek	beaver pond	2024-06-14	Parachironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	5.33

Rinearson Creek	beaver pond	2024-06-14	Pseudochironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	10.66
Rinearson Creek	beaver pond	2024-06-14	Stictochironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	5.33
Rinearson Creek	beaver pond	2024-06-14	Paratanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	21.32
Rinearson Creek	beaver pond	2024-06-14	Tanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	74.62
Rinearson Creek	beaver pond	2024-06-14	Cricotopus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	90.61
Rinearson Creek	beaver pond	2024-06-14	Psectrocladius	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	5.33
Rinearson Creek	beaver pond	2024-06-14	Ablabesmyia	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	10.66
Rinearson Creek	beaver pond	2024-06-14	Psectrotanypus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	10.66
Rinearson Creek	beaver pond	2024-06-14	Tanypus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	37.31
Rinearson Creek	beaver pond	2024-06-14	Ceratopogoninae	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Ceratopogonidae	no-see-um midges	5.33
Rinearson Creek	beaver pond	2024-06-14	Sphaeriidae	U	non-insect	Aquatic	Mollusca: Bivalvia	x	Sphaeriidae	pea clams	111.93
Rinearson Creek	beaver pond	2024-06-14	Dytiscidae	L	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Dytiscidae	predaceous diving beetles	5.33
Rinearson Creek	beaver pond	2024-06-14	Hydroporinae	L	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Dytiscidae	predaceous diving beetles	5.33
Rinearson Creek	beaver pond	2024-06-14	Crangonyx	U	non-insect	Aquatic	Crustacea: Amphipoda	x	Crangonyctidae	scuds	42.64
Rinearson Creek	beaver pond	2024-06-14	Hyalella	U	non-insect	Aquatic	Crustacea: Amphipoda	x	Talitridae	scuds	1151.28
Rinearson Creek	beaver pond	2024-06-14	Oligochaeta	U	non-insect	Aquatic	Annelida: Oligochaeta	miscellaneous non-insect	x	segmented worms	21.32
Rinearson Creek	beaver pond	2024-06-14	Physa/Physella	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Physidae	snails	719.55
Rinearson Creek	beaver pond	2024-06-14	Gyraulus	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Planorbidae	snails	53.3
Rinearson Creek	beaver pond	2024-06-14	Corixidae	L	insect	Aquatic	Arthropoda: Insecta	Hemiptera: Heteroptera	Corixidae	water boatman	106.6
Rinearson Creek	beaver pond	2024-06-14	Chydoridae	U	non-insect	Aquatic	Crustacea: Cladocera	x	Chydoridae	water fleas	47.97
Rinearson Creek	beaver pond	2024-06-14	Hydrophilidae	L	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Hydrophilidae	water scavenger beetles	5.33
Rinearson Creek	emergent marsh	2024-06-14	Caecidotea	U	non-insect	Aquatic	Crustacea: Isopoda	x	Asellidae	aquatic sow bugs	75
Rinearson Creek	emergent marsh	2024-06-14	Lepidostoma unicolor group	L	insect	Aquatic	Arthropoda: Insecta	Trichoptera	Lepidostomatidae	caddisflies	1
Rinearson Creek	emergent marsh	2024-06-14	Psychoglypha	L	insect	Aquatic	Arthropoda: Insecta	Trichoptera	Limnephilidae	caddisflies	4
Rinearson Creek	emergent marsh	2024-06-14	Trepaxonemata	U	non-insect	Aquatic	Turbellaria	miscellaneous non-insect	x	flat worms	1
Rinearson Creek	emergent marsh	2024-06-14	Chironomidae	P	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae	midges	1
Rinearson Creek	emergent marsh	2024-06-14	Cryptochironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	16
Rinearson Creek	emergent marsh	2024-06-14	Phaenopsectra	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	2
Rinearson Creek	emergent marsh	2024-06-14	Polypedilum	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	7
Rinearson Creek	emergent marsh	2024-06-14	Stictochironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	1
Rinearson Creek	emergent marsh	2024-06-14	Micropsectra	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	1
Rinearson Creek	emergent marsh	2024-06-14	Paratanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	1
Rinearson Creek	emergent marsh	2024-06-14	Brillia	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	5
Rinearson Creek	emergent marsh	2024-06-14	Cricotopus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	1
Rinearson Creek	emergent marsh	2024-06-14	Parametriocnemus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	1
Rinearson Creek	emergent marsh	2024-06-14	Prodiamesa	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Prodiamesinae	midges	9
Rinearson Creek	emergent marsh	2024-06-14	Procladius	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	6
Rinearson Creek	emergent marsh	2024-06-14	Thienemannimyia complex	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	18
Rinearson Creek	emergent marsh	2024-06-14	Ceratopogoninae	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Ceratopogonidae	no-see-um midges	3
Rinearson Creek	emergent marsh	2024-06-14	Sphaeriidae	U	non-insect	Aquatic	Mollusca: Bivalvia	x	Sphaeriidae	pea clams	9
Rinearson Creek	emergent marsh	2024-06-14	Crangonyx	U	non-insect	Aquatic	Crustacea: Amphipoda	x	Crangonyctidae	scuds	16
Rinearson Creek	emergent marsh	2024-06-14	Oligochaeta	U	non-insect	Aquatic	Annelida: Oligochaeta	miscellaneous non-insect	x	segmented worms	9
Rinearson Creek	emergent marsh	2024-06-14	Fluminicola	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Hydrobiidae	snails	35
Rinearson Creek	emergent marsh	2024-06-14	Physa/Physella	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Physidae	snails	4
Rinearson Creek	emergent marsh	2024-06-14	Ferrissia	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Planorbidae	snails	1
Rinearson Creek	emergent marsh	2024-06-14	Menetus	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Planorbidae	snails	1
Rinearson Creek	emergent marsh	2024-06-14	Juga	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Pleuroceridae	snails	21
Rinearson Creek	emergent marsh	2024-06-14	Potamopyrgus antipodarum	U	non-insect	Aquatic	Mollusca: Gastropoda	x	uncertain status	snails	1
Rinearson Creek	engineered riffle	2024-06-14	Caecidotea	U	non-insect	Aquatic	Crustacea: Isopoda	x	Asellidae	aquatic sow bugs	38.61
Rinearson Creek	engineered riffle	2024-06-14	Lirceus	U	non-insect	Aquatic	Crustacea: Isopoda	x	Asellidae	aquatic sow bugs	603.46
Rinearson Creek	engineered riffle	2024-06-14	Corbicula	U	non-insect	Aquatic	Mollusca: Bivalvia	x	Corbiculidae	asiatic clam	1.43
Rinearson Creek	engineered riffle	2024-06-14	Simulium	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Simuliidae	black flies	4.29
Rinearson Creek	engineered riffle	2024-06-14	Cheumatopsyche	L	insect	Aquatic	Arthropoda: Insecta	Trichoptera	Hydropsychidae	caddisflies	1.43
Rinearson Creek	engineered riffle	2024-06-14	Hydroptila	L	insect	Aquatic	Arthropoda: Insecta	Trichoptera	Hydroptilidae	caddisflies	5.72
Rinearson Creek	engineered riffle	2024-06-14	Hydroptila	P	insect	Aquatic	Arthropoda: Insecta	Trichoptera	Hydroptilidae	caddisflies	1.43
Rinearson Creek	engineered riffle	2024-06-14	Peltodytes	L	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Haliplidae	crawling water beetles	2.86
Rinearson Creek	engineered riffle	2024-06-14	Pacifastacus	U	non-insect	Aquatic	Crustacea: Decapoda	x	Astacidae	crayfish	1.43
Rinearson Creek	engineered riffle	2024-06-14	Argia	L	insect	Aquatic	Arthropoda: Insecta	Odonata	Coenagrionidae	damselflies	1.43
Rinearson Creek	engineered riffle	2024-06-14	Coenagrion/Enallagma	L	insect	Aquatic	Arthropoda: Insecta	Odonata	Coenagrionidae	damselflies	1.43
Rinearson Creek	engineered riffle	2024-06-14	Trepaxonemata	U	non-insect	Aquatic	Turbellaria	miscellaneous non-insect	x	flat worms	28.6
Rinearson Creek	engineered riffle	2024-06-14	Erpobdella	U	non-insect	Aquatic	Annelida: Hirudinea	miscellaneous non-insect	Erpobdellidae	leeches	1.43
Rinearson Creek	engineered riffle	2024-06-14	Helobdella stagnalis complex	U	non-insect	Aquatic	Annelida: Hirudinea	miscellaneous non-insect	Glossiphoniidae	leeches	1.43
Rinearson Creek	engineered riffle	2024-06-14	Chironomidae	P	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae	midges	2.86
Rinearson Creek	engineered riffle	2024-06-14	Cryptochironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	1.43
Rinearson Creek	engineered riffle	2024-06-14	Polypedilum	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	2.86
Rinearson Creek	engineered riffle	2024-06-14	Pseudochironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	1.43
Rinearson Creek	engineered riffle	2024-06-14	Stictochironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	1.43
Rinearson Creek	engineered riffle	2024-06-14	Micropsectra	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	4.29
Rinearson Creek	engineered riffle	2024-06-14	Paratanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	1.43
Rinearson Creek	engineered riffle	2024-06-14	Cricotopus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	10.01
Rinearson Creek	engineered riffle	2024-06-14	Eukiefferiella claripennis group	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	4.29
Rinearson Creek	engineered riffle	2024-06-14	Parametriocnemus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	2.86
Rinearson Creek	engineered riffle	2024-06-14	Prodiamesa	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Prodiamesinae	midges	1.43
Rinearson Creek	engineered riffle	2024-06-14	Thienemannimyia complex	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	2.86
Rinearson Creek	engineered riffle	2024-06-14	Ceratopogoninae	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Ceratopogonidae	no-see-um midges	4.29
Rinearson Creek	engineered riffle	2024-06-14	Sphaeriidae	U	non-insect	Aquatic	Mollusca: Bivalvia	x	Sphaeriidae	pea clams	10.01
Rinearson Creek	engineered riffle	2024-06-14	Nemata	U	non-insect	Aquatic	Nemata	miscellaneous non-insect	x	round worms	1.43
Rinearson Creek	engineered riffle	2024-06-14	Crangonyx	U	non-insect	Aquatic	Crustacea: Amphipoda	x	Crangonyctidae	scuds	32.89
Rinearson Creek	engineered riffle	2024-06-14	Hyalella	U	non-insect	Aquatic	Crustacea: Amphipoda	x	Talitridae	scuds	2.86
Rinearson Creek	engineered riffle	2024-06-14	Oligochaeta	U	non-insect	Aquatic	Annelida: Oligochaeta	miscellaneous non-insect	x	segmented worms	37.18
Rinearson Creek	engineered riffle	2024-06-14	Fluminicola	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Hydrobiidae	snails	1.43
Rinearson Creek	engineered riffle	2024-06-14	Physa/Physella	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Physidae	snails	5.72
Rinearson Creek	engineered riffle	2024-06-14	Menetus	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Planorbidae	snails	2.86
Rinearson Creek	upper control	2024-06-14	Caecidotea	U	non-insect	Aquatic	Crustacea: Isopoda	x	Asellidae	aquatic sow bugs	140
Rinearson Creek	upper control	2024-06-14	Lirceus	U	non-insect	Aquatic	Crustacea: Isopoda	x	Asellidae	aquatic sow bugs	5
Rinearson Creek	upper control	2024-06-14	Lepidostoma unicolor group	L	insect	Aquatic	Arthropoda: Insecta	Trichoptera	Lepidostomatidae	caddisflies	1.25
Rinearson Creek	upper control	2024-06-14	Peltodytes	A	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Haliplidae	crawling water beetles	3.75
Rinearson Creek	upper control	2024-06-14	Haliplus	L	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Haliplidae	crawling water beetles	1.25
Rinearson Creek	upper control	2024-06-14	Peltodytes	L	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Haliplidae	crawling water beetles	5
Rinearson Creek	upper control	2024-06-14	Pacifastacus	U	non-insect	Aquatic	Crustacea: Decapoda	x	Astacidae	crayfish	1.25
Rinearson Creek	upper control	2024-06-14	Coenagrion/Enallagma	L	insect	Aquatic	Arthropoda: Insecta	Odonata	Coenagrionidae	damselflies	3.75
Rinearson Creek	upper control	2024-06-14	Dixella	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Dixidae	dixid midges	5
Rinearson Creek	upper control	2024-06-14	Aeshnidae	L	insect	Aquatic	Arthropoda: Insecta	Odonata	Aeshnidae	dragonflies	2.5
Rinearson Creek	upper control	2024-06-14	Trepaxonemata	U	non-insect	Aquatic	Turbellaria	miscellaneous non-insect	x	flat worms	2.5
Rinearson Creek	upper control	2024-06-14	Helobdella stagnalis complex	U	non-insect	Aquatic	Annelida: Hirudinea	miscellaneous non-insect	Glossiphoniidae	leeches	2.5
Rinearson Creek	upper control	2024-06-14	Chironomidae	P	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae	midges	5
Rinearson Creek	upper control	2024-06-14	Polypedilum	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	7.5
Rinearson Creek	upper control	2024-06-14	Stictochironomus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae	midges	1.25
Rinearson Creek	upper control	2024-06-14	Paratanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	8.75
Rinearson Creek	upper control	2024-06-14	Tanytarsus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Chironominae: Tanytarsini	midges	23.75
Rinearson Creek	upper control	2024-06-14	Brillia	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	1.25
Rinearson Creek	upper control	2024-06-14	Corynoneura	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	1.25
Rinearson Creek	upper control	2024-06-14	Cricotopus	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Orthocladiinae	midges	23.75
Rinearson Creek	upper control	2024-06-14	Odontomesa	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Prodiamesinae	midges	56.25
Rinearson Creek	upper control	2024-06-14	Procladius	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	45
Rinearson Creek	upper control	2024-06-14	Thienemannimyia complex	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Chironomidae: Tanypodinae	midges	5
Rinearson Creek	upper control	2024-06-14	Prostoma	U	non-insect	Aquatic	Annelida: Nemertea	miscellaneous non-insect	Tetrastemmatidae	nemerteans	1.25
Rinearson Creek	upper control	2024-06-14	Ceratopogoninae	L	insect	Aquatic	Arthropoda: Insecta	Diptera	Ceratopogonidae	no-see-um midges	2.5
Rinearson Creek	upper control	2024-06-14	Sphaeriidae	U	non-insect	Aquatic	Mollusca: Bivalvia	x	Sphaeriidae	pea clams	48.75
Rinearson Creek	upper control	2024-06-14	Crangonyx	U	non-insect	Aquatic	Crustacea: Amphipoda	x	Crangonyctidae	scuds	42.5
Rinearson Creek	upper control	2024-06-14	Hyalella	U	non-insect	Aquatic	Crustacea: Amphipoda	x	Talitridae	scuds	13.75
Rinearson Creek	upper control	2024-06-14	Oligochaeta	U	non-insect	Aquatic	Annelida: Oligochaeta	miscellaneous non-insect	x	segmented worms	7.5
Rinearson Creek	upper control	2024-06-14	Fluminicola	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Hydrobiidae	snails	141.25
Rinearson Creek	upper control	2024-06-14	Physa/Physella	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Physidae	snails	13.75
Rinearson Creek	upper control	2024-06-14	Menetus	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Planorbidae	snails	2.5
Rinearson Creek	upper control	2024-06-14	Juga	U	non-insect	Aquatic	Mollusca: Gastropoda	x	Pleuroceridae	snails	8.75
Rinearson Creek	upper control	2024-06-14	Potamopyrgus antipodarum	U	non-insect	Aquatic	Mollusca: Gastropoda	x	uncertain status	snails	33.75
Rinearson Creek	upper control	2024-06-14	Corixidae	L	insect	Aquatic	Arthropoda: Insecta	Hemiptera: Heteroptera	Corixidae	water boatman	10
Rinearson Creek	upper control	2024-06-14	Hydrophilidae	A	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Hydrophilidae	water scavenger beetles	1.25
Rinearson Creek	upper control	2024-06-14	Gyrinus	L	insect	Aquatic	Arthropoda: Insecta	Coleoptera	Gyrinidae	whirligig beetles	1.25

Taxon	Stage	Family	Common.name	Insect.	Higher.classification	Origin	Order	BCG.Attribute	Feeding.Group	CA.feeding.group	Habit	Tolerance	WY.HBI	PSSB.tolerance	CA.tolerance	Metals.tolerance	BCI.TV	PSSB.long.lived	Voltinism	Development	Occurrence.in.drift	Size.at.maturity	Rheophily	Thermal.preference	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	non-insect	Annelida: Hirudinea	Aquatic	miscellaneous non-insect	5	PR	PR	CL	HT	8	0	8	4	108	0	1	2	1	3	2	2	0.000102	3.25
Sphaeriidae	U	Sphaeriidae	pea clams	non-insect	Mollusca: Bivalvia	Aquatic	x	4	CF	CF	BU	0	8	0	8	3	108	0	1	3	1	1	2	2	0.0163	2.477
Ferrissia	U	Planorbidae	snails	non-insect	Mollusca: Gastropoda	Aquatic	x	4	SC	SC	CL	MT	6	0	6	1	108	0	3	2	1	1	2	2	0.0208	3.03
Menetus	U	Planorbidae	snails	non-insect	Mollusca: Gastropoda	Aquatic	x	4	SC	SC	CL	MT	8	0	6	11	108	0	3	2	1	1	2	2	0.0208	3.03
Potamopyrgus antipodarum	U	uncertain status	snails	non-insect	Mollusca: Gastropoda	Aquatic	x	6	CG	SC	CL	HT	8	0	8	11	108	0	2	2	1	1	2	2	0.0208	3.03
Crangonyx	U	Crangonyctidae	scuds	non-insect	Crustacea: Amphipoda	Aquatic	x	5	CG	CG	SW	MT	11	0	4	11	108	0	3	2	1	2	2	2	0.0058	3.015
Caecidotea	U	Asellidae	aquatic sow bugs	non-insect	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	non-insect	Crustacea: Decapoda	Aquatic	x	4	OM	OM	SP	0	6	0	6	3	108	0	1	3	1	3	2	2	0.0147	3.626
Baetis tricaudatus complex	L	Baetidae	mayflies	insect	Arthropoda: Insecta	Aquatic	Ephemeroptera	4	CG	CG	CL	0	6	0	6	11	72	0	3	1	3	1	2	2	0.0053	2.875
Lepidostoma	L	Lepidostomatidae	caddisflies	insect	Arthropoda: Insecta	Aquatic	Trichoptera	4	SH	SH	CM	0	1	0	1	1	18	0	2	2	1	2	2	2	0.0079	2.649
Lara	L	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	L	Empididae	dance flies	insect	Arthropoda: Insecta	Aquatic	Diptera	3	PR	PR	CL	0	6	0	6	4	95	0	2	2	1	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	L	Simuliidae	black flies	insect	Arthropoda: Insecta	Aquatic	Diptera	4	CF	CF	CL	0	6	0	6	11	108	0	3	1	3	1	3	2	0.002	3.011
Tipula	L	Tipulidae	crane flies	insect	Arthropoda: Insecta	Aquatic	Diptera	4	SH	SH	BU	0	4	0	4	11	36	0	1	2	1	3	2	2	0.0029	2.681
Chironomidae	P	Chironomidae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4	CG	CG	BU	0	6	0	6	11	108	0	3	1	3	1	2	2	0.0018	2.617
Alotanypus	L	Chironomidae: Tanypodinae	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	L	Chironomidae: Orthocladiinae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4	CG	SH	SP	0	5	0	5	4	108	0	3	1	3	1	2	2	0.0018	2.617
Chironomus	L	Chironomidae: Chironominae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	5	CG	CG	BU	HT	10	0	10	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	OM	SP	MT	8	0	8	11	108	0	3	1	3	1	2	2	0.0018	2.617
Heterotrissocladius marcidus group	L	Chironomidae: Orthocladiinae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	3	CG	CG	SP	MI	0	0	0	11	108	0	3	1	3	1	2	1	0.0018	2.617
Limnophyes	L	Chironomidae: Orthocladiinae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4	CG	CG	SP	MT	8	0	8	11	108	0	3	1	3	1	2	2	0.0018	2.617
Micropsectra	L	Chironomidae: Chironominae: Tanytarsini	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4	CG	CG	CL	0	7	0	7	1	108	0	3	1	3	1	2	2	0.0018	2.617
Parametriocnemus	L	Chironomidae: Orthocladiinae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4	CG	CG	SP	0	5	0	5	11	108	0	3	1	3	1	2	2	0.0018	2.617
Phaenopsectra	L	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	L	Chironomidae: Prodiamesinae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4	CG	CG	BU	MI	3	0	3	3	108	0	3	1	3	1	2	1	0.0018	2.617
Thienemannimyia complex	L	Chironomidae: Tanypodinae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4	PR	PR	SP	0	6	0	6	3	108	0	3	1	3	1	2	2	0.0018	2.617
Tvetenia bavarica group	L	Chironomidae: Orthocladiinae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4	CG	CG	SP	0	5	0	5	4	108	0	3	1	3	1	2	2	0.0018	2.617
Lymnaeidae	U	Lymnaeidae	snails	non-insect	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
Physa/Physella	U	Physidae	snails	non-insect	Mollusca: Gastropoda	Aquatic	x	5	CG	SC	CL	HT	8	0	8	4	108	0	3	2	2	2	2	3	0.0208	3.03
Gyraulus	U	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	non-insect	Crustacea: Cladocera	Aquatic	x	0	CG	CG	SW	MT	11	0	6	11	108	0	3	2	1	1	2	2	0.006753	2.27
Sperchon	U	x	mites	non-insect	Arachnida: Acari	Aquatic	x	4	PA	PR	SW	MT	5	0	8	11	108	0	3	2	2	1	2	2	0.053	2.494
Cheumatopsyche	L	Hydropsychidae	caddisflies	insect	Arthropoda: Insecta	Aquatic	Trichoptera	5	CF	CF	CL	MT	8	0	5	11	108	0	3	3	2	2	3	2	0.0046	2.926
Hydroptila	L	Hydroptilidae	caddisflies	insect	Arthropoda: Insecta	Aquatic	Trichoptera	4	PH	PH	CL	MT	6	0	6	4	108	0	3	2	2	1	2	2	0.0056	2.839
Ceratopogoninae	P	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
Cricotopus	L	Chironomidae: Orthocladiinae	midges	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	L	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	10	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	5	0	5	11	72	0	1	2	1	3	2	2	0.0082	2.813
Callibaetis	L	Baetidae	mayflies	insect	Arthropoda: Insecta	Aquatic	Ephemeroptera	5	CG	CG	SP	HT	9	0	9	11	72	0	3	1	2	1	2	2	0.0053	2.875
Notonecta	L	Notonectidae	back swimmers	insect	Arthropoda: Insecta	Aquatic	Hemiptera: Heteroptera	0	PR	PR	SW	0	7	0	5	11	72	0	3	2	1	2	1	3	0.0499	2.27
Corixidae	L	Corixidae	water boatman	insect	Arthropoda: Insecta	Aquatic	Hemiptera: Heteroptera	0	PH	PH	SW	MT	8	0	8	11	108	0	3	1	1	1	1	2	0.0031	2.904
Corixidae	A	Corixidae	water boatman	insect	Arthropoda: Insecta	Aquatic	Hemiptera: Heteroptera	0	PH	PH	SW	MT	8	0	8	11	108	0	3	1	1	1	1	2	0.0031	2.904
Hydrophilidae	L	Hydrophilidae	water scavenger beetles	insect	Arthropoda: Insecta	Aquatic	Coleoptera	4	PR	PR	CM	MT	5	0	5	11	72	0	2	3	1	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	5	0	5	11	54	0	2	2	1	1	1	3	0.0271	2.744
Dolichopodidae	L	Dolichopodidae	long-legged flies	insect	Arthropoda: Insecta	Aquatic	Diptera	5	PR	PR	SP	MT	4	0	4	4	108	0	2	2	1	2	1	2	0.0054	2.546
Psychodini	L	Psychodidae	moth flies	insect	Arthropoda: Insecta	Aquatic	Diptera	5	CG	CG	BU	HT	10	0	10	11	36	0	3	1	1	1	1	3	0.0025	2.692
Endochironomus	L	Chironomidae: Chironominae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	5	MH	MH	CL	HT	10	0	10	6	108	0	3	1	3	1	1	2	0.0018	2.617
Pseudosmittia	L	Chironomidae: Orthocladiinae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4	CG	CG	SP	0	6	0	5	11	108	0	3	1	3	1	2	2	0.0018	2.617
Psectrotanypus	L	Chironomidae: Tanypodinae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4	PR	PR	SP	MT	10	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	Nemata	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	non-insect	Mollusca: Gastropoda	Aquatic	x	4	OM	SC	CL	MT	7	0	7	11	108	0	1	3	2	2	2	2	0.0208	3.03
Fluminicola	U	Hydrobiidae	snails	non-insect	Mollusca: Gastropoda	Aquatic	x	4	SC	SC	CL	MT	8	0	6	11	108	0	1	2	1	1	2	2	0.0208	3.03
Lirceus	U	Asellidae	aquatic sow bugs	non-insect	Crustacea: Isopoda	Aquatic	x	5	CG	CG	CM	HT	8	0	8	5	108	0	3	2	1	2	2	2	0.0054	2.948
Coenagrion/Enallagma	L	Coenagrionidae	damselflies	insect	Arthropoda: Insecta	Aquatic	Odonata	5	PR	PR	CM	HT	8	0	9	11	72	0	2	2	1	2	2	3	0.0051	2.785
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	L	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	4	0	6	5	108	0	3	1	3	1	2	1	0.0018	2.617
Paratendipes	L	Chironomidae: Chironominae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4	CG	CG	BU	MT	8	0	8	11	108	0	3	1	3	1	1	2	0.0018	2.617
Smittia	L	Chironomidae: Orthocladiinae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4	CG	CG	BU	MT	6	0	6	11	108	0	3	1	3	1	2	2	0.0018	2.617
Helobdella stagnalis complex	U	Glossiphoniidae	leeches	non-insect	Annelida: Hirudinea	Aquatic	miscellaneous non-insect	5	PR	PR	CL	HT	6	0	6	4	108	0	2	2	1	2	2	2	0.000102	3.25
Musculium	U	Sphaeriidae	pea clams	non-insect	Mollusca: Bivalvia	Aquatic	x	4	CF	CF	BU	MT	8	0	8	3	108	0	1	3	1	1	2	2	0.0163	2.477
Ostracoda	U	x	seed shrimp	non-insect	Crustacea: Ostracoda	Aquatic	x	4	CG	CG	SW	0	8	0	6	11	108	0	3	2	1	1	2	2	0.006753	2.27
Trombidiformes	U	x	mites	non-insect	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	BU	MT	9	0	6	11	108	0	3	1	3	1	1	2	0.0018	2.617
Orthocladius	L	Chironomidae: Orthocladiinae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	3	CG	CG	SP	0	6	0	6	11	108	0	3	1	3	1	2	2	0.0018	2.617
Trepaxonemata	U	x	flat worms	non-insect	Turbellaria	Aquatic	miscellaneous non-insect	4	PR	PR	CL	0	4	0	4	11	108	0	2	2	1	2	2	2	0.0082	2.168
Simulium	P	Simuliidae	black flies	insect	Arthropoda: Insecta	Aquatic	Diptera	4	CF	CF	CL	0	6	0	6	11	108	0	3	1	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	10	0	10	4	108	0	3	1	3	1	1	2	0.0018	2.617
Prostoma	U	Tetrastemmatidae	nemerteans	non-insect	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	PR	CM	MT	7	0	7	11	108	0	2	2	1	2	2	2	0.0051	2.785
Dicranomyia	L	Tipulidae	crane flies	insect	Arthropoda: Insecta	Aquatic	Diptera	4	SH	SH	BU	MT	6	0	6	2	72	0	2	2	1	2	2	3	0.0029	2.681
Hyalella	U	Talitridae	scuds	non-insect	Crustacea: Amphipoda	Aquatic	x	4	CG	CG	SW	HT	8	0	8	3	108	0	3	2	2	1	2	2	0.0058	3.015
Oribatida	U	x	mites	non-insect	Arachnida: Acari	Terrestrial	x	4	PA	PR	SW	0	5	0	5	11	108	0	3	2	2	1	2	2	0.053	2.494
Abedus	L	Belostomatidae	giant water bugs	insect	Arthropoda: Insecta	Aquatic	Hemiptera: Heteroptera	0	PR	PR	SW	0	8	0	8	11	72	0	3	1	1	3	1	3	0.0499	2.27
Oxyethira	L	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	U	x	mites	non-insect	Arachnida: Acari	Aquatic	x	4	PA	PR	SW	MT	5	0	8	11	108	0	3	2	2	1	2	2	0.053	2.494
Hygrobates	U	x	mites	non-insect	Arachnida: Acari	Aquatic	x	4	PA	PR	SW	MT	5	0	8	11	108	0	3	2	2	1	2	2	0.053	2.494
Hemerodromia	L	Empididae	dance flies	insect	Arthropoda: Insecta	Aquatic	Diptera	4	PR	PR	SP	MT	6	0	6	4	95	0	3	2	1	2	2	2	0.0054	2.546
Stempellinella	L	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
Hydroporinae	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
Stictochironomus	L	Chironomidae: Chironominae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	4	CG	CG	BU	MT	9	0	9	4	108	0	3	1	3	1	1	2	0.0018	2.617
Tanypus	L	Chironomidae: Tanypodinae	midges	insect	Arthropoda: Insecta	Aquatic	Diptera	5	PR	PR	SP	MT	10	0	10	11	108	0	3	1	3	1	2	2	0.0018	2.617
Psychoglypha	L	Limnephilidae	caddisflies	insect	Arthropoda: Insecta	Aquatic	Trichoptera	3	SH	SH	SP	MI	1	0	2	2	24	0	2	2	1	3	2	2	0.004	2.933
Lepidostoma unicolor group	L	Lepidostomatidae	caddisflies	insect	Arthropoda: Insecta	Aquatic	Trichoptera	3	SH	SH	CM	0	1	0	1	1	18	0	2	2	1	2	1	1	0.0079	2.649
Corbicula	U	Corbiculidae	asiatic clam	non-insect	Mollusca: Bivalvia	Aquatic	x	6	CF	CF	BU	HT	6	0	10	11	108	0	1	3	1	3	2	3	0.0104	3.046
Hydroptila	P	Hydroptilidae	caddisflies	insect	Arthropoda: Insecta	Aquatic	Trichoptera	4	PH	PH	CL	MT	6	0	6	4	108	0	3	2	2	1	2	2	0.0056	2.839
Haliplus	L	Haliplidae	crawling water beetles	insect	Arthropoda: Insecta	Aquatic	Coleoptera	5	MH	MH	CM	MT	5	0	5	11	54	0	1	2	1	2	1	3	0.0077	2.91
Gyrinus	L	Gyrinidae	whirligig beetles	insect	Arthropoda: Insecta	Aquatic	Coleoptera	4	PR	PR	CM	MT	5	0	5	11	108	0	2	2	1	2	2	2	0.0077	2.91
Hydrophilidae	A	Hydrophilidae	water scavenger beetles	insect	Arthropoda: Insecta	Aquatic	Coleoptera	4	CG	CG	SW	MT	5	0	5	11	72	0	2	3	1	2	1	2	0.04	2.64

Explanation of metrics	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	
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)	Total biomass in full sample adjusted to a 1 square meter basis as calculated by length/mass regressions.
Large/rare biomass (mg)	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	Taxa in the insect orders Ephemeroptera+Plecoptera+Trichoptera, or mayflies+stoneflies+caddisflies.
Hilsenhoff Biotic Index (WY DEQ version)	
$HBI = \sum_{i=1}^{S} \frac{n_i \cdot a_i}{N}$	S is the number of taxa present. N is the total sample abundance. n_i is the abundance of the i-th taxa. 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.
$H' = -\sum_{i=1}^{S} \frac{n_i}{N} \ln\left(\frac{n_i}{N}\right)$	S is the number of taxa present. N is the total sample abundance. n_i is the abundance of the i-th taxa.
Shannon-Weaver Diversity (log2)	
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)	
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 mayflies.
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 "gather" 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	Found on leaves and stems of aquatic macrophytes or submerged branches and roots.
Burrower taxa	Burrow into fine sediments or tunnel into plant stems, leaves or roots (miners)
Unknowns taxa	Not able to classify as above.
STATE OF CALIFORNIA DESIGNATIONS	Traits coding according to CAMLnet January 27, 2003. List of California macroinvertebrate taxa and standard taxonomic effort.
CA % Sensitive EPT	Ephemeroptera, Plecoptera and Trichoptera with California Tolerance Value (CTV) of 0-2 on a 0-10 scaling.
CA % Intolerant individuals	All invertebrates with a CTV of 0-2 on a 0-10 scaling.
CA % Tolerant individuals	All invertebrates with a CTV of 8-10 on a 0-10 scaling.
CA weighted tolerance value	Calculates the Hilsenhoff Biotic Index using the California Tollerance Values (CTV)
CA % Predators	Primary designation of predator as classed by CA.
CA % Collector-gatherers	Primary designation of gatherer as classed by collector-gatherer by CA.
CA % Filterers	Primary designation of fileter as classed by collector-filterer by CA.
CA % Scrapers	Primary designation of scraper as classed by CA.
CA % Shredders	Primary designation of shredder as classed by CA.
BIOTIC CONDITION INDEX	
CTQa- Community Tolerance Quotient actual	
$CTQa = \sum_{i=1}^{S} \frac{TQ_i}{S}$	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.
CTQd-Community Tolerance Quotient dominance	
$\sum_{i=1}^{S}$	TQ_i and S as above.

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

Rinearson Creek	emergent marsh	5/19/2020	Juga	U	2	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Fluminicola	U	10	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Crangonyx	U	20	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Caecidotea	U	118	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Lirceus	U	1	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Potamopyrgus antipodarum	U	22	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Baetis tricaudatus complex	L	4	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Coenagrion/Enallagma	L	1	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Corixidae	L	9	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Dytiscidae	L	1	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Peltodytes	A	3	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Neoplasta	L	1	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Tipuloidea	P	1	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Ceratopogoninae	L	2	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Dixella	L	5	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Clinocera	L	1	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Tipula	L	4	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Alotanypus	L	7	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Brillia	L	14	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Chironomus	L	1	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Corynoneura	L	4	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Cricotopus	L	9	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Cryptochironomus	L	3	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Dicrotendipes	L	1	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Eukiefferiella claripennis group	L	3	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Heterotrissocladius marcidus group	L	2	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Limnophyes	L	4	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Micropsectra	L	36	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Odontomesa	L	6	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Paratanytarsus	L	9	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Paratendipes	L	2	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Phaenopsectra	L	10	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Polypedilum	L	1	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Procladius	L	4	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Prodiamesa	L	53	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Psectrocladius	L	1	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Psectrotanypus	L	7	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Smittia	L	2	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Tanytarsus	L	1	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Thienemannimyia complex	L	8	1.58	1	Y	no
Rinearson Creek	emergent marsh	5/19/2020	Tvetenia bavarica group	L	1	1.58	1	Y	no
Rinearson Creek	beaver pond	5/4/2021	Oligochaeta	U	8	1.45	1	Y	no
Rinearson Creek	beaver pond	5/4/2021	Helobdella stagnalis complex	U	15	1.45	1	Y	no
Rinearson Creek	beaver pond	5/4/2021	Sphaeriidae	U	2	1.45	1	Y	no
Rinearson Creek	beaver pond	5/4/2021	Physa/Physella	U	3	1.45	1	Y	no
Rinearson Creek	beaver pond	5/4/2021	Musculium	U	2	1.45	1	Y	no
Rinearson Creek	beaver pond	5/4/2021	Ostracoda	U	6	1.45	1	Y	no
Rinearson Creek	beaver pond	5/4/2021	Lirceus	U	4	1.45	1	Y	no
Rinearson Creek	beaver pond	5/4/2021	Crangonyx	U	86	1.45	1	Y	no
Rinearson Creek	beaver pond	5/4/2021	Caecidotea	U	35	1.45	1	Y	no
Rinearson Creek	beaver pond	5/4/2021	Trombidiformes	U	6	1.45	1	Y	no
Rinearson Creek	beaver pond	5/4/2021	Chydoridae	U	2	1.45	1	Y	no
Rinearson Creek	beaver pond	5/4/2021	Erpobdella	U	5	1.45	1	Y	no
Rinearson Creek	beaver pond	5/4/2021	Libellulidae	L	1	1.45	1	Y	no
Rinearson Creek	beaver pond	5/4/2021	Coenagrion/Enallagma	L	1	1.45	1	Y	no
Rinearson Creek	beaver pond	5/4/2021	Callibaetis	L	1	1.45	1	Y	no
Rinearson Creek	beaver pond	5/4/2021	Corixidae	L	9	1.45	1	Y	no
Rinearson Creek	beaver pond	5/4/2021	Ceratopogoninae	L	66	1.45	1	Y	no
Rinearson Creek	beaver pond	5/4/2021	Ceratopogoninae	P	1	1.45	1	Y	no
Rinearson Creek	beaver pond	5/4/2021	Chironomidae	P	38	1.45	1	N	no
Rinearson Creek	beaver pond	5/4/2021	Alotanypus	L	4	1.45	1	Y	no
Rinearson Creek	beaver pond	5/4/2021	Chironomus	L	11	1.45	1	Y	no
Rinearson Creek	beaver pond	5/4/2021	Cladopelma	L	2	1.45	1	Y	no
Rinearson Creek	beaver pond	5/4/2021	Cricotopus	L	4	1.45	1	Y	no
Rinearson Creek	beaver pond	5/4/2021	Cryptochironomus	L	70	1.45	1	Y	no
Rinearson Creek	beaver pond	5/4/2021	Dicrotendipes	L	4	1.45	1	Y	no
Rinearson Creek	beaver pond	5/4/2021	Odontomesa	L	10	1.45	1	Y	no
Rinearson Creek	beaver pond	5/4/2021	Orthocladius	L	8	1.45	1	Y	no
Rinearson Creek	beaver pond	5/4/2021	Paratanytarsus	L	27	1.45	1	Y	no
Rinearson Creek	beaver pond	5/4/2021	Paratendipes	L	4	1.45	1	Y	no
Rinearson Creek	beaver pond	5/4/2021	Phaenopsectra	L	8	1.45	1	Y	no
Rinearson Creek	beaver pond	5/4/2021	Polypedilum	L	8	1.45	1	Y	no
Rinearson Creek	beaver pond	5/4/2021	Procladius	L	13	1.45	1	Y	no
Rinearson Creek	beaver pond	5/4/2021	Prodiamesa	L	10	1.45	1	Y	no
Rinearson Creek	beaver pond	5/4/2021	Tanytarsus	L	125	1.45	1	Y	no
Rinearson Creek	emergent marsh	5/4/2021	Nemata	U	1	1	1	Y	no
Rinearson Creek	emergent marsh	5/4/2021	Oligochaeta	U	2	1	1	Y	no
Rinearson Creek	emergent marsh	5/4/2021	Erpobdella	U	3	1	1	Y	no
Rinearson Creek	emergent marsh	5/4/2021	Crangonyx	U	20	1	1	Y	no
Rinearson Creek	emergent marsh	5/4/2021	Caecidotea	U	144	1	1	Y	no
Rinearson Creek	emergent marsh	5/4/2021	Lirceus	U	10	1	1	Y	no
Rinearson Creek	emergent marsh	5/4/2021	Ceratopogoninae	L	5	1	1	Y	no
Rinearson Creek	emergent marsh	5/4/2021	Chironomidae	P	13	1	1	N	no
Rinearson Creek	emergent marsh	5/4/2021	Alotanypus	L	91	1	1	Y	no
Rinearson Creek	emergent marsh	5/4/2021	Chironomus	L	7	1	1	Y	no
Rinearson Creek	emergent marsh	5/4/2021	Cricotopus	L	10	1	1	Y	no
Rinearson Creek	emergent marsh	5/4/2021	Micropsectra	L	3	1	1	Y	no
Rinearson Creek	emergent marsh	5/4/2021	Paratendipes	L	106	1	1	Y	no
Rinearson Creek	emergent marsh	5/4/2021	Prodiamesa	L	151	1	1	Y	no
Rinearson Creek	emergent marsh	5/4/2021	Tanytarsus	L	5	1	1	Y	no
Rinearson Creek	engineered riffle	5/4/2021	Trepaxonemata	U	2	2.29	1	Y	no
Rinearson Creek	engineered riffle	5/4/2021	Nemata	U	2	2.29	1	Y	no
Rinearson Creek	engineered riffle	5/4/2021	Oligochaeta	U	17	2.29	1	Y	no
Rinearson Creek	engineered riffle	5/4/2021	Helobdella stagnalis complex	U	2	2.29	1	Y	no
Rinearson Creek	engineered riffle	5/4/2021	Erpobdella	U	1	2.29	1	Y	no
Rinearson Creek	engineered riffle	5/4/2021	Ostracoda	U	1	2.29	1	Y	no
Rinearson Creek	engineered riffle	5/4/2021	Lirceus	U	7	2.29	1	Y	no
Rinearson Creek	engineered riffle	5/4/2021	Crangonyx	U	173	2.29	1	Y	no
Rinearson Creek	engineered riffle	5/4/2021	Caecidotea	U	89	2.29	1	Y	no
Rinearson Creek	engineered riffle	5/4/2021	Pacifastacus	U	1	2.29	1	Y	no
Rinearson Creek	engineered riffle	5/4/2021	Trombidiformes	U	4	2.29	1	Y	no
Rinearson Creek	engineered riffle	5/4/2021	Libellulidae	L	1	2.29	1	Y	no
Rinearson Creek	engineered riffle	5/4/2021	Baetis tricaudatus complex	L	5	2.29	1	Y	no
Rinearson Creek	engineered riffle	5/4/2021	Cheumatopsyche	L	2	2.29	1	Y	no
Rinearson Creek	engineered riffle	5/4/2021	Ceratopogoninae	L	10	2.29	1	Y	no
Rinearson Creek	engineered riffle	5/4/2021	Simulium	L	5	2.29	1	Y	no
Rinearson Creek	engineered riffle	5/4/2021	Simulium	P	2	2.29	1	Y	no
Rinearson Creek	engineered riffle	5/4/2021	Tipula	L	1	2.29	1	Y	no
Rinearson Creek	engineered riffle	5/4/2021	Chironomidae	P	26	2.29	1	N	no
Rinearson Creek	engineered riffle	5/4/2021	Alotanypus	L	3	2.29	1	Y	no
Rinearson Creek	engineered riffle	5/4/2021	Chironomus	L	45	2.29	1	Y	no
Rinearson Creek	engineered riffle	5/4/2021	Cricotopus	L	19	2.29	1	Y	no
Rinearson Creek	engineered riffle	5/4/2021	Eukiefferiella claripennis group	L	11	2.29	1	Y	no

Rinearson Creek	engineered riffle	5/4/2021	Limnophyes	L	2	2.29	1	Y	no	
Rinearson Creek	engineered riffle	5/4/2021	Micropsectra	L	29	2.29	1	Y	no	
Rinearson Creek	engineered riffle	5/4/2021	Nanocladius	L	2	2.29	1	Y	no	
Rinearson Creek	engineered riffle	5/4/2021	Odontomesa	L	3	2.29	1	Y	no	
Rinearson Creek	engineered riffle	5/4/2021	Orthocladius	L	29	2.29	1	Y	no	
Rinearson Creek	engineered riffle	5/4/2021	Parachironomus	L	2	2.29	1	Y	no	
Rinearson Creek	engineered riffle	5/4/2021	Paratanytarsus	L	21	2.29	1	Y	no	
Rinearson Creek	engineered riffle	5/4/2021	Phaenopsectra	L	52	2.29	1	Y	no	
Rinearson Creek	engineered riffle	5/4/2021	Prodiamesa	L	7	2.29	1	Y	no	
Rinearson Creek	engineered riffle	5/4/2021	Tanytarsus	L	19	2.29	1	Y	no	
Rinearson Creek	engineered riffle	5/4/2021	Thienemannimyia complex	L	7	2.29	1	Y	no	
Rinearson Creek	engineered riffle	5/4/2021	Tvetenia bavarica group	L	2	2.29	1	Y	no	
Rinearson Creek	upper control	5/4/2021	Oligochaeta	U	3	1	1	Y	no	
Rinearson Creek	upper control	5/4/2021	Sphaeriidae	U	2	1	1	Y	no	
Rinearson Creek	upper control	5/4/2021	Erpobdella	U	2	1	1	Y	no	
Rinearson Creek	upper control	5/4/2021	Crangonyx	U	1	1	1	Y	no	
Rinearson Creek	upper control	5/4/2021	Caecidotea	U	37	1	1	Y	no	
Rinearson Creek	upper control	5/4/2021	Baetis tricaudatus complex	L	1	1	1	Y	no	
Rinearson Creek	upper control	5/4/2021	Ceratopogoninae	L	5	1	1	Y	no	
Rinearson Creek	upper control	5/4/2021	Chironomidae	P	1	1	1	N	no	
Rinearson Creek	upper control	5/4/2021	Alotanypus	L	8	1	1	Y	no	
Rinearson Creek	upper control	5/4/2021	Chironomus	L	2	1	1	Y	no	
Rinearson Creek	upper control	5/4/2021	Micropsectra	L	1	1	1	Y	no	
Rinearson Creek	upper control	5/4/2021	Paratendipes	L	3	1	1	Y	no	
Rinearson Creek	upper control	5/4/2021	Phaenopsectra	L	1	1	1	Y	no	
Rinearson Creek	upper control	5/4/2021	Polypedilum	L	2	1	1	Y	no	
Rinearson Creek	upper control	5/4/2021	Prodiamesa	L	125	1	1	Y	no	
Rinearson Creek	upper control	5/4/2021	Tanytarsus	L	2	1	1	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	Physa/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	11	7.06	1	Y	no	sample 2 for 2023
Rinearson Creek	beaver pond	8/16/2023	Nemata	U	2	7.06	1	Y	no	
Rinearson Creek	beaver pond	8/16/2023	Oligochaeta	U	99	7.06	1	Y	no	
Rinearson Creek	beaver pond	8/16/2023	Sphaeriidae	U	4	7.06	1	Y	no	
Rinearson Creek	beaver pond	8/16/2023	Lymnaeidae	U	1	7.06	1	Y	no	
Rinearson Creek	beaver pond	8/16/2023	Physa/Physella	U	22	7.06	1	Y	no	
Rinearson Creek	beaver pond	8/16/2023	Gyraulus	U	1	7.06	1	Y	no	
Rinearson Creek	beaver pond	8/16/2023	Ostracoda	U	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	Trombidiformes	U	2	7.06	1	Y	no	
Rinearson Creek	beaver pond	8/16/2023	Sperchon	U	2	7.06	1	Y	no	
Rinearson Creek	beaver pond	8/16/2023	Oribatida	U	1	7.06	1	Y	no	
Rinearson Creek	beaver pond	8/16/2023	Coenagrion/Enallagma	L	28	7.06	1	Y	no	
Rinearson Creek	beaver pond	8/16/2023	Aeshnidae	L	13	7.06	1	Y	no	
Rinearson Creek	beaver pond	8/16/2023	Callibaetis	L	24	7.06	1	Y	no	
Rinearson Creek	beaver pond	8/16/2023	Libellulidae	L	4	7.06	1	Y	no	
Rinearson Creek	beaver pond	8/16/2023	Corixidae	L	103	7.06	1	Y	no	
Rinearson Creek	beaver pond	8/16/2023	Abedus	L	1	7.06	1	Y	no	
Rinearson Creek	beaver pond	8/16/2023	Oxyethira	L	3	7.06	1	Y	no	
Rinearson Creek	beaver pond	8/16/2023	Hydrophilidae	L	1	7.06	1	Y	no	
Rinearson Creek	beaver pond	8/16/2023	Peltodytes	L	9	7.06	1	Y	no	
Rinearson Creek	beaver pond	8/16/2023	Peltodytes	A	14	7.06	1	Y	no	
Rinearson Creek	beaver pond	8/16/2023	Ceratopogoninae	L	10	7.06	1	Y	no	
Rinearson Creek	beaver pond	8/16/2023	Chironomidae	P	1	7.06	1	N	no	
Rinearson Creek	beaver pond	8/16/2023	Ablabesmyia	L	4	7.06	1	Y	no	
Rinearson Creek	beaver pond	8/16/2023	Corynoneura	L	3	7.06	1	Y	no	
Rinearson Creek	beaver pond	8/16/2023	Endochironomus	L	3	7.06	1	Y	no	
Rinearson Creek	beaver pond	8/16/2023	Nanocladius	L	1	7.06	1	Y	no	
Rinearson Creek	beaver pond	8/16/2023	Paratanytarsus	L	7	7.06	1	Y	no	
Rinearson Creek	beaver pond	8/16/2023	Polypedilum	L	9	7.06	1	Y	no	
Rinearson Creek	beaver pond	8/16/2023	Procladius	L	1	7.06	1	Y	no	
Rinearson Creek	beaver pond	8/16/2023	Psectrocladius	L	2	7.06	1	Y	no	
Rinearson Creek	beaver pond	8/16/2023	Pseudochironomus	L	45	7.06	1	Y	no	
Rinearson Creek	beaver pond	8/16/2023	Tanytarsus	L	1	7.06	1	Y	no	
Rinearson Creek	beaver pond	8/16/2023	Thienemannimyia complex	L	1	7.06	1	Y	no	
Rinearson Creek	emergent marsh	8/16/2023	Trepaxonemata	U	7	2	1	Y	no	sample 3 for 2023
Rinearson Creek	emergent marsh	8/16/2023	Nemata	U	5	2	1	Y	no	
Rinearson Creek	emergent marsh	8/16/2023	Oligochaeta	U	22	2	1	Y	no	
Rinearson Creek	emergent marsh	8/16/2023	Sphaeriidae	U	28	2	1	Y	no	
Rinearson Creek	emergent marsh	8/16/2023	Lymnaeidae	U	2	2	1	Y	no	
Rinearson Creek	emergent marsh	8/16/2023	Physa/Physella	U	7	2	1	Y	no	
Rinearson Creek	emergent marsh	8/16/2023	Gyraulus	U	2	2	1	Y	no	
Rinearson Creek	emergent marsh	8/16/2023	Juga	U	2	2	1	Y	no	
Rinearson Creek	emergent marsh	8/16/2023	Fluminicola	U	33	2	1	Y	no	
Rinearson Creek	emergent marsh	8/16/2023	Crangonyx	U	21	2	1	Y	no	
Rinearson Creek	emergent marsh	8/16/2023	Caecidotea	U	204	2	1	Y	no	
Rinearson Creek	emergent marsh	8/16/2023	Hyalella	U	5	2	1	Y	no	
Rinearson Creek	emergent marsh	8/16/2023	Potamopyrgus antipodarum	U	13	2	1	Y	no	
Rinearson Creek	emergent marsh	8/16/2023	Coenagrion/Enallagma	L	1	2	1	Y	no	
Rinearson Creek	emergent marsh	8/16/2023	Callibaetis	L	5	2	1	Y	no	
Rinearson Creek	emergent marsh	8/16/2023	Corixidae	L	10	2	1	Y	no	
Rinearson Creek	emergent marsh	8/16/2023	Peltodytes	L	9	2	1	Y	no	
Rinearson Creek	emergent marsh	8/16/2023	Ceratopogoninae	L	2	2	1	Y	no	
Rinearson Creek	emergent marsh	8/16/2023	Dixella	L	4	2	1	Y	no	
Rinearson Creek	emergent marsh	8/16/2023	Chironomidae	P	7	2	1	N	no	
Rinearson Creek	emergent marsh	8/16/2023	Ablabesmyia	L	1	2	1	Y	no	
Rinearson Creek	emergent marsh	8/16/2023	Alotanypus	L	1	2	1	Y	no	
Rinearson Creek	emergent marsh	8/16/2023	Chironomus	L	3	2	1	Y	no	
Rinearson Creek	emergent marsh	8/16/2023	Corynoneura	L	8	2	1	Y	no	
Rinearson Creek	emergent marsh	8/16/2023	Cricotopus	L	1	2	1	Y	no	

Rinearson Creek	emergent marsh	8/16/2023	Cryptochironomus	L	1	2	1	Y	no
Rinearson Creek	emergent marsh	8/16/2023	Eukiefferiella claripennis group	L	1	2	1	Y	no
Rinearson Creek	emergent marsh	8/16/2023	Heterotrissocladius marcidus group	L	3	2	1	Y	no
Rinearson Creek	emergent marsh	8/16/2023	Limnophyes	L	1	2	1	Y	no
Rinearson Creek	emergent marsh	8/16/2023	Micropsectra	L	2	2	1	Y	no
Rinearson Creek	emergent marsh	8/16/2023	Odontomesa	L	24	2	1	Y	no
Rinearson Creek	emergent marsh	8/16/2023	Orthocladius	L	1	2	1	Y	no
Rinearson Creek	emergent marsh	8/16/2023	Paratanytarsus	L	32	2	1	Y	no
Rinearson Creek	emergent marsh	8/16/2023	Paratendipes	L	39	2	1	Y	no
Rinearson Creek	emergent marsh	8/16/2023	Phaenopsectra	L	2	2	1	Y	no
Rinearson Creek	emergent marsh	8/16/2023	Polypedilum	L	1	2	1	Y	no
Rinearson Creek	emergent marsh	8/16/2023	Procladius	L	9	2	1	Y	no
Rinearson Creek	emergent marsh	8/16/2023	Pseudochironomus	L	1	2	1	Y	no
Rinearson Creek	emergent marsh	8/16/2023	Tanytarsus	L	1	2	1	Y	no
Rinearson Creek	emergent marsh	8/16/2023	Thienemannimyia complex	L	4	2	1	Y	no
Rinearson Creek	upper control	8/16/2023	Trepaxonemata	U	1	1	1	Y	no
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	8/16/2023	Crangonyx	U	10	1	1	Y	no
Rinearson Creek	upper control	8/16/2023	Caecidotea	U	127	1	1	Y	no
Rinearson Creek	upper control	8/16/2023	Sperchonopsis	U	4	1	1	Y	no
Rinearson Creek	upper control	8/16/2023	Hygrobates	U	1	1	1	Y	no
Rinearson Creek	upper control	8/16/2023	Fluminicola	U	10	1	1	Y	no
Rinearson Creek	upper control	8/16/2023	Coenagrion/Enallagma	L	1	1	1	Y	no
Rinearson Creek	upper control	8/16/2023	Ceratopogoninae	L	1	1	1	Y	no
Rinearson Creek	upper control	8/16/2023	Dixella	L	3	1	1	Y	no
Rinearson Creek	upper control	8/16/2023	Hemerodromia	L	1	1	1	Y	no
Rinearson Creek	upper control	8/16/2023	Neoplasta	L	2	1	1	Y	no
Rinearson Creek	upper control	8/16/2023	Chironomidae	P	1	1	1	N	no
Rinearson Creek	upper control	8/16/2023	Ablabesmyia	L	2	1	1	Y	no
Rinearson Creek	upper control	8/16/2023	Brillia	L	2	1	1	Y	no
Rinearson Creek	upper control	8/16/2023	Corynoneura	L	3	1	1	Y	no
Rinearson Creek	upper control	8/16/2023	Cryptochironomus	L	1	1	1	Y	no
Rinearson Creek	upper control	8/16/2023	Heterotrissocladius marcidus group	L	4	1	1	Y	no
Rinearson Creek	upper control	8/16/2023	Limnophyes	L	1	1	1	Y	no
Rinearson Creek	upper control	8/16/2023	Micropsectra	L	4	1	1	Y	no
Rinearson Creek	upper control	8/16/2023	Odontomesa	L	4	1	1	Y	no
Rinearson Creek	upper control	8/16/2023	Orthocladius	L	1	1	1	Y	no
Rinearson Creek	upper control	8/16/2023	Paratanytarsus	L	2	1	1	Y	no
Rinearson Creek	upper control	8/16/2023	Paratendipes	L	11	1	1	Y	no
Rinearson Creek	upper control	8/16/2023	Polypedilum	L	38	1	1	Y	no
Rinearson Creek	upper control	8/16/2023	Procladius	L	11	1	1	Y	no
Rinearson Creek	upper control	8/16/2023	Stempellinella	L	1	1	1	Y	no
Rinearson Creek	upper control	8/16/2023	Tanytarsus	L	2	1	1	Y	no
Rinearson Creek	upper control	8/16/2023	Thienemannimyia complex	L	18	1	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Trepaxonemata	U	11	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Oligochaeta	U	4	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Sphaeriidae	U	21	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Physa/Physella	U	135	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Gyraulus	U	10	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Chydoridae	U	9	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Helobdella stagnalis complex	U	4	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Crangonyx	U	8	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Hyalella	U	216	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Caecidotea	U	20	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Pacifastacus	U	1	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Libellulidae	L	1	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Coenagrion/Enallagma	L	14	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Callibaetis	L	5	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Corixidae	L	20	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Hydrophilidae	L	1	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Peltodytes	L	1	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Dytiscidae	L	1	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Hydroporinae	L	1	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Ceratopogoninae	L	1	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Dixella	L	1	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Chironomidae	P	11	5.33	1	N	no
Rinearson Creek	beaver pond	6/14/2024	Ablabesmyia	L	2	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Chironomus	L	8	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Cladopelma	L	1	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Endochironomus	L	1	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Cricotopus	L	17	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Cryptochironomus	L	3	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Dicrotendipes	L	5	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Parachironomus	L	1	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Paratanytarsus	L	4	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Psectrocladius	L	1	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Pseudochironomus	L	2	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Psectrotanypus	L	2	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Stictochironomus	L	1	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Tanypus	L	7	5.33	1	Y	no
Rinearson Creek	beaver pond	6/14/2024	Tanytarsus	L	14	5.33	1	Y	no
Rinearson Creek	emergent marsh	6/14/2024	Trepaxonemata	U	1	1	1	Y	no
Rinearson Creek	emergent marsh	6/14/2024	Oligochaeta	U	9	1	1	Y	no
Rinearson Creek	emergent marsh	6/14/2024	Sphaeriidae	U	9	1	1	Y	no
Rinearson Creek	emergent marsh	6/14/2024	Ferrissia	U	1	1	1	Y	no
Rinearson Creek	emergent marsh	6/14/2024	Physa/Physella	U	4	1	1	Y	no
Rinearson Creek	emergent marsh	6/14/2024	Menetus	U	1	1	1	Y	no
Rinearson Creek	emergent marsh	6/14/2024	Juga	U	21	1	1	Y	no
Rinearson Creek	emergent marsh	6/14/2024	Fluminicola	U	35	1	1	Y	no
Rinearson Creek	emergent marsh	6/14/2024	Crangonyx	U	16	1	1	Y	no
Rinearson Creek	emergent marsh	6/14/2024	Caecidotea	U	75	1	1	Y	no
Rinearson Creek	emergent marsh	6/14/2024	Potamopyrgus antipodarum	U	1	1	1	Y	no
Rinearson Creek	emergent marsh	6/14/2024	Psychoglypha	L	4	1	1	Y	no
Rinearson Creek	emergent marsh	6/14/2024	Lepidostoma unicolor group	L	1	1	1	Y	no
Rinearson Creek	emergent marsh	6/14/2024	Ceratopogoninae	L	3	1	1	Y	no
Rinearson Creek	emergent marsh	6/14/2024	Chironomidae	P	1	1	1	Y	no
Rinearson Creek	emergent marsh	6/14/2024	Brillia	L	5	1	1	Y	no
Rinearson Creek	emergent marsh	6/14/2024	Cricotopus	L	1	1	1	Y	no
Rinearson Creek	emergent marsh	6/14/2024	Cryptochironomus	L	16	1	1	Y	no
Rinearson Creek	emergent marsh	6/14/2024	Micropsectra	L	1	1	1	Y	no
Rinearson Creek	emergent marsh	6/14/2024	Parametriocnemus	L	1	1	1	Y	no
Rinearson Creek	emergent marsh	6/14/2024	Paratanytarsus	L	1	1	1	Y	no
Rinearson Creek	emergent marsh	6/14/2024	Phaenopsectra	L	2	1	1	Y	no
Rinearson Creek	emergent marsh	6/14/2024	Polypedilum	L	7	1	1	Y	no
Rinearson Creek	emergent marsh	6/14/2024	Procladius	L	6	1	1	Y	no
Rinearson Creek	emergent marsh	6/14/2024	Prodiamesa	L	9	1	1	Y	no
Rinearson Creek	emergent marsh	6/14/2024	Stictochironomus	L	1	1	1	Y	no

Rinearson Creek	emergent marsh	6/14/2024	Thienemannimyia complex	L	18	1	1	Y	no
Rinearson Creek	engineered riffle	6/14/2024	Trepaxonemata	U	20	1.43	1	Y	no
Rinearson Creek	engineered riffle	6/14/2024	Nemata	U	1	1.43	1	Y	no
Rinearson Creek	engineered riffle	6/14/2024	Oligochaeta	U	26	1.43	1	Y	no
Rinearson Creek	engineered riffle	6/14/2024	Erpobdella	U	1	1.43	1	Y	no
Rinearson Creek	engineered riffle	6/14/2024	Sphaeriidae	U	7	1.43	1	Y	no
Rinearson Creek	engineered riffle	6/14/2024	Physa/Physella	U	4	1.43	1	Y	no
Rinearson Creek	engineered riffle	6/14/2024	Menetus	U	2	1.43	1	Y	no
Rinearson Creek	engineered riffle	6/14/2024	Corbicula	U	1	1.43	1	Y	no
Rinearson Creek	engineered riffle	6/14/2024	Fluminicola	U	1	1.43	1	Y	no
Rinearson Creek	engineered riffle	6/14/2024	Crangonyx	U	23	1.43	1	Y	no
Rinearson Creek	engineered riffle	6/14/2024	Hyalella	U	2	1.43	1	Y	no
Rinearson Creek	engineered riffle	6/14/2024	Caecidotea	U	27	1.43	1	Y	no
Rinearson Creek	engineered riffle	6/14/2024	Pacifastacus	U	1	1.43	1	Y	no
Rinearson Creek	engineered riffle	6/14/2024	Lirceus	U	422	1.43	1	Y	no
Rinearson Creek	engineered riffle	6/14/2024	Helobdella stagnalis complex	U	1	1.43	1	Y	no
Rinearson Creek	engineered riffle	6/14/2024	Argia	L	1	1.43	1	Y	no
Rinearson Creek	engineered riffle	6/14/2024	Coenagrion/Enallagma	L	1	1.43	1	Y	no
Rinearson Creek	engineered riffle	6/14/2024	Cheumatopsyche	L	1	1.43	1	Y	no
Rinearson Creek	engineered riffle	6/14/2024	Hydroptila	L	4	1.43	1	Y	no
Rinearson Creek	engineered riffle	6/14/2024	Hydroptila	P	1	1.43	1	Y	no
Rinearson Creek	engineered riffle	6/14/2024	Peltodytes	L	2	1.43	1	Y	no
Rinearson Creek	engineered riffle	6/14/2024	Ceratopogoninae	L	3	1.43	1	Y	no
Rinearson Creek	engineered riffle	6/14/2024	Simulium	L	3	1.43	1	Y	no
Rinearson Creek	engineered riffle	6/14/2024	Chironomidae	P	2	1.43	1	N	no
Rinearson Creek	engineered riffle	6/14/2024	Cricotopus	L	7	1.43	1	Y	no
Rinearson Creek	engineered riffle	6/14/2024	Cryptochironomus	L	1	1.43	1	Y	no
Rinearson Creek	engineered riffle	6/14/2024	Eukiefferiella claripennis group	L	3	1.43	1	Y	no
Rinearson Creek	engineered riffle	6/14/2024	Micropsectra	L	3	1.43	1	Y	no
Rinearson Creek	engineered riffle	6/14/2024	Parametriocnemus	L	2	1.43	1	Y	no
Rinearson Creek	engineered riffle	6/14/2024	Paratanytarsus	L	1	1.43	1	Y	no
Rinearson Creek	engineered riffle	6/14/2024	Polypedilum	L	2	1.43	1	Y	no
Rinearson Creek	engineered riffle	6/14/2024	Prodiamesa	L	1	1.43	1	Y	no
Rinearson Creek	engineered riffle	6/14/2024	Pseudochironomus	L	1	1.43	1	Y	no
Rinearson Creek	engineered riffle	6/14/2024	Stictochironomus	L	1	1.43	1	Y	no
Rinearson Creek	engineered riffle	6/14/2024	Thienemannimyia complex	L	2	1.43	1	Y	no
Rinearson Creek	upper control	6/14/2024	Trepaxonemata	U	2	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Oligochaeta	U	6	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Helobdella stagnalis complex	U	2	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Sphaeriidae	U	39	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Prostoma	U	1	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Physa/Physella	U	11	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Menetus	U	2	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Juga	U	7	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Fluminicola	U	113	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Crangonyx	U	34	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Hyalella	U	11	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Caecidotea	U	112	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Pacifastacus	U	1	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Lirceus	U	4	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Potamopyrgus antipodarum	U	27	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Coenagrion/Enallagma	L	3	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Aeshnidae	L	2	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Corixidae	L	8	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Lepidostoma unicolor group	L	1	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Haliplus	L	1	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Peltodytes	L	4	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Peltodytes	A	3	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Gyrinus	L	1	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Hydrophilidae	A	1	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Ceratopogoninae	L	2	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Dixella	L	4	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Chironomidae	P	4	1.25	1	N	no
Rinearson Creek	upper control	6/14/2024	Brillia	L	1	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Corynoneura	L	1	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Cricotopus	L	19	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Odontomesa	L	45	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Paratanytarsus	L	7	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Polypedilum	L	6	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Procladius	L	36	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Stictochironomus	L	1	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Tanytarsus	L	19	1.25	1	Y	no
Rinearson Creek	upper control	6/14/2024	Thienemannimyia complex	L	4	1.25	1	Y	no

Appendix F

Equipment Calibration Certificates

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 212186
Description YSI Pro Quatro
Calibrated 4/22/2024 1:37:14PM

Manufacturer YSI
Model Number 605000
Serial Number/ Lot Number 22D104355
Location Seattle
Department

State Certified
Status Pass
Temp °C 19
Humidity % 31

Calibration Specifications

Group # 1
Group Name PH
Stated Accy Pct of Reading
Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

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	7.01	0.14%	Pass
4.00 / 4.00	PH	4.00	PH	4.10	4.01	0.25%	Pass
10.00 / 10.00	PH	10.00	PH	9.96	10.00	0.00%	Pass

Group # 2
Group Name Conductivity
Stated Accy Pct of Reading
Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.000

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
1.413 / 1.413	ms/cm	1.413	ms/cm	1.362	1.413	0.00%	Pass

Group # 3
Group Name Redox (ORP)
Stated Accy Pct of Reading
Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
240.00 / 240.00	mv	240.00	mv	236.90	240.00	0.00%	Pass

Group # 4
Group Name Dissolved Oxygen Span
Stated Accy Pct of Reading
Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
100.00 / 100.00	%	100.00	%	103.00	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 212186
Description YSI Pro Quatro
Calibrated 4/22/2024 1:37:14PM

Test Instruments Used During the Calibration **(As Of Cal Entry Date)**

Test Standard ID	Description	Manufacturer	Model Number	Serial Number / Lot Number	Last Cal Date/ Opened Date	Next Cal Date / Expiration Date
SEA COND 1.413 3GE0626	Conductivity solution 1.413 µS/cm 3GE0626	AquaPhoenix Scientific	Conductivity 1.413 mS/cm	3GE0626		5/31/2024
SEA ORP-3GL0404	ORP STANDARD 240 mV	Pine Environmental Services, Inc.	32001	3GL0404		9/1/2024
SEA PH 10 2GGG018	pH 10 Buffer Solution	AquaPhoenix Scientific	32034	2GGG018		7/24/2024
SEA PH 7 3GA068	pH 7 Buffer Solution	AquaPhoenix Scientific	32025	3GA068		5/30/2024
SEA PH4 3GE-0156	SEA PH4 BUFFER 3GE0156	Pine	32017	EGE-0156		5/30/2025

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

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 *48520*
Description *YSI Pro Plus*
Calibrated *6/19/2024 4:17:19PM*

Manufacturer *YSI*
Model Number 605000
Serial Number/ Lot Number 19K100045
Location Seattle
Department

State Certified
Status Pass
Temp °C *24*
Humidity % *36*

Calibration Specifications

Group # 1
Group Name PH
Stated Accy Pct of Reading
Range Acc % *0.0000*
Reading Acc % *3.0000*
Plus/Minus *0.00*

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	7.01	7.00	*0.00%*	*Pass*
4.00 / 4.00	PH	4.00	PH	3.84	4.00	*0.00%*	*Pass*
10.00 / 10.00	PH	10.00	PH	10.02	10.00	*0.00%*	*Pass*

Group # 2
Group Name Conductivity
Stated Accy Pct of Reading
Range Acc % *0.0000*
Reading Acc % *3.0000*
Plus/Minus *0.000*

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
1.413 / 1.413	ms/cm	1.413	ms/cm	1.374	1.413	*0.00%*	*Pass*

Group # 3
Group Name Redox (ORP)
Stated Accy Pct of Reading
Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
240.00 / 240.00	mv	240.00	mv	241.50	240.00	0.00%	Pass

Group # 4
Group Name Disolved Oxygen Span
Stated Accy Pct of Reading
Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
100.00 / 100.00	%	100.00	%	100.10	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 48520
Description YSI Pro Plus
Calibrated 6/19/2024 4:17:19PM

Test Instruments Used During the Calibration (As Of Cal Entry Date)

Test Standard ID	Description	Manufacturer	Model Number	Serial Number / Lot Number	Next Cal Date / Last Cal Date/ Expiration Date Opened Date
SEA 7 PH	SEA 7 PH 3GE007	Pine	32025	3GE007	5/30/2025
SEA PH 10 2GGG018	pH 10 Buffer Solution	AquaPhoenix Scientific	32034	2GGG018	7/24/2024
SEA PH4 3GE-0156	SEA PH4 BUFFER 3GE0156	Pine	32017	EGE-0156	5/30/2025
SEA-COND 1.413	SEA-COND 1.413 4GA0218	Pine Environmental Services, Inc.	31986	4GA0218	1/30/2025
SEA-ORP 4GC1490	ORP STANDARD 240 mV	Pine Environmental Services, Inc.	32001	4GC1490	9/1/2024

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Dzung Pham

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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 223347
Description YSI Pro DSS Sonde
Calibrated 8/19/2024 1:38:29PM

Manufacturer YSI
Model Number Pro DSS
Serial Number/ Lot Number 223347
Location Seattle
Department

State Certified
Status Pass
Temp °C 25
Humidity % 39

Calibration Specifications

Group # 1
Group Name PH
Stated Accy Pct of Reading

Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

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	7.08	7.00	0.00%	Pass
4.00 / 4.00	PH	4.00	PH	4.01	4.00	0.00%	Pass
10.00 / 10.00	PH	10.00	PH	10.06	10.00	0.00%	Pass

Group # 2
Group Name Turbidity (NTU)
Stated Accy Pct of Reading

Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
0.00 / 0.00	NTU	0.00	NTU	1.12	0.00	0.00%	Pass
124.00 / 124.00	NTU	124.00	NTU	118.18	124.00	0.00%	Pass

Group # 3
Group Name Conductivity
Stated Accy Pct of Reading

Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.000

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
1.413 / 1.413	ms/cm	1.413	ms/cm	1.304	1.413	0.00%	Pass

Group # 4
Group Name Redox (ORP)
Stated Accy Pct of Reading

Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
240.00 / 240.00	mv	240.00	mv	248.00	240.00	0.00%	Pass

Group # 5
Group Name Dissolved Oxygen Span
Stated Accy Pct of Reading

Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

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 223347
Description YSI Pro DSS Sonde
Calibrated 8/19/2024 1:38:29PM

Group # 5
Group Name Dissolved Oxygen Span
Stated Accy Pct of Reading

Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
100.00 / 100.00	%	100.00	%	101.80	100.00	0.00%	Pass

Test Instruments Used During the Calibration (As Of Cal Entry Date)

Test Standard ID	Description	Manufacturer	Model Number	Serial Number / Lot Number	Last Cal Date/ Opened Date	Next Cal Date / Expiration Date
SEA 126NTU 24A24008342	SEA 126NTU 24A24008342	YSI	607300	24A24008342		1/30/2025
SEA 7 PH	SEA 7 PH 3GE007	Pine	32025	3GE007		5/30/2025
SEA AUTOCAL 21470032	SEA AUTOCAL AMCO Clear	GFS	8483	24003824		8/30/2024
SEA PH10 32034	SEA PH10 BUFFER	Pine	32034	3GA510		1/28/2025
SEA PH4 3GE-0156	SEA PH4 BUFFER 3GE0156	Pine	32017	EGE-0156		5/30/2025
SEA-COND 1.413	SEA-COND 1.413 4GA0218	Pine Environmental Services, Inc.	31986	4GA0218		1/30/2025
SEA-ORP 4GC1490	ORP STANDARD 240 mV	Pine Environmental Services, Inc.	32001	4GC1490		9/1/2024

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Dzung Pham

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

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 223010
Description YSI Pro DSS Display
Calibrated 8/19/2024 1:36:45PM

Manufacturer YSI
Model Number YSI Pro DSS
Serial Number/ Lot Number 24B106619
Location Seattle
Department

State Certified
Status Pass
Temp °C *25*
Humidity % *39*

Calibration Specifications

Group # 1
Group Name Instrument Test
Test Performed: Yes **As Found Result: Pass** **As Left Result: Pass**

Test Instruments Used During the Calibration **(As Of Cal Entry Date)**

Test Standard ID	Description	Manufacturer	Model Number	Serial Number / Lot Number	Next Cal Date / Last Cal Date/ Expiration Date Opened Date

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated *Dzung Pham*

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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 43952
Description YSI Professional Plus
Calibrated 11/5/2024 5:07:29PM

Manufacturer YSI
Model Number Professional Plus
Serial Number/ Lot Number 18J102188
Location Seattle
Department

State Certified
Status Pass
Temp °C 20
Humidity % 36

Calibration Specifications

Group # 1
Group Name PH
Stated Accy Pct of Reading
Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

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	7.16	7.01	0.14%	Pass
4.00 / 4.00	PH	4.00	PH	4.11	4.00	0.00%	Pass
10.00 / 10.00	PH	10.00	PH	9.98	10.01	0.10%	Pass

Group # 2
Group Name Conductivity
Stated Accy Pct of Reading
Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.000

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
1.413 / 1.413	ms/cm	1.413	ms/cm	1.436	1.413	0.00%	Pass

Group # 3
Group Name Redox (ORP)
Stated Accy Pct of Reading
Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
240.00 / 240.00	mv	240.00	mv	238.80	240.00	0.00%	Pass

Group # 4
Group Name Disolved Oxygen Span
Stated Accy Pct of Reading
Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
100.00 / 100.00	%	100.00	%	97.90	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 43952
Description YSI Professional Plus
Calibrated 11/5/2024 5:07:29PM

Test Instruments Used During the Calibration *(As Of Cal Entry Date)*

Test Standard ID	Description	Manufacturer	Model Number	Serial Number / Lot Number	Last Cal Date/ Opened Date	Next Cal Date / Expiration Date
SEA 7 PH	SEA 7 PH 3GE007	Pine	32025	3GE007		5/30/2025
SEA PH10 32034	SEA PH10 BUFFER	Pine	32034	3GA510		1/28/2025
SEA PH4 3GE-0156	SEA PH4 BUFFER 3GE0156	Pine	32017	EGE-0156		5/30/2025
SEA-ORP 4GC1490	ORP STANDARD 240 mV	Pine Environmental Services, Inc.	32001	4GE1370		2/28/2025
SEACOND 1.413	SEA-COND 1.413	Pine	31986	4GF1133		6/28/2025

Notes about this calibration

Calibration Result *Calibration Successful*
Who Calibrated *Dzung Pham*

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PROJECT:	**Rinearson**	**CATEGORY**		**TREATMENT TYPE**		
CLIENT:	**Columbia Restoration Group**	**Forestry**	**aquatics**	**Site Prep**	**Establishment**	**Stewardship**
ADDRESS:	**(45.380558, -122.615179**					
DATE:	**1/5/2024**					
TIME IN:	**8:00 AM**					
TIME OUT:	**2:30 PM**				**TOTAL ACRES:**	**4.28**

	Prescription (oz/ac or v/v%)	**Targets**	**Equipment & Method**	**Acres**
A.	2% Garlon, 2% Competitor, 2% Aquaneat, 0.5% Hi-Light	Himalayan Blackberry	Backpack, Spot Spray	4.28
B.				
C.				
D.				

HERBICIDE INVENTORY

Glyphosate	**Herbicide Amount (oz)**	**Water (gal or oz)**	**Purchased by:**
Rodeo EPA Reg #62719-324			
AquaNeat EPA Reg #228-365	136	51 gal	ACFM
Triclopyr			
Vastlan EPA Reg #62719-687			
Garlon 3A EPA Reg #62719-37	136		
Other Herbicides			
Transline EPA Reg #62719-259			
Imazapyr 4 SL EPA Reg# 81927-24			
Milestone EPA Reg #62719-519			
Poast EPA Reg #7969-58			
Surfactants/ Adjuvants			
Competitor	136		ACFM
Class Act			
Hasten			
Colorant			
Hi-Light Blue dye	34		ACFM

WEATHER CONDITIONS

Time	**Conditions**	**Relative Humidity (%)**	**Temperature (°F)**	**Wind Speed - High (mph)**	**Wind Speed - Low (mph)**	**Wind Direction**
8:00 AM	Partially Cloudy	80	45	3	0	WSW
11:00 AM	Partially Cloudy	77	41	0	0	WSW
1:00 PM	Partially Cloudy	71	41	15	0	SSW

CERTIFIED LICENSED APPLICATOR:	**CERTIFIED LICENSED APPLICATOR NO.:**
Bryant Young	**AG-L1046535CPA**

PROJECT:	**Rinearson**	**CATEGORY**		**TREATMENT TYPE**		
CLIENT:	**Columbia Restoration Group**	**Forestry**	**aquatics**	**Site Prep**	**Establishment**	**Stewardship**
ADDRESS:	**(45.380558, -122.615179**					
DATE:	**1/5/2024**					
TIME IN:	**8:00 AM**					
TIME OUT:	**2:30 PM**				**TOTAL ACRES:**	**4.28**

	Prescription (oz/ac or v/v%)	**Targets**	**Equipment & Method**	**Acres**
A.	2% Garlon, 2% Competitor, 2% Aquaneat, 0.5% Hi-Light	Himalayan Blackberry	Backpack, Spot Spray	4.28
B.				
C.				
D.				

HERBICIDE INVENTORY

Glyphosate	**Herbicide Amount (oz)**	**Water (gal or oz)**	**Purchased by:**
Rodeo EPA Reg #62719-324			
AquaNeat EPA Reg #228-365	136	51 gal	ACFM
Triclopyr			
Vastlan EPA Reg #62719-687			
Garlon 3A EPA Reg #62719-37	136		
Other Herbicides			
Transline EPA Reg #62719-259			
Imazapyr 4 SL EPA Reg# 81927-24			
Milestone EPA Reg #62719-519			
Poast EPA Reg #7969-58			
Surfactants/ Adjuvants			
Competitor	136		ACFM
Class Act			
Hasten			
Colorant			
Hi-Light Blue dye	34		ACFM

WEATHER CONDITIONS

Time	**Conditions**	**Relative Humidity (%)**	**Temperature (°F)**	**Wind Speed - High (mph)**	**Wind Speed - Low (mph)**	**Wind Direction**
8:00 AM	Partially Cloudy	80	45	3	0	WSW
11:00 AM	Partially Cloudy	77	41	0	0	WSW
1:00 PM	Partially Cloudy	71	41	15	0	SSW

CERTIFIED LICENSED APPLICATOR:	**CERTIFIED LICENSED APPLICATOR NO.:**
Bryant Young	**AG-L1046535CPA**

Rinearson		4/29/2024			
Applicators	**Applicator IST #**	**CPA License #**	**Washington CPO**	**Categories**	**On Site ONLY?**
Hit Team 1					
Annalise Meyer	AG-L1088117IST				
Bethany Erdman	AG-L1086748IST				
Edward Benkhin	AG-L1086713IST	AG-L1090990CPA		Forest	
Ellie Winter		AG-L1089281CPA		Forest	
Michael Briggs	AG-L1086597IST	AG-L1088557CPA		Aquatic	
Preston Massingham		AG-L1083967CPA		Forest	
Samantha Marcotte	AG-L1083359IST	AG-L1087215CPA		Forest, Aquatic	
Hit Team 2					
Alex Maitland	AG-L1086710IST	AG-L1091293CPA		Forest	
Conrad Nielsen	AG-L1088672IST	AG-L1090159CPA		Forest	X
Eugene Dixon	AG-L1088780IST				
Fiona O'Loughlin		AG-L1088824CPA	108959	Forest, Aquatic	
Kevin Reed	AG-L1089119IST	AG-L1090974CPA		Forest	
Thomas Hauser	AG-L1086596IST	AG-L1090660CPA		Forest	
Hit Team 3					
Emily Stewart		AG-L1087914CPA		Forest	
Scott Smethurst		AG-L1089565CPA		Forest	
Val Mitsui	AG-L1085741IST	AG-L1090835CPA		Forest	
Hit Team 4					
Chloe Paschke	AG-L1090536IST				
Cody Barker	AG-L1033206IST				
Isaac Gandee	AG-L1090354IST				
Jack Delaney	AG-L1086968IST	AG-L1090976CPA		Forest	
Olivia Ray	AG-L1090353IST				
Tomasz Cunha	AG-L1086595IST	AG-L1090973CPA		Forest	
Hit Team 5					
Mathew Lipski	AG-L1087020IST	AG-L1089060CPA		Aquatic	
Spencer Page		AG-L1084646CPA		Forest, Aquatic	
Tyler Csolkovits		AG-L1088042CPA		Forest	
Hit Team 6					
Audrey Brickey	AG-L1088335IST				
Gryston Fonseca		AG-L1099598CPA		Forest, Aquatic	
Matthew DeCosta	AG-L1087195IST				X
Tyler Nagel	AG-L1087322IST				
Willow Venablerose	AG-L1088420IST	AG-L1090365CPA		Forest	
Hit Team 7					
Catherine Luecht	AG-L1086006IST	AG-L1091294CPA		Forest, Aquatic	
Cole Baumeister	AG-L1086040IST	AG-L1090395CPA		Forest	
James Gorsline	AG-L1089294IST	AG-L1091219CPA		Forest	
Madison Ferrell	AG-L1089504IST				
Nik Cooke	AG-L1089280IST	AG-L1091296CPA		Forest	X
Tennyson Schill	AG-L1087682IST				
Aaron Fry		AG-L1087974CPA	108962	Forest, Aquatic	
Addison Dillon		AG-L1083125CPA	104418	Forest, Aquatic	
Aissa Bennett		AG-L1076653CPA	103167	Forest, Aquatic, ROW	X
Camille Oster		AG-L1088169CPA	108961	Forest, Aquatic	
Coleman Krohn		AG-L1079092CPA	105150	Forest, Aquatic, ROW	
Ian Christie		AG-L1050813CPA	102752	Forest, Aquatic, ROW	
Isabella Lopez-Dion		AG-L1083844CPA		Forest	
Jill Tamborello		AG-L1084134CPA	107997	Forest, Aquatic	
Kobe Rossi		AG-L1084397CPA	107826	Forest, Aquatic, ROW	
Kyle Peterson		AG-L1077904CPA	104877	Forest, Aquatic, ROW	
Lauren Smith		AG-L1081083CPA	106759	Forest, Aquatic, ROW	
Nick Lewis	AG-L1045857IST				
Owen Phinney	AG-L1059333IST				
Rio Hybert-Zack		AG-L1069212CPA		Agriculture, Herbicide	

Trevor Burrows		AG-L1084398CPA	107824	Forest, Aquatic, ROW	
Trainers					
Bryant Young		AG-L1046535CPA		Forest	
Emily Martin	AG-L1061041IST				
Elise Snortum		AG-L1087294CPA		Forest	X
Erik Saastamo		AG-L1083719CPA	107935	Forest, Aquatic	
Evan Stewart		AG-L1073266CPA		Forest	
Kenzie Lovelace		AG-L1076427CPA	103061	Forest, Aquatic	
Mallory Mitsui		AG-L1087975CPA		Forest, Aquatic	
Mark Dickison	AG-L1079023IST				
Nick Crosby		AG-L1083823CPA		Forest	X
Support Staff					
Brad Burke	AG-L1052766IST	AG-L1071184CPA		Forest	
Brendan Collins	AG-L1089866IST				
David Chiang	AG-L1054240IST				
Morgan Seitzer	AG-L1087550IST				
Rachel Woodcock	AG-L1091149IST				
Samuel Wright	AG-L1091099IST				
Vaughn Monaghan		AG-L1071976CPA		Forest	
Zach Vande Slunt	AG-L1055689IST		100807		

PROJECT:	**Rinearson**	**CATEGORY**		**TREATMENT TYPE**		
CLIENT:	**Columbia Restoration Group**	**Forestry**	**Aquatic**	**Site Prep**	**Establishment**	**Stewardship**
ADDRESS:	**45.377722, -122.611083**					
DATE:	**4/29/2024**					
TIME IN:	**1:00 PM**					
TIME OUT:	**4:00 PM**				**TOTAL ACRES:**	**1.34**

	Prescription (oz/ac or v/v%)	**Targets**	**Equipment & Method**	**Acres**
A.	2% Garlon, 2% Aquaneat, 1.5% Competitor, 0.5% Hi-Light	Tansy ragwort, Teasle, Canada thistle, Bull thistle, Bittersweet nightshade, Bird's-foot trefoil, Himalayan blackberry, and Reed canary grass	Backpack, Spot Spray	1.34
B.	2% Aquaneat, 1.5% Competitor, 0.5% Hi-Light	Reed canary grass	Backpack, Spot Spray	1.34
C.	4% Aquaneat, 2% Competitor, 0.5% Hi-Light	Yellow flag iris	Backpack, Spot Spray	0.36
D.				

HERBICIDE INVENTORY

Glyphosate	**Herbicide Amount (oz)**	**Water (gal or oz)**	**Purchased by:**
Rodeo EPA Reg #62719-324			
AquaNeat EPA Reg #228-365	37.33	13 gal	ACFM
Triclopyr			
Vastlan EPA Reg #62719-687			
Garlon 3A EPA Reg #62719-37	20	13 gal	ACFM
Other Herbicides			
Transline EPA Reg #62719-259			
Imazapyr 4 SL EPA Reg# 81927-24			
Milestone EPA Reg #62719-519			
Poast EPA Reg #7969-58			
Surfactants/ Adjuvants			
Competitor	26.67	13 gal	ACFM
Class Act			
Hasten			
Colorant			
Hi-Light Blue dye	8.66	13 gal	ACFM

WEATHER CONDITIONS

Time	**Conditions**	**Relative Humidity (%)**	**Temperature (°F)**	**Wind Speed - High (mph)**	**Wind Speed - Low (mph)**	**Wind Direction**
1:00 PM	Drizzle	81%	47	6	0	W
2:30 PM	Drizzle	74%	49	6	0	WSW

CERTIFIED LICENSED APPLICATOR:	**CERTIFIED LICENSED APPLICATOR NO.:**
Edward Benkhin	**AG-L1090990CPA**

Rinearson Spray		5/1/2024			
Applicators	**Applicator IST #**	**CPA License #**	**Washington CPO**	**Categories**	**On Site ONLY?**
Hit Team 1					
Annalise Meyer	AG-L1088117IST				
Bethany Erdman	AG-L1086748IST				
Edward Benkhin	AG-L1086713IST	AG-L1090990CPA		Forest	
Ellie Winter		AG-L1089281CPA		Forest	
Michael Briggs	AG-L1086597IST	AG-L1088557CPA		Aquatic	
Preston Massingham		AG-L1083967CPA		Forest	
Samantha Marcotte	AG-L1083359IST	AG-L1087215CPA		Forest, Aquatic	
Hit Team 2					
Alex Maitland	AG-L1086710IST	AG-L1091293CPA		Forest	
Conrad Nielsen	AG-L1088672IST	AG-L1090159CPA		Forest	
Eugene Dixon	AG-L1088780IST				
Fiona O'Loughlin		AG-L1088824CPA	108959	Forest, Aquatic	
Kevin Reed	AG-L1089119IST	AG-L1090974CPA		Forest	
Thomas Hauser	AG-L1086596IST	AG-L1090660CPA		Forest	
Hit Team 3					
Emily Stewart		AG-L1087914CPA		Forest	
Scott Smethurst		AG-L1089565CPA		Forest	
Val Mitsui	AG-L1085741IST	AG-L1090835CPA		Forest	
Hit Team 4					
Chloe Paschke	AG-L1090536IST				
Cody Barker	AG-L1033206IST				
Isaac Gandee	AG-L1090354IST				
Jack Delaney	AG-L1086968IST	AG-L1090976CPA		Forest	
Olivia Ray	AG-L1090353IST				
Tomasz Cunha	AG-L1086595IST	AG-L1090973CPA		Forest	
Hit Team 5					
Mathew Lipski	AG-L1087020IST	AG-L1089060CPA		Aquatic	
Spencer Page		AG-L1084646CPA		Forest, Aquatic	
Tyler Csolkovits		AG-L1088042CPA		Forest	
Hit Team 6					
Audrey Brickey	AG-L1088335IST				
Gryston Fonseca		AG-L1099598CPA		Forest, Aquatic	
Matthew DeCosta	AG-L1087195IST				
Tyler Nagel	AG-L1087322IST				
Willow Venablerose	AG-L1088420IST	AG-L1090365CPA		Forest	
Hit Team 7					
Catherine Luecht	AG-L1086006IST	AG-L1091294CPA		Forest, Aquatic	
Cole Baumeister	AG-L1086040IST	AG-L1090395CPA		Forest	
James Gorsline	AG-L1089294IST	AG-L1091219CPA		Forest	
Madison Ferrell	AG-L1089504IST				
Nik Cooke	AG-L1089280IST	AG-L1091296CPA		Forest	
Tennyson Schill	AG-L1087682IST				
Project Staff					
Aaron Fry		AG-L1087974CPA	108962	Forest, Aquatic	
Addison Dillon		AG-L1083125CPA	104418	Forest, Aquatic	
Aissa Bennett		AG-L1076653CPA	103167	Forest, Aquatic, ROW	
Camille Oster		AG-L1088169CPA	108961	Forest, Aquatic	
Coleman Krohn		AG-L1079092CPA	105150	Forest, Aquatic, ROW	
Ian Christie		AG-L1050813CPA	102752	Forest, Aquatic, ROW	
Isabella Lopez-Dion		AG-L1083844CPA		Forest	
Jill Tamborello		AG-L1084134CPA	107997	Forest, Aquatic	
Kobe Rossi		AG-L1084397CPA	107826	Forest, Aquatic, ROW	
Kyle Peterson		AG-L1077904CPA	104877	Forest, Aquatic, ROW	
Lauren Smith		AG-L1081083CPA	106759	Forest, Aquatic, ROW	
Nick Lewis	AG-L1045857IST				
Owen Phinney	AG-L1059333IST				
Rio Hybert-Zack		AG-L1069212CPA		Agriculture, Herbicide	

Trevor Burrows		AG-L1084398CPA	107824	Forest, Aquatic, ROW	
Trainers					
Bryant Young		AG-L1046535CPA		Forest	
Emily Martin	AG-L1061041IST				
Elise Snortum		AG-L1087294CPA		Forest	
Erik Saastamo		AG-L1083719CPA	107935	Forest, Aquatic	
Evan Stewart		AG-L1073266CPA		Forest	
Kenzie Lovelace		AG-L1076427CPA	103061	Forest, Aquatic	
Mallory Mitsui		AG-L1087975CPA		Forest, Aquatic	
Mark Dickison	AG-L1079023IST				
Nick Crosby		AG-L1083823CPA		Forest	
Support Staff					
Brad Burke	AG-L1052766IST	AG-L1071184CPA		Forest	
Brendan Collins	AG-L1089866IST				
David Chiang	AG-L1054240IST				
Morgan Seitzer	AG-L1087550IST				
Rachel Woodcock	AG-L1091149IST				
Samuel Wright	AG-L1091099IST				
Vaughn Monaghan		AG-L1071976CPA		Forest	
Zach Vande Slunt	AG-L1055689IST		100807		

PROJECT: Rinearson Spray	CATEGORY		TREATMENT TYPE		
CLIENT: Columbia Restoration Group	Forestry	Aquatic	Site Prep	Establishment	Stewardship
ADDRESS: 45.377722, -122.611083					
DATE: 5/1/2024					
TIME IN: 7:30 AM					
TIME OUT: 3:00 PM				TOTAL ACRES:	0.01

Prescription (oz/ac or v/v%)		Targets	Equipment & Method	Acres
A.	50% Garlon3A, 0.5% Hi-Light	Empress Tree, Tree of Heaven	Spray Bottle, Cut-stump	0.01
B.			Backpack, Spot Spray	
C.			Backpack, Spot Spray	
D.			Backpack, Spot Spray	

HERBICIDE INVENTORY

Glyphosate	Herbicide Amount (oz)	Water (gal or oz)	Purchased by:
Rodeo EPA Reg #62719-324			
AquaNeat EPA Reg #228-365			
Triclopyr			
Vastlan EPA Reg #62719-687			
Garlon 3A EPA Reg #62719-37	0.5	0.5oz	ACFM
Other Herbicides			
Transline EPA Reg #62719-259			
Imazapyr 4 SL EPA Reg# 81927-24			
Milestone EPA Reg #62719-519			
Poast EPA Reg #7969-58			
Surfactants/ Adjuvants			
Competitor			
Class Act			
Hasten			
Colorant			
Hi-Light Blue dye		0.5oz	ACFM

WEATHER CONDITIONS

Time	Conditions	Relative Humidity (%)	Temperature (°F)	Wind Speed - High (mph)	Wind Speed - Low (mph)	Wind Direction
8:00 AM	Partially Cloudy	87%	45	3	0	SW
9:00 AM	Partially Cloudy	77%	49	3	0	SW
10:00 AM	Partially Cloudy	70%	50	5	0	SW

CERTIFIED LICENSED APPLICATOR:	CERTIFIED LICENSED APPLICATOR NO.:
Conrad Nielsen	AG-L1090159CPA

Rinearson Spray		5/1/2024			
Applicators	**Applicator IST #**	**CPA License #**	**Washington CPO**	**Categories**	**On Site ONLY?**
Hit Team 1					
Annalise Meyer	AG-L1088117IST				
Bethany Erdman	AG-L1086748IST				
Edward Benkhin	AG-L1086713IST	AG-L1090990CPA		Forest	
Ellie Winter		AG-L1089281CPA		Forest	
Michael Briggs	AG-L1086597IST	AG-L1088557CPA		Aquatic	
Preston Massingham		AG-L1083967CPA		Forest	
Samantha Marcotte	AG-L1083359IST	AG-L1087215CPA		Forest, Aquatic	
Hit Team 2					
Alex Maitland	AG-L1086710IST	AG-L1091293CPA		Forest	
Conrad Nielsen	AG-L1088672IST	AG-L1090159CPA		Forest	
Eugene Dixon	AG-L1088780IST				
Fiona O'Loughlin		AG-L1088824CPA	108959	Forest, Aquatic	
Kevin Reed	AG-L1089119IST	AG-L1090974CPA		Forest	
Thomas Hauser	AG-L1086596IST	AG-L1090660CPA		Forest	
Hit Team 3					
Emily Stewart		AG-L1087914CPA		Forest	
Scott Smethurst		AG-L1089565CPA		Forest	
Val Mitsui	AG-L1085741IST	AG-L1090835CPA		Forest	
Hit Team 4					
Chloe Paschke	AG-L1090536IST				
Cody Barker	AG-L1033206IST				
Isaac Gandee	AG-L1090354IST				
Jack Delaney	AG-L1086968IST	AG-L1090976CPA		Forest	
Olivia Ray	AG-L1090353IST				
Tomasz Cunha	AG-L1086595IST	AG-L1090973CPA		Forest	
Hit Team 5					
Mathew Lipski	AG-L1087020IST	AG-L1089060CPA		Aquatic	
Spencer Page		AG-L1084646CPA		Forest, Aquatic	
Tyler Csolkovits		AG-L1088042CPA		Forest	
Hit Team 6					
Audrey Brickey	AG-L1088335IST				
Gryston Fonseca		AG-L1099598CPA		Forest, Aquatic	
Matthew DeCosta	AG-L1087195IST				
Tyler Nagel	AG-L1087322IST				
Willow Venablerose	AG-L1088420IST	AG-L1090365CPA		Forest	
Hit Team 7					
Catherine Luecht	AG-L1086006IST	AG-L1091294CPA		Forest, Aquatic	
Cole Baumeister	AG-L1086040IST	AG-L1090395CPA		Forest	
James Gorsline	AG-L1089294IST	AG-L1091219CPA		Forest	
Madison Ferrell	AG-L1089504IST				
Nik Cooke	AG-L1089280IST	AG-L1091296CPA		Forest	
Tennyson Schill	AG-L1087682IST				
Project Staff					
Aaron Fry		AG-L1087974CPA	108962	Forest, Aquatic	
Addison Dillon		AG-L1083125CPA	104418	Forest, Aquatic	
Aissa Bennett		AG-L1076653CPA	103167	Forest, Aquatic, ROW	
Camille Oster		AG-L1088169CPA	108961	Forest, Aquatic	
Coleman Krohn		AG-L1079092CPA	105150	Forest, Aquatic, ROW	
Ian Christie		AG-L1050813CPA	102752	Forest, Aquatic, ROW	
Isabella Lopez-Dion		AG-L1083844CPA		Forest	
Jill Tamborello		AG-L1084134CPA	107997	Forest, Aquatic	
Kobe Rossi		AG-L1084397CPA	107826	Forest, Aquatic, ROW	
Kyle Peterson		AG-L1077904CPA	104877	Forest, Aquatic, ROW	
Lauren Smith		AG-L1081083CPA	106759	Forest, Aquatic, ROW	
Nick Lewis	AG-L1045857IST				
Owen Phinney	AG-L1059333IST				
Rio Hybert-Zack		AG-L1069212CPA		Agriculture, Herbicide	

Trevor Burrows		AG-L1084398CPA	107824	Forest, Aquatic, ROW	
Trainers					
Bryant Young		AG-L1046535CPA		Forest	
Emily Martin	AG-L1061041IST				
Elise Snortum		AG-L1087294CPA		Forest	
Erik Saastamo		AG-L1083719CPA	107935	Forest, Aquatic	
Evan Stewart		AG-L1073266CPA		Forest	
Kenzie Lovelace		AG-L1076427CPA	103061	Forest, Aquatic	
Mallory Mitsui		AG-L1087975CPA		Forest, Aquatic	
Mark Dickison	AG-L1079023IST				
Nick Crosby		AG-L1083823CPA		Forest	

PROJECT: Rinearson Spray	CATEGORY		TREATMENT TYPE		
CLIENT: Columbia Restoration Group	Forestry	Aquatic	Site Prep	Establishment	Stewardship
ADDRESS: 45.377722, -122.611083					
DATE: 5/1/2024					
TIME IN: 7:30 AM					
TIME OUT: 3:00 PM				TOTAL ACRES:	3.68

Prescription (oz/ac or v/v%)		Targets	Equipment & Method	Acres
A.	2% Garlon, 2% Aquaneat, 1% Competitor, 0.5% Hi-Light	Reed canary	Backpack, Spot Spray	3.26
B.	2% Aquaneat, 1%competitor, 0.5% Hilite	Teasel, tansy, thistle, blackberry, nightshade	Backpack, Spot Spray	7.49
C.	4% Aquaneat, 2% competitor, 0.5% Hilite	Yellow flag iris	Backpack, Spot Spray	2.65
D.	2% Garlon, 4% Aquaneat, 1% Competitor, 0.5% Hi-Light	English Ivy	Backpack, Spot Spray	0.42

HERBICIDE INVENTORY

Glyphosate	Herbicide Amount (oz)	Water (gal or oz)	Purchased by:
Rodeo EPA Reg #62719-324			
AquaNeat EPA Reg #228-365	232	75	ACFM
Triclopyr			
Vastlan EPA Reg #62719-687			
Garlon 3A EPA Reg #62719-37	128	48	ACFM
Other Herbicides			
Transline EPA Reg #62719-259			
Imazapyr 4 SL EPA Reg# 81927-24			
Milestone EPA Reg #62719-519			
Poast EPA Reg #7969-58			
Surfactants/ Adjuvants			
Competitor	158	75	ACFM
Class Act			
Hasten			
Colorant			
Hi-Light Blue dye	50	75	ACFM

WEATHER CONDITIONS

Time	Conditions	Relative Humidity (%)	Temperature (°F)	Wind Speed - High (mph)	Wind Speed - Low (mph)	Wind Direction
8:00 AM	Partially Cloudy	87%	45	3	0	SW
9:00 AM	Partially Cloudy	77%	49	3	0	SW
10:00 AM	Partially Cloudy	70%	50	5	0	SW

CERTIFIED LICENSED APPLICATOR:	CERTIFIED LICENSED APPLICATOR NO.:
Thomas Hauser	AG-L1090660CPA

Rinearson		7/1/2024			
Applicators	**Applicator IST #**	**CPA License #**	**Washington CPO**	**Categories**	**On Site ONLY?**
Hit Team 1					
Annalise Meyer	AG-L1088117IST	AG-L1092402CPA		Forest	
Edward Benkhin	AG-L1086713IST	AG-L1090990CPA		Forest	
Ellie Winter		AG-L1089281CPA		Forest, ROW	
Michael Briggs	AG-L1086597IST	AG-L1088557CPA	109547	Forest, Aquatic	
Preston Massingham		AG-L1083967CPA		Forest	
Samantha Marcotte	AG-L1083359IST	AG-L1087215CPA	109640	Forest, Aquatic	
Hit Team 2					
Alex Maitland	AG-L1086710IST	AG-L1091293CPA		Forest	
Ethan Yarish	AG-L1087487IST				
Eugene Dixon	AG-L1088780IST				
Fiona O'Loughlin		AG-L1088824CPA	108959	Forest, Aquatic	
Kevin Reed	AG-L1089119IST	AG-L1090974CPA		Forest	
Thomas Hauser	AG-L1086596IST	AG-L1090660CPA		Forest	
Hit Team 3					
Emily Stewart		AG-L1087914CPA		Forest	
Scott Smethurst		AG-L1089565CPA		Forest	
Val Mitsui	AG-L1085741IST	AG-L1090835CPA		Forest	
Hit Team 4					
Chloe Paschke	AG-L1090536IST				
Cody Barker	AG-L1033206IST	AG-L1036513CPA		Forest	
Isaac Gandee	AG-L1090354IST	AG-L1092316CPA		Forest	
Jack Delaney	AG-L1086968IST	AG-L1090976CPA		Forest	
Olivia Ray	AG-L1090353IST	AG-L1091746CPA		Forest	
Tomasz Cunha	AG-L1086595IST	AG-L1090973CPA		Forest	
Hit Team 5					
Mathew Lipski	AG-L1087020IST	AG-L1089060CPA		Aquatic	
Morgan Seitzer	AG-L1087550IST				
Rachel Woodcock	AG-L1091149IST				
Spencer Page		AG-L1084646CPA	109310	Forest, Aquatic, ROW	
Tyler Csolkovits		AG-L1088042CPA		Forest	
Hit Team 6					
Audrey Brickey	AG-L1088335IST	AG-L1091782CPA		Forest	
Gryston Fonseca		AG-L1099598CPA	109549	Forest, Aquatic, ROW	
Matthew DeCosta	AG-L1087195IST	AG-L1091783CPA		Forest	
Tyler Nagel	AG-L1087322IST	AG-L1091784CPA		Forest	
Willow Venablerose	AG-L1088420IST	AG-L1090365CPA		Forest, ROW	
Hit Team 7					
Catherine Luecht	AG-L1086006IST	AG-L1091294CPA	109388	Forest, Aquatic	
James Gorsline	AG-L1089294IST	AG-L1091219CPA		Forest	
Nik Cooke	AG-L1089280IST	AG-L1091296CPA		Forest	
Project Staff					
Aaron Fry		AG-L1087974CPA	108962	Forest, Aquatic, ROW	
Addison Dillon		AG-L1083125CPA	104418	Forest, Aquatic	
Aissa Bennett		AG-L1076653CPA	103167	Forest, Aquatic, ROW	
Camille Oster		AG-L1088169CPA	108961	Forest, Aquatic, ROW	
Coleman Krohn		AG-L1079092CPA	105150	Forest, Aquatic, ROW	
Ian Christie		AG-L1050813CPA	102752	Forest, Aquatic, ROW	
Isabella Lopez-Dion		AG-L1083844CPA		Forest, ROW	
Jill Tamborello		AG-L1084134CPA	107997	Forest, Aquatic	
Kobe Rossi		AG-L1084397CPA	107826	Forest, Aquatic, ROW	
Kyle Peterson		AG-L1077904CPA	104877	Forest, Aquatic, ROW	
Lauren Smith		AG-L1081083CPA	106759	Forest, Aquatic, ROW	
Nick Lewis	AG-L1045857IST				
Owen Phinney	AG-L1059333IST				

Trevor Burrows		AG-L1084398CPA	107824	Forest, Aquatic, ROW	
Trainers					
Bryant Young		AG-L1046535CPA		Forest	
Emily Martin	AG-L1061041IST				
Elise Snortum		AG-L1087294CPA		Forest	
Erik Saastamo		AG-L1083719CPA	107935	Forest, Aquatic	
Evan Stewart		AG-L1073266CPA		Forest	
Kenzie Lovelace		AG-L1076427CPA	103061	Forest, Aquatic	
Mallory Mitsui		AG-L1087975CPA		Forest, Aquatic	
Mark Dickison	AG-L1079023IST				
Nick Crosby		AG-L1083823CPA		Forest	

PROJECT: Rinearson	CATEGORY		TREATMENT TYPE		
CLIENT: Columbia Restoration Group	Forestry	Aquatic	Site Prep	Establishment	Stewardship
ADDRESS: 45.380558, -122.615179					
DATE: 7/1/2024					
TIME IN: 7:00 AM					
TIME OUT: 2:30 PM				TOTAL ACRES:	5.48

	Prescription (oz/ac or v/v%)	Targets	Equipment & Method	Acres
A.	4% aquaneat, 2% Competitor, .5% Hilite	Yellow flag iris	Backpack, Spot Spray	2.43
B.	1.5% vastlan, 1% competitor, .5% Hilite	Thistle, Teasle, tansy, blackberry, penny royal	Backpack, Spot Spray	1.37
C.	1.5% vastlan, 2% aquaneat, 1% competitor, .5% Hilite	Thistle, Teasle, tansy, pennyroyal, blackberry, reed canary grass.	Backpack, Spot Spray	1.68
D.				

HERBICIDE INVENTORY

Glyphosate	Herbicide Amount (oz)	Water (gal or oz)	Purchased by:
Rodeo EPA Reg #62719-324			
AquaNeat EPA Reg #228-365	46	13.5 gal	ACFM
Triclopyr			
Vastlan EPA Reg #62719-687	16.5	16.5 gal	ACFM
Garlon 3A EPA Reg #62719-37			
Other Herbicides			
Transline EPA Reg #62719-259			
Imazapyr 4 SL EPA Reg# 81927-24			
Milestone EPA Reg #62719-519			
Poast EPA Reg #7969-58			
Surfactants/ Adjuvants			
Competitor	14	19.5 gal	ACFM
Class Act			
Hasten			
Colorant			
Hi-Light Blue dye	13.5	19.5 gal	ACFM

WEATHER CONDITIONS

Time	Conditions	Relative Humidity (%)	Temperature (°F)	Wind Speed - High (mph)	Wind Speed - Low (mph)	Wind Direction
8:00 AM	Partially Cloudy	78	64	4	0	NNW
10:00 AM	Partially Cloudy	61	71	4	0	NNW
1:00 PM	Partially Cloudy	45	77	3	0	W

CERTIFIED LICENSED APPLICATOR:	CERTIFIED LICENSED APPLICATOR NO.:
Thomas Hauser	AG-L1090660CPA

Rinearson		9/10/2024			
Applicators	**Applicator IST #**	**CPA License #**	**Washington CPO**	**Categories**	**On Site ONLY?**
Hit Team 1					
Edward Benkhin	AG-L1086713IST	AG-L1090990CPA		Forest	
Ellie Winter		AG-L1089281CPA		Forest, ROW	
Samantha Marcotte	AG-L1083359IST	AG-L1087215CPA	109640	Forest, Aquatic	
Hit Team 2					
Alex Maitland	AG-L1086710IST	AG-L1091293CPA		Forest	
Eugene Dixon	AG-L1088780IST	AG-L1092765CPA		Forest	
Jamie O'Loughlin		AG-L1088824CPA	108959	Forest, Aquatic	
Michael Briggs	AG-L1086597IST	AG-L1088557CPA	109547	Forest, Aquatic, ROW	
Thomas Hauser	AG-L1086596IST	AG-L1090660CPA		Forest	
Hit Team 3					
Emily Stewart		AG-L1087914CPA	110027	Forest, Aquatic	
Gillian Williford	AG-L1092698IST				
Katarina Wulf	AG-L1091703IST	AG-L1093229CPA		Forest	
Scott Smethurst		AG-L1089565CPA		Forest, Aquatic	
Val Mitsui	AG-L1085741IST	AG-L1090835CPA		Forest	
Hit Team 4					
Chloe Paschke	AG-L1090536IST	AG-L1093190CPA		Forest	
Cody Barker	AG-L1033206IST	AG-L1036513CPA		Forest	
Isaac Gandee	AG-L1090354IST	AG-L1092316CPA		Forest	
Jack Delaney	AG-L1086968IST	AG-L1090976CPA		Forest	
Olivia Ray	AG-L1090353IST	AG-L1091746CPA		Forest	
Tomasz Cunha	AG-L1086595IST	AG-L1090973CPA		Forest	
Hit Team 5					
Adelaide Sadler	AG-L1091505IST	AG-L1093643CPA		Forest	
Mathew Lipski	AG-L1087020IST	AG-L1089060CPA	109874	Forest, Aquatic	
Morgan Seitzer	AG-L1087550IST	AG-L1092199CPA		Forest	
Rachel Woodcock	AG-L1091149IST	AG-L1093191CPA		Forest	
Spencer Page		AG-L1084646CPA	109310	Forest, Aquatic, ROW	
Hit Team 6					
Audrey Brickey	AG-L1088335IST	AG-L1091782CPA		Forest	
Gryston Fonseca		AG-L1099598CPA	109549	Forest, Aquatic, ROW	
Matthew DeCosta	AG-L1087195IST	AG-L1091783CPA		Forest	
Tyler Nagel	AG-L1087322IST	AG-L1091784CPA		Forest	
Willow Venablerose	AG-L1088420IST	AG-L1090365CPA		Forest, ROW	
Hit Team 7					
Catherine Luecht	AG-L1086006IST	AG-L1091294CPA	109388	Forest, Aquatic, ROW	
James Gorsline	AG-L1089294IST	AG-L1091219CPA		Forest	
Kanyakorn Waree	AG-L1092161IST	AG-L1093973CPA		Forest	
Nik Cooke	AG-L1089280IST	AG-L1091296CPA		Forest	
Project Staff					
Aaron Fry		AG-L1087974CPA	108962	Forest, Aquatic, ROW	
Addison Dillon		AG-L1083125CPA	104418	Forest, Aquatic	
Aissa Bennett		AG-L1076653CPA	103167	Forest, Aquatic, ROW	
Camille Oster		AG-L1088169CPA	108961	Forest, Aquatic, ROW	
Coleman Krohn		AG-L1079092CPA	105150	Forest, Aquatic, ROW	
Ian Christie		AG-L1050813CPA	102752	Forest, Aquatic, ROW	
Isabella Lopez-Dion		AG-L1083844CPA		Forest, ROW	
Jill Tamborello		AG-L1084134CPA	107997	Forest, Aquatic, ROW	
Kobe Rossi		AG-L1084397CPA	107826	Forest, Aquatic, ROW	
Kyle Peterson		AG-L1077904CPA	104877	Forest, Aquatic, ROW	
Lauren Smith		AG-L1081083CPA	106759	Forest, Aquatic, ROW	
Nick Lewis	AG-L1045857IST	AG-L1049790CPA		Forest	X
Trevor Burrows		AG-L1084398CPA	107824	Forest, Aquatic, ROW	
Trainers					
Bryant Young		AG-L1046535CPA		Forest	
Emily Martin	AG-L1061041IST	AG-L1064107CPA		Forest	
Elise Snortum		AG-L1087294CPA		Forest	

Erik Saastamo		AG-L1083719CPA	107935	Forest, Aquatic	
Evan Stewart		AG-L1073266CPA		Forest	
Kenzie Lovelace		AG-L1076427CPA	103061	Forest, Aquatic	
Mallory Mitsui		AG-L1087975CPA		Forest, Aquatic	
Mark Dickison	AG-L1079023IST				
Nick Crosby		AG-L1083823CPA		Forest	
Support Staff					
Aedan Burns	AG-L1093833IST				
Alex Clarke	AG-L1093281IST	AG-L1094138CPA		Forest	
Aspen Ashcraft	AG-L1093141IST				
Brad Burke	AG-L1052766IST	AG-L1071184CPA		Forest	
Chloe Robinson	AG-L1092914IST				
Claire Wolcott	AG-L1093281IST				
Grayson Lindsey	AG-L1093149IST				
Jacob Cox	AG-L1093146IST				
Jasyn McPherson	AG-L1093713IST				
Jessica Gonzalez	AG-L1093150IST				
Jonathan Davies	AG-L1093561IST				

PROJECT: Rinearson	CATEGORY		TREATMENT TYPE		
CLIENT: Columbia Restoration Group	Forestry	Aquatic	Site Prep	Establishment	Stewardship
ADDRESS: 45.377481, -122.611198					
DATE: 9/10/2024					
TIME IN: 7:30 AM					
TIME OUT: 3:00 PM				TOTAL ACRES:	4.32

Prescription (oz/ac or v/v%)		Targets	Equipment & Method	Acres
A.	1.5% Vastlan, 4% Aquaneat, 2% Competitor, 0.5% Hi-Light	English ivy, English Hawthorne, and English holly	Backpack, Spot Spray	3.84
B.	1.5% Vastlan, 2% Aquaneat, 1% Competitor, 0.5% Hi-Light	Himalayan blackberry, Teasel, Reed canary grass	Backpack, Spot Spray	0.82
C.	1% Imazapyr, 1% Competitor, 0.5% Hi-Light	Japanese Knotweed	Backpack, Spot Spray	0.11
D.	1.5% Vastlan, 4% Aquaneat, 1% Competitor, 0.5% Hi-Light	English ivy, English Hawthorne, and English holly	Backpack, Spot Spray	3.84

HERBICIDE INVENTORY

Glyphosate	Herbicide Amount (oz)	Water (gal or oz)	Purchased by:
Rodeo EPA Reg #62719-324			
AquaNeat EPA Reg #228-365	240 oz	60 gal	ACFM
Triclopyr			
Vastlan EPA Reg #62719-687	126 oz	60 gal	ACFM
Garlon 3A EPA Reg #62719-37			
Other Herbicides			
Transline EPA Reg #62719-259			
Imazapyr 4 SL EPA Reg# 81927-24	4 oz	3 gal	ACFM
Milestone EPA Reg #62719-519			
Poast EPA Reg #7969-58			
Surfactants/ Adjuvants			
Competitor	116 oz	63 gal	ACFM
Class Act			
Hasten			
Colorant			
Hi-Light Blue dye	42 oz	63 gal	ACFM

WEATHER CONDITIONS

Time	Conditions	Relative Humidity (%)	Temperature (°F)	Wind Speed - High (mph)	Wind Speed - Low (mph)	Wind Direction
7:30 AM	Partially Cloudy	90%	56	2	0	NE
10:30 AM	Partially Cloudy	63%	65	3	0	N
2:00 PM	Sunny	35%	78	3	0	WNW

CERTIFIED LICENSED APPLICATOR:	CERTIFIED LICENSED APPLICATOR NO.:
Ellie Winter	AG-L1089281CPA

Rinearson		9/9/2024			
Applicators	**Applicator IST #**	**CPA License #**	**Washington CPO**	**Categories**	**On Site ONLY?**
Hit Team 1					
Edward Benkhin	AG-L1086713IST	AG-L1090990CPA		Forest	
Ellie Winter		AG-L1089281CPA		Forest, ROW	
Samantha Marcotte	AG-L1083359IST	AG-L1087215CPA	109640	Forest, Aquatic	
Hit Team 2					
Alex Maitland	AG-L1086710IST	AG-L1091293CPA		Forest	
Eugene Dixon	AG-L1088780IST	AG-L1092765CPA		Forest	
Jamie O'Loughlin		AG-L1088824CPA	108959	Forest, Aquatic	
Michael Briggs	AG-L1086597IST	AG-L1088557CPA	109547	Forest, Aquatic, ROW	
Thomas Hauser	AG-L1086596IST	AG-L1090660CPA		Forest	
Hit Team 3					
Emily Stewart		AG-L1087914CPA	110027	Forest, Aquatic	
Gillian Williford	AG-L1092698IST				
Katarina Wulf	AG-L1091703IST	AG-L1093229CPA		Forest	
Scott Smethurst		AG-L1089565CPA		Forest, Aquatic	
Val Mitsui	AG-L1085741IST	AG-L1090835CPA		Forest	
Hit Team 4					
Chloe Paschke	AG-L1090536IST	AG-L1093190CPA		Forest	
Cody Barker	AG-L1033206IST	AG-L1036513CPA		Forest	
Isaac Gandee	AG-L1090354IST	AG-L1092316CPA		Forest	
Jack Delaney	AG-L1086968IST	AG-L1090976CPA		Forest	
Olivia Ray	AG-L1090353IST	AG-L1091746CPA		Forest	
Tomasz Cunha	AG-L1086595IST	AG-L1090973CPA		Forest	
Hit Team 5					
Adelaide Sadler	AG-L1091505IST	AG-L1093643CPA		Forest	
Mathew Lipski	AG-L1087020IST	AG-L1089060CPA	109874	Forest, Aquatic	
Morgan Seitzer	AG-L1087550IST	AG-L1092199CPA		Forest	
Rachel Woodcock	AG-L1091149IST	AG-L1093191CPA		Forest	
Spencer Page		AG-L1084646CPA	109310	Forest, Aquatic, ROW	
Hit Team 6					
Audrey Brickey	AG-L1088335IST	AG-L1091782CPA		Forest	
Gryston Fonseca		AG-L1099598CPA	109549	Forest, Aquatic, ROW	
Matthew DeCosta	AG-L1087195IST	AG-L1091783CPA		Forest	
Tyler Nagel	AG-L1087322IST	AG-L1091784CPA		Forest	
Willow Venablerose	AG-L1088420IST	AG-L1090365CPA		Forest, ROW	
Hit Team 7					
Catherine Luecht	AG-L1086006IST	AG-L1091294CPA	109388	Forest, Aquatic, ROW	
James Gorsline	AG-L1089294IST	AG-L1091219CPA		Forest	
Kanyakorn Waree	AG-L1092161IST	AG-L1093973CPA		Forest	
Nik Cooke	AG-L1089280IST	AG-L1091296CPA		Forest	
Project Staff					
Aaron Fry		AG-L1087974CPA	108962	Forest, Aquatic, ROW	
Addison Dillon		AG-L1083125CPA	104418	Forest, Aquatic	
Aissa Bennett		AG-L1076653CPA	103167	Forest, Aquatic, ROW	
Camille Oster		AG-L1088169CPA	108961	Forest, Aquatic, ROW	
Coleman Krohn		AG-L1079092CPA	105150	Forest, Aquatic, ROW	
Ian Christie		AG-L1050813CPA	102752	Forest, Aquatic, ROW	
Isabella Lopez-Dion		AG-L1083844CPA		Forest, ROW	
Jill Tamborello		AG-L1084134CPA	107997	Forest, Aquatic, ROW	
Kobe Rossi		AG-L1084397CPA	107826	Forest, Aquatic, ROW	
Kyle Peterson		AG-L1077904CPA	104877	Forest, Aquatic, ROW	
Lauren Smith		AG-L1081083CPA	106759	Forest, Aquatic, ROW	
Nick Lewis	AG-L1045857IST	AG-L1049790CPA		Forest	X
Trevor Burrows		AG-L1084398CPA	107824	Forest, Aquatic, ROW	
Trainers					
Bryant Young		AG-L1046535CPA		Forest	
Emily Martin	AG-L1061041IST	AG-L1064107CPA		Forest	
Elise Snortum		AG-L1087294CPA		Forest	

Erik Saastamo		AG-L1083719CPA	107935	Forest, Aquatic	
Evan Stewart		AG-L1073266CPA		Forest	
Kenzie Lovelace		AG-L1076427CPA	103061	Forest, Aquatic	
Mallory Mitsui		AG-L1087975CPA		Forest, Aquatic	
Mark Dickison	AG-L1079023IST				
Nick Crosby		AG-L1083823CPA		Forest	X
Support Staff					
Aedan Burns	AG-L1093833IST				
Alex Clarke	AG-L1093281IST	AG-L1094138CPA		Forest	
Aspen Ashcraft	AG-L1093141IST				
Brad Burke	AG-L1052766IST	AG-L1071184CPA		Forest	
Chloe Robinson	AG-L1092914IST				
Claire Wolcott	AG-L1093281IST				
Grayson Lindsey	AG-L1093149IST				
Jacob Cox	AG-L1093146IST				
Jasyn McPherson	AG-L1093713IST				
Jessica Gonzalez	AG-L1093150IST				
Jonathan Davies	AG-L1093561IST				
Kristina Schmidt	AG-L1092915IST				
Mattison Perry	AG-L1093031IST				
Ruslan Bryan	AG-L1093140IST				
Ryan Sciarabba	AG-L1093281IST	AG-L1094005CPA		Forest	
Vaughn Monaghan		AG-L1071976CPA		Forest	
Zach Vande Slunt	AG-L1055689IST		100807		

PROJECT: Rinearson	CATEGORY		TREATMENT TYPE		
CLIENT: Columbia Restoration Group	Forestry	Aquatic	Site Prep	Establishment	Stewardship
ADDRESS: (45.3805232, -122.6151380)					
DATE: 9/9/2024					
TIME IN: 7:30 AM					
TIME OUT: 3:00 PM				TOTAL ACRES:	1.91

	Prescription (oz/ac or v/v%)	Targets	Equipment & Method	Acres
A.	2% aquaneat, 2% garlan, 1% comp, 0.5% hi-light	Himalayan blackberry, Mullen, butterfly bush, teasel, Canada thistle, tansey, reed canary grass	Backpack, Spot Spray	1.91
B.	2% aquaneat, 1.5 % vastlan, 1% comp, 0.5% hi-light	Himalayan blackberry, Mullen, butterfly bush, teasel, canada thistle, tansey, reed canary grass	Backpack, Spot Spray	1.91
C.	4% aquaneat, 1.5% vastlan, 1% comp, 0.5% hi-light	Ivy	Backpack, Spot Spray	1.09
D.				

HERBICIDE INVENTORY

Glyphosate	Herbicide Amount (oz)	Water (gal or oz)	Purchased by:
Rodeo EPA Reg #62719-324			
AquaNeat EPA Reg #228-365	108 oz	37.5 gal	ACFM
Triclopyr			
Vastlan EPA Reg #62719-687	69 oz		ACFM
Garlon 3A EPA Reg #62719-37	4 oz		ACFM
Other Herbicides			
Transline EPA Reg #62719-259			
Imazapyr 4 SL EPA Reg# 81927-24			
Milestone EPA Reg #62719-519			
Poast EPA Reg #7969-58			
Surfactants/ Adjuvants			
Competitor	50 oz		ACFM
Class Act			
Hasten			
Colorant			
Hi-Light Blue dye	25		ACFM

WEATHER CONDITIONS

Time	Conditions	Relative Humidity (%)	Temperature (°F)	Wind Speed - High (mph)	Wind Speed - Low (mph)	Wind Direction
8:00 AM	Cloudy	79%	62	4	2	N
12:00 PM	Partially Cloudy	57%	72	4	4	N
3:00 PM	Sunny	46%	81	7	7	N

CERTIFIED LICENSED APPLICATOR:	CERTIFIED LICENSED APPLICATOR NO.:
Edward Benkhin	AG-L1090990CPA

Rinearson		12/10/2024			
Applicators	**Applicator IST #**	**CPA License #**	**Washington CPO**	**Categories**	**On Site ONLY?**
Hit Team 1					
Edward Benkhin	AG-L1086713IST	AG-L1090990CPA		Forest	
Grayson Lindsey	AG-L1093149IST	AG-L1094310CPA		Forest	
Jacob Cox	AG-L1093146IST	AG-L1094440CPA		Forest	
Jasyn McPherson	AG-L1093713IST	AG-L1094566CPA		Forest	
Hit Team 2					
Alex Maitland	AG-L1086710IST	AG-L1091293CPA		Forest	
Michael Briggs	AG-L1086597IST	AG-L1088557CPA	109547	Forest, Aquatic, ROW	
Thomas Hauser	AG-L1086596IST	AG-L1090660CPA		Forest	
Hit Team 3					
Alex Clarke	AG-L1093281IST	AG-L1094138CPA		Forest	
Gillian Williford	AG-L1092698IST	AG-L1094311CPA		Forest	
Jessica Gonzalez	AG-L1093150IST	AG-L1094309CPA		Forest	
Katarina Wulf	AG-L1091703IST	AG-L1093229CPA		Forest	
Scott Smethurst		AG-L1089565CPA	110342	Forest, Aquatic	
Hit Team 4					
Isaac Gandee	AG-L1090354IST	AG-L1092316CPA		Forest	
Olivia Ray	AG-L1090353IST	AG-L1091746CPA		Forest	
Tomasz Cunha	AG-L1086595IST	AG-L1090973CPA		Forest	
Hit Team 5					
Adelaide Sadler	AG-L1091505IST	AG-L1093643CPA		Forest	
Morgan Seitzer	AG-L1087550IST	AG-L1092199CPA		Forest	
Rachel Woodcock	AG-L1091149IST	AG-L1093191CPA		Forest	
Spencer Page		AG-L1084646CPA	109310	Forest, Aquatic, ROW	
Hit Team 6					
Aedan Burns	AG-L1093833IST	AG-L1094751CPA		Forest	
Audrey Brickey	AG-L1088335IST	AG-L1091782CPA		Forest	
Gryston Fonseca		AG-L1099598CPA	109549	Forest, Aquatic, ROW	
Jonathan Davies	AG-L1093561IST	AG-L1094395CPA		Forest	
Willow Venablerose	AG-L1088420IST	AG-L1090365CPA		Forest, ROW	
Hit Team 7					
Catherine Luecht	AG-L1086006IST	AG-L1091294CPA	109388	Forest, Aquatic, ROW	
Claire Wolcott	AG-L1093281IST	AG-L1094658CPA		Forest	
James Gorsline	AG-L1089294IST	AG-L1091219CPA		Forest, Aquatic	
Kanyakorn Waree	AG-L1092161IST	AG-L1093973CPA		Forest	
Ryan Sciarabba	AG-L1093281IST	AG-L1094005CPA		Forest	
Project Staff					
Addison Dillon		AG-L1083125CPA	104418	Forest, Aquatic	
Brad Burke	AG-L1052766IST	AG-L1071184CPA		Forest	
Coleman Krohn		AG-L1079092CPA	105150	Forest, Aquatic, ROW	
Ian Christie		AG-L1050813CPA	102752	Forest, Aquatic, ROW	
Jack Delaney	AG-L1086968IST	AG-L1090976CPA		Forest	
Lauren Smith		AG-L1081083CPA	106759	Forest, Aquatic, ROW	
Mark Dickison	AG-L1079023IST				
Nick Lewis	AG-L1045857IST	AG-L1049790CPA		Forest	
Senior HRS/Floater					
Aaron Fry		AG-L1087974CPA	108962	Forest, Aquatic, ROW	
Aissa Bennett		AG-L1076653CPA	103167	Forest, Aquatic, ROW	
Bryant Young		AG-L1046535CPA		Forest	
Camille Oster		AG-L1088169CPA	108961	Forest, Aquatic, ROW	
Cody Barker	AG-L1033206IST	AG-L1036513CPA		Forest	
Emily Stewart		AG-L1087914CPA	110027	Forest, Aquatic	
Elise Snortum		AG-L1087294CPA		Forest	

PROJECT:	**Rinearson**	**CATEGORY**		**TREATMENT TYPE**		
CLIENT:	**Columbia restoration group**	**Forestry**	**Aquatic**	**Site Prep**	**Establishment**	**Stewardship**
ADDRESS:	**45.380599, -122.615154**					
DATE:	**12/10/2024**					
TIME IN:	**8:00 AM**					
TIME OUT:	**4:30 PM**				**TOTAL ACRES:**	**8.42**

	Prescription (oz/ac or v/v%)	**Targets**	**Vol Applied (gal)**	**Equipment & Method**	**Acres**
A.	2% Garlon, 2%Aquaneat, 1.5% competitor, 0.5% Hilight	HBB, TTT's, trefoil, holly sprouts, butterfly bush sprouts.	54	Backpack, Spot Spray	5.4
B.	2% Garlon, 2%Aquaneat, 1% competitor, 0.5% Hilight	HBB, TTT's, trefoil, holly sprouts, butterfly bush sprouts.	16.5	Backpack, Spot Spray	3.02
C.					
D.					

HERBICIDE INVENTORY

Glyphosate	**Herbicide Amount (oz)**	**Water (gal or oz)**	**Purchased by:**
Rodeo EPA Reg #62719-324			
AquaNeat EPA Reg #228-365	188	70.5	ACFM
Triclopyr			
Vastlan EPA Reg #62719-687			
Garlon 3A EPA Reg #62719-37	188	70.5	ACFM
Other Herbicides			
Transline EPA Reg #62719-259			
Imazapyr 4 SL EPA Reg# 81927-24			
Milestone EPA Reg #62719-519			
Poast EPA Reg #7969-58			
Surfactants/ Adjuvants			
Competitor	130	70.5	ACFM
Class Act			
Hasten			
Colorant			
Hi-Light Blue dye	47	70.5	ACFM

WEATHER CONDITIONS

Time	**Conditions**	**Relative Humidity (%)**	**Temperature (°F)**	**Wind Speed - High (mph)**	**Wind Speed - Low (mph)**	**Wind Direction**
8:00 AM	Cloudy	73	35	5		SE
12:00 PM	Overcast	80	40	5		SE
4:00 PM	Overcast	93	39	5		ESE

CERTIFIED LICENSED APPLICATOR:	**CERTIFIED LICENSED APPLICATOR NO.:**
Aissa Bennett	AG-L1076653CPA

PHOTO MONITORING DOCUMENTATION

PP1-C

Date: May 17, 2024





Date: June 21, 2024









Date: July 23, 2024






Date: August 23, 202







Date: September 27, 2024








PP2-C

Date: May 17, 2024







Date: June 21, 2024







Date: July 23, 2024







Date: August 23, 2024







Date: September 27, 2024



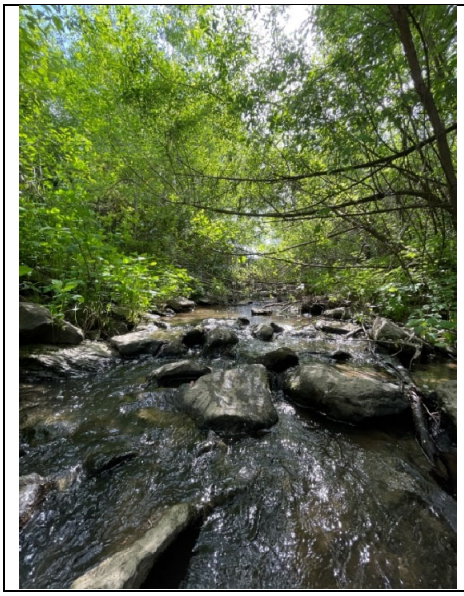




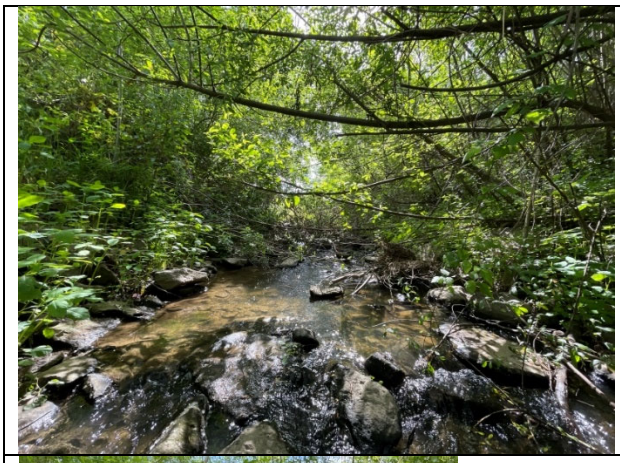


PP3-C

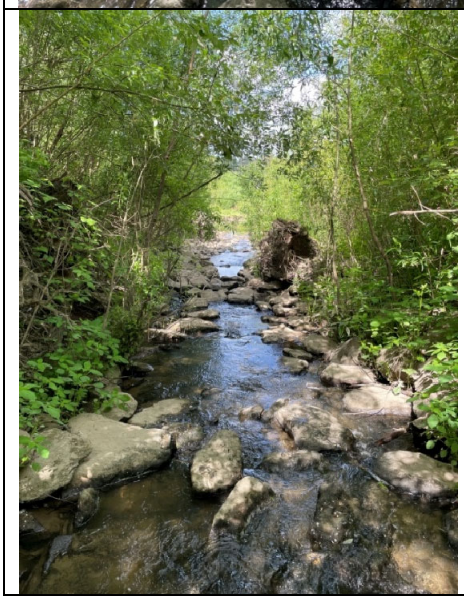
Date: May 17, 2024



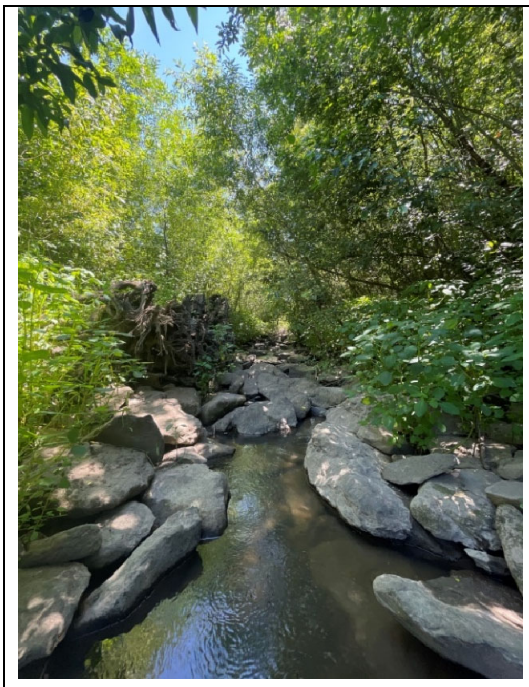








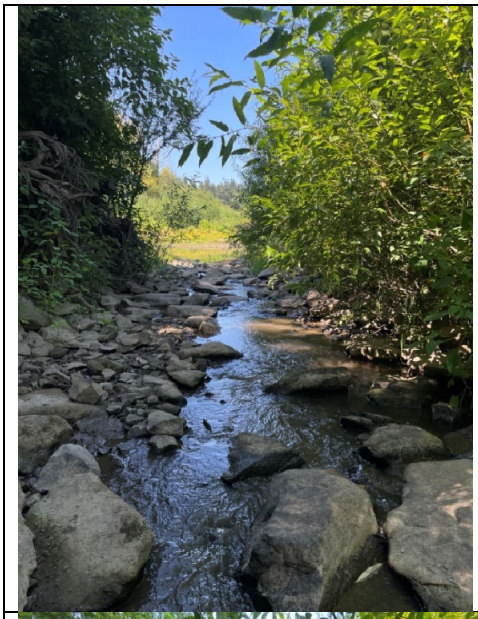
Date: June 21, 2024



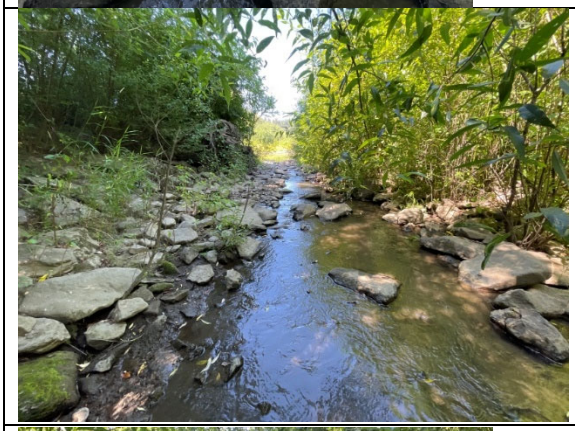


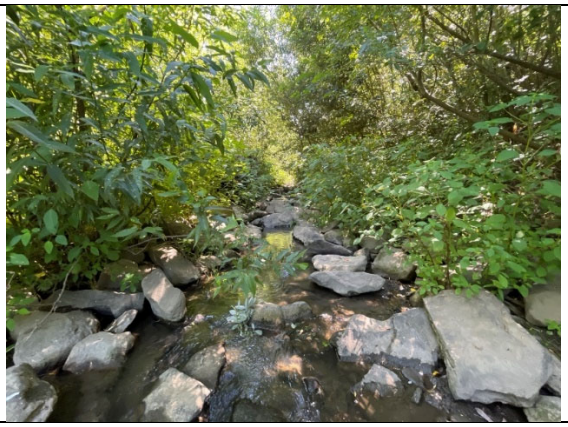


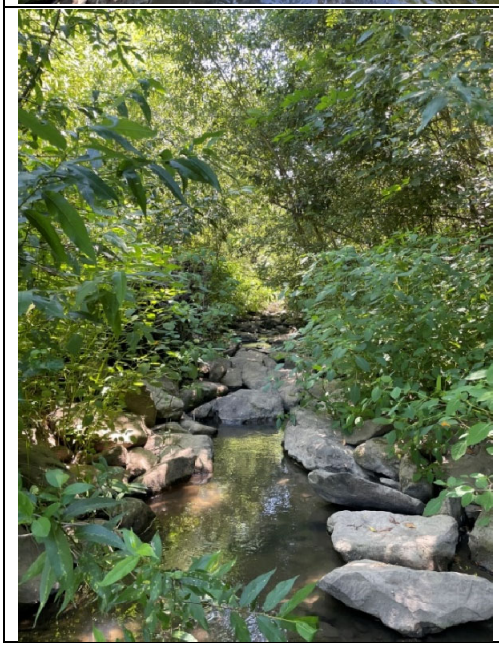
Date: July 23, 2024







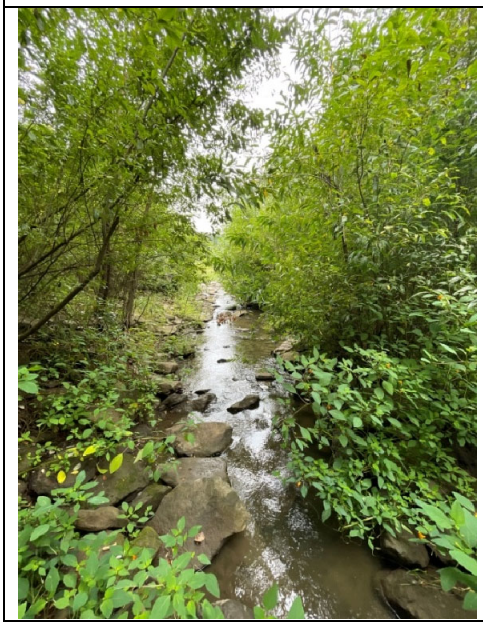




Date: August 23, 202



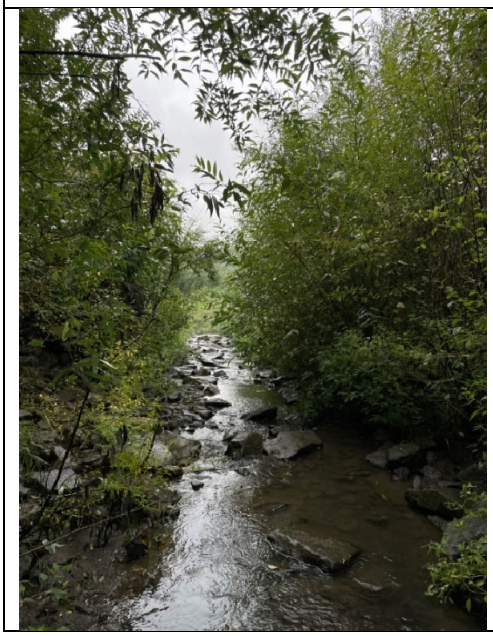


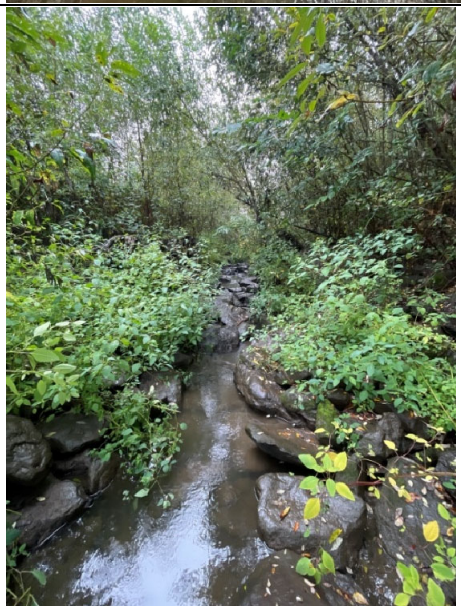


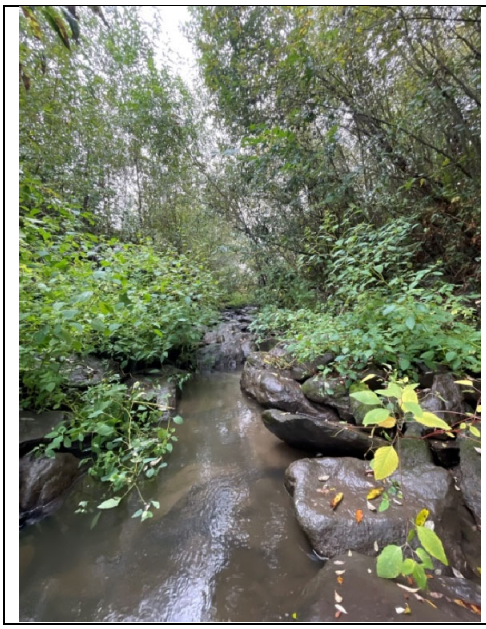
Date: September 27, 2024













PP4-C

Date: May 17, 2024









Date: June 21, 2024









Date: July 23, 2024







Date: August 23, 2024









Date: September 27, 2024






PP5-C

Date: May 17, 2024








Date: June 21, 2024





Date: July 23, 2024









Date: August 23, 2024









Date: September 27, 2024











PP6-C

Date: May 17, 2024







Date: June 21, 2024







Date: July 23, 2024







Date: August 23, 2024









Date: September 27, 2024









PP7-C

Date: May 17, 2024







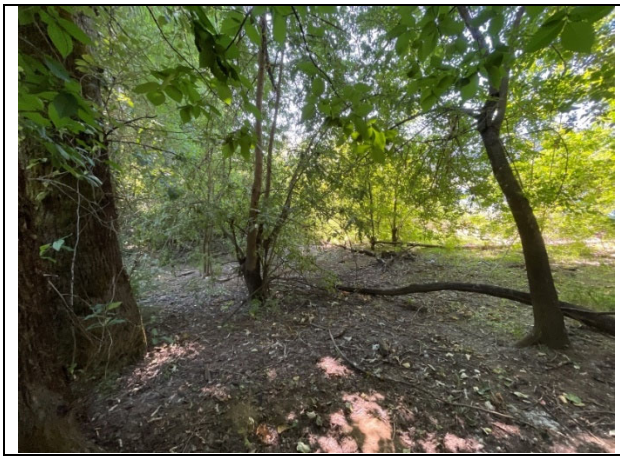
Date: June 21, 2024







Date: July 23, 2024







Date: August 23, 2024









Date: September 27, 2024






PP8-C

Date: May 17, 2024








Date: June 21, 2024







Date: July 23, 2024







Date: August 23, 2024







Date: September 27, 2024







PP9-C

Date: May 17, 2024







Date: June 21, 2024







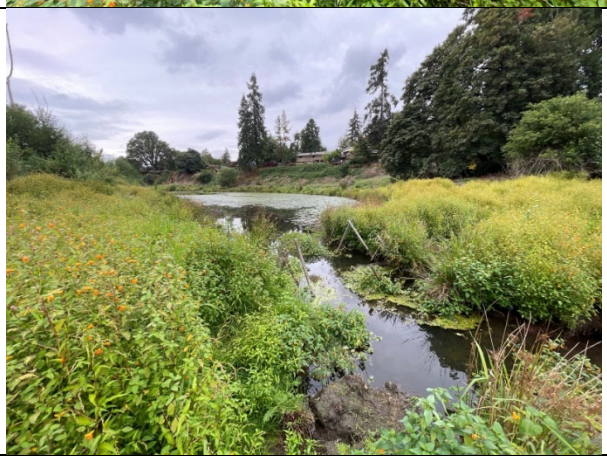


Date: August 23, 2024









Date: September 27, 2024











PP10-C

Date: May 17, 2024





Date: June 21, 2024





Date: July 23, 2024





Date: August 23, 2024







Date: September 27, 2024









PP11-C

Date: May 17, 2024



Date: June 21, 2024

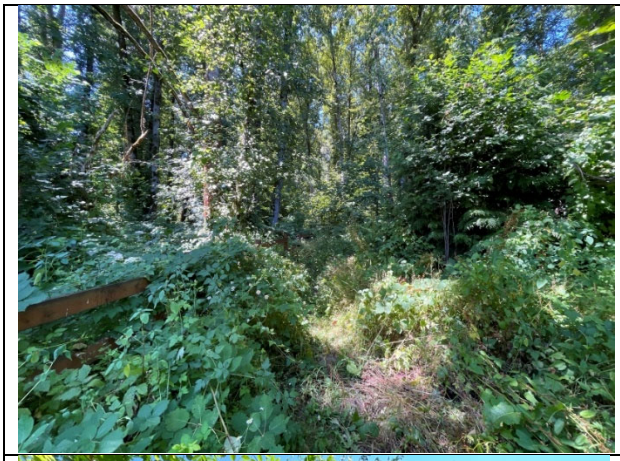




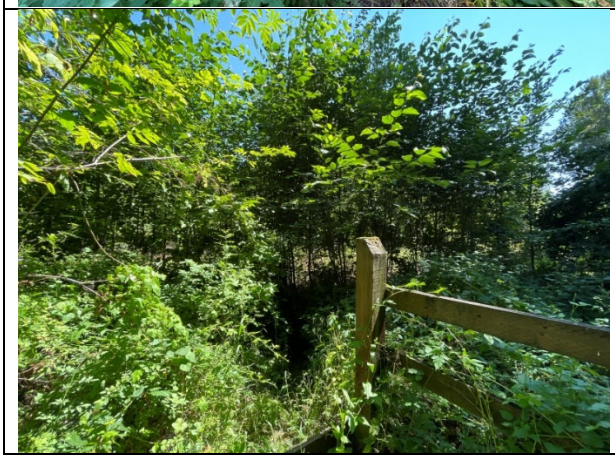




Date: July 23, 2024







Date: August 23, 2024







Date: September 27, 2024





PP12-C

Date: July 23, 2024





Date: September 27, 2024







PP13-C

Date: May 17, 2024





Date: June 21, 2024





Date: July 23, 2024



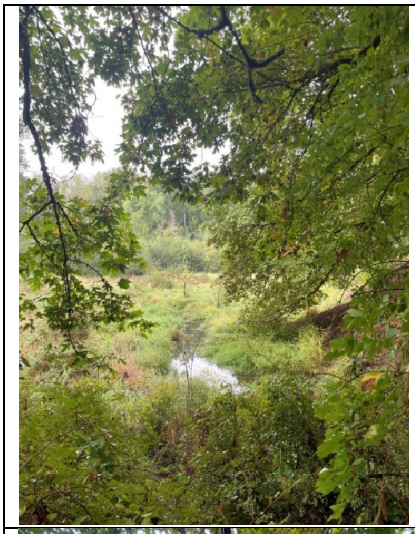


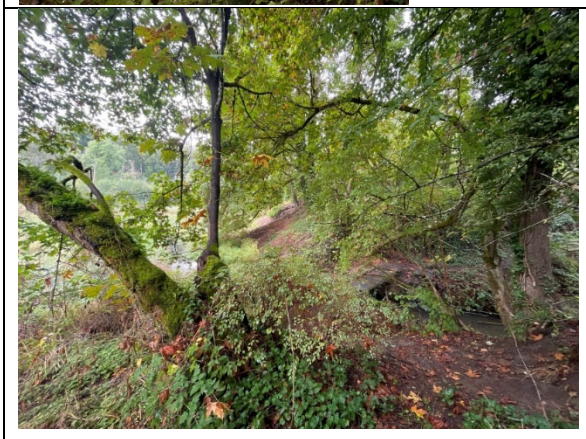
Date: August 23, 2024

Date: September 27, 2024









PP14-C

Date: May 17, 2024







Date: June 21, 2024



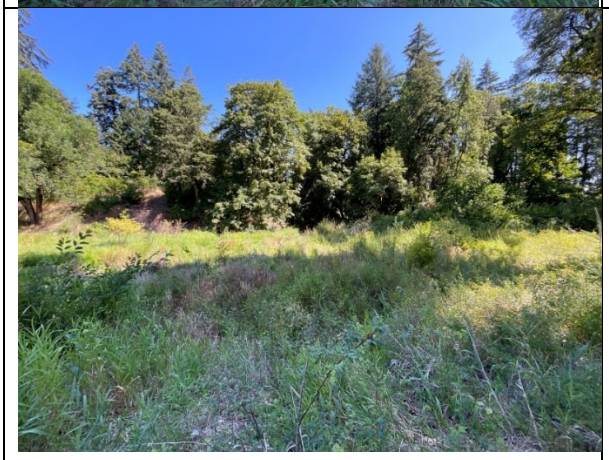




Date: July 23, 2024









Date: August 23, 2024









Date: September 27, 2024











PP15-C

Date: May 17, 2024







Date: June 21, 2024







Date: July 23, 2024









Date: August 23, 2024









Date: September 27, 2024











PP16-C

Date: May 17, 2024







Date: June 21, 2024





Date: July 23, 2024







Date: August 23, 2024





Date: September 27, 2024







PP17-320

Date: May 17, 2024







Date: June 21, 2024







Date: July 23, 2024







Date: August 23, 2024






Date: September 27, 2024








PP18

Date: May 17, 2024







Date: June 21, 2024







Date: July 23, 2024







Date: August 23, 2024









Date: September 27, 2024







PP19-260-90

Date: May 17, 2024







Date: June 21, 2024

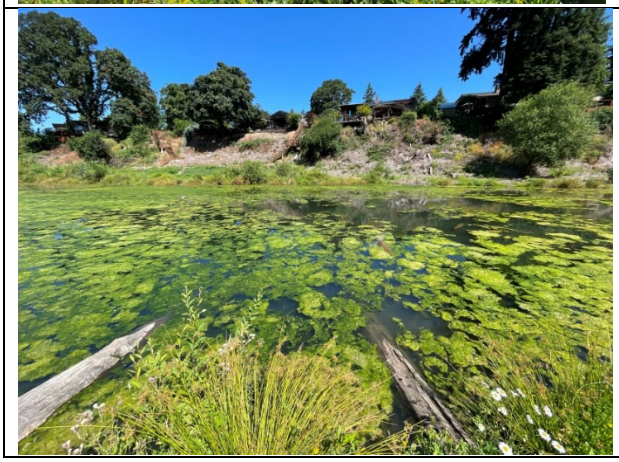






Date: July 23, 2024






Date: August 23, 2024






Date: September 27, 2024









PP20-131

Date: May 17, 2024









Date: July 23, 2024









Date: September 27, 2024











Rinearson 2024 Map



4/26/2024

Field Notes (Areas)

Marsh

RCG Treatment Area

Boundaries

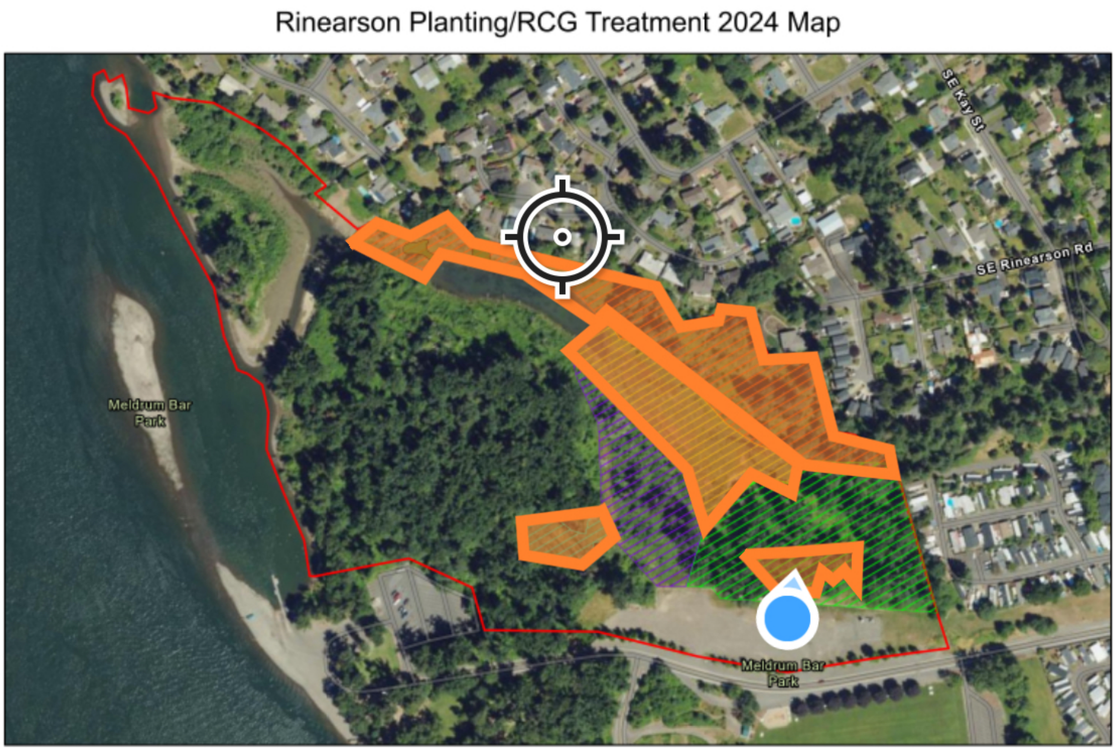
1:5,000

0 0.03 0.06 0.12 mi

0 0.05 0.1 0.19 km

Source: Esri, USDA FSA, Esri Community Maps Contributors, Oregon Metro, Oregon State Parks, State of Oregon GEO, © OpenStreetMap, Microsoft,

500 ft


Rinearson Planting/RCG Treatment 2024 Map
SE Kay St
SE Rinearson Rd
Meldrum Bar Park
Meldrum Bar Park
4/30/2024
Field Notes (Areas)
Other
Turtle Habitat
Field Notes (Areas)
Marsh
RCG Meadow
Northern Spray
SE Canopy
Boundaries
1:5,100
0 0.03 0.07 0.13 mi
0 0.05 0.1 0.2 km
Source: Esri, USDA FSA, Esri Community Maps Contributors, Oregon Metro, Oregon State Parks, State of Oregon GEO, © OpenStreetMap, Microsoft,

Rinearson 2024 Priority Map



2:05 45%
Rinearson 2024 Pri...



45.380393, -122.616204


N

rson 22



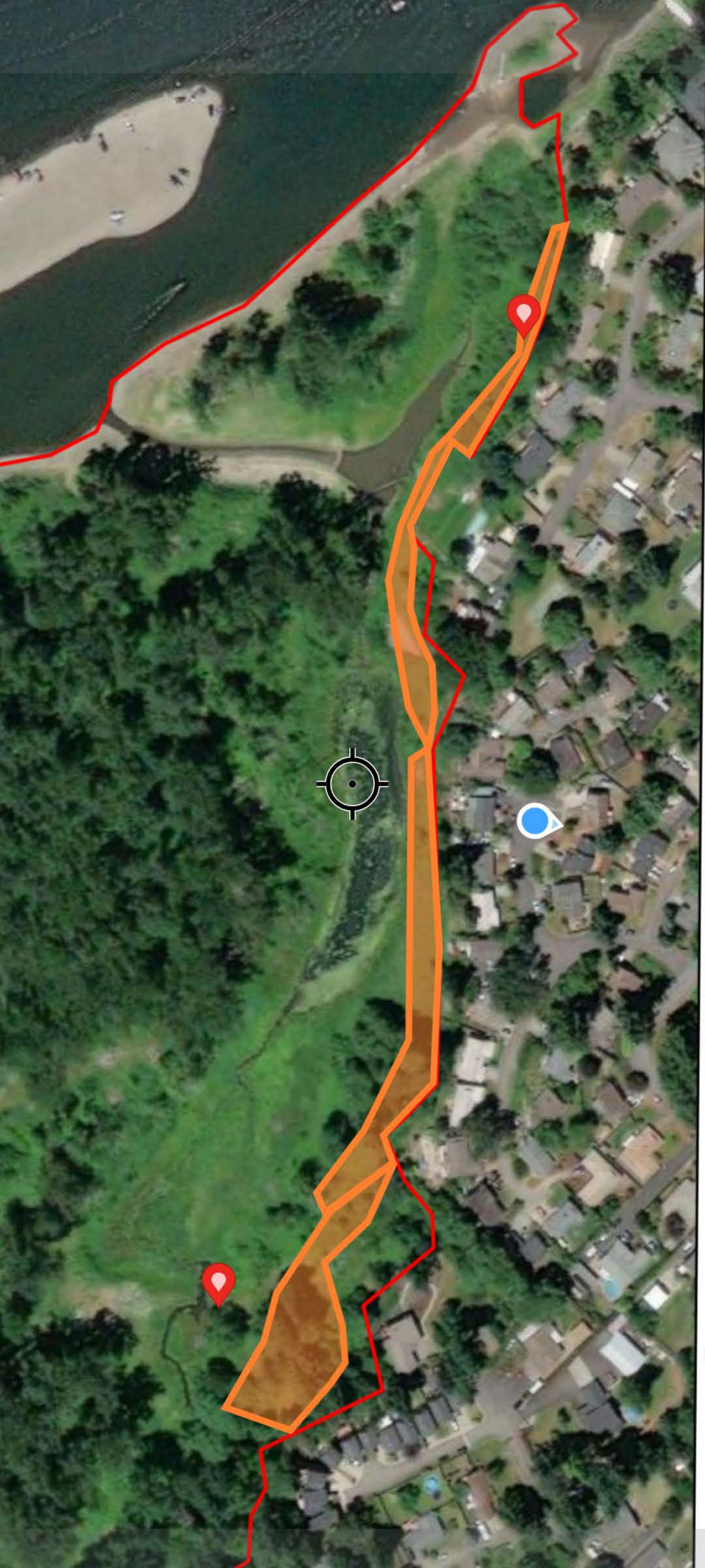
1:4,727

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

Citations

1.2m Resolution Metadata



Rinearson 22



2022

rson 22 - Field Notes (Areas)

Boundaries

World Imagery

Low Resolution 15m Imagery

High Resolution 60cm Imagery

High Resolution 30cm Imagery

Citations

1.2m Resolution Metadata

1:4,727

0 0.03 0.06

0 0.04 0.09

Maxar