



Keeyask Generation Project
Aquatic Effects Monitoring Plan

Benthic Macroinvertebrate Monitoring Report

AEMP-2018-09



KEEYASK GENERATION PROJECT

AQUATIC EFFECTS MONITORING PLAN

REPORT #AEMP-2018-09

BENTHIC MACROINVERTEBRATE MONITORING IN THE NELSON RIVER, 2017: YEAR 4 CONSTRUCTION

Prepared for

Manitoba Hydro

By

K. Dawson

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North/South Consultants Inc.
Aquatic Environment Specialists

83 Scurfield Blvd.
Winnipeg, Manitoba, R3Y 1G4
Website: www.nscons.ca

Tel.: (204) 284-3366
Fax: (204) 477-4173
E-mail: nscons@nscons.ca

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SUMMARY

Background

The Keeyask Hydropower Limited Partnership (KHLPP) was required to prepare a plan to monitor the effects of construction and operation of the Keeyask Generating Station (GS) on the environment. Besides measuring the accuracy of the predictions made and actual effects of the GS on the environment, monitoring results will provide information on how construction and operation of the GS will affect the environment and if more needs to be done to reduce harmful effects.

Construction of the Keeyask GS began in mid-July 2014 with the construction of cofferdams that blocked flow in the north and central channels of Gull Rapids (see map). During the winter of 2015/2016, the Spillway Cofferdam, which partially blocks the south channel was constructed. Beginning late in 2016 and continuing in 2017, the Tailrace Cofferdam was constructed. Work was completed in fall 2017 with the exception of an opening that was left to allow fish movement into and out of the cofferdam over the 2017/18 winter.

Benthic macroinvertebrates (BMIs) are tiny animals without backbones, such as insect larvae and clams, which live in, or on, the bottom sediments of lakes and rivers. The BMI community is an important part of the overall plan to monitor the effects of construction and operation of the Keeyask GS on the aquatic environment. BMIs are often used to determine the health of lakes and rivers, and are used in monitoring programs all over the world. For example, observing the changes in the numbers of mayflies, which is one of many different kinds of BMIs, is very helpful because these insects spend the early part of their lives in the bottom sediments and are sensitive to changes in the environment. BMIs are also a valuable food source for fish, including Lake Sturgeon, and important in describing the quality of habitat for fish.

This report describes the results of the BMI community monitoring conducted during fall 2017 (fourth year of construction at Gull Rapids). Samples were collected upstream of construction activities in the Burntwood River and Split Lake, immediately downstream of construction activities in the Nelson River, and farther downstream in Stephens Lake.



Map of instream structures at the Keeyask generating station site, September 2017.

Why is the study being done?

The study is being done to address a key question:

Are construction activities changing the numbers and/or kinds of BMIs living in the bottom sediments of the Nelson River downstream of the Keeyask GS into Stephens Lake in comparison to either upstream and/or pre-construction conditions?

When construction work for a GS is done in a lake or river, sediments (the mud at the bottom of a lake or river) often get disturbed and mixed into the water; sediments mixed in the water will travel downstream with the current and eventually settle to the bottom. To understand if the numbers and kinds of BMIs changed downstream of the construction site, BMIs are sampled at locations in the Nelson River and Stephens Lake. Negative effects of increased sediments in the water may include decreases in the numbers of fingernail clams and mayflies.

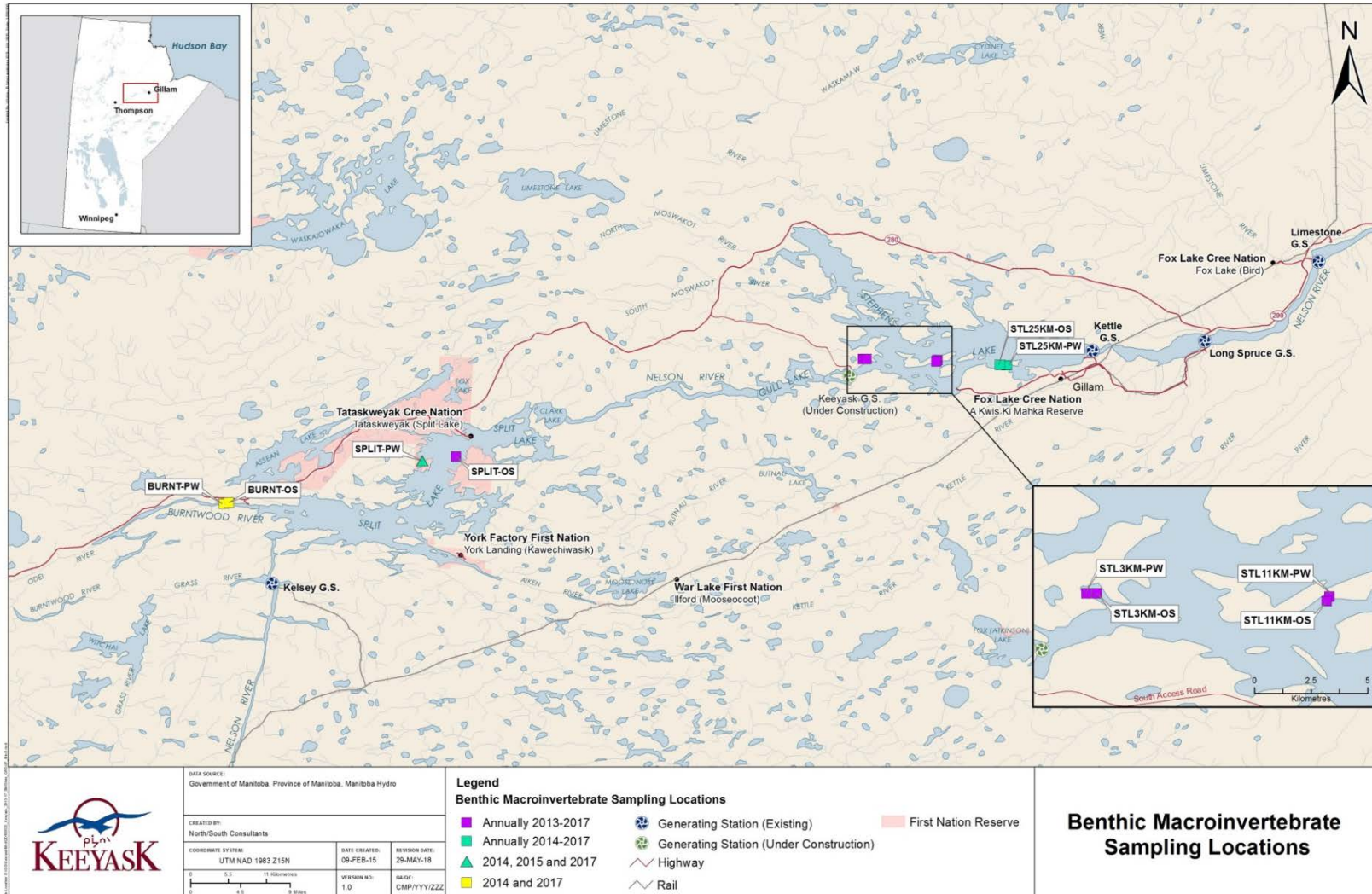
What was done?

BMIs were collected in late September of 2017 (Year 4 of construction) in three areas downstream of Gull Rapids. The areas were approximately 3 kilometres (km) (near-field), 11 km (mid-field area), and 25 km (far-field area) downstream of the construction site at Gull Rapids (see map below). Within each sampling area, BMIs were sampled from both nearshore (close to the shoreline in shallow water) and offshore (far from the shoreline in deeper water) habitat types. Five stations were sampled with a dredge (see photo below) to collect bottom sediments and BMIs in these two habitat types.



Collecting a benthic macroinvertebrate grab with an Ekman dredge

BMIs were also sampled in the Burntwood River and Split Lake in late August 2017 as an example of conditions within an area unaffected by construction to monitor natural changes over time.



Locations of the reference and impact BMI sampling areas at the Burntwood River, Split Lake and the sites downstream of Gull Rapids in Stephens Lake: 2013 (pre-construction), 2014 (Year 1), 2015 (Year 2), 2016 (Year 3) and 2017 (Year 4).

What was found?

Nearshore Habitat

- There were no changes to BMIs in nearshore habitat at 3 km downstream of Gull Rapids in 2017 despite an increase in the amount of loose mud on the bottom of the lake at this site.
- In comparison to pre-construction, and similar to 2016, there was a decrease in the proportion of mayflies, stoneflies and caddisflies (EPT) in samples collected at 11 km downstream of Gull Rapids.
- The large reduction in the total number of BMIs, mayflies, and fingernail clams in nearshore habitat 25 km downstream of Gull Rapids observed in 2016 did not persist in 2017.

Offshore Habitat

- There were no changes to BMIs in offshore habitat at 3 km downstream of Gull Rapids in 2017 despite an increase in the amount of sand on the bottom of the lake at this site.
- There was a decrease in the proportion of mayflies, stoneflies and caddisflies in samples collected at 11 km downstream of Gull Rapids.

What does it mean?

Overall, the variety of results observed in Stephens Lake since the start of construction suggest that observed changes to BMIs are not related to construction; instead, they are more likely due to natural variation.

What will be done next?

BMI monitoring will be conducted in late August of 2018 (Year 5 of construction). Results of monitoring conducted in 2018 will be compared to pre-construction results, as well as results from Split Lake, and presented in the Year 5 construction report.

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The collection of biological samples described in this report was authorized by Manitoba Conservation and Water Stewardship, Fisheries Branch, under terms of the Scientific Collection Permit #09-17.

STUDY TEAM

Data Collection

Claire Hrenchuk

Kelvin Kitchokeesik

Christine Lacho

Data Analysis, Report Preparation, and Report Review

Leanne Dolce Blanchard

Kathleen Dawson

Friederike Schneider-Vieira

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1.0 INTRODUCTION

The Keeyask Generation Project (the Project) is a 695-megawatt (MW) hydroelectric generating station at Gull (Keeyask) Rapids on the lower Nelson River in northern Manitoba. The Project is approximately 725 kilometres (km) northeast of Winnipeg, 35 km upstream of the existing Kettle Generating Station, where Gull Lake flows into Stephens Lake, 60 km east of the community of Split Lake, 180 km east-northeast of Thompson and 30 km west of Gillam (Map 1). Construction of the Project began in July 2014.

The *Keeyask Generation Project: Response to EIS Guidelines*, completed in June 2012, provides a summary of predicted effects and planned mitigation for the Project. Technical supporting information for the aquatic environment, including a description of the environmental setting, effects and mitigation, and a summary of proposed monitoring and follow-up programs is provided in the *Keeyask Generation Project Environmental Impact Statement: Aquatic Environment Supporting Volume* (AE SV). As part of the licencing process for the Project, an *Aquatic Effects Monitoring Plan* (AEMP) was developed detailing the monitoring activities of various components of the aquatic environment including the focus of this report, specifically monitoring the benthic macroinvertebrate (BMI) community, for the construction and operation phases of the Project.

Construction monitoring of the BMI community specifically addresses the biological effects of increases in total suspended solids (TSS) due to in-stream work on the Nelson River (Map 2). Monitoring of BMI occurred immediately downstream of instream construction activities where effects, should they be measureable, would be greatest. Locations farther downstream in Stephens Lake were also sampled. Benthic macroinvertebrates were also assessed upstream of construction in waterbodies unaffected by the Project (Split Lake and the Burntwood River) using data collected as part of Manitoba and Manitoba Hydro's Coordinated Aquatic Monitoring Program (CAMP); these sites provide an ongoing reference to support the assessment of Project effects on BMIs throughout construction and into operation.

The key questions during construction phase monitoring are:

- *To what degree will benthic invertebrate abundance and/or community composition change during construction activities in comparison to either upstream or pre-project conditions?*
- *Are there any unexpected effects on benthic macroinvertebrates that may be related to GS construction activities?*

Unlike water or sediment, where protection of aquatic life guidelines may be used to develop triggers or thresholds for an assessment of effects, there are no universal benchmarks for BMI metrics such as abundance and diversity. Rather, the magnitude of change or difference relative to expected conditions is used to establish an appropriate benchmark for biological variables. Based on guidance provided in the Metal Mining Environmental Effects Monitoring (EEM)

document (EC 2012) and scientific literature, experience with other AEMPs (e.g., Azimuth 2012), and power analysis utilizing CAMP data for a regional waterbody, an effect size of ± 50 percent (%) change in the mean of a metric (in comparison to reference areas and/or pre-construction data) was chosen as most appropriate to use (*i.e.*, realistically achievable with a well-designed program) for the AEMP.

The following report presents the results of BMI monitoring completed in the fall of 2017 during Year 4 of construction. Results are assessed using the framework summarized in Section 3.4.2 and detailed in the AEMP.

2.0 STUDY SETTING

The study area for the 2017 BMI construction monitoring program included the Burntwood River, Split Lake, downstream of Gull Rapids on the Nelson River, and Stephens Lake (Map 1).

The Burntwood River flows in a south-easterly direction from First Rapids for approximately 35 km prior to emptying into the western arm of Split Lake (Map 1). It is unknown if First Rapids represents a natural barrier to upstream fish passage, however, it is assumed to be under high flow conditions. Hard substrates predominate in the main channel, while loose fine sediments and associated macrophyte growth occur in many off-current areas. The hydrology of the Burntwood River has been affected by the Churchill River Diversion (CRD). Outflow from the Burntwood River to Split Lake prior to CRD was estimated at 90.0 m³/s at First Rapids, and increased nearly 10-fold following diversion to 849.0 m³/s.

Split Lake is immediately downstream of the Kelsey GS at the confluence of the Burntwood and Nelson rivers (Map 3). Due to large inflows from the Nelson and Burntwood rivers, the lake has a detectable current in several locations. Split Lake has maximum and mean depths of 28.0 m and 3.9 m respectively, at a water surface elevation of 167.0 m above sea level (ASL) (Lawrence *et al.* 1999). The surface area of Split Lake was determined to be 26,100 hectare (ha) (excluding islands), with a total shoreline length, including islands, of 940.0 km (Lawrence *et al.* 1999). The numerous islands in Split Lake represent 411.6 km of the total shoreline.

Gull Rapids is located approximately 3 km downstream of Caribou Island on the Nelson River (Map 3). Two large islands and several small islands occur within the rapids, prior to the river narrowing. The rapids are approximately 2 km in length, and the river elevation drops approximately 11 m along its 2 km length. A summary of construction activities at Gull Rapids is provided in Section 2.1.

Just below Gull Rapids, the Nelson River enters Stephens Lake. Stephens Lake was formed in 1971 by construction of the Kettle GS. Between Gull Rapids and Stephens Lake there is an approximately 6 km long reach of the Nelson River that, although affected by water regulation at the Kettle GS, remains riverine habitat with moderate velocity (Map 3). Construction of the Kettle GS flooded Moose Nose Lake (which formed the north arm of Stephens Lake) and several other small lakes that previously drained into the Nelson River, as well as the old channels of the Nelson River that now lie within the southern portion of the lake. Major tributaries to Stephens Lake include the North and South Moswakot rivers, which enter the north arm of the lake. Looking Back Creek is a second order stream that also drains into the north arm of Stephens Lake. Kettle GS is located approximately 40 km downstream of Gull Rapids.

2.1 CONSTRUCTION SUMMARY

Construction of the Keeyask GS began in mid-July 2014 with the construction of cofferdams in the north and central channels of Gull Rapids (Map 2). These cofferdams resulted in the dewatering of the north and central channels and the diversion of all flow to the south channel. Construction of the spillway cofferdam, which extends into the south channel of Gull Rapids, was completed in 2015. During 2016 there was little instream construction until placement of rock for the Tailrace Cofferdam began in late fall and continued into 2017. Large rocks were placed in the Nelson River to form the inner and outer groins of the Tailrace Cofferdam. An opening was left in the rock groins to allow fish to move into and out of the cofferdam. Placement of fine material between the two sections of the cofferdam began and was completed in late 2017. An opening was created to allow fish to move freely over the winter of 2017/18. The opening will be closed in spring 2018.

2.2 FLOWS AND WATER LEVELS

From October 2016 to October 2017, Split Lake outflows ranged from about 3,200–6,600 m³/s. Flow exceeded the historical annual median flow of approximately 3,300 m³/s each month except for October 2017 when it dropped to about 3,200 m³/s. From about October 2016 through mid-September 2017, the flow exceeded the historical 75th percentile flow of about 3,780 m³/s, and from about May to mid-August 2017 the flow exceeded the 95th percentile flow of approximately 5,230 m³/s. During the spring melt in May 2017, flow rose to about 6,590 m³/s, which is near the historical maximum flow observed in August 2005. Water levels varied in conjunction with flow, ranging from about 154.9–156.6 m ASL on Gull Lake, with the highest level observed during the near historical maximum flow in May.

3.0 METHODS

The following sections provide a description of the study design, sampling sites, field and laboratory methods, and data analysis methods for the BMI construction monitoring program.

3.1 STUDY DESIGN

The AEMP sampling design is comparable to the current CAMP design, such that data generated by the latter program will be used to augment AEMP reporting. Sampling areas (*i.e.*, polygons) were stratified by water depth and constrained by other aquatic habitat attributes (*e.g.*, substrate type, presence/absence of aquatic plants, water velocity, *etc.*) such that sampling areas represent the predominant habitat types(s). Sampling downstream of the construction site follows a gradient design: it extends from the area of maximum predicted sediment deposition at the inlet of Stephens Lake, where effects are most likely (near-field), out into the south basin of the lake (mid-field and far-field sites). Sampling conducted in 2013 (pre-construction/baseline) was based on the sampling design refined during AEMP development in an attempt to minimize the inherent variability within the benthic invertebrate data. As such, 2013 results are directly comparable to data collected in 2014 (Year 1 of construction), 2015 (Year 2), 2016 (Year 3) and 2017 (Year 4). The construction monitoring program is designed to facilitate comparisons of BMI metrics spatially (*i.e.*, upstream and downstream of construction activities) to delineate Project-related effects. Specifically, the program is designed to facilitate statistical comparisons of community metrics in reference areas to those monitored downstream of construction activities (*i.e.*, areas that are predicted to be most affected by the Project). The overall objectives of monitoring during the construction period are to determine if instream activities result in or contribute to exceedances of the benchmark and to confirm predictions in the AE SV.

3.2 SAMPLING LOCATIONS

Benthic macroinvertebrate sampling was conducted in late August/September from 2013–2017 (Table 1). Reference sites upstream of the Project area are sampled under CAMP (Split Lake is sampled annually and the Burntwood River is sampled on a 3-year rotational basis; Map 3) and AEMP monitoring sites downstream of Gull Rapids into Stephens Lake (at approximately 3 km, 11 km, and 25 km downstream of the construction site; Map 3) are sampled annually. In most years, a total of 40 samples are collected (10 at each site), but the Burntwood River was also sampled in 2017, bringing the number of Year 4 BMI monitoring samples to 50.

Within each sampling polygon, samples were collected from the nearshore in predominantly wetted (PW) habitat and in the deeper offshore (OS) habitat. For PW habitat, water depths of between 1 and 3 m, areas with consistent water movement (*i.e.*, standing water, low water

velocity), and homogeneous substrate were targeted; areas with aquatic macrophyte beds were avoided. For the OS, sampling sites were constrained by the same habitat attributes, with the exception of water depth, which was between 3 and 10 m. The spatial extent of a polygon was at least 100 m x 100 m, and large enough to adequately accommodate five replicate stations. For pre-construction and construction monitoring, the locations of the five replicate stations were established by field crews and selected based on specific habitat attributes (*i.e.*, water depth, substrate type, absence of aquatic plants, water velocity) and the spatial separation criteria outlined in Metal Mining Technical Guidance for EEM (EC 2012). By EEM definition, a replicate station is a specific, fixed sampling location within an area that can be recognized, re-sampled, and defined quantitatively (*e.g.*, UTM position and a written description). The geographic extent of each replicate station was minimally 10 m x 10 m and separated from other replicate stations by at least 20 m. Within the habitat type(s), a replicate station consisted of three (construction) to five (pre-construction) randomly collected benthic invertebrate sub-samples; the sub-samples were composited to provide an estimate of the benthic community at each station. Field sub-samples were collected using a random number table and from designated sampling locations around an anchored boat within the 10 m x 10 m replicate station area.

3.3 FIELD SAMPLING AND LABORATORY METHODS

3.3.1 SUPPORTING *IN SITU* MEASUREMENTS AND SEDIMENT SAMPLING

Supporting environmental variables measured/recorded at each replicate station included:

- Water temperature (using a hand-held thermometer for water surface measurement);
- UTM position (using a hand-held GPS receiver);
- Water transparency (using a Secchi disk);
- Water velocity (using a Swoffer current velocity meter at approximately 20 centimetres [cm] below water surface or visually estimated);
- Aquatic macrophytes (description of relative abundance and dominant type); and
- Dominant and secondary substrate types.

An additional benthic grab was taken at each replicate station and sub-sampled with a 5 cm diameter core tube (0.002 square metres [m²] surface area) to provide a sample of approximately 100 millilitres (mL) of sediment to characterize the general type of sediments in terms of total organic carbon (TOC) content and particle size composition. Sediment samples were sent frozen in coolers to the North/South Consultants Inc. (NSC) laboratory (Winnipeg, MB) and stored frozen/cold pending submission to the analytical laboratory. Sediment laboratory analyses were conducted by ALS Laboratory Group (ALS; Winnipeg, MB).

Supporting environmental variables measured/recorded at each sub-sample/grab site included:

- Water depth (using a hand-held depth sounder or metered benthic dredge rope);
- Presence/absence of aquatic macrophytes in sub-sample; and
- Substrate composition (visual description e.g., percent cobble, gravel, silt, *etc.*).

3.3.2 BENTHIC MACROINVERTEBRATES

Benthic invertebrates were sampled at sites using either a petite Ponar dredge or an Ekman dredge (both with 0.023 m² opening). All sites were accessed by boat.

At each site within a replicate station, one benthic invertebrate sample was retrieved to the surface and carefully sieved through a 500 micrometre (or micron; µm) mesh rinsing bag. An acceptable sample required that the jaws be completely closed upon retrieval. If the jaws were not completely closed, the sample was discarded into a bucket (and disposed of once sampling was completed) and the procedure was repeated. All sampling equipment was rinsed before sampling at the next site. All material retained by the screen, including invertebrates, was transferred to labelled plastic jars and fixed with 10% formaldehyde. Fixed samples were shipped to the NSC laboratory (Winnipeg, MB) for processing.

At the laboratory, samples from all locations were rinsed with water through a 500 µm sieve and sorted under a 3X magnifying lamp. The invertebrates were transferred to 70% ethanol prior to being identified to the appropriate taxonomic level. A Leica Mz125 microscope (maximum 100x magnification) and reference texts from Clifford (1991), Merritt and Cummins (1996), Peckarsky *et al.* (1990), Smith (2001), Stewart and Stark (2002), and Wiggins (2004) were used for taxonomic identification. Scientific names used followed the Integrated Taxonomic Information System (ITIS 2018) classification. Invertebrates were identified to major group (subclass, order, or family) and Ephemeroptera were identified to genus. All invertebrate identification and enumeration was performed by an invertebrate taxonomist at NSC.

All samples were processed following NSC's Quality Assurance/Quality Control (QA/QC) guidelines (Appendix 1). All sorted samples were checked by a second laboratory technician (QA/QC technician). Additional invertebrates collected during the QA/QC process were combined with the original sample, but counted separately. Sorting efficiency must be ≥ 95%. The QA/QC technician checked on a tray-by-tray basis so that the sample was handled as few times as possible; the QA/QC technician sorted any remaining invertebrates from the tray and recorded the number of missed invertebrates per tray. The QA/QC technician also checked the bench sheet data to ensure it matched the sample data. Ten percent (10%) of the in-house identifications were randomly selected and re-identified by a second in-house taxonomist for QA/QC. The accuracy of the sample subset was assessed for identification and enumeration. The target overall accuracy level for in-house invertebrate identifications and enumeration was

95%. Corrected identifications and enumeration values were used in place of any data discrepancies.

All sorted samples will be retained and archived for the duration of the construction phase should further identification be required. A reference collection of benthic invertebrates will be maintained to ensure taxonomic consistency throughout the monitoring program duration.

3.4 DATA ANALYSIS

3.4.1 BENTHIC MACROINVERTEBRATES

To prepare the data for analysis, abundance of invertebrates was converted to density (number of invertebrates per square metre [individuals/m²]) by dividing the total number of invertebrates by the area of the sampling device (0.023 m²). The mean, standard deviation (\pm SD), standard error (\pm SE), median, minimum, maximum, coefficient of variation (COV; %), and mean \pm 50% were calculated to characterize each aquatic habitat type sampled within a polygon for each waterbody.

Benthic invertebrate community descriptors were calculated for each replicate station and habitat type. Composition metrics included:

- Total macroinvertebrate density;
- Densities and relative proportions of major groups. (non-Insecta: Oligochaeta, Amphipoda, Bivalvia, Gastropoda; Insecta: Chironomidae, Ephemeroptera, Plecoptera, Trichoptera);
- Percent Ephemeroptera;
- Percent Ephemeroptera, Plecoptera, and Trichoptera (EPT) (EPT index; Sullivan *et al.* 2004);
- Percent of total organisms made up of Oligochaeta and Chironomidae; and
- Ratio of EPT to Chironomidae.

Richness measures included:

- Total taxonomic richness (family-level; total number of invertebrate families within a habitat polygon; Barbour *et al.* 1999; Klemm *et al.* 2002; Resh *et al.* 1997); and
- EPT richness (family-level; total number of families of Ephemeroptera, Plecoptera, and Trichoptera within a habitat polygon).

Diversity indices included:

- Simpson's Diversity Index (EC 2012; Magurran 1988, 2004; Mandaville 2002).

The AEMP identified the following BMI community metrics (which are sensitive to environmental change) and a benchmark to focus the monitoring program and provide a framework for adaptive management:

- Total macroinvertebrate abundance;
- Total taxonomic richness; and
- Simpson's Diversity Index.

Results of the BMI monitoring program are subject to the steps outlined in Figure 1. This framework prescribes data analysis methods and other tasks to be undertaken based on results of the monitoring program. Step 1 of the framework entails comparison of the mean values of replicate samples for metrics to the benchmark identified in the AEMP. If the benchmark is not exceeded, the assessment would proceed to Response Level 1: trend analysis. If the benchmark is exceeded, the assessment would proceed to Step 2: determination of whether there is a statistical difference between upstream and downstream areas (*i.e.*, control-impact) and/or relative to pre-construction conditions (before-after). If a statistical difference is not observed, the assessment would proceed to Response Level 1. Where statistical differences are identified, the assessment would proceed to Step 3, in which a determination of cause (*i.e.*, is the difference Project-related?) would be undertaken.

All metrics were reviewed and compared to the benchmark (*i.e.*, $\pm 50\%$ change in the mean of a metric in comparison to each previous year of monitoring data) to identify the potential for effects on the BMI community. For each metric that exceeded the benchmark, a statistical comparison between every year of data was undertaken. Prior to statistical analyses, macroinvertebrate metrics were tested for normality and homogeneity of variances and where the assumptions were met, were compared through a t-test or an Analysis of Variance (ANOVA) with Bonferroni pairwise comparison ($\alpha = 0.05$). Where these assumptions were not met, non-parametric analyses were applied such as the Mann-Whitney U-test or Kruskal-Wallis test followed by Dunn's multiple pairwise comparisons procedure ($\alpha = 0.05$). When data are non-normal, non-parametric tests are more powerful than parametric ones, *i.e.*, non-parametric analyses may be able to detect significant differences in the data when parametric analyses would not (Zar 1999). Non-parametric analyses are performed on ranks of the data and therefore do not require transformation of data; thus, all analyses are performed on the raw data. Since 2015, to reduce the likelihood of false-positives, the Bonferroni Correction has been applied when more than two years of data are compared. In these cases, a modified significance level (MSL) was obtained by dividing the critical p value (α) by the number of samples being compared. All analyses were performed using a current version of XLStat.

During the analyses conducted in support of this report, the power analyses conducted in support of the Keeyask Generation Project AEMP were revisited and, based on the consistency of data collected from Split Lake for the Keeyask EIS, it was determined that a measure of change benchmark of $\pm 25\%$ was more appropriate for two of the three metrics that are sensitive to environmental change: total taxonomic richness and Simpson's Diversity index. Results from

all years of monitoring were assessed using this new, more stringent benchmark, and any changes/trends that were identified as a result of this adjustment are highlighted in the discussion of this report.

3.4.2 SUPPORTING SEDIMENTS

Summary statistics (mean, \pm SD, \pm SE, median, minimum, and maximum, and COV (%)) were calculated to characterize the general type of sediments observed in each aquatic habitat type sampled within a polygon. To facilitate these calculations, any parameters measured below the analytical detection limit were assigned a value of one-half the detection limit.

Statistical comparisons (ANOVA, Mann-Whitney or Kruskal-Wallis; as described in Section 3.4.1) were conducted to determine if changes to substrate composition and TOC that had occurred between monitoring years were statistically significant. In previous Keeyask BMI monitoring reports (Zrum and Gill 2015, 2016; Dawson 2017), only those results that exhibited a change that exceeded a \pm 50% difference in the mean of a metric between years were selected for further statistical analyses. However, statistical comparisons are now being applied to all sediment data. The 50% difference was identified specifically for benthic invertebrate data, as the target minimum difference that could be detected with the sample size in the study.

4.0 RESULTS

4.1 BENTHIC MACROINVERTEBRATES

Environmental conditions at each replicate station from 2013 to 2017 are presented in Table 1. Benthic macroinvertebrate data for individual replicate stations sampled in each year are presented in Appendix 2. Summary statistics by habitat type for metrics not presented in the following sections are provided in Appendix 3.

Differences between the BMI communities in Split Lake (reference) and Stephens Lake (impact) were noted for the pre-construction program (Zrum and Gill 2015). For example, the mean total macroinvertebrate density in offshore habitat at the 3 km and 11 km downstream sites in Stephens Lake in 2013 was more than 50% lower than the mean total macroinvertebrate density in offshore habitat in Split Lake in the same year, a difference that already exceeded the benchmark and construction had yet to begin. As such, assessment of construction effects could not be based on a direct upstream/downstream comparison; instead, the identification of potential effects of construction-related activities on downstream BMIs was based on changes over time within a given polygon. However, data collected from the reference waterbodies can be used to identify changes in BMI metrics that occur in waterbodies throughout the study area and are therefore likely due to changes in environmental conditions that are not related to construction (e.g., water temperature). For this reason, results from sites downstream of the construction site are discussed first in the sections below, followed by results from the upstream reference sites to provide regional context.

4.1.1 KEY METRICS

As described in Section 3.4.2, total macroinvertebrate abundance, total taxonomic richness, and Simpson's Diversity index were selected as indicators of construction effects because of their sensitivity to environmental change.

4.1.1.1 TOTAL MACROINVERTEBRATE ABUNDANCE

4.1.1.1.1 NEARSHORE HABITAT

In Stephens Lake at 3 km downstream from construction, mean total macroinvertebrate density has been consistent from 2013–2017, never exceeding the $\pm 50\%$ benchmark between years (Table 2; Figure 2). Mean total macroinvertebrate abundance at the Stephens Lake monitoring site 11 km downstream from construction was much higher in 2013 (pre-construction) than all subsequent years, with results from 2017 falling lower than the benchmark, but this decrease

was not statistically significant (Table 3; Figure 2; Appendix 3). Results from Stephens Lake at 25 km downstream from construction have been extremely variable: while the 2017 mean was similar to the 2014 mean, it was more than 50% higher than the 2016 mean and more than 50% lower than the 2015 mean (neither difference was statistically significant; Table 4; Figure 2).

Mean total macroinvertebrate density in nearshore habitat on the Burntwood River was similar between years (2014 and 2017) (Table 5; Figure 2). Mean density in Split Lake in 2017 was more than 50% higher than the 2014 mean, while it was more than 50% lower than the 2015 mean, but neither of these differences was statistically significant (Table 6; Figure 2).

4.1.1.1.2 OFFSHORE HABITAT

At both Stephens Lake 3 km and 11 km, mean macroinvertebrate density in 2017 was similar to the 2013 means (and in the case of 3 km, it was also similar to the 2014 mean) but it was much higher than the 2015 and 2016 means (although not significantly different) (Tables 2 and 3; Figure 3). The 2017 mean at Stephens Lake 25 km was consistently within $\pm 50\%$ of mean from all previous years of sampling (Table 4; Figure 3).

In 2017, the mean density of macroinvertebrates in offshore habitat on the Burntwood River was more than 50% higher than the 2014 mean, a difference that was statistically significant (Table 5; Figure 3). The opposite was seen in Split Lake: the 2017 mean was more than 50% lower (significantly so) than the pre-construction (2013) and 2014 means, while it was within the benchmark compared to the 2015 mean (although lower) and almost identical to the 2016 mean (Table 6; Figure 3).

4.1.1.2 TOTAL TAXONOMIC RICHNESS

4.1.1.2.1 NEARSHORE HABITAT

The mean total taxonomic richness (at the family level) measured in nearshore habitat at Stephens Lake 3 km in 2017 was outside the $\pm 25\%$ benchmark compared to the 2013, 2014 and 2016 means (Table 2; Figure 4). In all three cases, the 2017 mean was lower, but the difference was never statistically significant (Appendix 3). At Stephens Lake 11 km, mean total richness in 2017 was similar to the 2013 and 2016 means, and higher but not significantly different from the 2014 and 2015 means (Table 3; Figure 4; Appendix 3). The mean total richness at Stephens Lake 25 km in 2017 was more than 25% higher than the 2016 mean, although the difference was not statistically significant, and within the $\pm 25\%$ benchmark compared to all other years (Table 4; Figure 4).

On the Burntwood River, mean total taxonomic richness in nearshore habitat was similar between sampling years (2014 and 2017) (Table 5; Figure 4). In 2017, mean total richness in Split Lake was slightly lower than the 2015 mean and slightly higher than the 2014 mean, but always within the $\pm 25\%$ benchmark (Table 6; Figure 4).

4.1.1.2.2 OFFSHORE HABITAT

In 2017, mean total taxonomic richness at Stephens Lake 3 km was the highest it had been since in 2013, and notably (but not significantly) higher than the 2015 mean (Table 2; Figure 5; Appendix 3). At Stephens Lake 11 km and 25 km, mean total taxonomic richness in 2017 was higher than all other monitoring years, and although some differences between years exceeded the $\pm 25\%$ benchmark, none of them were statistically significant (Tables 3 and 4; Figure 5).

Mean total taxonomic richness in offshore habitat of the reference waterbodies was consistent between years: the 2014 and 2017 means in the Burntwood River were very similar (Table 5; Figure 5), and mean total taxonomic richness in Split Lake has never exceeded the $\pm 25\%$ benchmark between years (Table 6; Figure 5).

4.1.1.3 SIMPSON'S DIVERSITY INDEX

4.1.1.3.1 NEARSHORE HABITAT

Simpson's diversity results at Stephens Lake 3 km have been variable over time, with the 2017 mean more than 25% lower than the 2013 and 2014 means, more than 25% higher than the 2015 mean, and within the benchmark set by the 2016 mean (Table 2; Figure 6). None of these differences were statistically significant (Appendix 3). At Stephens Lake 11 km, mean Simpson's diversity has steadily increased each year since monitoring began, and in 2017 this metric was more than 25% higher than the pre-construction (2013) mean, a difference that was statistically significant (Table 3; Figure 6). Mean Simpson's diversity at Stephens Lake 25 km has been consistent over time and has remained within the benchmark between years (Table 4; Figure 6).

Similar to Stephens Lake 25 km downstream of the construction site, mean Simpson's diversity measurements from nearshore habitat in both reference waterbodies (Burntwood River and Split Lake) have been consistent between years and inter-annual changes have never exceeded the $\pm 25\%$ benchmark (Tables 5 and 6; Figure 6).

4.1.1.3.2 OFFSHORE HABITAT

At Stephens Lake 3 km in 2017, Simpson's diversity was higher than all previous years, and above the +25% benchmark compared to the 2013, 2015 and 2016 means (this difference was statistically significant only compared to the 2015 result) (Table 2; Figure 7). In 2017, mean Simpson's diversity at Stephens Lake 11 km was within $\pm 25\%$ of the 2015 and 2016 means, but was more than 25% higher than the 2013 although neither of these difference was statistically significant (Table 3; Figure 7; Appendix 3). The 2017 mean at Stephens Lake 25 km was more than 25% higher than the 2015 mean (but not significantly higher) and was otherwise within the benchmark when compared to other years (Table 4; Figure 7).

As was seen for nearshore habitat, mean Simpson's diversity values for offshore habitat in the Burntwood River and Split Lake were similar between years and there were no exceedances of the $\pm 25\%$ benchmark (Tables 5 and 6; Figure 7).

4.1.2 ADDITIONAL METRICS

Benthic macroinvertebrate metrics expected to be negatively affected by increases in TSS include a decrease in Ephemeroptera (mayfly) abundance, % EPT (% mayfly, stonefly, and caddisfly), and Pisidiidae (fingernail clam) abundance; as such, they are presented in the following sections.

4.1.2.1 NEARSHORE HABITAT

4.1.2.1.1 EPHEMEROPTERA ABUNDANCE

High variability was observed at the monitoring sites on Stephens Lake. At Stephens Lake 3 km, the 2017 mean was within the benchmark compared to the 2014 mean, but was more than 50% higher than the 2013, 2015 and 2016 means (although only the difference with 2015 was statistically significant) (Table 2; Figure 8; Appendix 3). Mean Ephemeroptera density at Stephens Lake 11 km in 2017 was within the benchmark compared to the 2015 mean, more than 50% lower than the 2013 and 2014 means, and more than 50% higher than the 2016 mean, but none of these differences were statistically significant (Table 3; Figure 8; Appendix 3). The 2017 mean at Stephens Lake 25 km was higher than the 2013 mean but within the $\pm 50\%$ benchmark, while it was more than 50% higher than the 2016 mean and more than 50% lower than the 2014 mean (but not significantly different from either; Table 4; Figure 8; Appendix 3).

This metric was also variable between years in nearshore habitat of the two reference waterbodies (Tables 5 and 6; Figure 8). The mean density of mayflies in the Burntwood River in 2017 was more than 50% lower than the 2014 mean, but this difference was not statistically significant. The 2017 mean in Split Lake was lower than the 2015 mean but within the benchmark, and more than 50% higher than the 2014 mean (a statistically significant difference).

4.1.2.1.2 PERCENT EPT

At Stephens Lake 3 km in 2017, % EPT was more than 50% higher than all other years. Although only the difference with 2015 was statistically significant, the 2017 mean was notably higher than the 2013 and 2016 means (Table 2; Figure 9; Appendix 3). Mean % EPT at Stephens Lake 11 km in 2017 was within the benchmark compared to all other years of operation monitoring, but more than 50% lower than the 2013 (pre-construction) mean, and this difference was statistically significant (Table 3; Figure 9; Appendix 3). The 2017 mean at

Stephens Lake 25 km was within the $\pm 50\%$ benchmark compared to the 2015 mean, but was more than 50% higher than the 2014 and 2016 means (although not significantly different) (Table 4; Figure 9; Appendix 3).

In 2017, mean % EPT in nearshore habitat on the Burntwood River was within the $\pm 50\%$ benchmark compared to 2014 (Table 5; Figure 9). In Split Lake, the same was true for 2014, but the 2017 mean was more than 50% higher than the 2015 mean (not a significant difference) (Table 6; Figure 9; Appendix 3).

4.1.2.1.3 PISIDIIDAE ABUNDANCE

In 2017, mean Pisidiidae density at Stephens Lake 3 km was more than 50% lower than the recorded means for all previous years, and was most different from the pre-construction mean, but none of these differences were statistically significant (Table 2; Figure 10). At both Stephens Lake 11 km and 25 km, mean Pisidiidae density in 2017 was higher than all previous years of monitoring (Tables 3 and 4; Figure 10). At 11 km, it was more than 50% higher than the 2013, 2014 and 2015 means, while at 25 km it was similar to the 2013 and 2014 means but more than 50% higher than the 2016 mean. None of the differences at 11 km or 25 km were statistically significant, but 2016 really sticks out as an anomalous year at 25 km (Appendix 3).

Mean Pisidiidae density in nearshore habitat on the Burntwood River in 2017 was more than 50% higher than the 2014 mean density, and the difference was statistically significant (Table 5; Figure 10). On Split Lake, the 2017 mean was also more than 50% higher than the 2014 mean (but the difference was not statistically significant), while it was within the benchmark compared to the 2015 mean (Table 6; Figure 10).

4.1.2.2 OFFSHORE HABITAT

4.1.2.2.1 EPHEMEROPTERA ABUNDANCE

In 2017, mean Ephemeroptera density at Stephens Lake 3 km was more than 50% higher than the means in all other years of monitoring, but it was only significantly different from the 2015 mean (Table 2; Figure 11). Although mean Ephemeroptera density has generally decreased over time in offshore habitat at Stephens Lake 11 km, 2013 was the only year when the mean was more than 50% higher than the 2017 mean, and this difference was not statistically significant (Table 3; Figure 11, Appendix 3). Since 2014, mean Ephemeroptera density at Stephens Lake 25 km has generally been consistent, except for 2015, when the mean was significantly lower than all other years (Table 4; Figure 11).

Offshore habitat in the Burntwood River had a similar mean Ephemeroptera density between years (2014 and 2017), but it was 10–20 times lower than the same metric in Split Lake (Table 5; Figure 11). In 2017, mean Ephemeroptera density in Split Lake was within the $\pm 50\%$ benchmark compared to the 2014 and 2016 means, but it was more than 50% lower than the

2013 mean and more than 50% higher than the 2015 mean (although neither of these differences was statistically significant) (Table 6; Figure 11; Appendix 3).

4.1.2.2.2 PERCENT EPT

There has been a general increase in % EPT over time at Stephens Lake 3 km, but this metric has fluctuated between years: the 2017 mean was more than 50% higher than the 2013, 2014 and 2016 means, but these differences were not statistically significant (Table 2; Figure 12, Appendix 3). At Stephens Lake 11 km, mean % EPT was the lowest recorded to date: for the first time at this site, the mean for this metric was outside the benchmark, with the 2017 mean more than 50% lower than the 2013, 2014 and 2016 means, and significantly lower than 2013 and 2014 (Table 3; Figure 12; Appendix 3). Mean % EPT at Stephens Lake 25 km has been very consistent over time except in 2015, when the mean was more than 50% lower than all other years, but the differences were not statistically significant (Table 4; Figure 12; Appendix 3).

In 2017, mean % EPT in offshore habitat on the Burntwood River was within the $\pm 50\%$ benchmark set by 2014 sampling (Table 5; Figure 12). In Split Lake in 2017, this metric was more than 50% higher than the 2014 and 2015 mean (a significant difference in both cases), but within $\pm 50\%$ of the 2013 and 2016 means (Table 6; Figure 12).

4.1.2.2.3 PISIDIIDAE ABUNDANCE

Similar to what has been observed for nearshore habitat, Pisidiidae abundance has been low in offshore habitat at Stephens Lake 3 km in all years (Figure 13). In 2017, the 3 km mean was more than 50% higher than the 2013 and 2015 means, but more than 50% lower than the 2016 mean (none of those differences were statistically significant) (Table 2; Figure 13). Pisidiidae have been completely absent from offshore habitat in Stephens Lake 11 km in all years (Figure 13). And at Stephens Lake 25 km, Pisidiidae were present in 2014 samples in very low numbers but have not been captured since that time.

In 2017, mean Pisidiidae density in the offshore habitat of the Burntwood River was more than 50% higher than the 2014 mean, but the difference was not statistically significant (Table 5, Figure 13). In Split Lake, Pisidiidae density has decreased each year since 2013, and in 2017 they were completely absent from offshore samples; a difference that was statistically significant compared to the 2013 and 2014 means (Table 6; Figure 13).

4.2 SUPPORTING SEDIMENTS

Sediment data for individual replicate stations sampled in 2013 (pre-construction), 2014 (Year 1 construction), 2015 (Year 2 construction), 2016 (Year 3 construction) and 2017 (Year 4 construction) are presented in Appendix 2. As mentioned in Section 3.4.2, changes in sediment

composition between years were compared to the $\pm 50\%$ benchmark in previous reports, but in this year's report, statistically significant changes are highlighted instead.

4.2.1 NEARSHORE HABITAT

4.2.1.1 TOC (%)

There were no significant differences between the 2017 mean and previous years' monitoring results at sites in Split Lake or Stephens Lake (Figure 14; Appendix 3). A close examination of *p* values reveals some differences (increases) between years at Stephens Lake 3 km that were pronounced but not quite large enough to be statistically significant. Mean TOC content in the samples collected from nearshore habitat on the Burntwood River in 2017 was significantly higher than the mean TOC content of samples from 2014.

4.2.1.2 SAND (%)

At both the sites downstream of the construction site and in the reference waterbodies, the 2017 results for mean % sand in nearshore habitat were not significantly different from any other year when sampling was conducted (Figure 15; Appendix 3).

4.2.1.3 SILT (%)

While the same was true for Stephens Lake 11 km and 25 km (*i.e.*, the 2017 mean was not significantly different from the mean in previous years of sampling), the mean % silt at Stephens Lake 3 km in 2017 was significantly higher than the 2013, 2015 and 2016 means (Figure 16; Appendix 3). The mean % silt in nearshore samples from the reference waterbodies in 2017 was not significantly different from the 2014 and 2015 means (Figure 16; Appendix 3).

4.2.1.4 CLAY (%)

On Stephens Lake, the same pattern observed for % silt was also seen for % clay: no significant differences were measured at Stephens Lake 11 km or 25 km, while at Stephens Lake 3 km there was a statistically significant change, in this case a decrease, in the % clay compared to all previous years of sampling (Figure 17; Appendix 3). Similar to % silt, the mean % clay in nearshore habitat on the Burntwood River and in Split Lake in 2017 did not change significantly compared to 2014 (or 2015 in the case of Split Lake).

4.2.2 OFFSHORE HABITAT

4.2.2.1 TOC (%)

Mean % TOC in offshore samples at Stephens Lake 3 km in 2017 was not significantly different from previous years of monitoring (Figure 18; Appendix 3). In the Burntwood River, there was a statistically significant increase in mean % TOC in 2017 offshore samples compared to 2014. The 2017 mean % TOC in offshore samples from Split Lake was identical to the 2016 value, but represented an increase compared to 2013–2015, but only the difference between 2013 and 2017 was statistically significant.

4.2.2.2 SAND (%)

At Stephens Lake 3 km, there was a significantly higher mean % sand in 2017 than 2013, but between years this metric has been variable based on the patchy nature of offshore habitat (Figure 19; Appendix 3). In all years of sampling, the mean % sand at Stephens Lake 11 km was very low (< 1%), with no significant difference between years. Sand also comprised a very low proportion of the sediment at Stephens Lake 25 km in all sampling years (< 2%), but there the 2017 mean was significantly higher than the 2014 mean. The mean % sand in samples collected from offshore habitat in the reference waterbodies was consistent between years.

4.2.2.3 SILT (%)

The mean % silt in samples collected offshore at Stephens Lake 3 km and 11 km was not significantly different between years (Figure 20; Appendix 3). Mean % silt in samples from Stephens Lake 25 km was quite variable, with the 2016 mean significantly lower than the 2017 mean, and the 2014 mean also quite a bit lower than 2017, but the 2015 mean was higher than the 2017 mean. There was no significant difference in the mean % silt in samples collected from offshore habitat in the Burntwood River or Split Lake, although the 2017 mean in Split Lake was quite a bit higher than the 2014 mean.

4.2.2.4 CLAY (%)

Mean % clay in offshore samples at Stephens Lake 3 km was lower in 2017 than all previous sampling years, and significantly lower than the 2013 mean (Figure 21; Appendix 3). Examination of replicate samples reveals that this increase was not uniform (*i.e.*, sampling was patchy). At Stephens Lake 11 km, there was no significant difference between years, while mean % clay at Stephens Lake 25 km (similar to % silt) exhibited high variability between years, with the 2017 mean falling significantly lower than the 2014 and 2016 means, but somewhat higher than the 2015 mean. Offshore samples collected from the reference waterbodies in 2017 did not show a significant increase in mean % clay compared to previous monitoring years.

5.0 DISCUSSION

5.1 STEPHENS LAKE

Decreases in mean richness, diversity, and fingernail clam density, and increases in mean mayfly density and % EPT were observed in nearshore samples at Stephens Lake 3 km in 2017. None of these changes in the BMI community were statistically significant, but they coincided with a statistically significant change in sediment composition (Tables 2 and 7). Results showed that sediment samples contained an increased proportion of silt and a decreased proportion of clay compared to all previous years of sampling, and these changes were uniform across all replicates within the nearshore habitat polygon (*i.e.*, the substrate in the sampling area was consistent, not patchy).

Compared to the pre-construction baseline, there was also a statistically significant increase in the proportion of sand and a decreased proportion of clay in offshore samples collected from Stephens Lake 3 km downstream of the construction site, but these changes were not as uniform as those observed in nearshore habitat (*i.e.*, the substrate offshore was more patchy). Increases (*i.e.*, values more than 50% greater than the baseline mean) in diversity, Ephemeroptera and Pisidiidae densities, and % EPT were observed in the offshore habitat at this site in 2017, but none of them were statistically significant (Tables 2 and 7).

As described in Section 2.2 of this report, October 2016 to October 2017 was a period of extremely high natural flows on the Nelson River. As described in the 2016/17 PEMP report, sediment traps in Stephens Lake caught more sediment in 2016/2017 than the two previous years of monitoring (pre-construction data are not available) (Manitoba Hydro 2018), so it is possible that these high flows resulted in a change in sediment transport into Stephens Lake. The small shifts observed in the benthic community 3 km downstream of the construction site were likely in response to the measured difference in substrate, but the lack of statistically significant changes suggests that conditions were within the natural range.

In the nearshore habitat at Stephens Lake 11 km, there was an increase in diversity and a decrease in % EPT compared to baseline, which was also observed in 2016 (Tables 3 and 8; Figures 8 and 9). Significant decreases in total invertebrate and Ephemeroptera densities measured in 2016 did not persist in 2017; however, these metrics were still more than 50% lower than the pre-construction means. It appears that decreased Ephemeroptera density is generally responsible for decreases in total invertebrate density at this site, as mean Ephemeroptera density has been at least 50% lower than the pre-construction mean (2013) for every year of construction monitoring (2014–2017).

In 2017, offshore samples from Stephens Lake 11 km exhibited a statistically significant decrease in % EPT compared to 2013 (Tables 3 and 8; Figure 11; Appendix 3); this change was

due to an increase in the number of amphipods relative to all other taxa, including the Ephemeroptera, Plecoptera and Trichoptera (EPT). In all years since 2013, diversity in offshore habitat at 11 km has consistently been more than 25% higher than the pre-construction mean (statistically significant increases in 2014 and 2015), and Ephemeroptera density from 2015–2017 was consistently outside the pre-construction benchmark (*i.e.*, more than 50% lower than the 2013 mean).

While the timing of the observed decrease in Ephemeroptera density at Stephens Lake 11 km coincided with the beginning of project construction, this change was more likely due to natural variability (*i.e.*, patchy distribution, life history, environmental conditions) than construction effects. This conclusion was supported by the facts that similar decreases in Ephemeroptera were not seen in samples collected 3 km downstream of the construction site, and turbidity monitoring conducted by Manitoba Hydro from 2014–2017 has not detected increases in TSS due to construction (Manitoba Hydro 2018).

Nearshore habitat sampling sites in Stephens Lake were wetted throughout the 2017 open-water season (Figure 22), and the decreases in total invertebrate, Ephemeroptera and Pisidiidae density observed in nearshore habitat at Stephens Lake 25 km in 2016 did not persist into 2017. Similar to 2016, offshore habitat at this site did not exhibit any statistically significant changes in the six BMI metrics used to monitor construction effects (Table 4; Appendix 3).

5.2 REFERENCE WATERBODIES

Pre-construction sampling revealed inherent differences in the BMI communities in the main reference waterbody (Split Lake) and the impact waterbody (Stephens Lake) that preclude a direct upstream/downstream comparison (see Section 4.1). Identification of potential construction-related effects to benthos are limited to changes over time within each habitat polygon. Data collected from the reference waterbodies were instead used to identify changes in BMI metrics in response to environmental conditions throughout the study area.

Changes similar to those in Stephens Lake have not been observed in the Burntwood River, where results have been fairly consistent between 2014 and 2017, with no statistically significant decreases in the six metrics used to monitor for construction effects (Table 5; Appendix 3). In 2017, mean Pisidiidae density in nearshore samples and mean total invertebrate density in offshore samples were more than 50% higher than the 2014 means (significant differences in both cases).

Results from Split Lake were more variable between years, but the only statistically significant difference in nearshore habitat in 2017 compared to 2014 or 2015 was an increase in Ephemeroptera density, which was more than 50% higher than the 2014 mean (Table 6; Appendix 3). More data are available for offshore habitat on Split Lake, where total invertebrate density has been significantly lower than the 2013 and 2014 means for the past three sampling years (2015–2017), and mean Pisidiidae density in 2017 was more than 50% lower than the

benchmark set by all previous years (a statistically significant decrease compared to 2013 and 2014 means) (Tables 6 and 9; Appendix 3). Results from offshore habitat in Split Lake also suggest that Ephemeroptera were more abundant in 2013 than 2015, 2016 and 2017 (all more than 50% lower than the pre-construction mean), although only the difference in 2015 was statistically significant. This trend in Ephemeroptera density is similar to what has been observed in offshore habitat at Stephens Lake 11 km, but similar results were not obtained in offshore habitat at 3 km downstream (where annual mean density has been either within the pre-construction benchmark, or more than 50% higher than it), or 25 km downstream (where the annual mean has been consistent from 2014–2017 except in 2015, when it exhibited a significant decrease).

The statistically significant changes in Split Lake BMI metrics in 2017 (a decrease in total invertebrate abundance and Pisidiidae density in offshore habitat) were not consistent with changes observed in Stephens Lake: increased proportions of silt and sand in nearshore and offshore samples, respectively, from the 3 km site; increased diversity in nearshore samples from the 11 km site; and decreased % EPT in nearshore and offshore samples from the 11 km site. The inter-annual variability in monitoring results from Split Lake suggests that the observed changes in Stephens Lake can be attributed to the inherent variability of benthic organisms as a group, and are not linked to construction effects.

5.3 KEY QUESTIONS

Two key questions were considered.

To what degree will benthic invertebrate abundance and/or community composition change during construction activities in comparison to either upstream or pre-project conditions?

The AE SV (KHLP 2012) considered the following pathways of effect during construction of the Project:

- Changes to water quality, such as increases in concentration of TSS and related variables (e.g., turbidity). However, it was expected that measures to protect water quality would reduce the likelihood of any measurable effects on the BMI community; and
- Deposition of sediments in Stephens Lake. This was not expected to affect BMI as the total amount of sediments deposited was predicted to be very small (less than 0.6 cm thickness over the period of construction) and the composition of bottom substrate would not be changed.

Based on the available monitoring data, the BMI community 3 km downstream of the construction site has been variable over time: while there have only been a handful of statistically significant changes at this site, benchmark exceedances are frequent and often shift back and forth from one year to the next (Tables 2 and 7). In 2017, nearshore sediments

contained a significantly higher proportion of silt than previous years of monitoring, while offshore samples contained a higher proportion of sand than 2013 (although the change in nearshore habitat was much more striking). These sediment changes corresponded with increases in flow on the Nelson River that were not related to project construction, and the observed changes to the BMI community (some positive, some negative) were not statistically significant. It is likely that the observed benchmark exceedances were a normal response of the BMI community to the significant shift in available substrate.

Monitoring results in both nearshore and offshore habitat 11 km downstream of Gull Rapids in 2017 were similar to those from 2016. In fact, the BMI metrics monitored at Stephens Lake 11 km have been relatively consistent throughout construction monitoring, and most of the observed shifts appear to be related to changes in the relative abundance of Ephemeroptera in samples from year to year (Tables 3 and 8).

Significant changes in the BMI metrics used to monitor construction effects at 25 km downstream of Gull Rapids have never persisted for more than one year; conditions at this site have been consistent over time (Table 4).

Monitoring results from the Burntwood River were consistent between 2014 and 2017, while results from Split Lake were more variable (Tables 5, 6 and 9). The statistically significant changes observed in Split Lake in 2017 were not consistent with those observed in Stephens Lake in 2017 (*i.e.*, there was no indication of a regional change in the BMI).

Monitoring in 2017 did not identify any new changes to the BMI community downstream of the construction site. Significant differences compared to pre-construction (2013) were only observed at Stephens Lake 11 km. At this location, the proportion of EPT in nearshore samples decreased and the diversity increased (results that were consistent with 2016, and likely a result of decreased numbers of Ephemeroptera) and the proportion of EPT in offshore samples decreased (a change that can be attributed to an increase in amphipod density).

Are there any unexpected effects on benthic macroinvertebrates that may be related to GS construction activities?

To date, BMI monitoring during construction has not indicated any effects associated with instream construction activities.

6.0 SUMMARY AND CONCLUSIONS

Benthic macroinvertebrates were sampled in late August and late September of 2017 (Year 4 of construction) in one area of the Burntwood River, one area of Split Lake and three areas of Stephens Lake to monitor for effects from construction. The three areas in Stephens Lake were located approximately 3 km (near-field area), 11 km (mid-field area), and 25 km (far-field area) downstream of Gull Rapids. Within each sampling area, BMIs were sampled from both nearshore (close to the shoreline in shallow water) and offshore (further from the shoreline in deeper water) habitat types. Five stations were sampled with a bottom dredge to collect bottom sediments and BMIs from each of these two habitat types. Split Lake and the Burntwood River served as reference areas.

Results at 3 km and 11 km downstream of Gull Rapids in 2017 were generally within the range observed since construction started, although there were notable differences from the baseline (2013) as follows:

- Significant changes in sediment composition were observed at 3 km downstream of Gull Rapids in 2017: there was an increased proportion of silt in nearshore samples compared to all previous years of monitoring, except 2014, and the proportion of sand in offshore samples increased relative to the baseline. The differences in substrate composition may be due to a change in sediment transport caused by extremely high flows on the Nelson River in late 2016 and early 2017. The observed shifts in substrate composition did not coincide with any statistically significant changes to the BMI metrics used to monitor construction effects; however, in nearshore habitat three of these metrics (richness, diversity and fingernail clam density) were more than 50% lower than the baseline mean.
- Compared to pre-construction, the proportion of mayflies, stoneflies and caddisflies (EPT) in nearshore habitat from 11 km downstream of Gull Rapids was significantly lower in 2017, a difference that was also observed in 2016. Invertebrate and mayfly densities also remained at more than 50% less than the baseline mean, but the differences were not statistically significant (they had been in 2016).
- Mayfly density in offshore samples from 11 km downstream of Gull Rapids has been similar from 2015–2017 (more than 50% lower than the baseline mean, but not a statistically significant decrease). However, a shift in invertebrate composition in 2017 (a statistically significant increase in amphipod density) resulted in the proportion of EPT in offshore samples being significantly lower than the 2013 mean for the first time since construction began.

At 25 km downstream of Gull Rapids, the nearshore decreases in BMI metrics that were detected for the first time in 2016 did not persist into 2017, and offshore samples did not exhibit

any statistically significant decreases in BMI community metrics compared to previous years of monitoring.

Similar to 2016, it is unlikely that the significant decreases in BMI metrics observed in Stephens Lake in 2017 resulted from construction activities, as TSS increases due to construction were not observed, and changes to the BMI community were not detected at the site closest to construction (3 km downstream).

Overall, the lack of consistent changes in the BMI community in Stephens Lake, together with the variability observed in samples collected from Split Lake, suggest that differences from the baseline at 3 km, 11 km and 25 km downstream of Gull Rapids are very likely related to the inherent variability in the BMI community rather than an effect of construction.

The key questions related to BMI monitoring during construction are addressed below:

- *To what degree will benthic invertebrate abundance and/or community composition change during construction activities in comparison to either upstream or pre-project conditions?*

Monitoring in 2017 did not identify changes to the BMI community that were linked with construction.

- *Are there any unexpected effects on benthic macroinvertebrates that may be related to GS construction activities?*

BMI monitoring during construction has not detected any unexpected effects that may be related to instream construction.

Based on the analyses completed to date, no change to monitoring activity is anticipated. BMI monitoring will be conducted in late August of 2018 (Year 5 of construction) as set out in the AEMP.

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TABLES

Table 1: Coordinates and supporting habitat variables measured at benthic macroinvertebrate monitoring sites sampled in 2013 (pre-construction)^{a,b}, 2014 (Year 1 construction), 2015 (Year 2 construction), 2016 (Year 3 construction), and 2017 (Year 4 construction).

Waterbody	Site ID	Habitat Type	Sample Date	Study Year	UTM (NAD 83)			Water Temperature (°C)	Water Velocity (m/sec)	Mean Water Depth (m)	Mean Secchi Depth (m)	Substrate Description
					Zone	Easting	Northing					
Burntwood River ^c	BURNT-PW	NRSH-PW	19-Aug-14	2014	14	645413	6224249	18	0.17	2.5	0.45	clay
Burntwood River	BURNT-PW	NRSH-PW	26-Aug-17	2017	14	645419	6224249	18	0.18	2.9	0.54	clay
Burntwood River	BURNT-OS	OFFSH	19-Aug-14	2014	14	646090	6224449	18	0.32	8.3	0.35	clay/OM
Burntwood River	BURNT-OS	OFFSH	26-Aug-17	2017	14	646111	6224454	18	0.42	7.7	0.62	clay
Split Lake	SPLIT-PW	NRSH-PW	23-Aug-14	2014	14	673602	6232992	17	0.00	2.6	0.30	clay
Split Lake	SPLIT-PW	NRSH-PW	23-Aug-15	2015	14	673607	6232997	16	-	1.1	0.60	clay/OM
Split Lake	SPLIT-PW	NRSH-PW	24-Aug-17	2017	14	673612	6233004	18	0.00	1.9	0.67	clay/sand/OM
Split Lake	SPLIT-OS	OFFSH	22-Aug-13	2013	14	678461	6233976	17	0.00	7.4	0.46	clay
Split Lake	SPLIT-OS	OFFSH	23-Aug-14	2014	14	678466	6233977	18	0.00	7.8	0.52	clay
Split Lake	SPLIT-OS	OFFSH	23-Aug-15	2015	14	678468	6233975	16	-	5.9	0.60	clay
Split Lake	SPLIT-OS	OFFSH	27-Aug-16	2016	14	678463	6233981	18	0.07	7.0	0.50	clay/silt
Split Lake	SPLIT-OS	OFFSH	24-Aug-17	2017	14	678460	6233995	18	0.23	7.3	0.69	clay/shells
Stephens Lake	STL3KM-PW	NRSH-PW	25-Sep-13	2013	15	365672	6248917	14	0.00	2.8	0.33	clay
Stephens Lake	STL3KM-PW	NRSH-PW	16-Sep-14	2014	15	365666	6248912	10	0.00	2.8	0.30	silt/OM
Stephens Lake	STL3KM-PW	NRSH-PW	20-Aug-15	2015	15	365666	6248914	16	-	2.3	-	clay/OM/gravel
Stephens Lake	STL3KM-PW	NRSH-PW	10-Sep-16	2016	15	365664	6248906	15	0.05	2.5	0.40	silt/clay/OM
Stephens Lake	STL3KM-PW	NRSH-PW	23-Sep-17	2017	15	365672	6248915	12	0.07	2.2	0.48	silt/clay/sand
Stephens Lake	STL3KM-OS	OFFSH	25-Sep-13	2013	15	366128	6248908	14	0.02	6.1	0.30	clay
Stephens Lake	STL3KM-OS	OFFSH	16-Sep-14	2014	15	366127	6248901	10	0.00	6.0	0.30	silt/clay
Stephens Lake	STL3KM-OS	OFFSH	20-Aug-15	2015	15	366125	6248901	16	-	5.3	-	clay
Stephens Lake	STL3KM-OS	OFFSH	10-Sep-16	2016	15	366122	6248910	15	0.08	5.6	0.40	silt/clay
Stephens Lake	STL3KM-OS	OFFSH	23-Sep-17	2017	15	366137	6248901	12	0.07	5.3	0.48	silt/clay/OM
Stephens Lake	STL11KM-PW	NRSH-PW	26-Sep-13	2013	15	376454	6248753	11	0.00	2.4	0.58	clay
Stephens Lake	STL11KM-PW	NRSH-PW	16-Sep-14	2014	15	376451	6248753	10	0.00	2.2	0.30	silt/clay/OM
Stephens Lake	STL11KM-PW	NRSH-PW	21-Aug-15	2015	15	376445	6248747	16	-	2.1	-	clay
Stephens Lake	STL11KM-PW	NRSH-PW	10-Sep-16	2016	15	376455	6248750	15	0.05	1.7	0.43	sand/OM/silt
Stephens Lake	STL11KM-PW	NRSH-PW	22-Sep-17	2017	15	376450	6248761	12	0.05	2.1	0.48	clay/silt

Table 1: Coordinates and supporting habitat variables measured at benthic macroinvertebrate monitoring sites sampled in 2013 (pre-construction)^{a,b}, 2014 (Year 1 construction), 2015 (Year 2 construction), 2016 (Year 3 construction), and 2017 (Year 4 construction).

Waterbody	Site ID	Habitat Type	Sample Date	Study Year	UTM (NAD 83)			Water Temperature (°C)	Water Velocity (m/sec)	Mean Water Depth (m)	Mean Secchi Depth (m)	Substrate Description
					Zone	Easting	Northing					
Stephens Lake	STL11KM-OS	OFFSH	26-Sep-13	2013	15	376340	6248573	11	0.00	6.9	0.70	clay
Stephens Lake	STL11KM-OS	OFFSH	16-Sep-14	2014	15	376354	6248567	10	0.00	6.8	0.30	clay
Stephens Lake	STL11KM-OS	OFFSH	20-Aug-15	2015	15	376351	6248567	16	-	6.3	-	clay
Stephens Lake	STL11KM-OS	OFFSH	10-Sep-16	2016	15	376360	6248559	15	0.03	6.7	0.41	silt
Stephens Lake	STL11KM-OS	OFFSH	22-Sep-17	2017	15	385544	6248051	12	0.04	6.5	0.48	OM/sand/clay
Stephens Lake	STL25KM-PW	NRSH-PW	17-Sep-14	2014	15	386545	6247951	10	0.00	2.5	0.35	silt/clay
Stephens Lake	STL25KM-PW	NRSH-PW	08-Sep-15	2015	15	386545	6247952	15.5	-	1.6	0.50	sand/clay/OM
Stephens Lake	STL25KM-PW	NRSH-PW	10-Sep-16	2016	15	386569	6247952	15	0.07	2.1	0.40	gravel/sand/silt/OM
Stephens Lake	STL25KM-PW	NRSH-PW	22-Sep-17	2017	15	386559	6247962	12	0.18	2.1	0.48	sand/silt/clay/OM
Stephens Lake	STL25KM-OS	OFFSH	17-Sep-14	2014	15	385548	6248048	10	0.00	9.1	0.35	clay
Stephens Lake	STL25KM-OS	OFFSH	21-Aug-15	2015	15	385549	6248050	16	-	8.9	-	clay
Stephens Lake	STL25KM-OS	OFFSH	10-Sep-16	2016	15	385559	6248050	15	0.06	9.1	0.42	silt/OM
Stephens Lake	STL25KM-OS	OFFSH	22-Sep-17	2017	15	385544	6248051	12	0.10	9.1	0.48	clay/silt/OM

a. Stephens Lake sites 25 km downstream added after 2013 to address concerns with unanticipated downstream effects.

b. Split Lake predominantly wetted was first added to CAMP sampling in 2014, and could not be sampled in 2016 for logistical reasons.

c. Burntwood River sites during construction are only sampled on three year rotational cycle with CAMP.

OS = offshore.

PW = predominantly wetted (nearshore).

OM = organic matter.

Table 2: Comparison of Year 4 construction (2017) benthic macroinvertebrate monitoring results against baseline (2013), Year 1 (2014), Year 2 (2015), and Year 3 (2016) results for metrics expected to be negatively affected by increases in TSS at 3 km downstream in Stephens Lake.

Key Metrics	Magnitude of Change Benchmark	Nearshore 2017				Offshore 2017			
		2013	2014	2015	2016	2013	2014	2015	2016
Total Invertebrate Density	± 50%	√	√	√	√	√	√	↑	↑
Total Taxonomic Richness (25%)	± 25%	↓	↓	√	↓	√	√	↑	√
Simpson's Diversity Index (25%)	± 25%	↓	↓	↑	√	↑	√	↑	↑
Ephemeroptera Density	± 50%	↑	√	↑	↑	↑	↑	↑	↑
% EPT	± 50%	↑	↑	↑	↑	↑	↑	√	↑
Pisidiidae Density	± 50%	↓	↓	↓	↓	↑	√	↑	↓

√ = 2017 mean was within the magnitude of change benchmark compared to the 2013, 2014, 2015, or 2016 mean.

↑ = 2017 mean represented an increase that exceeded the magnitude of change benchmark compared to the 2013, 2014, 2015, or 2016 mean (difference was not statistically significant).

↓ = 2017 mean represented a decrease that exceeded the magnitude of change benchmark compared to the 2013, 2014, 2015, or 2016 mean (difference was not statistically significant).

↑ = 2017 mean represented an increase that exceeded the magnitude of change benchmark compared to the 2013, 2014, 2015, or 2016 mean (difference was statistically significant).

↓ = 2017 mean represented a decrease that exceeded the magnitude of change benchmark compared to the 2013, 2014, 2015, or 2016 mean (difference was statistically significant).

Table 3: Comparison of Year 4 construction (2017) benthic macroinvertebrate monitoring results against baseline (2013), Year 1 (2014), Year 2 (2015), and Year 3 (2016) results for metrics expected to be negatively affected by increases in TSS at 11 km downstream in Stephens Lake.

Key Metrics	Magnitude of Change Benchmark	Nearshore 2017				Offshore 2017			
		2013	2014	2015	2016	2013	2014	2015	2016
Total Invertebrate Density	± 50%	↓	✓	✓	✓	✓	↑	↑	↑
Total Taxonomic Richness	± 25%	✓	↑	↑	✓	↑	✓	↑	✓
Simpson's Diversity Index	± 25%	↑	✓	✓	✓	↑	↑	✓	✓
Ephemeroptera Density	± 50%	↓	↓	✓	↑	↓	✓	✓	✓
% EPT	± 50%	↓	✓	✓	✓	↓	↓	✓	↓
Pisidiidae Density	± 50%	↑	↑	↑	✓	✓	✓	✓	✓

✓ = 2017 mean was within the magnitude of change benchmark compared to the 2013, 2014, 2015, or 2016 mean.

↑ = 2017 mean represented an increase that exceeded the magnitude of change benchmark compared to the 2013, 2014, 2015, or 2016 mean (difference was not statistically significant).

↓ = 2017 mean represented a decrease that exceeded the magnitude of change benchmark compared to the 2013, 2014, 2015, or 2016 mean (difference was not statistically significant).

↑ = 2017 mean represented an increase that exceeded the magnitude of change benchmark compared to the 2013, 2014, 2015, or 2016 mean (difference was statistically significant).

↓ = 2017 mean represented a decrease that exceeded the magnitude of change benchmark compared to the 2013, 2014, 2015, or 2016 mean (difference was statistically significant).

Table 4: Comparison of Year 4 construction (2017) benthic macroinvertebrate monitoring results against Year 1 (2014), Year 2 (2015), and Year 3 (2016) results for metrics expected to be negatively affected by increases in TSS at 25 km downstream in Stephens Lake.

Key Metrics	Magnitude of Change Benchmark	Nearshore 2017			Offshore 2017		
		2014	2015	2016	2014	2015	2016
Total Invertebrate Density	± 50%	✓	↓	↑	✓	✓	✓
Total Taxonomic Richness	± 25%	✓	✓	↑	↑	↑	✓
Simpson's Diversity Index	± 25%	✓	✓	✓	✓	↑	✓
Ephemeroptera Density	± 50%	✓	↓	↑	✓	↑	✓
% EPT	± 50%	↑	✓	↑	✓	↑	✓
Pisidiidae Density	± 50%	✓	✓	↑	↓	✓	✓

✓ = 2017 mean was within the magnitude of change benchmark compared to the 2014, 2015, or 2016 mean.

↑ = 2017 mean represented an increase that exceeded the magnitude of change benchmark compared to the 2014, 2015, or 2016 mean (difference was not statistically significant).

↓ = 2017 mean represented a decrease that exceeded the magnitude of change benchmark compared to the 2014, 2015, or 2016 mean (difference was not statistically significant).

↑ = 2017 mean represented an increase that exceeded the magnitude of change benchmark compared to the 2014, 2015, or 2016 mean (difference was statistically significant).

↓ = 2017 mean represented a decrease that exceeded the magnitude of change benchmark compared to the 2014, 2015, or 2016 mean (difference was statistically significant).

Table 5: Comparison of Year 4 construction (2017) benthic macroinvertebrate monitoring results against Year 1 (2014) results for metrics in the reference waterbody Burntwood River.

Key Metrics	Magnitude of Change Benchmark	Nearshore 2017	Offshore 2017
		2014	2014
Total Invertebrate Density	± 50%	✓	↑
Total Taxonomic Richness	± 25%	✓	✓
Simpson's Diversity Index	± 25%	✓	✓
Ephemeroptera Density	± 50%	↓	✓
% EPT	± 50%	✓	✓
Pisidiidae Density	± 50%	↑	↑

✓ = 2017 mean was within the magnitude of change benchmark compared to the 2014 mean.

↑ = 2017 mean represented an increase that exceeded the magnitude of change benchmark compared to the 2014 mean (difference was not statistically significant).

↓ = 2017 mean represented a decrease that exceeded the magnitude of change benchmark compared to the 2014 mean (difference was not statistically significant).

↑ = 2017 mean represented an increase that exceeded the magnitude of change benchmark compared to the 2014 mean (difference was statistically significant).

↓ = 2017 mean represented a decrease that exceeded the magnitude of change benchmark compared to the 2014 mean (difference was statistically significant).

Table 6: Comparison of Year 4 construction (2017) benthic macroinvertebrate monitoring results against baseline (2013 – offshore only), Year 1 (2014), Year 2 (2015), and Year 3 (2016 – offshore only) results for metrics in the reference waterbody Split Lake.

Key Metrics	Magnitude of Change Benchmark	Nearshore 2017		Offshore 2017			
		2014	2015	2013	2014	2015	2016
Total Invertebrate Density	± 50%	↑	↓	↓	↓	✓	✓
Total Taxonomic Richness	± 25%	✓	✓	✓	✓	✓	✓
Simpson's Diversity Index	± 25%	✓	✓	✓	✓	✓	✓
Ephemeroptera Density	± 50%	↑	✓	↓	✓	↑	✓
% EPT	± 50%	✓	↑	✓	↑	↑	✓
Pisidiidae Density	± 50%	↑	✓	↓	↓	↓	↓

✓ = 2017 mean was within the magnitude of change benchmark compared to the 2014, 2015, or 2016 mean.

↑ = 2017 mean represented an increase that exceeded the magnitude of change benchmark compared to the 2014, 2015, or 2016 mean (difference was not statistically significant).

↓ = 2017 mean represented a decrease that exceeded the magnitude of change benchmark compared to the 2014, 2015, or 2016 mean (difference was not statistically significant).

↑ = 2017 mean represented an increase that exceeded the magnitude of change benchmark compared to the 2014, 2015, or 2016 mean (difference was statistically significant).

↓ = 2017 mean represented a decrease that exceeded the magnitude of change benchmark compared to the 2014, 2015, or 2016 mean (difference was statistically significant).

Table 7: Summary of benchmark exceedances (compared to 2013 baseline) for metrics expected to be negatively affected by increases in TSS at 3 km downstream in Stephens Lake.

Key Metric	Nearshore ¹			Offshore ¹		
	+MCB	-MCB	sig. ²	+MCB	-MCB	sig. ²
Total Invertebrate Density						
2014	N	N	-	N	N	-
2015	N	N	-	-	Y	N
2016	N	N	-	N	N	-
2017	N	N	-	N	N	-
Total Taxonomic Richness						
2014	N	N	-	-	Y	N
2015	-	Y	N	-	Y	Y
2016	N	N	-	-	Y	N
2017	-	Y	N	N	N	-
Simpson's Diversity Index						
2014	N	N	-	N	N	-
2015	-	Y	N	-	Y	N
2016	N	N	-	N	N	-
2017	-	Y	N	Y	-	N
Ephemeroptera Density						
2014	Y	-	N	N	N	-
2015	-	Y	N	-	Y	N
2016	Y	-	N	N	N	-
2017	Y	-	N	Y	-	N
Percent EPT						
2014	Y	-	N	N	N	-
2015	-	Y	N	Y	-	N
2016	N	N	-	N	N	-
2017	Y	-	N	Y	-	N
Pisidiidae Density						
2014	-	Y	N	Y	-	N
2015	-	Y	N	-	Y	N
2016	N	N	-	Y	-	N
2017	-	Y	N	Y	-	N

1 - MCB = magnitude of change benchmark; 25% for Total Taxonomic Richness and Simpson's Diversity Index, 50% for EPT and all density metrics.

2 – Due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Y = yes, the benchmark was exceeded (or the exceedance was statistically significant).

N = no, the benchmark was not exceeded (or the exceedance was not statistically significant).

Table 8: Summary of benchmark exceedances (compared to 2013 baseline) for metrics expected to be negatively affected by increases in TSS at 11 km downstream in Stephens Lake.

Key Metric	Nearshore ¹			Offshore ¹		
	+MCB	-MCB	sig.	+MCB	-MCB	sig.
Total Invertebrate Density						
2014	N	N	-	N	N	-
2015	-	Y	N	N	N	-
2016	-	Y	Y	N	N	-
2017	-	Y	N	N	N	-
Total Taxonomic Richness						
2014	N	N	-	N	N	-
2015	N	N	-	N	N	-
2016	N	N	-	N	N	-
2017	N	N	-	Y	-	N
Simpson's Diversity Index						
2014	N	N	-	Y	-	N
2015	N	N	-	Y	-	Y
2016	Y	-	Y	Y	-	Y
2017	Y	-	Y	Y	-	N
Ephemeroptera Density						
2014	-	Y	N	N	N	-
2015	-	Y	N	-	Y	N
2016	-	Y	Y	-	Y	N
2017	-	Y	N	-	Y	N
Percent EPT						
2014	N	N	-	N	N	-
2015	N	N	-	N	N	-
2016	-	Y	Y	N	N	-
2017	-	Y	Y	-	Y	Y
Pisidiidae Density						
2014	N	N	-	N	N	-
2015	N	N	-	N	N	-
2016	N	N	-	N	N	-
2017	Y	-	N	N	N	-

1 - MCB = magnitude of change benchmark; 25% for Total Taxonomic Richness and Simpson's Diversity Index, 50% for EPT and all density metrics.

2 - Due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Y = yes, the benchmark was exceeded (or the exceedance was statistically significant).

N = no, the benchmark was not exceeded (or the exceedance was not statistically significant).

Table 9: Summary of offshore benchmark exceedances in the reference waterbody Split Lake (compared to 2013 baseline).

Key Metric	Offshore ¹		
	+MCB	-MCB	sig.
Total Invertebrate Density			
2014	N	N	-
2015	-	Y	N
2016	-	Y	Y
2017	-	Y	Y
Total Taxonomic Richness			
2014	N	N	-
2015	N	N	-
2016	N	N	-
2017	N	N	-
Simpson's Diversity Index			
2014	N	N	-
2015	N	N	-
2016	N	N	-
2017	N	N	-
Ephemeroptera Density			
2014	N	N	-
2015	-	Y	Y
2016	-	Y	N
2017	-	Y	N
Percent EPT			
2014	-	Y	N
2015	-	Y	N
2016	N	N	-
2017	N	N	-
Pisidiidae Density			
2014	N	N	-
2015	-	Y	N
2016	-	Y	N
2017	-	Y	Y

1 - MCB = magnitude of change benchmark; 25% for Total Taxonomic Richness and Simpson's Diversity Index, 50% for EPT and all density metrics.

2 – Due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Y = yes, the benchmark was exceeded (or the exceedance was statistically significant).

N = no, the benchmark was not exceeded (or the exceedance was not statistically significant).

FIGURES

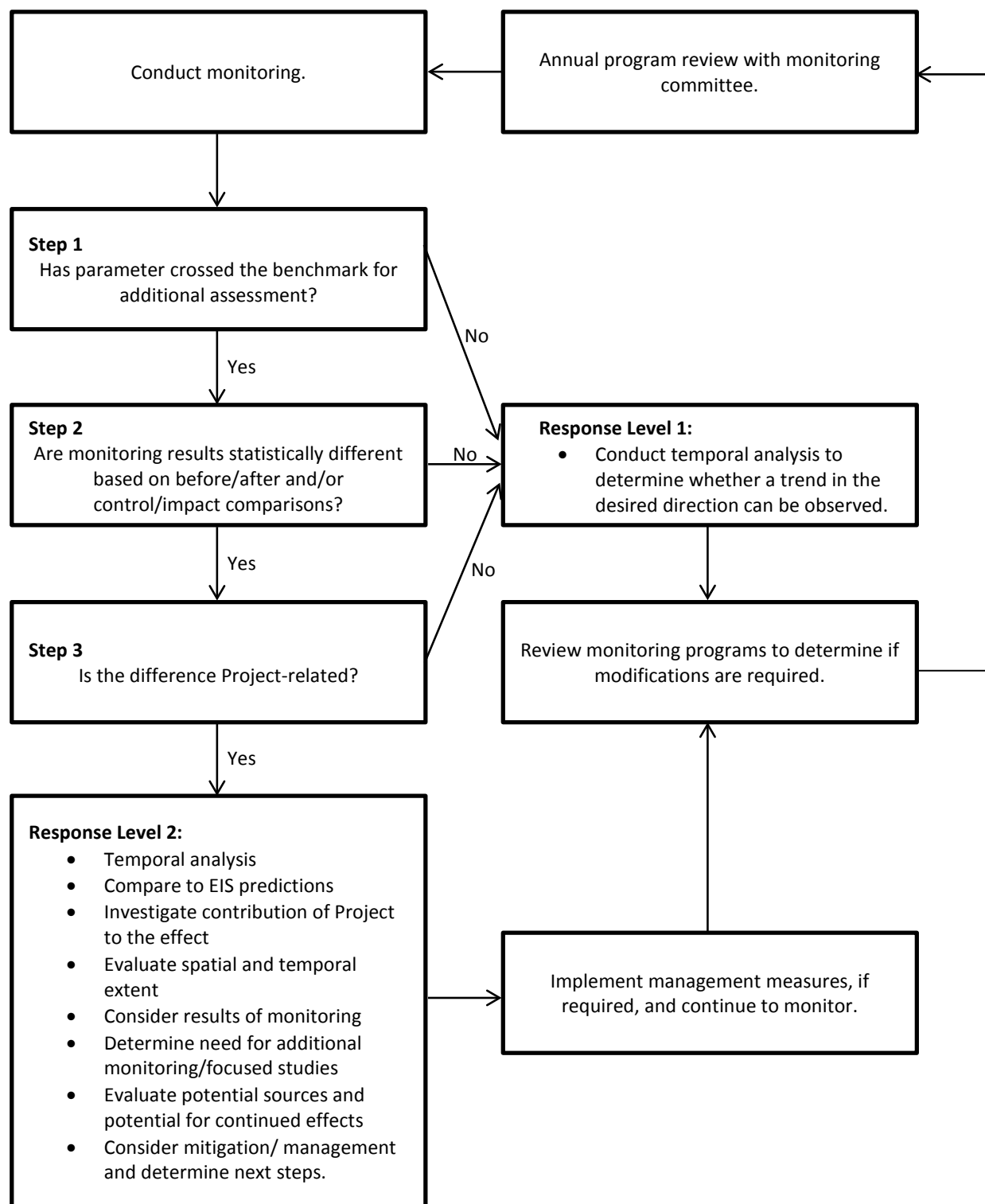


Figure 1: Benthic macroinvertebrate response framework.

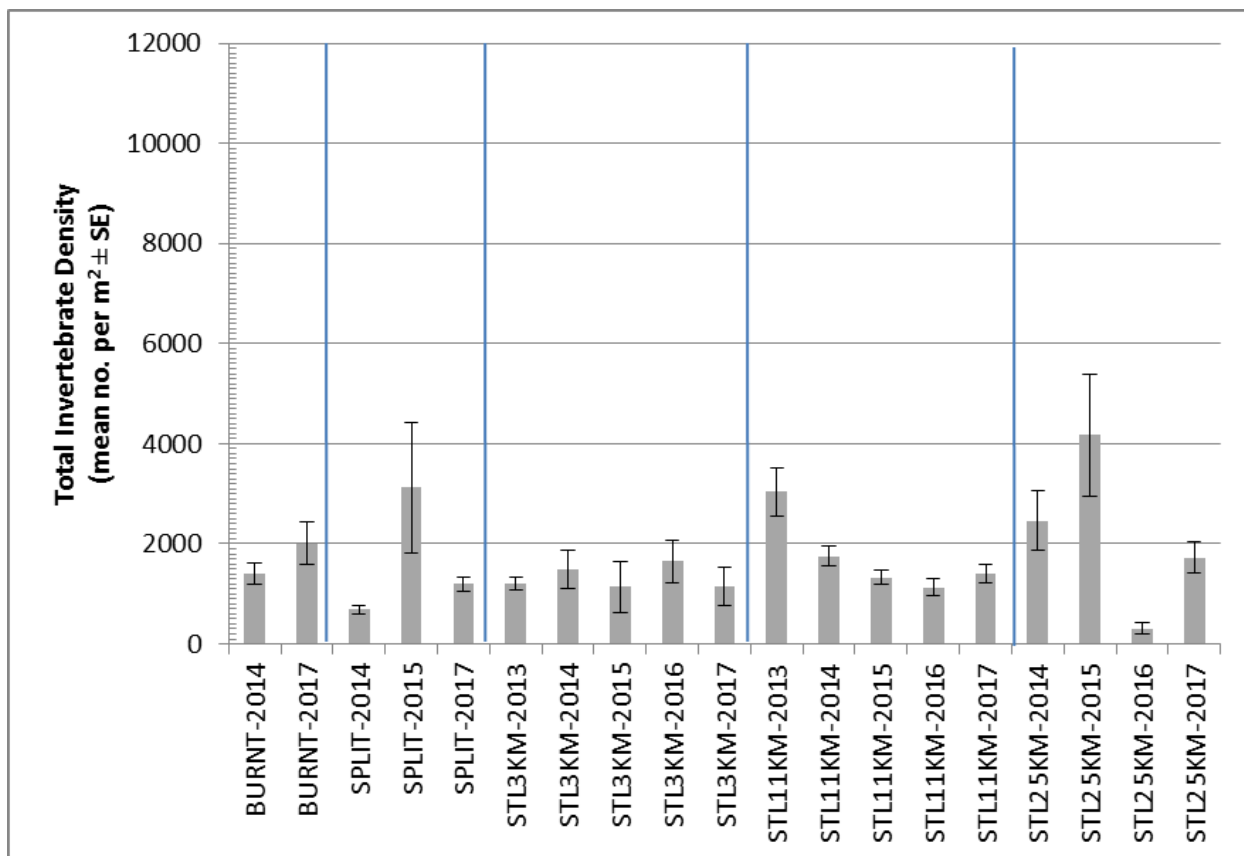


Figure 2: Total macroinvertebrate abundance (density, mean no. per m² ± SE) in nearshore habitat in 2013 (pre-construction), 2014 (Year 1 construction), 2015 (Year 2 construction), 2016 (Year 3 construction), and 2017 (Year 4 construction).

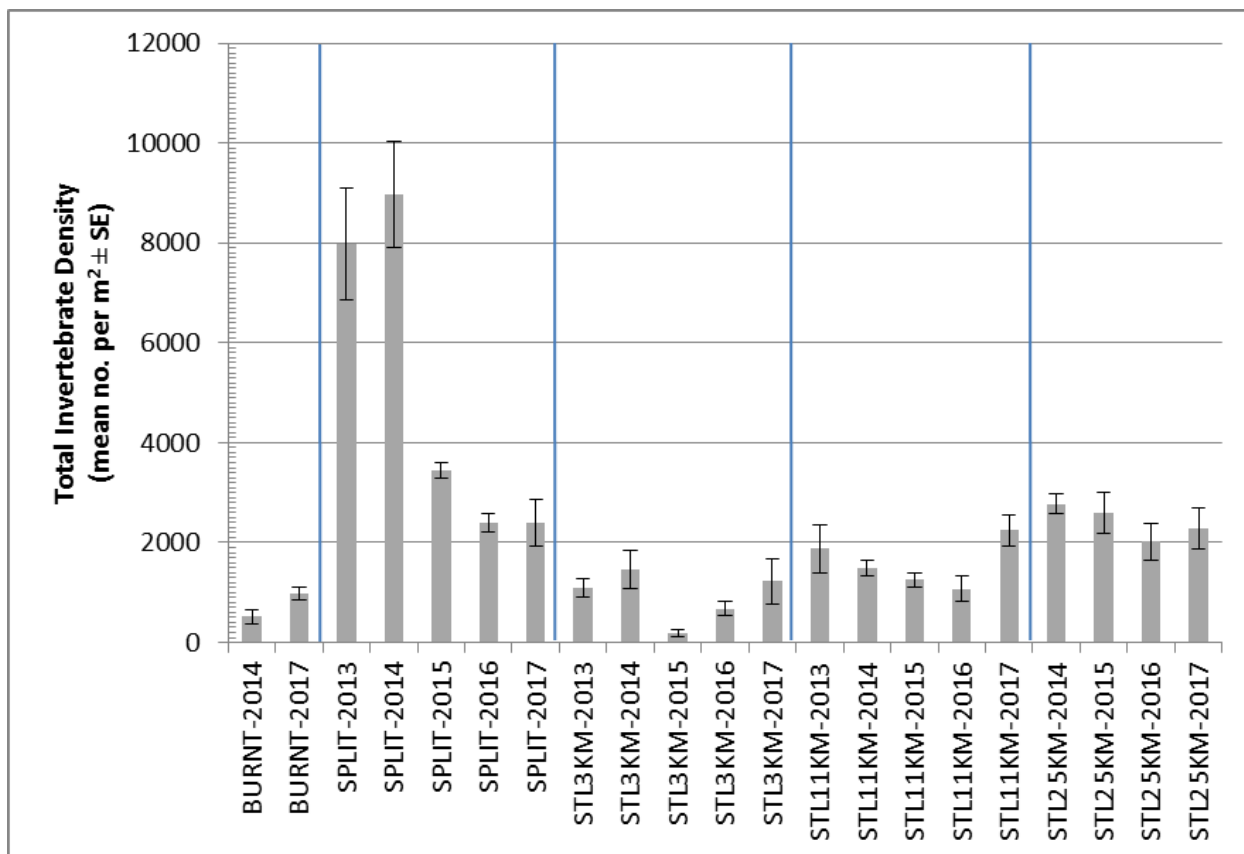


Figure 3: Total macroinvertebrate abundance (density, mean no. per m² ± SE) in offshore habitat in 2013 (pre-construction), 2014 (Year 1 construction), 2015 (Year 2 construction), 2016 (Year 3 construction), and 2017 (Year 4 construction).

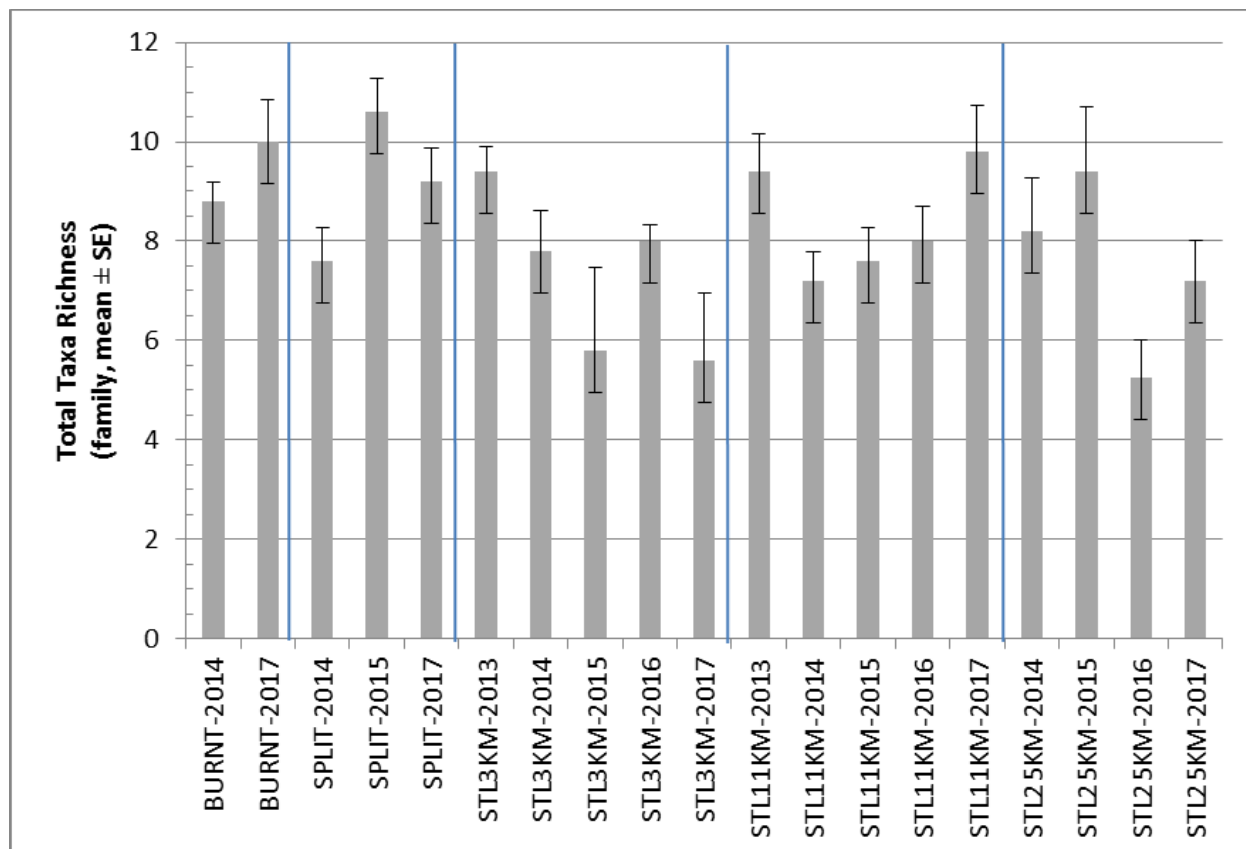


Figure 4: Total richness (Family-level, mean \pm SE) in nearshore habitat in 2013 (pre-construction), 2014 (Year 1 construction), 2015 (Year 2 construction), 2016 (Year 3 construction), and 2017 (Year 4 construction).

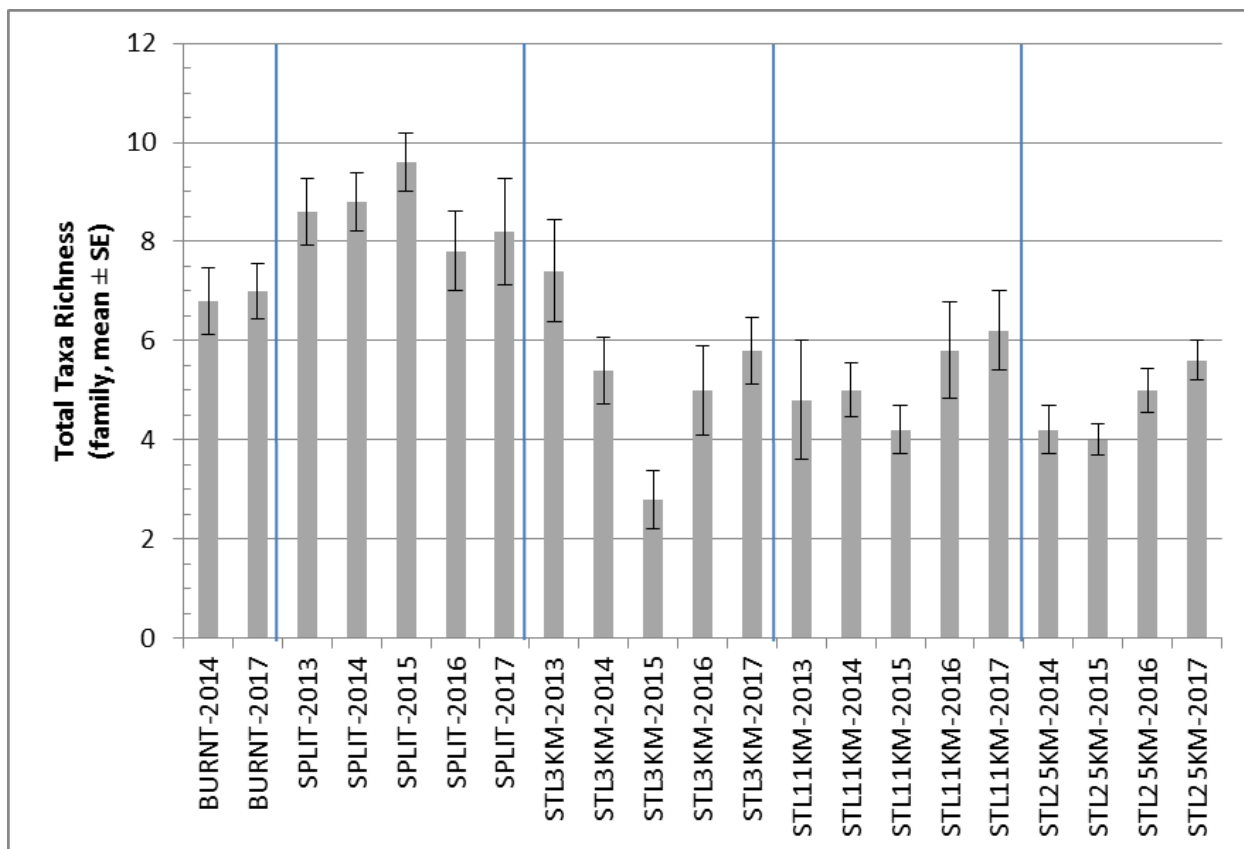


Figure 5: Total richness (Family-level, mean \pm SE) in offshore habitat in 2013 (pre-construction), 2014 (Year 1 construction), 2015 (Year 2 construction), 2016 (Year 3 construction), and 2017 (Year 4 construction).

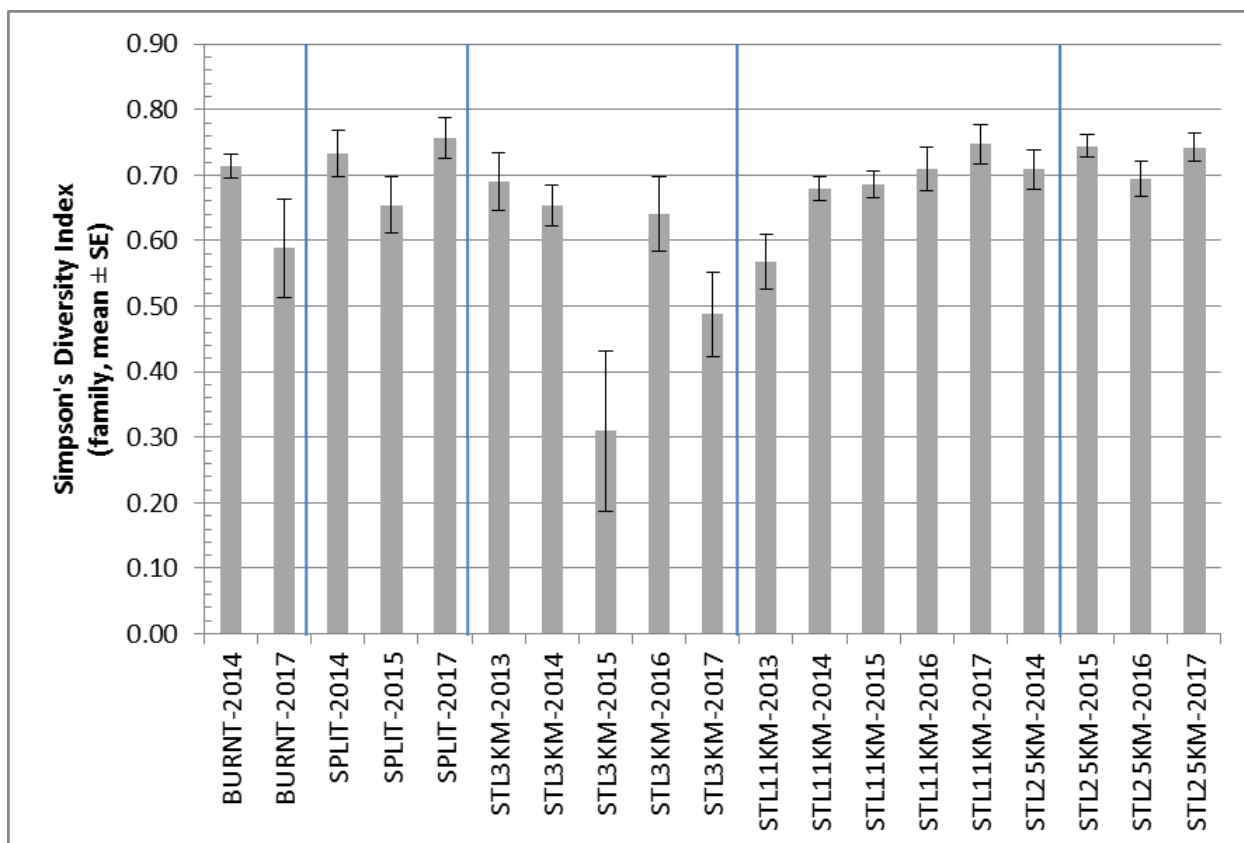


Figure 6: Simpson's diversity index (mean ± SE) in nearshore habitat in 2013 (pre-construction), 2014 (Year 1 construction), 2015 (Year 2 construction), 2016 (Year 3 construction), and 2017 (Year 4 construction).

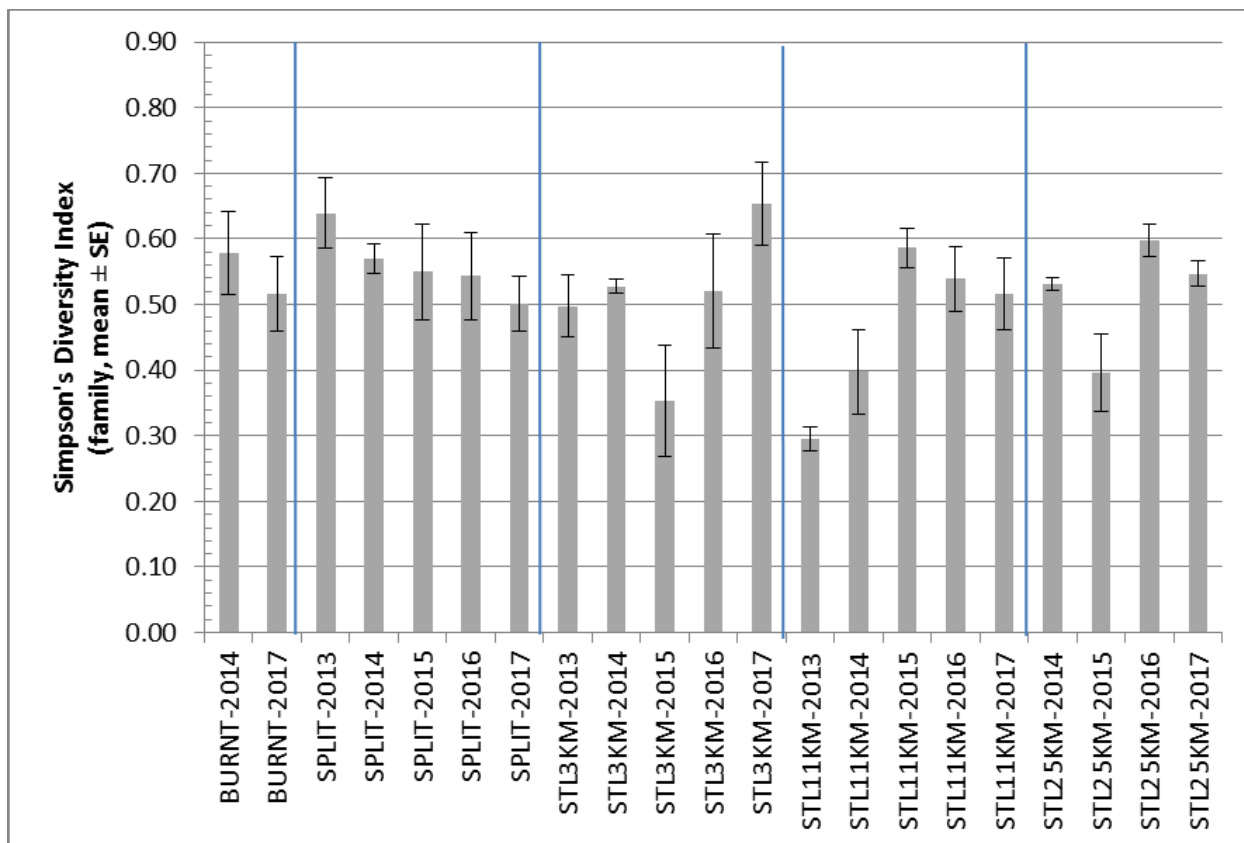


Figure 7: Simpson's diversity index (mean ± SE) in offshore habitat in 2013 (pre-construction), 2014 (Year 1 construction), 2015 (Year 2 construction), 2016 (Year 3 construction), and 2017 (Year 4 construction).

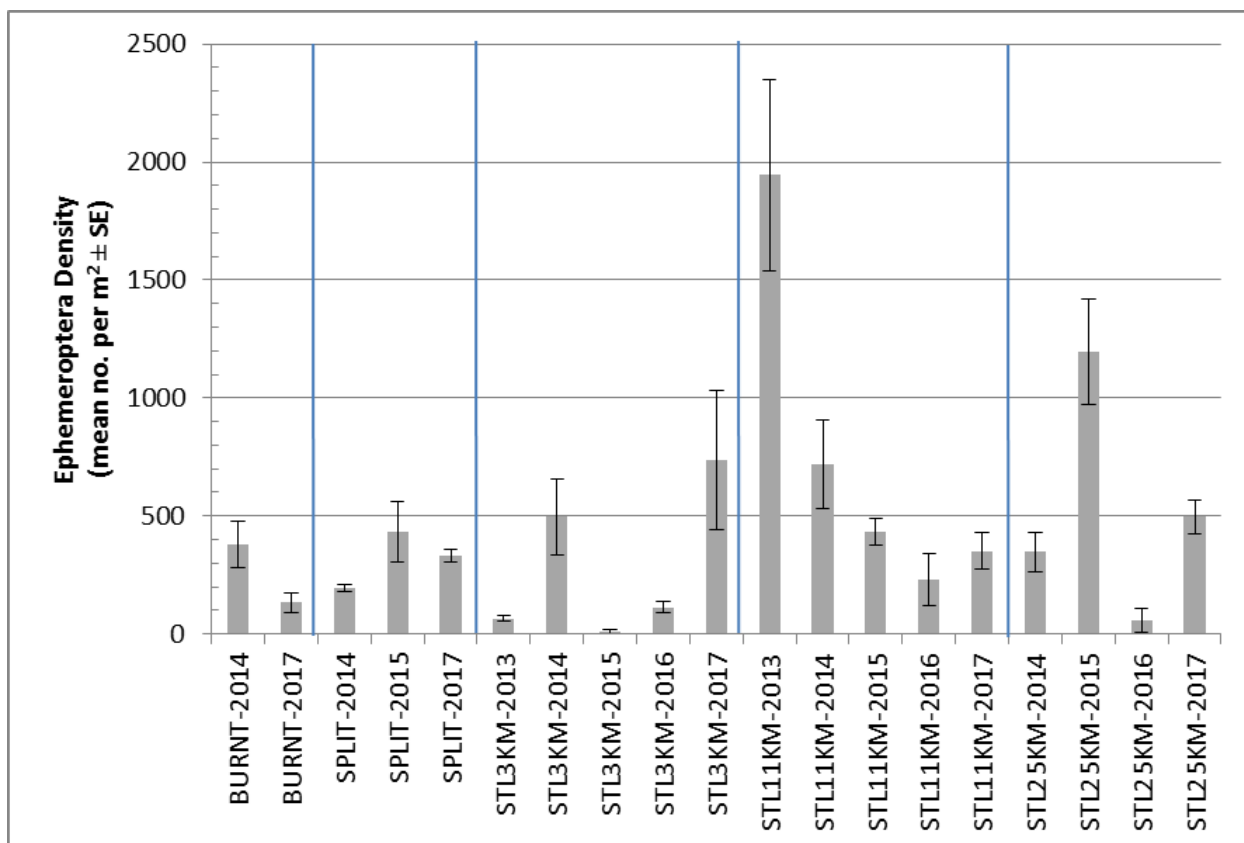


Figure 8: Ephemeroptera abundance (density, mean no. per m² ± SE) in nearshore habitat in 2013 (pre-construction), 2014 (Year 1 construction), 2015 (Year 2 construction), 2016 (Year 3 construction), and 2017 (Year 4 construction).

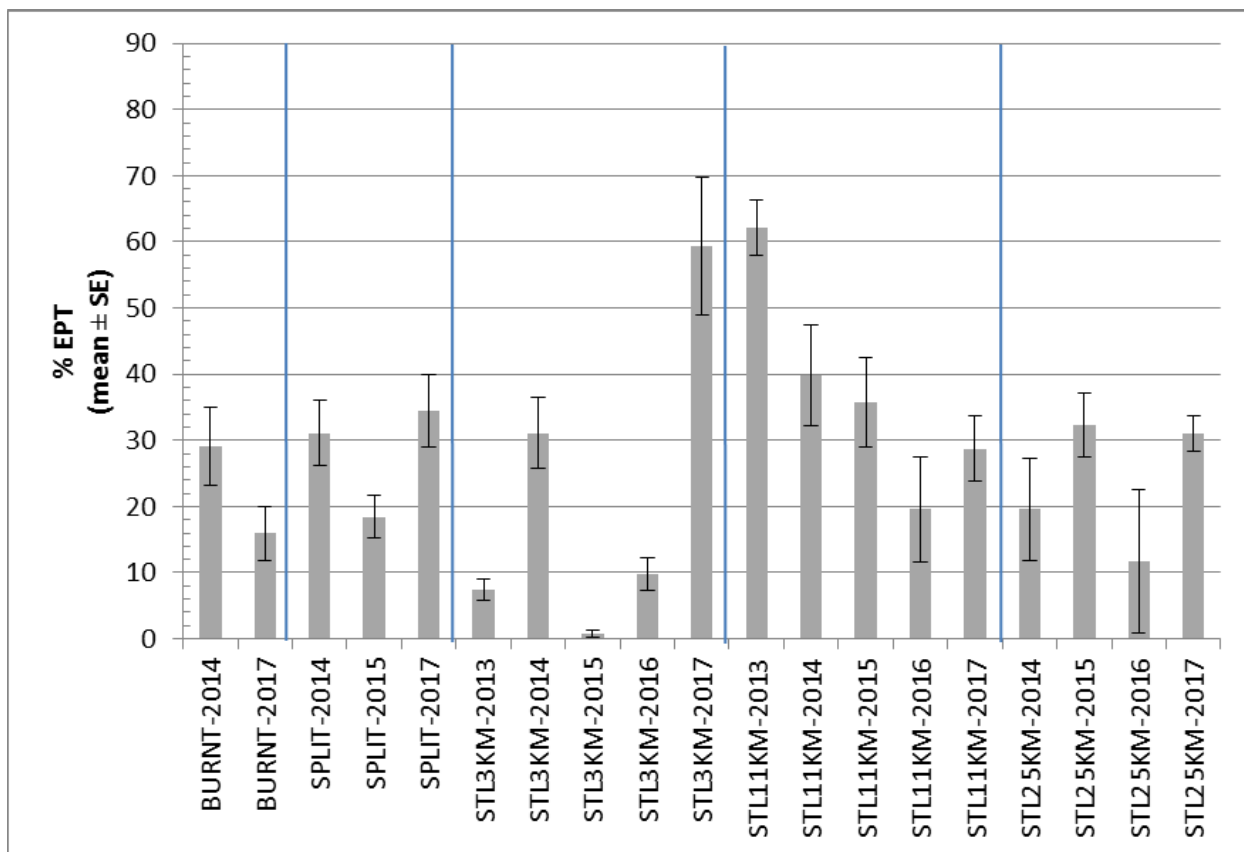


Figure 9: Percent EPT (mean ± SE) in nearshore habitat in 2013 (pre-construction), 2014 (Year 1 construction), 2015 (Year 2 construction), 2016 (Year 3 construction), and 2017 (Year 4 construction).

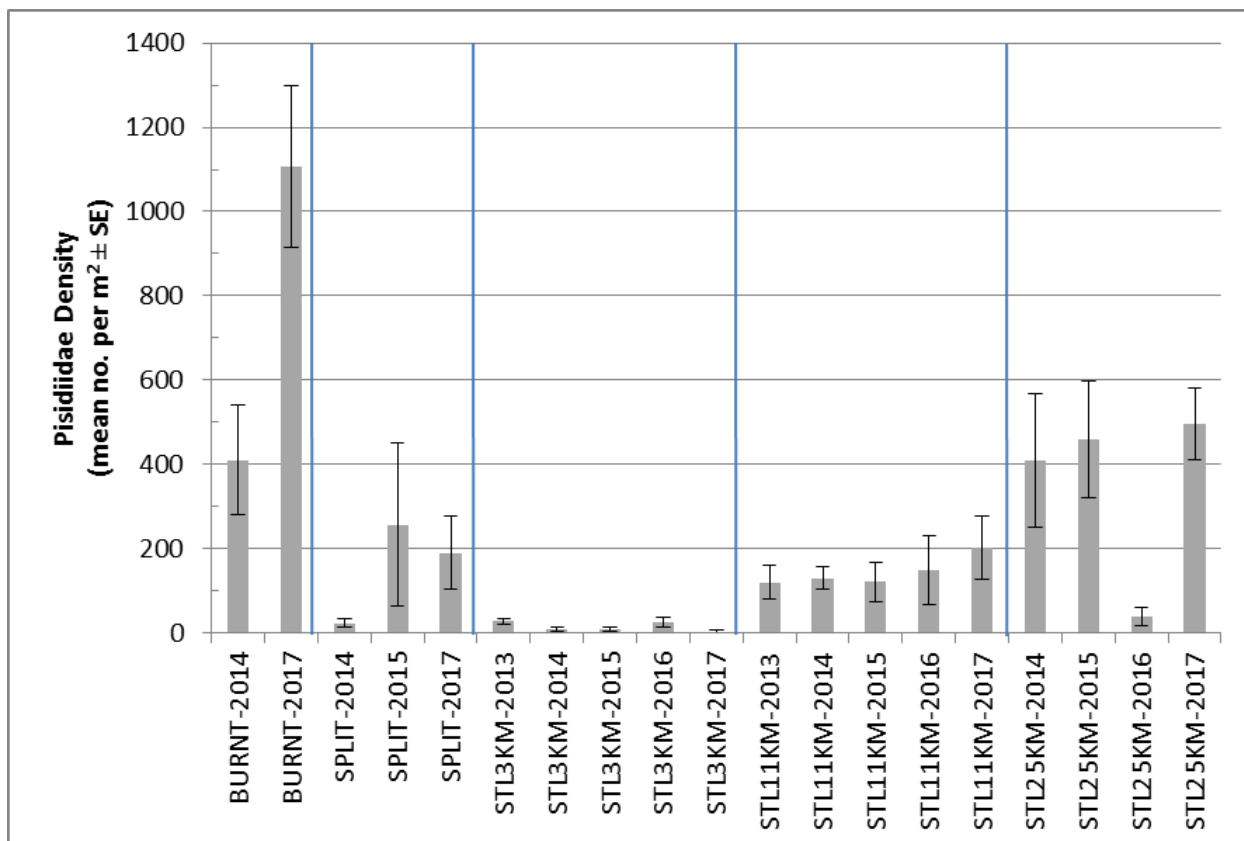


Figure 10: Pisiidiidae abundance (density, mean no. per m² ± SE) in nearshore habitat in 2013 (pre-construction), 2014 (Year 1 construction), 2015 (Year 2 construction), 2016 (Year 3 construction), and 2017 (Year 4 construction).

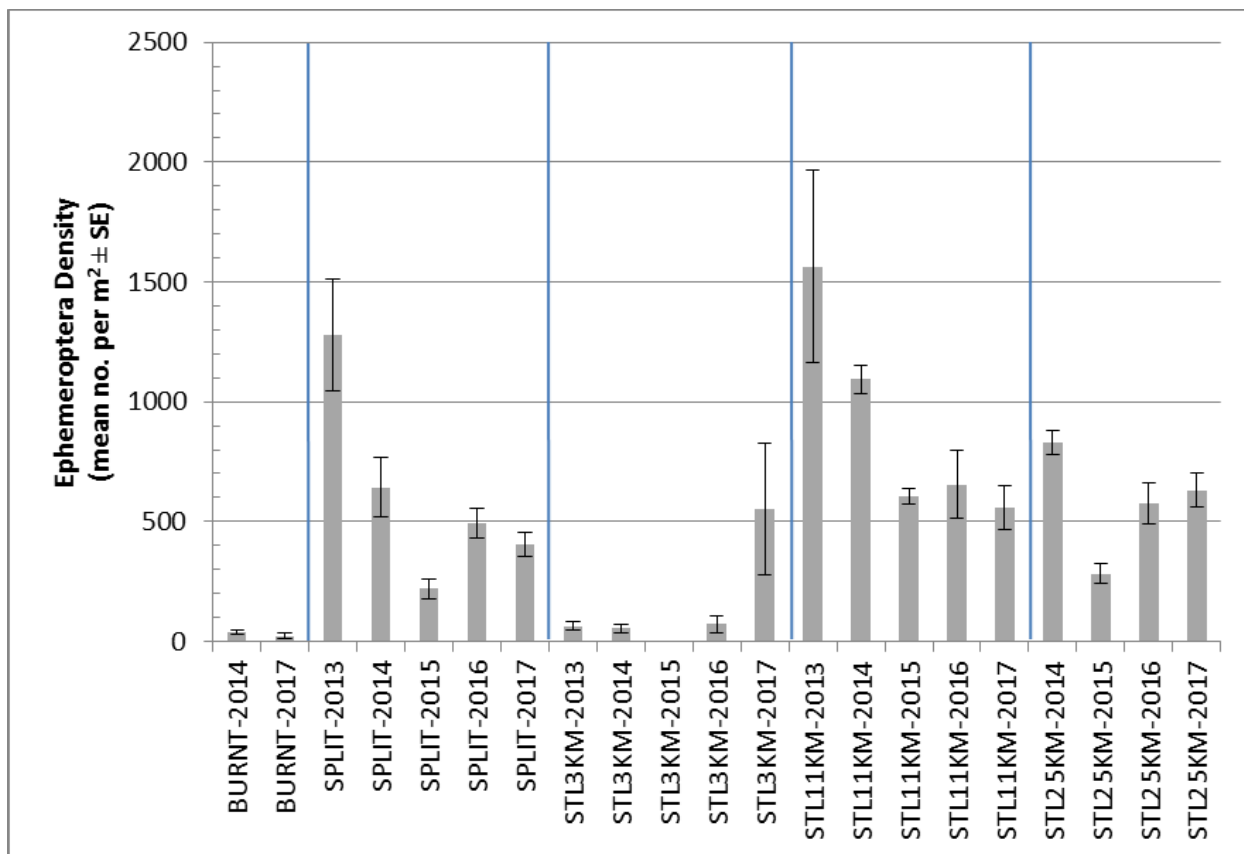


Figure 11: Ephemeroptera abundance (density, mean no. per m² ± SE) in offshore habitat in 2013 (pre-construction), 2014 (Year 1 construction), 2015 (Year 2 construction), 2016 (Year 3 construction), and 2017 (Year 4 construction).

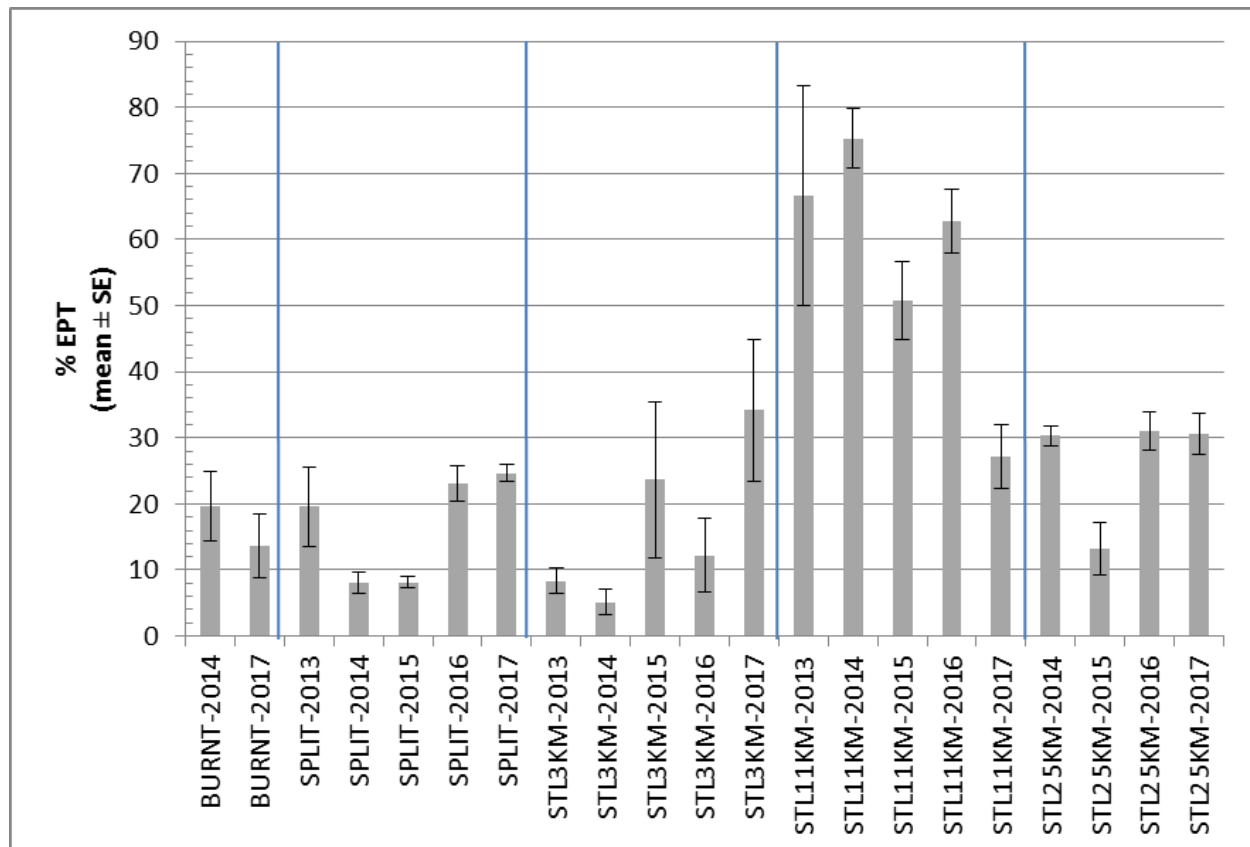


Figure 12: Percent EPT (mean ± SE) in offshore habitat in 2013 (pre-construction), 2014 (Year 1 construction), 2015 (Year 2 construction), 2016 (Year 3 construction), and 2017 (Year 4 construction).

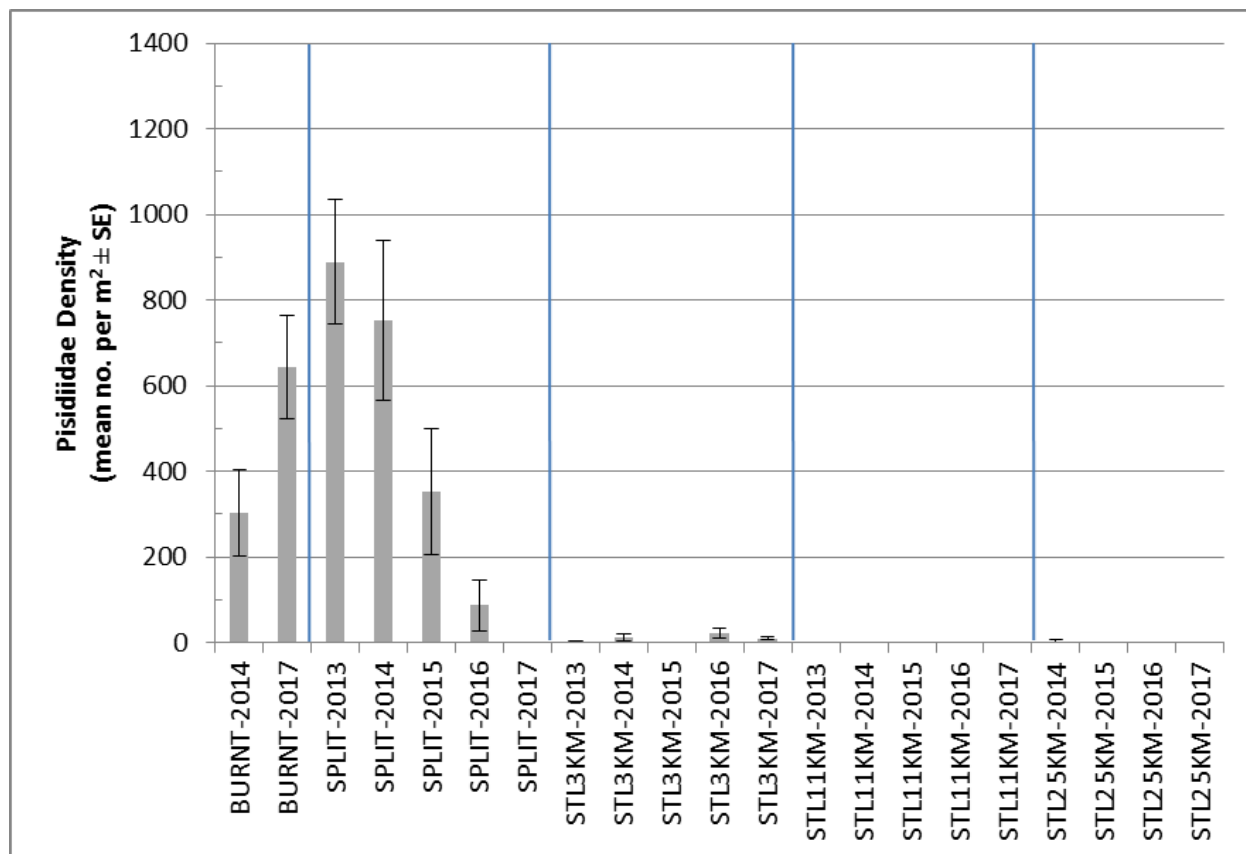


Figure 13: Pisiidiidae abundance (density, mean no. per m² ± SE) in offshore habitat in 2013 (pre-construction), 2014 (Year 1 construction), 2015 (Year 2 construction), 2016 (Year 3 construction), and 2017 (Year 4 construction).

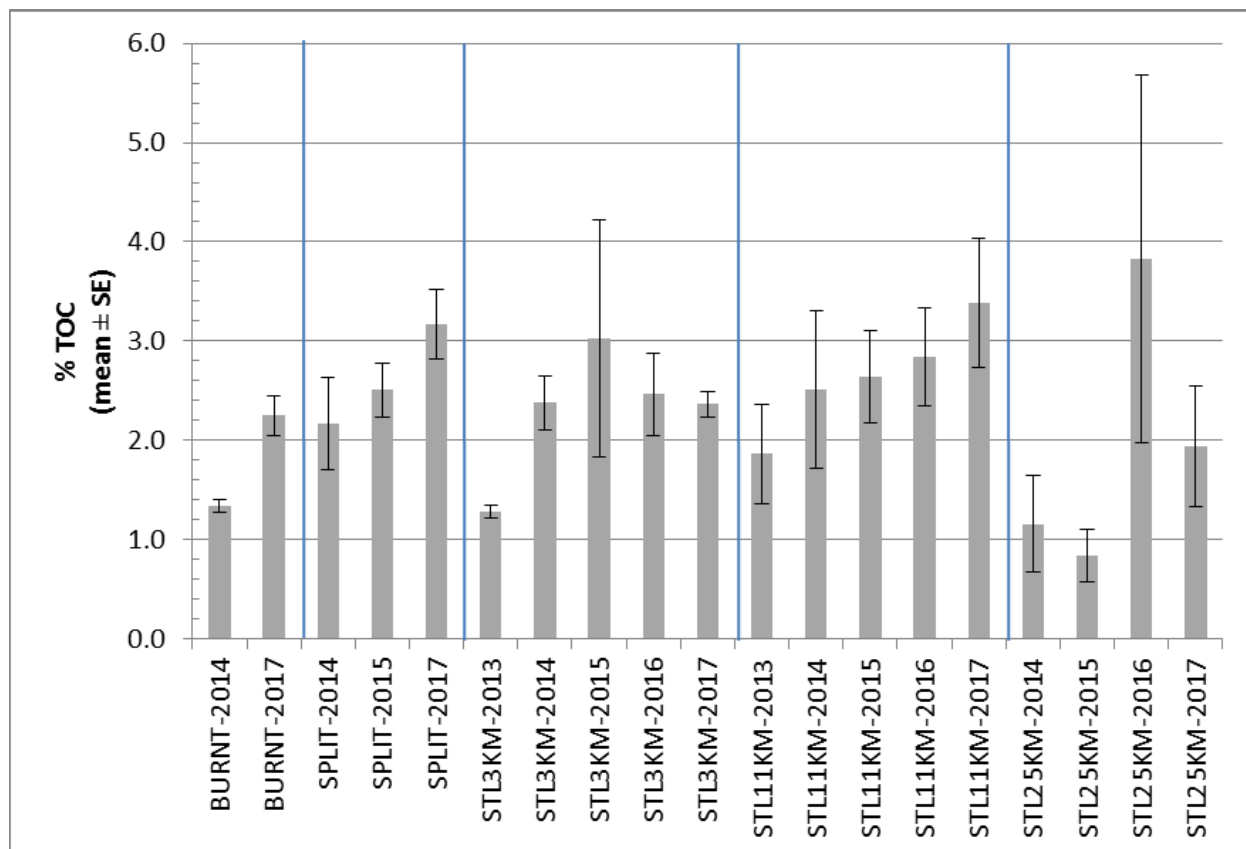


Figure 14: Percent TOC (mean ± SE) in nearshore habitat in 2013 (pre-construction), 2014 (Year 1 construction), 2015 (Year 2 construction), 2016 (Year 3 construction), and 2017 (Year 4 construction).

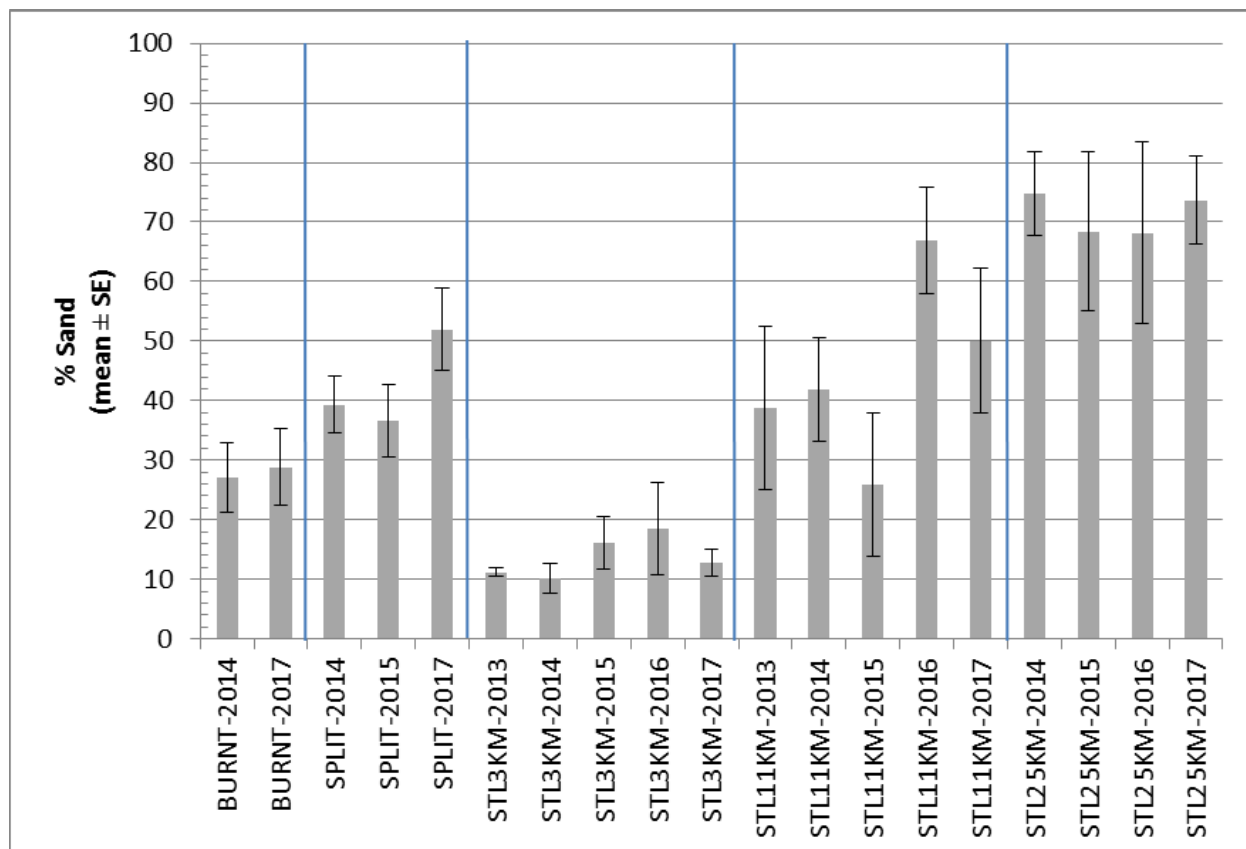


Figure 15: Percent sand (mean \pm SE) in nearshore habitat in 2013 (pre-construction), 2014 (Year 1 construction), 2015 (Year 2 construction), 2016 (Year 3 construction), and 2017 (Year 4 construction).

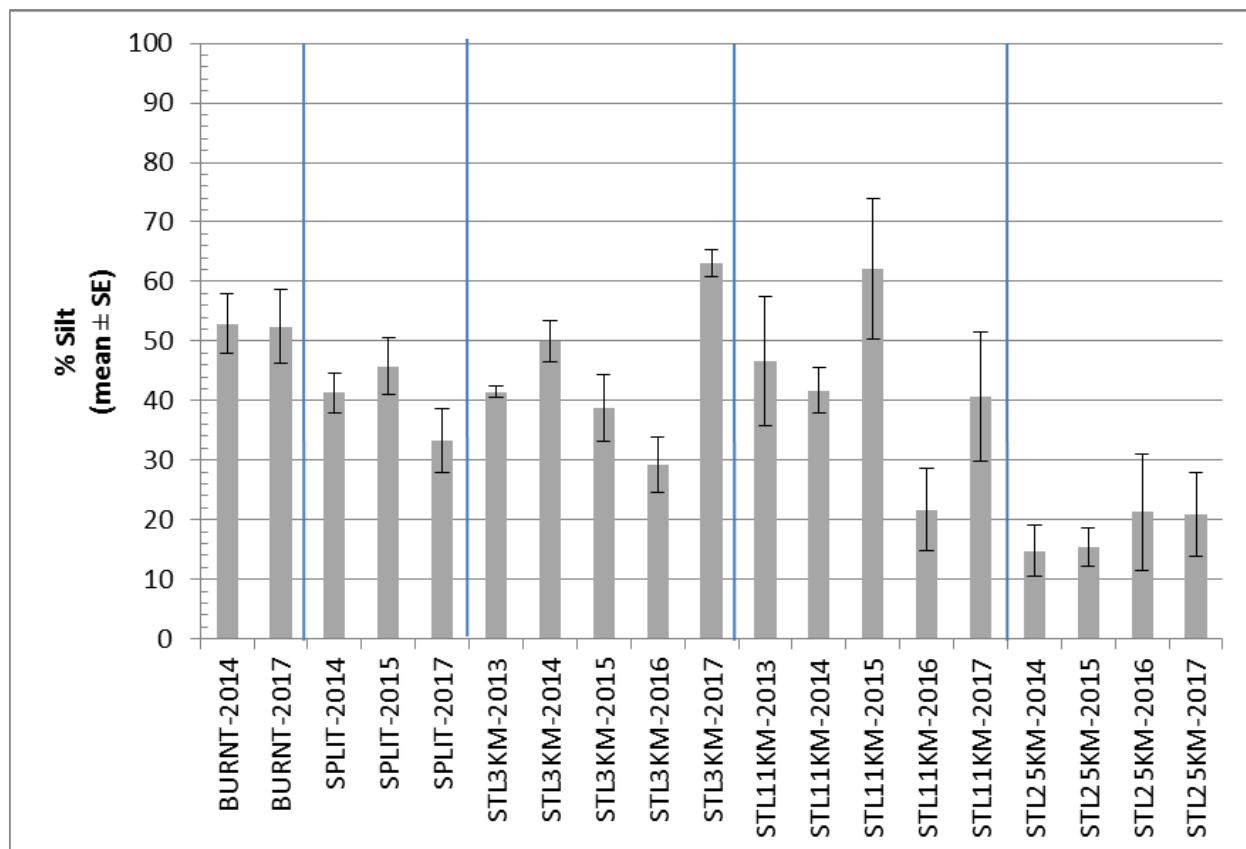


Figure 16: Percent silt (mean \pm SE) in nearshore habitat in 2013 (pre-construction), 2014 (Year 1 construction), 2015 (Year 2 construction), 2016 (Year 3 construction), and 2017 (Year 4 construction).

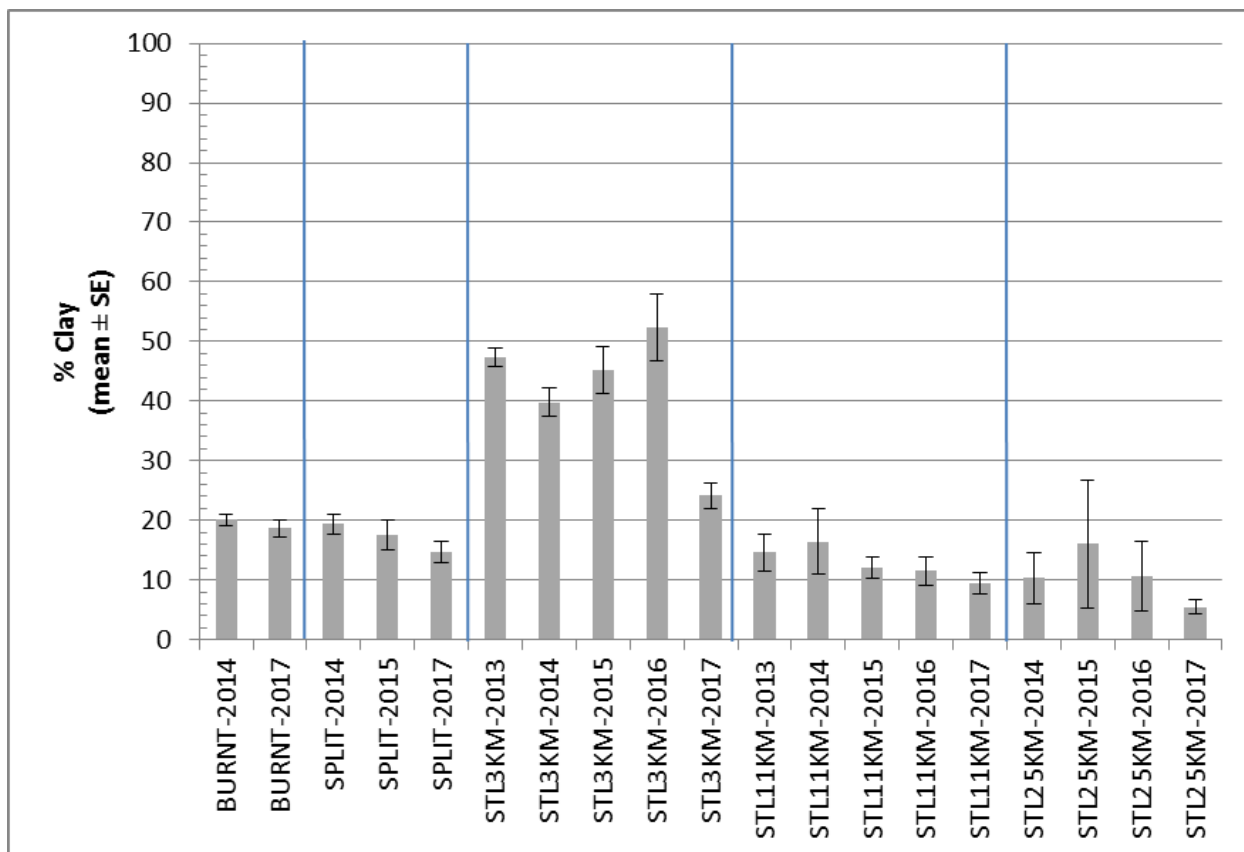


Figure 17: Percent clay (mean ± SE) in nearshore habitat in 2013 (pre-construction), 2014 (Year 1 construction), 2015 (Year 2 construction), 2016 (Year 3 construction), and 2017 (Year 4 construction).

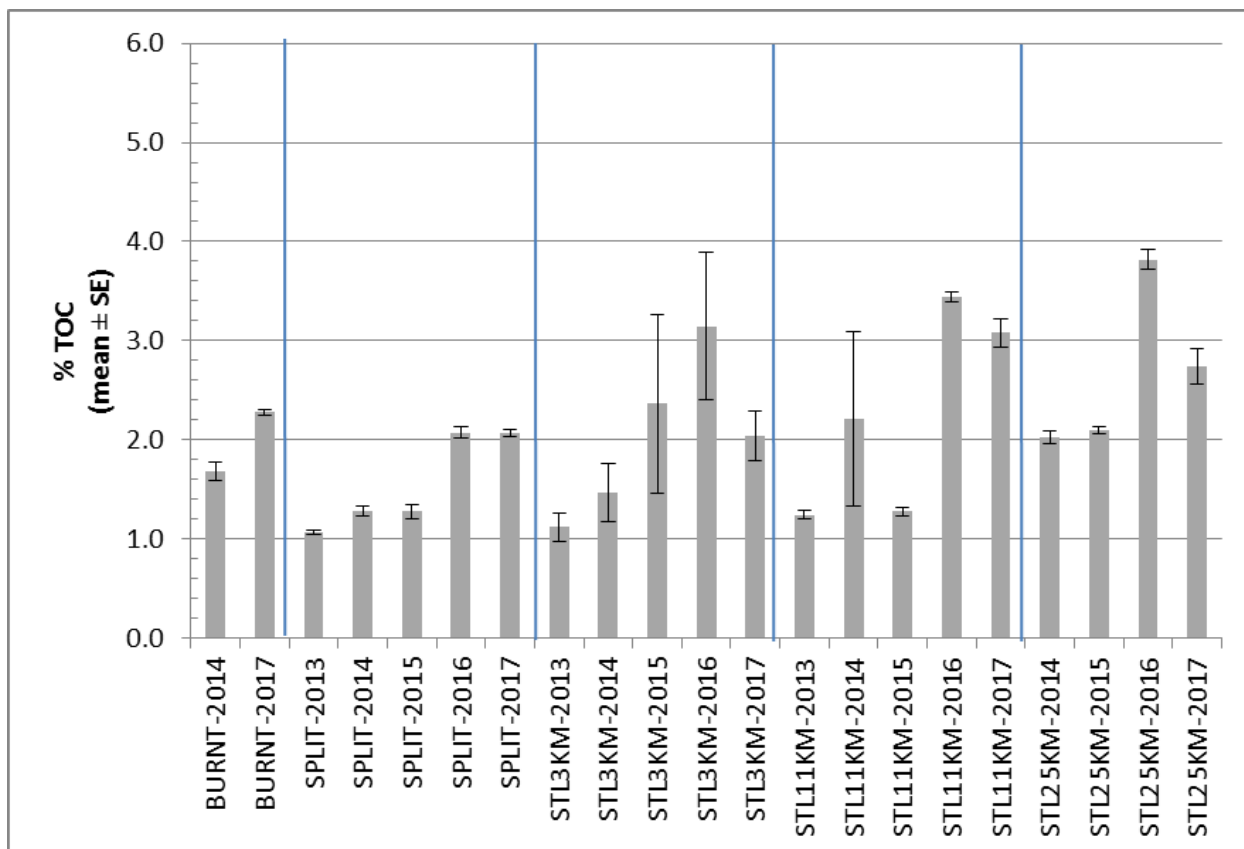


Figure 18: Percent TOC (mean ± SE) in offshore habitat in 2013 (pre-construction), 2014 (Year 1 construction), 2015 (Year 2 construction), 2016 (Year 3 construction), and 2017 (Year 4 construction).

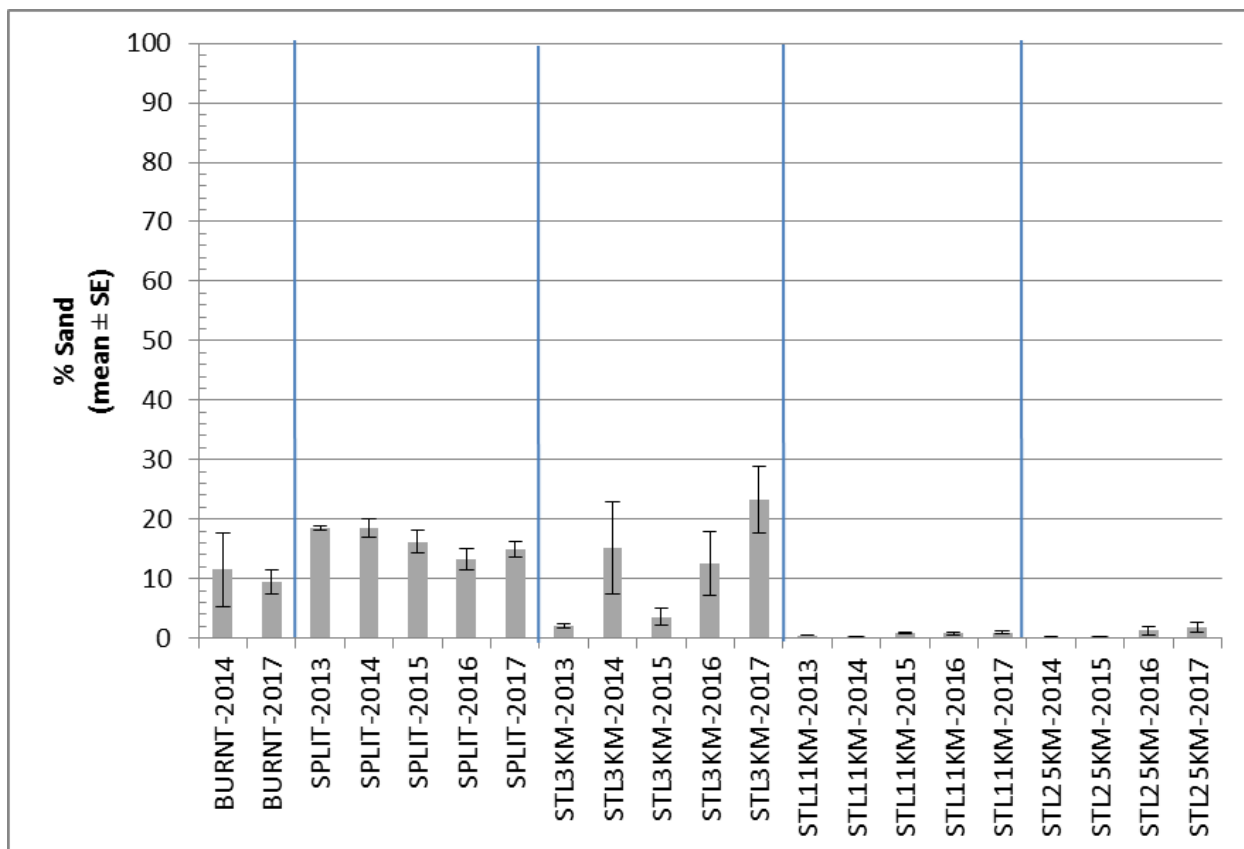


Figure 19: Percent sand (mean ± SE) in offshore habitat in 2013 (pre-construction), 2014 (Year 1 construction), 2015 (Year 2 construction), 2016 (Year 3 construction), and 2017 (Year 4 construction).

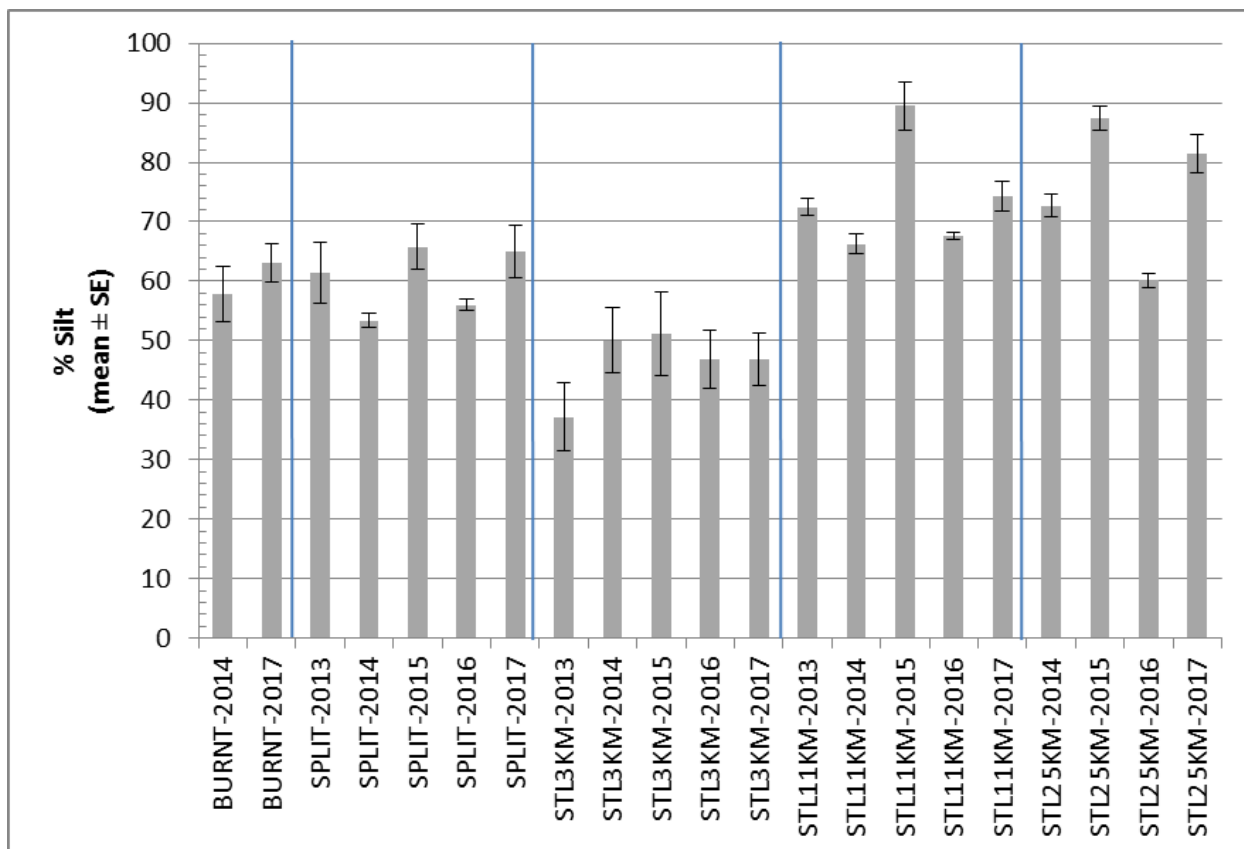


Figure 20: Percent silt (mean ± SE) in offshore habitat in 2013 (pre-construction), 2014 (Year 1 construction), 2015 (Year 2 construction), 2016 (Year 3 construction), and 2017 (Year 4 construction).

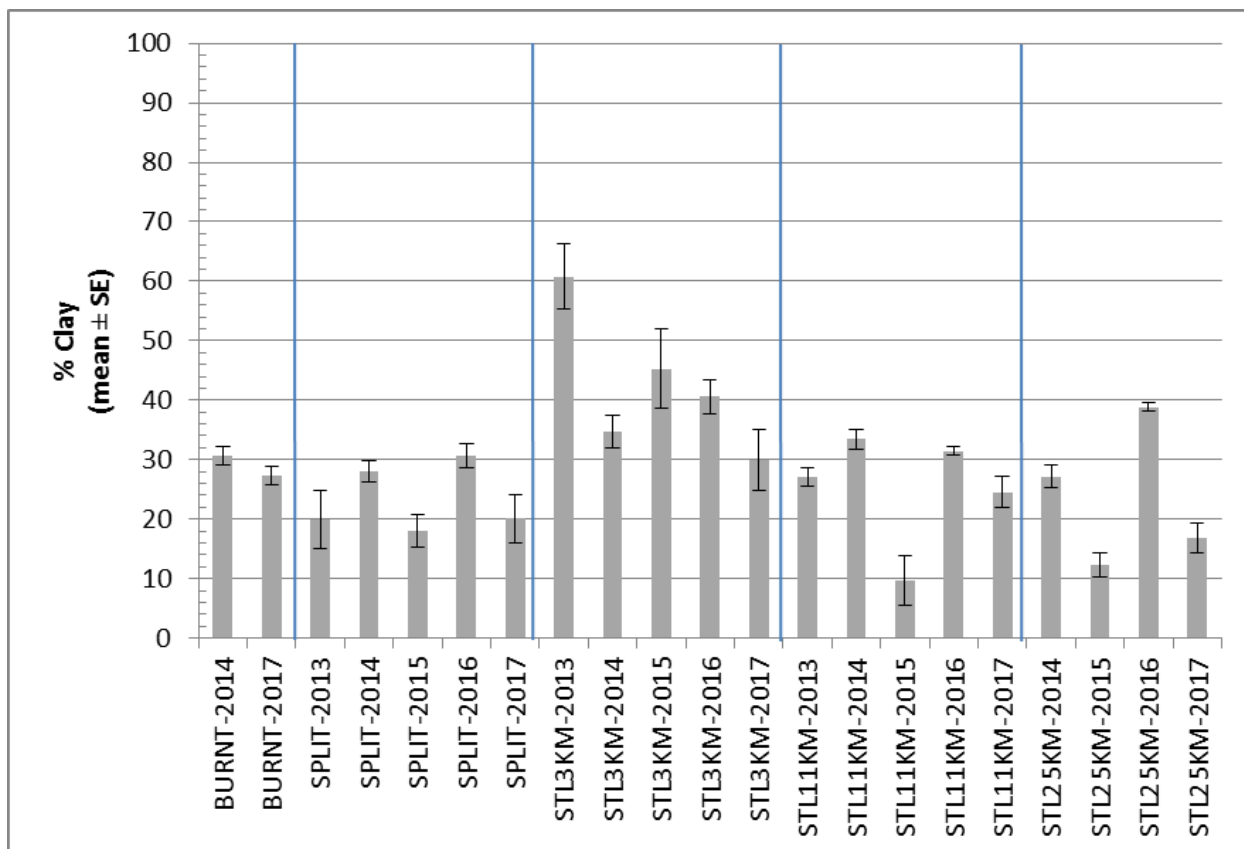


Figure 21: Percent clay (mean ± SE) in offshore habitat in 2013 (pre-construction), 2014 (Year 1 construction), 2015 (Year 2 construction), 2016 (Year 3 construction), and 2017 (Year 4 construction).

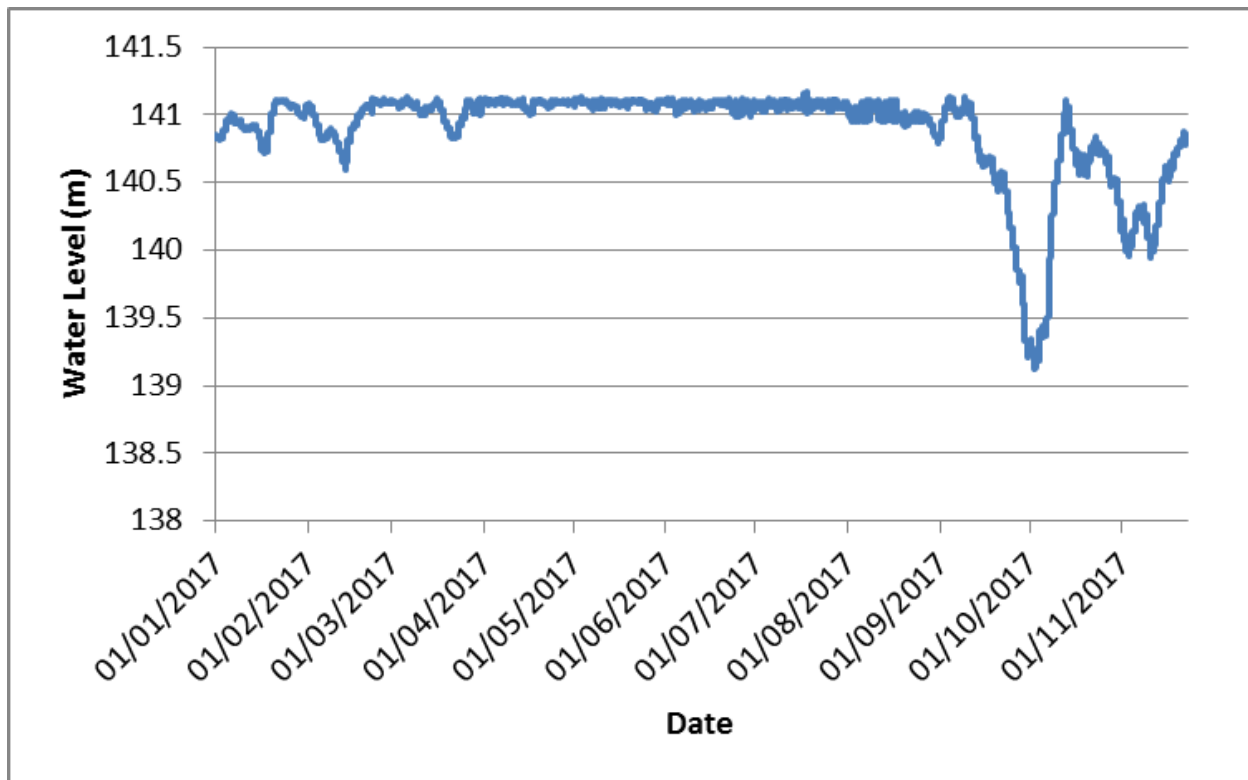
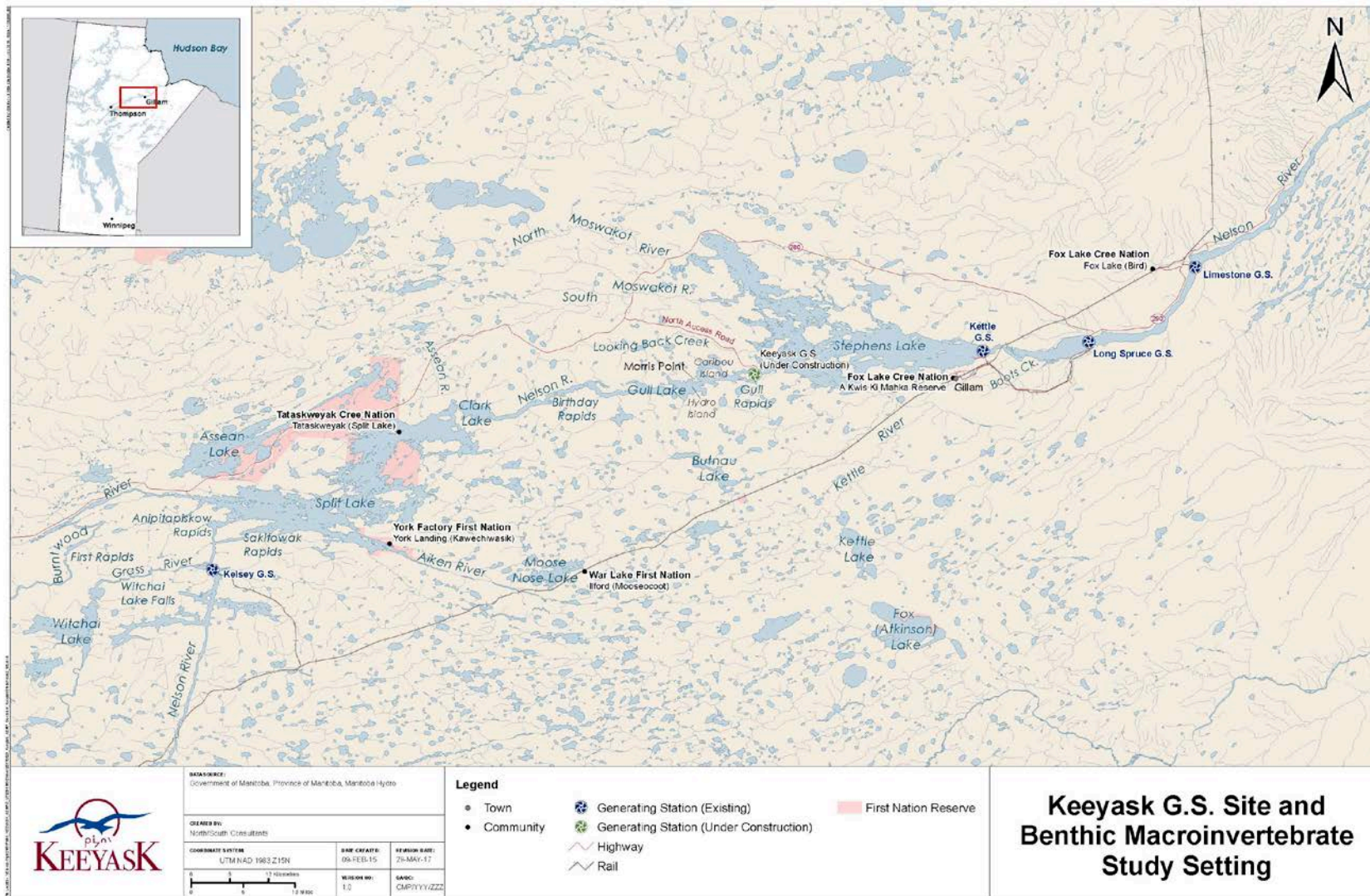


Figure 22: Stephens Lake water level (mASL), 2017.

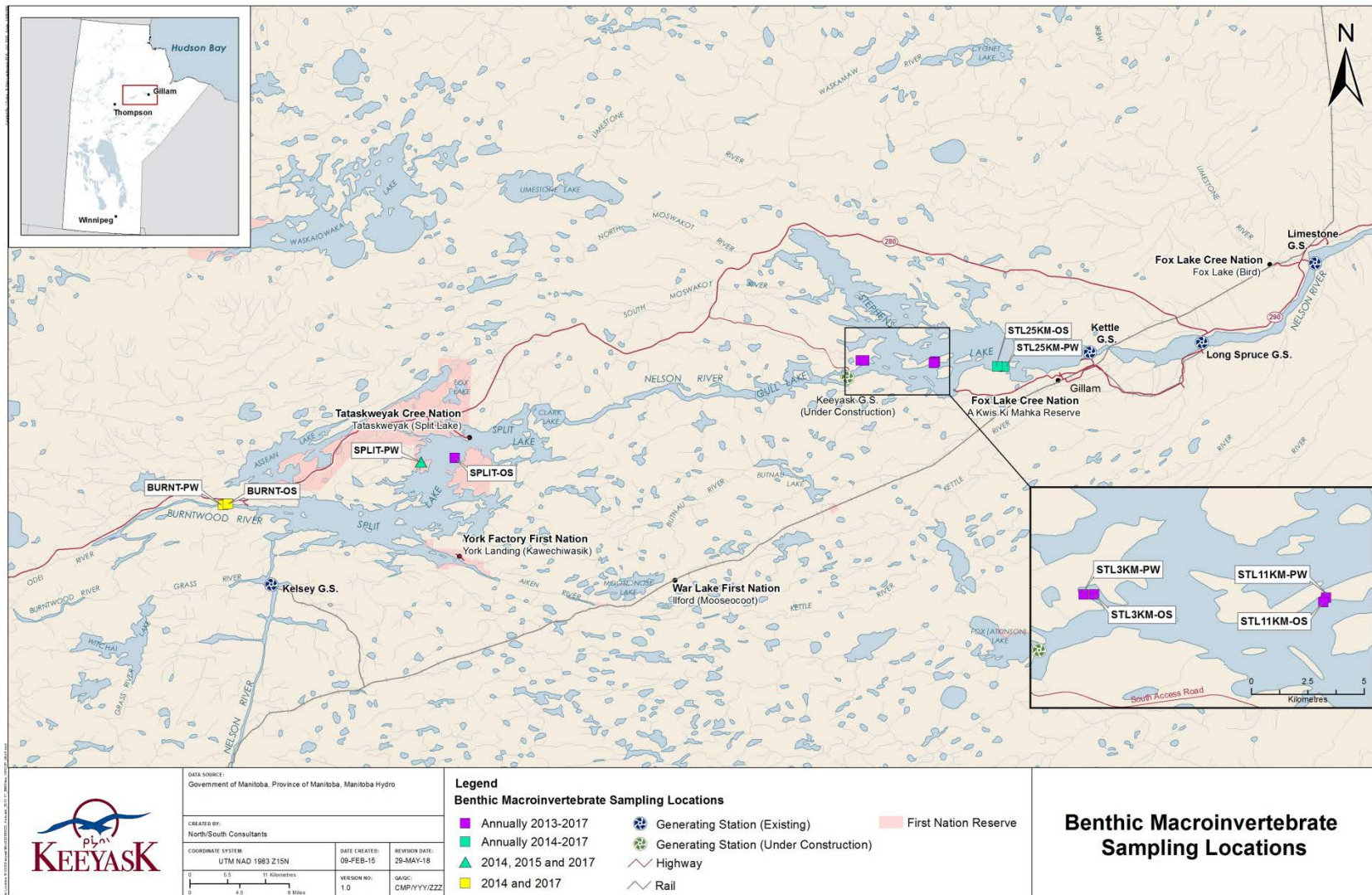
MAPS



Map 1: Map of the Nelson River showing the site of the Keeyask Generating Station and the benthic macroinvertebrate monitoring study setting.



Map 2: Map of instream structures at the Keeyask Generating Station site, September 2017.



Map 3: Benthic macroinvertebrate sampling locations, 2013 (pre-construction), 2014 (Year 1 construction), 2015 (Year 2 construction), 2016 (Year 3 construction) and 2017 (Year 4 construction).

APPENDICES

APPENDIX 1:

QUALITY ASSURANCE AND QUALITY CONTROL (QA/QC) PROCEDURES FOR AQUATIC MACROINVERTEBRATE SAMPLE PROCESSING

Detailed sample processing protocols are developed on a by-project-basis depending on the specific needs of each client. The following provides an overview of standard QA/QC procedures employed for each project.

Large &/or Rare Search for Samples Requiring Sub-Sampling

- Sample is washed and sieved using appropriate sized mesh;
- Entire sample is scanned for large &/or rare invertebrates in an appropriately sized tray. This scan is conducted on a per sample basis to avoid under-representing taxa that tend to occur singly or in few numbers that may be missed as a result of sub-sampling;
- Large organisms tend to occur in small numbers (e.g., Belostomatidae, crayfish); these organisms are rare in relation to the overall number of organisms in the sample being processed. Based on the overall number of organisms in the sample, if an organism tends to occur rarely with respect to the rest of the organisms in the sample, this organism is removed (or more, if > 1) and retained in a separate vial for taxonomic identification; and
- Large &/or rare organisms are not included in the split correction and this is indicated clearly on the bench sheet. It is noted that there is a separate vial containing large &/or rare organisms.

Sample Processing

Sub-Sampling

- Most samples are sub-sampled (unless requested by the client) to decrease processing time. A minimum of 300 organisms processed ensures the inclusion of more rare taxa and permits comparisons of richness among sites;
- The entire sample is examined in a large tray and estimate the number of splits necessary to produce the appropriate number of aliquots needed to achieve a 300-organism target;
- If a sample contains > 300 organisms, large &/or rare invertebrates and any small fish are removed from the whole sample before sub-sampling (see above);
- When > 300 organisms are present, the sample is split into halves. In order to reduce any bias created by the mixing/splitting process, the well-cleaned and mixed sample is split using a 1.0 or 4.0 L [specific to sample volume] Folsom Plankton Splitter. Each sub-sample is subsequently sorted until at least 300 animals are counted. When the 300-organism count

is achieved part way through a sub-sample, the remainder of this fraction is sorted so that a known fraction is sorted. All splitting information is recorded on the bench sheet.

- In sparse samples (*i.e.*, containing ~300 animals or less), the entire sample is processed;
- To be counted, a specimen must have enough intact body parts to permit its identification to the targeted level, and it must have a head (this prevents a body and detached head from being counted as two animals);
- Larval exuviae (exoskeleton remains), and empty shells (snails and clams) and cases (caddisflies) are not counted in the 300-fixed count. If there are no “live” molluscs in the sample, a few empty shells are set aside for identification; these are placed into vial with the large &/or rare specimens;
- The taxa Porifera, Nemata, Copepoda, Cladocera, Rotifera, Platyhelminthes, Ostracoda, and non-aquatic (terrestrial) taxa are not included in the 300 organism count because they are not considered as part of the benthic macroinvertebrate community. Typically, they are counted and their numbers recorded on the bench sheet.

Sorting Samples

- Sorting aquatic samples involves removing aquatic macroinvertebrates from organic and inorganic materials within each sample;
- All sorting is conducted with a 3x desktop magnifier or stereomicroscope [specific to Project];
- All sorted samples are checked by a 2nd laboratory technician (QA/QC technician);
- Any additional invertebrates collected during the QA/QC process are combined with the original sample, but counted separately;
- Sorting efficiency must be $\geq 95\%$. The QA/QC technician checks on a tray-by-tray basis so that the sample is handled as few times as possible; the QA/QC technician will sort any remaining invertebrates from the tray and record the number of missed invertebrates per tray;
- The QA/QC technician will also check the bench sheet data to ensure it matches the sample data; and
- Sorted invertebrate samples are stored in 70% ethanol prior to delivery to the taxonomist.

Verification of Taxonomic Identification

- NSC taxonomists regularly communicate with external taxonomic specialists to ensure accuracy and consistency.

Sample Identifications

- Samples are identified to the appropriate taxonomic level [specific to client] by an in-house or external taxonomist. Ten percent (10%) of the in-house identifications are randomly

selected and sent to an external taxonomy specialist for QA/QC. The accuracy of the sample subset is assessed for identification and enumeration; all unknown invertebrates are sent to an external specialist; incorrect identifications and/or enumeration discrepancies are noted on the laboratory datasheet;

- The target overall accuracy level for in-house invertebrate identifications and enumeration is 95% at the Family level and 90% at the Genus level. Corrected identifications and enumeration values received from the external taxonomist are used in place of in-house data discrepancies. If the average error rate of audited samples is outside the target, the entire project must be re-identified by someone other than the original taxonomist.

Data Processing

- Data from field books and laboratory bench sheets are entered into an MS Excel® data template;
- Data templates specify the Project Name, Study Area, Site Location/Description, GPS coordinates (Global Positioning System), Site Label, Sampling Date, Time of Day, Gear Type, Sieve Mesh Size in Field/Laboratory, Presence or Absence of Vegetation/Algae, Water Temperature, Water Depth, Velocity, Substrate Type, Number of Splits, Taxonomic List, Life Stage, and Enumeration List;
- A 2nd and 3rd technician sequentially verify all entered data and formulae to original field book and laboratory bench sheets (*i.e.*, verification is done twice) and a final verification is conducted by the project biologist and/or report author.

APPENDIX 2: MEANS OF BENTHIC MACROINVERTEBRATE METRICS AND SUPPORTING SEDIMENT RESULTS BY REPLICATE STATION FOR 2013 (PRE-CONSTRUCTION), 2014 (YEAR 1 CONSTRUCTION), 2015 (YEAR 2 CONSTRUCTION), 2016 (YEAR 3 CONSTRUCTION), AND 2017 (YEAR 4 CONSTRUCTION)

Note: results for each site continue over four pages.

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Water Depth	Total Invertebrate Density	Oligochaeta Density	Amphipoda Density	Pisidiidae Density	Gastropoda Density
Units					meters	no. per m ²	no. per m ²	no. per m ²	no. per m ²	no. per m ²
Burntwood River	NRSH-PW	2014	reference	BURNT-PW-REP2	2.4	1273	0	0	277	139
Burntwood River	NRSH-PW	2014	reference	BURNT-PW-REP3	2.5	1307	0	0	537	355
Burntwood River	NRSH-PW	2014	reference	BURNT-PW-REP4	2.6	762	26	0	225	208
Burntwood River	NRSH-PW	2014	reference	BURNT-PW-REP5	2.3	2000	26	9	866	710
Burntwood River	NRSH-PW	2014	reference	BURNT-PW-REP6	2.2	1705	17	0	147	641
Burntwood River	NRSH-PW	2017	reference	BURNT-PW-REP1	1.8	1082	0	14	418	87
Burntwood River	NRSH-PW	2017	reference	BURNT-PW-REP2	2.4	1443	14	0	1068	29
Burntwood River	NRSH-PW	2017	reference	BURNT-PW-REP3	5.7	2684	58	0	1558	72
Burntwood River	NRSH-PW	2017	reference	BURNT-PW-REP4	3.1	1486	0	0	1154	87
Burntwood River	NRSH-PW	2017	reference	BURNT-PW-REP5	1.8	3347	101	0	1342	1342
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP1	2.6	808	14	115	0	144
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP2	2.9	721	0	0	29	29
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP3	2.6	649	144	0	14	58
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP4	2.4	866	29	0	58	202
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP5	2.5	404	14	0	14	14
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R1	0.9	2323	29	87	43	115
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R2	1.1	2222	159	14	144	29
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R3	1.2	1111	289	0	72	43

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Water Depth	Total Invertebrate Density	Oligochaeta Density	Amphipoda Density	Pisidiidae Density	Gastropoda Density
Units					meters	no. per m ²	no. per m ²	no. per m ²	no. per m ²	no. per m ²
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R4	1.0	1659	43	0	0	289
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R5	1.1	8281	1039	0	1024	390
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R1	1.8	1010	0	29	87	130
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R2	1.4	1443	115	0	404	72
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R3	2.4	1226	375	0	58	0
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R4	2.3	736	43	0	0	58
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R5	1.7	1544	159	14	404	87
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP1	3.0	1264	164	9	35	338
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP2	2.8	1524	26	0	26	866
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP3	3.1	727	17	0	52	216
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP4	2.6	1143	35	0	9	511
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP5	2.5	1368	156	0	17	883
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP1	3.0	779	0	0	0	43
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP2	3.1	476	58	0	29	87
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP3	3.0	2352	231	0	0	289
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP4	2.7	2280	101	0	0	188

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Water Depth	Total Invertebrate Density	Oligochaeta Density	Amphipoda Density	Pisidiidae Density	Gastropoda Density
Units					meters	no. per m ²	no. per m ²	no. per m ²	no. per m ²	no. per m ²
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP5	2.2	1515	144	14	14	231
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R1	2.4	216	14	0	0	0
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R2	2.8	3015	14	14	29	14
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R3	2.7	231	29	0	0	72
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R4	2.2	1414	101	0	14	245
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R5	1.4	808	0	0	0	14
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R1	2.6	1428	0	14	0	87
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R2	2.8	707	29	0	29	144
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R3	2.7	1154	159	14	58	101
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R4	2.6	1746	87	0	43	317
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R5	1.8	3203	87	0	0	851

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Water Depth	Total Invertebrate Density	Oligochaeta Density	Amphipoda Density	Pisidiidae Density	Gastropoda Density
Units					meters	no. per m ²	no. per m ²	no. per m ²	no. per m ²	no. per m ²
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R1	2.3	2150	43	29	0	0
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R2	2.8	404	0	0	0	14
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R3	2.3	693	43	0	0	0
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R4	2.1	505	0	0	0	0
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R5	1.4	1991	14	0	14	101
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP1	3.0	3298	78	0	242	416
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP2	2.2	2329	130	0	156	649
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP3	2.2	3740	312	9	139	641
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP4	2.1	1567	78	0	26	476
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP5	2.6	4242	130	0	35	286
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP1	3.4	1832	58	29	173	390

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Water Depth	Total Invertebrate Density	Oligochaeta Density	Amphipoda Density	Pisidiidae Density	Gastropoda Density
Units					meters	no. per m ²	no. per m ²	no. per m ²	no. per m ²	no. per m ²
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP2	2.1	1529	58	0	144	433
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP3	2.0	2496	115	0	159	808
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP4	1.9	1472	0	0	29	606
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP5	1.5	1428	144	0	144	43
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R1	3.5	1443	14	87	188	274
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R2	1.8	1010	0	0	274	115
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R3	2.2	1284	43	0	29	144
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R4	1.8	1068	29	0	43	87
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R5	1.1	1803	115	0	72	216
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R1	2.7	1558	101	29	476	361
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R2	1.6	851	14	0	101	664

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Water Depth	Total Invertebrate Density	Oligochaeta Density	Amphipoda Density	Pisidiidae Density	Gastropoda Density
Units					meters	no. per m ²	no. per m ²	no. per m ²	no. per m ²	no. per m ²
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R3	1.2	721	130	29	58	188
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R4	1.9	1515	130	0	43	87
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R5	1.2	995	260	0	72	29
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R1	4.2	1861	14	260	447	14
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R2	2.1	765	43	43	231	87
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R3	1.2	1313	159	0	231	332
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R4	1.9	1630	0	0	101	216
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R5	1.2	1414	14	14	0	476
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP1	2.9	1169	14	43	188	707
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP2	2.5	2669	462	0	332	1039
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP3	1.9	2727	245	0	274	1197

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Water Depth	Total Invertebrate Density	Oligochaeta Density	Amphipoda Density	Pisidiidae Density	Gastropoda Density
Units					meters	no. per m ²	no. per m ²	no. per m ²	no. per m ²	no. per m ²
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP4	3.2	1313	188	0	216	159
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP5	2.3	4429	476	14	1039	2539
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R1	2.0	1457	43	14	620	260
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R2	1.3	4357	375	0	361	1068
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R3	1.0	3203	130	0	72	1573
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R4	2.4	3174	346	0	346	433
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R5	1.1	8685	346	29	895	3347
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R1	3.5	491	43	14	43	0
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R2	1.5	0	0	0	0	0
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R3	1.5	491	14	0	101	101
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R4	3.1	72	0	29	14	0

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Water Depth	Total Invertebrate Density	Oligochaeta Density	Amphipoda Density	Pisidiidae Density	Gastropoda Density
Units					meters	no. per m ²	no. per m ²	no. per m ²	no. per m ²	no. per m ²
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R5	1.3	159	0	14	0	72
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R1	3.0	779	0	0	346	173
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R2	1.7	2669	0	0	519	1241
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R3	1.5	1472	29	0	303	404
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R4	3.0	1645	87	0	534	173
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R5	1.3	2049	87	0	779	418
Burntwood River	OFFSH	2014	reference	BURNT-OS-REP1	7.5	441	0	0	320	0
Burntwood River	OFFSH	2014	reference	BURNT-OS-REP2	8.6	970	9	0	545	0
Burntwood River	OFFSH	2014	reference	BURNT-OS-REP3	8.2	649	9	0	493	0
Burntwood River	OFFSH	2014	reference	BURNT-OS-REP4	8.4	320	0	17	156	9
Burntwood River	OFFSH	2014	reference	BURNT-OS-REP5	8.6	199	17	0	0	0
Burntwood River	OFFSH	2017	reference	BURNT-OS-REP1	6.5	693	0	14	361	0
Burntwood River	OFFSH	2017	reference	BURNT-OS-REP2	8.7	808	0	0	390	0
Burntwood River	OFFSH	2017	reference	BURNT-OS-REP3	8.2	1298	0	14	952	0
Burntwood River	OFFSH	2017	reference	BURNT-OS-REP4	6.8	1226	14	14	866	0
Burntwood River	OFFSH	2017	reference	BURNT-OS-REP5	8.2	837	14	0	649	0
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP1	7.0	4040	14	1544	332	130
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP2	6.3	9248	29	1818	1125	4069
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP3	9.1	7517	58	1919	1111	2626
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP4	6.4	10806	0	895	895	6983
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP5	8.3	8281	29	895	981	5800
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP1	7.2	6175	29	1371	260	3506
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP2	6.8	7012	29	1212	649	4415

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Water Depth	Total Invertebrate Density	Oligochaeta Density	Amphipoda Density	Pisidiidae Density	Gastropoda Density
Units					meters	no. per m ²	no. per m ²	no. per m ²	no. per m ²	no. per m ²
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP3	9.3	11311	58	2308	1125	6983
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP4	6.9	11311	29	1241	1241	6896
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP5	8.9	9060	0	1789	491	6233
Split Lake	OFFSH	2015	reference	SPLIT-OS-R1	6.1	3939	14	2193	534	87
Split Lake	OFFSH	2015	reference	SPLIT-OS-R2	5.9	3506	0	1601	750	202
Split Lake	OFFSH	2015	reference	SPLIT-OS-R3	6.5	3477	29	2684	0	29
Split Lake	OFFSH	2015	reference	SPLIT-OS-R4	5.7	3001	29	1616	447	58
Split Lake	OFFSH	2015	reference	SPLIT-OS-R5	5.4	3246	14	2583	29	87
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP1	6.9	1962	43	1226	0	14
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP2	6.2	2958	29	1573	303	58
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP3	9.4	2222	29	1385	0	0
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP4	6.2	2712	29	1457	130	173
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP5	6.3	2106	43	1746	0	0
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP1	7.5	3102	101	1991	0	0
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP2	6.3	3852	72	2698	0	0
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP3	9.4	1371	43	822	0	0
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP4	6.7	1443	0	952	0	14
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP5	6.4	2207	0	1731	0	0
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP1	6.3	1394	0	9	0	744
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP2	6.0	710	9	0	0	164
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP3	6.0	822	0	0	0	424
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP4	6.2	900	17	0	0	121
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP5	6.2	1679	35	0	9	156
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP1	6.5	404	0	0	14	216

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Water Depth	Total Invertebrate Density	Oligochaeta Density	Amphipoda Density	Pisidiidae Density	Gastropoda Density
Units					meters	no. per m ²	no. per m ²	no. per m ²	no. per m ²	no. per m ²
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP2	6.1	1082	14	29	0	202
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP3	6.1	1428	0	43	0	491
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP4	5.1	2684	29	14	43	1630
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP5	6.3	1731	0	14	0	1111
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R1	5.7	159	0	0	0	29
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R2	5.2	346	0	14	0	14
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R3	5.3	43	0	0	0	0
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R4	4.9	72	0	0	0	0
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R5	5.4	303	0	0	0	0
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R1	6.0	505	0	43	0	433
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R2	5.2	1197	29	29	14	620
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R3	5.7	447	0	43	0	202
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R4	4.9	649	0	0	43	491
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R5	6.0	577	0	0	58	361

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Water Depth	Total Invertebrate Density	Oligochaeta Density	Amphipoda Density	Pisidiidae Density	Gastropoda Density
Units					meters	no. per m ²	no. per m ²	no. per m ²	no. per m ²	no. per m ²
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R1	6.2	2106	115	0	14	14
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R2	5.1	923	29	14	0	231
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R3	5.3	462	0	0	0	101
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R4	4.5	2482	0	0	14	1212
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R5	5.3	173	0	0	14	115
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP1	6.6	2190	0	130	0	52
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP2	7.3	2225	9	130	0	9
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP3	7.1	2779	26	69	0	9
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP4	7.2	2199	35	69	0	0
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP5	6.6	0	0	0	0	0
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP1	6.4	1284	0	202	0	43
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP2	6.8	1818	14	361	0	0
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP3	6.5	1890	14	433	0	0
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP4	7.6	1140	0	72	0	0

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Water Depth	Total Invertebrate Density	Oligochaeta Density	Amphipoda Density	Pisidiidae Density	Gastropoda Density
Units					meters	no. per m ²	no. per m ²	no. per m ²	no. per m ²	no. per m ²
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP5	6.9	1313	0	72	0	0
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R1	5.9	1702	0	765	0	29
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R2	6.3	1111	0	491	0	0
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R3	6.6	1414	0	433	0	0
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R4	6.8	895	0	115	0	0
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R5	6.1	1125	0	159	0	0
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R1	6.3	736	0	231	0	115
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R2	6.3	1977	14	317	0	115
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R3	7.2	505	0	87	0	14
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R4	6.8	1284	0	332	0	14
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R1	5.8	2554	0	1876	0	72
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R2	6.3	3232	14	2323	0	101
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R3	6.8	1472	0	1039	0	14
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R4	6.7	1876	0	1111	0	14

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Water Depth	Total Invertebrate Density	Oligochaeta Density	Amphipoda Density	Pisidiidae Density	Gastropoda Density
Units					meters	no. per m ²	no. per m ²	no. per m ²	no. per m ²	no. per m ²
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R5	6.8	2078	14	534	0	115
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R5	7.2	866	0	144	0	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP1	9.1	2857	0	1616	14	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP2	9.2	3102	14	2020	0	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP3	8.6	3232	43	2034	0	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP4	9.5	2135	0	1226	0	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP5	9.2	2510	0	1544	0	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R1	9.0	3434	0	2871	0	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R2	8.5	2453	0	2005	0	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R3	8.6	3419	14	2813	0	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R4	9.3	1255	0	707	0	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R5	8.9	2409	0	1659	0	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R1	9.4	2294	0	1298	0	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R2	8.9	1241	0	548	0	0

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Water Depth	Total Invertebrate Density	Oligochaeta Density	Amphipoda Density	Pisidiidae Density	Gastropoda Density
Units					meters	no. per m ²	no. per m ²	no. per m ²	no. per m ²	no. per m ²
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R3	5.8	2871	0	1544	0	29
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R4	9.6	995	0	447	0	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R5	9.4	2669	0	1702	0	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R1	8.8	1327	0	736	0	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R2	9.3	3434	0	2280	0	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R3	8.3	1645	0	995	0	14
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R4	9.7	3116	0	2020	0	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R5	9.1	1904	0	938	0	0

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Chironomidae Density	Ephemeroptera Density	Plecoptera Density	Trichoptera Density	EPT Density	Ratio of EPT to Chironomidae
Units					no. per m ²	no. per m ²	no. per m ²	no. per m ²	no. per m ²	-
Burntwood River	NRSH-PW	2014	reference	BURNT-PW-REP2	225	580	0	17	597	2.70
Burntwood River	NRSH-PW	2014	reference	BURNT-PW-REP3	104	242	0	52	294	2.80
Burntwood River	NRSH-PW	2014	reference	BURNT-PW-REP4	121	139	0	26	164	1.40
Burntwood River	NRSH-PW	2014	reference	BURNT-PW-REP5	69	294	0	17	312	4.50
Burntwood River	NRSH-PW	2014	reference	BURNT-PW-REP6	208	641	0	17	658	3.20
Burntwood River	NRSH-PW	2017	reference	BURNT-PW-REP1	159	260	0	58	317	2.00
Burntwood River	NRSH-PW	2017	reference	BURNT-PW-REP2	115	58	0	115	173	1.50
Burntwood River	NRSH-PW	2017	reference	BURNT-PW-REP3	404	58	0	519	577	1.40
Burntwood River	NRSH-PW	2017	reference	BURNT-PW-REP4	87	72	0	58	130	1.50
Burntwood River	NRSH-PW	2017	reference	BURNT-PW-REP5	216	216	0	58	274	1.30
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP1	274	216	0	14	231	0.84
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP2	390	159	0	0	159	0.41
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP3	159	159	0	14	173	1.09
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP4	231	245	0	0	245	1.06
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP5	144	188	0	14	202	1.40
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R1	1601	202	0	43	245	0.2
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R2	1241	433	0	14	447	0.4
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R3	361	245	0	58	303	0.8
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R4	822	361	0	14	375	0.5
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R5	4386	923	0	29	952	0.2
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R1	260	289	0	101	390	1.5
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R2	317	390	0	87	476	1.5
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R3	433	245	0	43	289	0.7
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R4	216	375	0	14	390	1.8
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R5	476	361	0	14	375	0.8
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP1	398	69	0	43	113	0.3
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP2	398	104	0	0	104	0.3
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP3	208	69	0	26	95	0.5

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Chironomidae Density	Ephemeroptera Density	Plecoptera Density	Trichoptera Density	EPT Density	Ratio of EPT to Chironomidae
Units					no. per m ²	no. per m ²	no. per m ²	no. per m ²	no. per m ²	-
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP4	390	43	0	9	52	0.1
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP5	190	35	0	17	52	0.3
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP1	491	202	0	14	216	0.4
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP2	245	58	0	0	58	0.2
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP3	837	923	0	14	938	1.1
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP4	1183	664	0	87	750	0.6
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP5	462	635	0	14	649	1.4
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R1	188	0	0	0	0	-
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R2	2886	14	0	14	29	0.0
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R3	115	0	0	0	0	-
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R4	952	43	0	0	43	0.0
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R5	794	0	0	0	0	-
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R1	1039	115	0	0	115	0.1
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R2	346	72	0	14	87	0.3

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Chironomidae Density	Ephemeroptera Density	Plecoptera Density	Trichoptera Density	EPT Density	Ratio of EPT to Chironomidae
Units					no. per m ²	no. per m ²	no. per m ²	no. per m ²	no. per m ²	-
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R3	447	159	0	29	188	29.0
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R4	895	173	0	14	188	0.2
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R5	1962	43	0	0	43	0.0
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R1	332	1674	0	0	1674	5.0
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R2	216	115	0	0	115	0.5
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R3	303	317	0	0	317	1.0
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R4	58	418	0	14	433	7.5
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R5	620	1154	0	14	1169	1.9
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP1	173	2329	0	9	2337	13.5
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP2	147	1229	0	9	1238	8.4
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP3	225	2372	0	9	2381	10.6
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP4	147	788	0	17	805	5.5
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP5	718	3004	0	35	3038	4.2
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP1	216	952	0	0	952	4.4

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Chironomidae Density	Ephemeroptera Density	Plecoptera Density	Trichoptera Density	EPT Density	Ratio of EPT to Chironomidae
Units					no. per m ²	no. per m ²	no. per m ²	no. per m ²	no. per m ²	-
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP2	58	822	0	0	822	14.3
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP3	188	1226	0	0	1226	6.5
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP4	606	216	0	14	231	0.4
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP5	606	375	0	29	404	0.7
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R1	519	361	0	0	361	0.7
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R2	87	462	0	0	462	5.3
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R3	433	592	0	0	592	1.4
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R4	346	491	0	14	505	1.5
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R5	1039	260	0	0	260	0.3
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R1	101	447	0	0	447	4.4
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R2	14	29	0	14	43	3.0
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R3	289	0	0	29	29	0.1
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R4	433	548	0	144	693	1.6
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R5	491	130	0	14	144	0.3

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Chironomidae Density	Ephemeroptera Density	Plecoptera Density	Trichoptera Density	EPT Density	Ratio of EPT to Chironomidae
Units					no. per m ²	no. per m ²	no. per m ²	no. per m ²	no. per m ²	-
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R1	534	563	0	14	577	1.1
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R2	72	274	0	0	274	3.8
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R3	346	202	0	0	202	0.6
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R4	938	216	0	101	317	0.3
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R5	289	505	0	87	592	2.1
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP1	0	202	0	0	202	-
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP2	505	231	0	43	274	0.5
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP3	491	404	0	14	418	0.9
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP4	101	649	0	0	649	6.4
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP5	101	245	0	0	245	2.4
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R1	72	433	0	0	433	6.0
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R2	808	1587	0	29	1616	2.0
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R3	462	952	0	0	952	2.1
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R4	534	1486	0	14	1500	2.8

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Chironomidae Density	Ephemeroptera Density	Plecoptera Density	Trichoptera Density	EPT Density	Ratio of EPT to Chironomidae
Units					no. per m ²	no. per m ²	no. per m ²	no. per m ²	no. per m ²	-
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R5	2395	1529	0	0	1529	0.6
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R1	173	216	0	0	216	1.3
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R2	0	0	0	0	0	-
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R3	260	14	0	0	14	0.1
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R4	29	0	0	0	0	0.0
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R5	58	0	0	0	0	0.0
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R1	14	231	14	0	245	17.0
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R2	274	577	0	29	606	2.2
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R3	260	462	0	0	462	1.8
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R4	173	606	0	43	649	3.8
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R5	130	606	0	14	620	4.8
Burntwood River	OFFSH	2014	reference	BURNT-OS-REP1	26	43	0	26	69	2.7
Burntwood River	OFFSH	2014	reference	BURNT-OS-REP2	147	17	0	251	268	1.8
Burntwood River	OFFSH	2014	reference	BURNT-OS-REP3	87	26	0	0	26	0.3
Burntwood River	OFFSH	2014	reference	BURNT-OS-REP4	69	35	0	17	52	0.8
Burntwood River	OFFSH	2014	reference	BURNT-OS-REP5	69	69	0	0	69	1.0
Burntwood River	OFFSH	2017	reference	BURNT-OS-REP1	245	43	0	29	72	0.3
Burntwood River	OFFSH	2017	reference	BURNT-OS-REP2	130	0	0	260	260	2.0

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Chironomidae Density	Ephemeroptera Density	Plecoptera Density	Trichoptera Density	EPT Density	Ratio of EPT to Chironomidae
Units					no. per m ²	no. per m ²	no. per m ²	no. per m ²	no. per m ²	-
Burntwood River	OFFSH	2017	reference	BURNT-OS-REP3	245	43	0	43	87	0.4
Burntwood River	OFFSH	2017	reference	BURNT-OS-REP4	144	29	0	144	173	1.2
Burntwood River	OFFSH	2017	reference	BURNT-OS-REP5	87	0	0	43	43	0.5
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP1	216	1587	0	101	1688	7.8
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP2	462	1558	0	58	1616	3.5
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP3	418	1298	0	58	1356	3.2
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP4	346	1587	0	87	1674	4.8
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP5	144	375	0	58	433	3.0
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP1	159	808	0	0	808	5.1
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP2	72	534	0	58	592	8.2
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP3	231	491	0	87	577	2.5
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP4	173	1039	0	58	1096	6.3
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP5	144	346	0	29	375	2.6
Split Lake	OFFSH	2015	reference	SPLIT-OS-R1	563	361	0	43	404	0.7
Split Lake	OFFSH	2015	reference	SPLIT-OS-R2	592	130	0	101	231	0.4
Split Lake	OFFSH	2015	reference	SPLIT-OS-R3	404	159	0	72	231	0.6
Split Lake	OFFSH	2015	reference	SPLIT-OS-R4	505	274	0	29	303	0.6
Split Lake	OFFSH	2015	reference	SPLIT-OS-R5	245	173	0	58	231	0.9
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP1	159	491	0	29	519	3.3
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP2	231	592	0	43	635	2.8
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP3	115	462	0	202	664	5.8
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP4	159	649	0	0	649	4.1
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP5	0	274	0	14	289	-
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP1	173	462	0	346	808	4.7
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP2	58	548	0	404	952	16.5
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP3	115	289	0	101	390	3.4
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP4	87	303	0	43	346	4.0
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP5	14	418	0	29	447	31.0
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP1	493	69	0	43	113	0.2
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP2	424	95	0	9	104	0.2

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Chironomidae Density	Ephemeroptera Density	Plecoptera Density	Trichoptera Density	EPT Density	Ratio of EPT to Chironomidae
Units					no. per m ²	no. per m ²	no. per m ²	no. per m ²	no. per m ²	-
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP3	364	9	0	9	17	0.0
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP4	684	52	0	26	78	0.1
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP5	1324	95	0	43	139	0.1
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP1	173	0	0	0	0	0.0
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP2	721	101	0	14	115	0.2
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP3	794	87	0	14	101	0.1
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP4	909	43	0	14	58	0.1
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP5	505	43	0	58	101	0.2
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R1	87	0	0	43	43	0.5
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R2	289	0	0	14	14	0.1
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R3	0	0	0	29	29	-
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R4	58	0	0	14	14	0.3
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R5	289	0	0	0	0	0.0
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R1	0	29	0	0	29	-

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Chironomidae Density	Ephemeroptera Density	Plecoptera Density	Trichoptera Density	EPT Density	Ratio of EPT to Chironomidae
Units					no. per m ²	no. per m ²	no. per m ²	no. per m ²	no. per m ²	-
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R2	202	188	0	72	260	1.3
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R3	58	115	0	14	130	2.3
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R4	101	14	0	0	14	0.1
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R5	144	14	0	0	14	0.1
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R1	476	1428	0	0	1428	3.0
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R2	317	274	0	29	303	1.0
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R3	130	115	0	29	144	1.1
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R4	245	952	0	14	967	3.9
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R5	29	0	0	0	0	0.0
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP1	173	1801	0	0	1801	10.4
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP2	242	1818	0	0	1818	7.5
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP3	390	2277	0	0	2277	5.8
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP4	164	1922	0	0	1922	11.7
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP5	0	0	0	0	0	-

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Chironomidae Density	Ephemeroptera Density	Plecoptera Density	Trichoptera Density	EPT Density	Ratio of EPT to Chironomidae
Units					no. per m ²	no. per m ²	no. per m ²	no. per m ²	no. per m ²	-
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP1	72	938	0	14	952	13.2
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP2	188	1241	0	0	1241	6.6
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP3	216	1226	0	0	1226	5.7
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP4	29	1039	0	0	1039	36.0
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP5	173	1024	0	0	1024	5.9
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R1	289	606	0	0	606	2.1
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R2	101	491	0	0	491	4.9
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R3	317	664	0	0	664	2.1
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R4	144	620	0	0	620	4.3
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R5	303	649	0	0	649	2.1
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R1	14	375	0	0	375	26.0
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R2	375	1082	0	0	1082	2.9
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R3	43	332	0	0	332	7.7
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R4	87	808	0	14	822	9.5

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Chironomidae Density	Ephemeroptera Density	Plecoptera Density	Trichoptera Density	EPT Density	Ratio of EPT to Chironomidae
Units					no. per m ²	no. per m ²	no. per m ²	no. per m ²	no. per m ²	-
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R1	159	447	0	0	447	2.8
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R2	173	620	0	0	620	3.6
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R3	87	274	0	43	317	3.7
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R4	72	649	0	14	664	9.2
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R5	491	808	0	58	866	1.8
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R5	43	678	0	0	678	15.7
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP1	245	967	0	0	967	3.9
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP2	216	851	0	0	851	3.9
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP3	231	909	0	0	909	3.9
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP4	173	736	0	0	736	4.3
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP5	274	693	0	0	693	2.5
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R1	188	375	0	0	375	2.0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R2	260	188	0	0	188	0.7
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R3	404	188	0	0	188	0.5

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Chironomidae Density	Ephemeroptera Density	Plecoptera Density	Trichoptera Density	EPT Density	Ratio of EPT to Chironomidae
Units					no. per m ²	no. per m ²	no. per m ²	no. per m ²	no. per m ²	-
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R4	202	332	0	14	346	1.7
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R5	390	332	0	14	346	0.9
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R1	245	736	0	0	736	3.0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R2	274	404	0	14	418	1.5
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R3	707	563	0	14	577	0.8
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R4	159	375	0	0	375	2.4
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R5	115	808	0	29	837	7.3
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R1	101	462	0	14	476	4.7
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R2	289	837	0	14	851	3.0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R3	115	476	0	43	519	4.5
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R4	375	678	0	14	693	1.8
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R5	216	707	0	29	736	3.4

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Percent Ephemeroptera	Percent EPT (EPT Index)	Percent of Oligochaeta and Chironomidae	Total Richness (Family-level)	EPT Richness (Family-level)	Simpson's Diversity Index
Units					%	%	%	-	-	-
Burntwood River	NRSH-PW	2014	reference	BURNT-PW-REP2	45.6	46.9	17.7	8	3	0.70
Burntwood River	NRSH-PW	2014	reference	BURNT-PW-REP3	18.5	22.5	8.0	9	4	0.72
Burntwood River	NRSH-PW	2014	reference	BURNT-PW-REP4	18.2	21.6	19.3	8	2	0.78
Burntwood River	NRSH-PW	2014	reference	BURNT-PW-REP5	14.7	15.6	4.8	9	2	0.67
Burntwood River	NRSH-PW	2014	reference	BURNT-PW-REP6	37.6	38.6	13.2	10	2	0.70
Burntwood River	NRSH-PW	2017	reference	BURNT-PW-REP1	24.0	29.3	14.7	12	3	0.76
Burntwood River	NRSH-PW	2017	reference	BURNT-PW-REP2	4.0	12.0	9.0	12	4	0.44
Burntwood River	NRSH-PW	2017	reference	BURNT-PW-REP3	2.2	21.5	17.2	8	3	0.62
Burntwood River	NRSH-PW	2017	reference	BURNT-PW-REP4	4.9	8.7	5.8	9	4	0.39
Burntwood River	NRSH-PW	2017	reference	BURNT-PW-REP5	6.5	8.2	9.5	9	2	0.73
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP1	26.8	28.6	35.7	8	2	0.77
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP2	22.0	22.0	54.0	6	1	0.64
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP3	24.4	26.7	46.7	10	2	0.81
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP4	28.3	28.3	30.0	7	1	0.78
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP5	46.4	50.0	39.3	7	2	0.65
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R1	8.70	10.56	70.19	11	2	0.51
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R2	19.48	20.13	62.99	11	2	0.64
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R3	22.08	27.27	58.44	11	1	0.77
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R4	21.74	22.61	52.17	8	1	0.67
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R5	11.15	11.50	65.51	12	2	0.67
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R1	28.57	38.57	25.71	11	5	0.83
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R2	27.00	33.00	30.00	10	4	0.80
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R3	20.00	23.53	65.88	9	3	0.74
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R4	50.98	52.94	35.29	7	2	0.65
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R5	23.36	24.30	41.12	9	2	0.77
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP1	5.48	8.9	44.52	11	3	0.79
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP2	6.82	6.8	27.84	8	1	0.61
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP3	9.52	13.1	30.95	9	3	0.78

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Percent Ephemeroptera	Percent EPT (EPT Index)	Percent of Oligochaeta and Chironomidae	Total Richness (Family-level)	EPT Richness (Family-level)	Simpson's Diversity Index
Units					%	%	%	-	-	-
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP4	3.79	4.5	37.12	10	3	0.69
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP5	2.53	3.8	25.32	9	2	0.57
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP1	25.93	27.8	62.96	6	2	0.53
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP2	12.12	12.1	63.64	6	1	0.68
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP3	39.26	39.9	45.40	9	2	0.70
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP4	29.11	32.9	56.33	10	4	0.64
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP5	41.90	42.9	40.00	8	2	0.71
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R1	0.00	0.00	93.33	3	0	0.24
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R2	0.48	0.96	96.17	8	1	0.08
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R3	0.00	0.00	62.50	5	0	0.67
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R4	3.06	3.06	74.49	11	2	0.52
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R5	0.00	0.00	98.21	2	0	0.04
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R1	8.08	8.08	72.73	7	1	0.45
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R2	10.20	12.24	53.06	9	2	0.72

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Percent Ephemeroptera	Percent EPT (EPT Index)	Percent of Oligochaeta and Chironomidae	Total Richness (Family-level)	EPT Richness (Family-level)	Simpson's Diversity Index
Units					%	%	%	-	-	-
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R3	13.75	16.25	52.50	8	2	0.78
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R4	9.92	10.74	56.20	8	2	0.68
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R5	1.35	1.35	63.96	8	1	0.58
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R1	77.85	77.85	17.45	5	1	0.37
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R2	28.57	28.57	53.57	4	1	0.61
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R3	45.83	45.83	50.00	4	1	0.59
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R4	82.86	85.71	11.43	4	2	0.30
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R5	57.97	58.70	31.88	11	2	0.57
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP1	70.60	70.9	7.61	8	3	0.48
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP2	52.79	53.2	11.90	8	2	0.63
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP3	63.43	63.7	14.35	9	2	0.56
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP4	50.28	51.4	14.36	10	3	0.69
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP5	70.82	71.6	20.00	12	5	0.48
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP1	51.97	52.0	14.96	8	1	0.66

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Percent Ephemeroptera	Percent EPT (EPT Index)	Percent of Oligochaeta and Chironomidae	Total Richness (Family-level)	EPT Richness (Family-level)	Simpson's Diversity Index
Units					%	%	%	-	-	-
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP2	53.77	53.8	7.55	6	1	0.62
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP3	49.13	49.1	12.14	7	2	0.71
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP4	14.71	15.7	41.18	6	2	0.68
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP5	26.26	28.3	52.53	9	3	0.73
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R1	25.00	25.00	37.00	7	1	0.76
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R2	45.71	45.71	8.57	6	1	0.69
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R3	46.07	46.07	37.08	7	1	0.67
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R4	45.95	47.30	35.14	8	1	0.67
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R5	14.40	14.40	64.00	10	1	0.64
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R1	28.70	28.70	12.96	7	1	0.77
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R2	3.39	5.08	3.39	9	2	0.60
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R3	0.00	4.00	58.00	8	2	0.76
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R4	36.19	45.71	37.14	10	3	0.76
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R5	13.04	14.49	75.36	6	2	0.67

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Percent Ephemeroptera	Percent EPT (EPT Index)	Percent of Oligochaeta and Chironomidae	Total Richness (Family-level)	EPT Richness (Family-level)	Simpson's Diversity Index
Units					%	%	%	-	-	-
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R1	30.23	31.01	29.46	8	2	0.75
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R2	35.85	35.85	15.09	8	1	0.76
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R3	15.38	15.38	38.46	9	1	0.83
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R4	13.27	19.47	57.52	12	5	0.64
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R5	35.71	41.84	21.43	12	4	0.76
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP1	17.28	17.28	1.23	8	2	0.76
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP2	8.65	10.27	36.22	10	4	0.76
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP3	14.81	15.34	26.98	11	2	0.73
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP4	49.45	49.45	21.98	5	1	0.69
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP5	5.54	5.54	13.03	7	1	0.60
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R1	29.70	29.70	7.92	7	1	0.70
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R2	36.42	37.09	27.15	12	2	0.77
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R3	29.73	29.73	18.47	7	1	0.74
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R4	46.82	47.27	27.73	8	1	0.72

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Percent Ephemeroptera	Percent EPT (EPT Index)	Percent of Oligochaeta and Chironomidae	Total Richness (Family-level)	EPT Richness (Family-level)	Simpson's Diversity Index
Units					%	%	%	-	-	-
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R5	17.61	17.61	31.56	13	2	0.79
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R1	44.12	44.12	44.12	6	2	0.71
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R2	0.00	0.00	0.00	0	0	-
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R3	2.94	2.94	55.88	6	1	0.65
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R4	0.00	0.00	40.00	3	0	0.65
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R5	0.00	0.00	36.36	6	0	0.77
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R1	29.63	31.48	1.85	5	2	0.67
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R2	21.62	22.70	10.27	7	2	0.80
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R3	31.37	31.37	19.61	6	1	0.77
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R4	36.84	39.47	15.79	9	2	0.74
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R5	29.58	30.28	10.56	9	2	0.73
Burntwood River	OFFSH	2014	reference	BURNT-OS-REP1	9.80	15.70	5.88	7	4	0.46
Burntwood River	OFFSH	2014	reference	BURNT-OS-REP2	1.79	27.70	16.07	6	3	0.61
Burntwood River	OFFSH	2014	reference	BURNT-OS-REP3	4.00	4.00	14.67	7	1	0.40
Burntwood River	OFFSH	2014	reference	BURNT-OS-REP4	10.81	16.20	21.62	9	3	0.70
Burntwood River	OFFSH	2014	reference	BURNT-OS-REP5	34.78	34.80	43.48	5	1	0.72
Burntwood River	OFFSH	2017	reference	BURNT-OS-REP1	6.25	10.42	35.42	6	3	0.60
Burntwood River	OFFSH	2017	reference	BURNT-OS-REP2	0.00	32.14	16.07	7	3	0.69

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Percent Ephemeroptera	Percent EPT (EPT Index)	Percent of Oligochaeta and Chironomidae	Total Richness (Family-level)	EPT Richness (Family-level)	Simpson's Diversity Index
Units					%	%	%	-	-	-
Burntwood River	OFFSH	2017	reference	BURNT-OS-REP3	3.33	6.67	18.89	6	3	0.43
Burntwood River	OFFSH	2017	reference	BURNT-OS-REP4	2.35	14.12	12.94	9	4	0.48
Burntwood River	OFFSH	2017	reference	BURNT-OS-REP5	0.00	5.17	12.07	7	2	0.38
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP1	39.29	41.79	5.71	10	3	0.69
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP2	16.85	17.47	5.30	10	2	0.72
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP3	17.27	18.04	6.33	9	2	0.76
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP4	14.69	15.49	3.20	7	2	0.55
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP5	4.53	5.23	2.09	7	2	0.48
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP1	13.08	13.08	3.04	8	1	0.61
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP2	7.61	8.44	1.44	10	3	0.56
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP3	4.34	5.10	2.55	10	3	0.60
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP4	9.18	9.69	1.79	9	2	0.59
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP5	3.82	4.14	1.59	7	2	0.48
Split Lake	OFFSH	2015	reference	SPLIT-OS-R1	9.16	10.26	14.65	11	1	0.64
Split Lake	OFFSH	2015	reference	SPLIT-OS-R2	3.70	6.58	16.87	11	1	0.71
Split Lake	OFFSH	2015	reference	SPLIT-OS-R3	4.56	6.64	12.45	9	1	0.39
Split Lake	OFFSH	2015	reference	SPLIT-OS-R4	9.13	10.10	17.79	8	1	0.65
Split Lake	OFFSH	2015	reference	SPLIT-OS-R5	5.33	7.11	8.00	9	1	0.36
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP1	25.00	26.47	10.29	6	2	0.54
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP2	20.00	21.46	8.78	9	2	0.66
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP3	20.78	29.87	6.49	10	4	0.58
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP4	23.94	23.94	6.91	8	1	0.64
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP5	13.01	13.70	2.05	6	2	0.30
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP1	14.88	26.05	8.84	10	5	0.57
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP2	14.23	24.72	3.37	11	5	0.48
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP3	21.05	28.42	11.58	7	4	0.59
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP4	21.00	24.00	6.00	8	3	0.52
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP5	18.95	20.26	0.65	5	2	0.35
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP1	4.97	8.07	35.40	9	3	0.59
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP2	13.41	14.63	60.98	8	3	0.59

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Percent Ephemeroptera	Percent EPT (EPT Index)	Percent of Oligochaeta and Chironomidae	Total Richness (Family-level)	EPT Richness (Family-level)	Simpson's Diversity Index
Units					%	%	%	-	-	-
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP3	1.05	2.11	44.21	5	2	0.54
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP4	5.77	8.65	77.88	5	2	0.40
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP5	5.67	8.25	80.93	10	3	0.37
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP1	0.00	0.00	42.86	3	0	0.53
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP2	9.33	10.67	68.00	6	2	0.51
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP3	6.06	7.07	55.56	5	2	0.57
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP4	1.61	2.15	34.95	7	2	0.52
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP5	2.50	5.83	29.17	6	2	0.51
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R1	0.00	27.27	54.55	3	0	0.60
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R2	0.00	4.17	83.33	5	0	0.30
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R3	0.00	66.67	0.00	2	0	0.45
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R4	0.00	20.00	80.00	2	0	0.32
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R5	0.00	0.00	95.24	2	0	0.09
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R1	5.71	5.71	0.00	3	1	0.26

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Percent Ephemeroptera	Percent EPT (EPT Index)	Percent of Oligochaeta and Chironomidae	Total Richness (Family-level)	EPT Richness (Family-level)	Simpson's Diversity Index
Units					%	%	%	-	-	-
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R2	15.66	21.69	19.28	8	2	0.71
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R3	25.81	29.03	12.90	6	2	0.70
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R4	2.22	2.22	15.56	4	1	0.40
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R5	2.50	2.50	25.00	4	1	0.54
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R1	67.81	67.81	28.08	6	1	0.49
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R2	29.69	32.81	37.50	8	2	0.75
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R3	25.00	31.25	28.13	5	2	0.79
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R4	38.37	38.95	9.88	6	2	0.72
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R5	0.00	0.00	16.67	4	0	0.52
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP1	82.21	82.21	7.91	6	1	0.31
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP2	81.71	81.71	11.28	6	1	0.32
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP3	81.93	81.93	14.95	6	1	0.31
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP4	87.40	87.40	9.06	6	2	0.24
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP5	0.00	0.00	0.00	0	0	-

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Percent Ephemeroptera	Percent EPT (EPT Index)	Percent of Oligochaeta and Chironomidae	Total Richness (Family-level)	EPT Richness (Family-level)	Simpson's Diversity Index
Units					%	%	%	-	-	-
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP1	73.03	74.16	5.62	6	2	0.44
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP2	68.25	68.25	11.11	6	1	0.49
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP3	64.89	64.89	12.21	5	1	0.52
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP4	91.14	91.14	2.53	3	1	0.16
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP5	78.02	78.02	13.19	5	1	0.37
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R1	35.59	35.59	16.95	6	1	0.64
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R2	44.16	44.16	9.09	4	1	0.60
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R3	46.94	46.94	22.45	3	1	0.64
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R4	69.35	69.35	16.13	4	1	0.48
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R5	57.69	57.69	26.92	4	1	0.58
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R1	50.98	50.98	1.96	4	1	0.62
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R2	54.74	54.74	19.71	8	1	0.64
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R3	65.71	65.71	8.57	7	1	0.54
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R4	62.92	64.04	6.74	7	2	0.54

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Percent Ephemeroptera	Percent EPT (EPT Index)	Percent of Oligochaeta and Chironomidae	Total Richness (Family-level)	EPT Richness (Family-level)	Simpson's Diversity Index
Units					%	%	%	-	-	-
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R1	17.51	17.51	6.21	4	1	0.43
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R2	19.20	19.20	5.80	6	1	0.44
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R3	18.63	21.57	5.88	6	2	0.46
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R4	34.62	35.38	3.85	6	2	0.53
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R5	38.89	41.67	24.31	9	2	0.72
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R5	78.33	78.33	5.00	3	1	0.36
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP1	33.84	33.84	8.59	5	1	0.56
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP2	27.44	27.44	7.44	5	1	0.50
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP3	28.13	28.13	8.48	5	1	0.52
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP4	34.46	34.46	8.11	3	1	0.55
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP5	27.59	27.59	10.92	3	1	0.53
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R1	10.92	10.92	5.46	4	1	0.29
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R2	7.65	7.65	10.59	3	1	0.31
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R3	5.49	5.49	12.24	4	1	0.31

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Percent Ephemeroptera	Percent EPT (EPT Index)	Percent of Oligochaeta and Chironomidae	Total Richness (Family-level)	EPT Richness (Family-level)	Simpson's Diversity Index
Units					%	%	%	-	-	-
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R4	26.44	27.59	16.09	4	1	0.59
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R5	13.77	14.37	16.17	5	1	0.48
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R1	32.08	32.08	10.69	5	1	0.59
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R2	32.56	33.72	22.09	4	2	0.65
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R3	19.60	20.10	24.62	6	2	0.61
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R4	37.68	37.68	15.94	4	1	0.63
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R5	30.27	31.35	4.32	6	2	0.51
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R1	34.78	35.87	7.61	5	2	0.57
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R2	24.37	24.79	8.40	5	2	0.49
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R3	28.95	31.58	7.02	5	2	0.54
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R4	21.76	22.22	12.04	7	2	0.52
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R5	37.12	38.64	11.36	6	3	0.61

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Total Organic Carbon	Sand	Silt	Clay
Units					%	%	%	%
Burntwood River	NRSH-PW	2014	reference	BURNT-PW-REP2	1.5	6.5	70.5	23.0
Burntwood River	NRSH-PW	2014	reference	BURNT-PW-REP3	1.1	39.6	41.6	18.7
Burntwood River	NRSH-PW	2014	reference	BURNT-PW-REP4	1.3	36.1	46.2	17.7
Burntwood River	NRSH-PW	2014	reference	BURNT-PW-REP5	1.4	29.8	49.9	20.3
Burntwood River	NRSH-PW	2014	reference	BURNT-PW-REP6	1.4	23.4	56.0	20.6
Burntwood River	NRSH-PW	2017	reference	BURNT-PW-REP1	2.8	11.1	66.1	22.8
Burntwood River	NRSH-PW	2017	reference	BURNT-PW-REP2	2.6	15.8	67.7	16.4
Burntwood River	NRSH-PW	2017	reference	BURNT-PW-REP3	2.3	41.4	41.0	17.6
Burntwood River	NRSH-PW	2017	reference	BURNT-PW-REP4	1.7	40.9	37.7	21.4
Burntwood River	NRSH-PW	2017	reference	BURNT-PW-REP5	1.9	35.0	49.8	15.2
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP1	3.97	25.9	49.1	25.0
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP2	1.51	55.0	30.0	15.0
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP3	2.21	40.6	40.0	19.4
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP4	1.65	33.6	47.3	19.1
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP5	1.51	41.4	40.2	18.4
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R1	2.67	24.5	53.0	22.5
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R2	3.26	29.3	46.6	24.0
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R3	2.78	29.6	57.6	12.8
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R4	1.67	41.8	41.8	16.4
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R5	2.17	58.2	29.8	12.0
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R1	3.58	37.7	46.4	15.9
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R2	2.85	63.6	22.7	13.6
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R3	4.09	35.8	45.3	18.9
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R4	2.01	70.3	21.6	8.1
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R5	3.29	52.4	30.8	16.8
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP1	1.48	12.6	42.8	44.6
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP2	1.13	11.4	42.8	45.8
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP3	1.14	9.4	38.2	52.4
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP4	1.25	10.2	40.7	49.1

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Total Organic Carbon	Sand	Silt	Clay
Units					%	%	%	%
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP5	1.41	12.5	42.8	44.7
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP1	1.96	3.5	61.2	35.3
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP2	1.67	11.8	50.8	37.3
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP3	3.13	7.8	43.5	48.6
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP4	2.84	9.6	52.2	38.2
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP5	2.28	18.2	42.1	39.7
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R1	6.83	7.4	48.7	43.9
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R2	0.89	30.6	20.3	49.1
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R3	1.16	21.6	40.4	38.0
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R4	4.89	12.2	51.1	36.8
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R5	1.36	8.7	33.0	58.3
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R1	3.32	10.6	36.5	52.9
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R2	1.59	49.1	15.9	35
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R3	3.43	13.4	41.3	45.2

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Total Organic Carbon	Sand	Silt	Clay
Units					%	%	%	%
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R4	1.49	11.8	21.6	66.6
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R5	2.48	7.4	30.7	61.9
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R1	2.03	8.1	66.2	25.7
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R2	2.54	6.8	68	25.2
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R3	2.64	17.4	61.1	21.6
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R4	2.08	14.3	55.2	30.5
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R5	2.52	17.3	64.9	17.8
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP1	1.97	4.0	71.0	25.0
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP2	0.49	75.7	16.5	7.8
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP3	1.57	54.6	33.5	11.9
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP4	1.68	49.6	40.3	10.1
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP5	3.61	10.3	71.6	18.1
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP1	2.47	35.7	51.0	13.3
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP2	1.26	52.9	34.9	12.2

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Total Organic Carbon	Sand	Silt	Clay
Units					%	%	%	%
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP3	1.59	54.6	35.2	10.2
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP4	1.64	55.5	36.1	8.4
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP5	5.60	10.6	51.4	37.9
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R1	2.35	1.2	83.1	15.7
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R2	1.04	65.0	26.5	8.5
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R3	3.78	3.8	87.7	8.5
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R4	3.16	18.8	70.3	10.9
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R5	2.87	40.8	42.7	16.5
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R1	4.42	35.5	46.6	17.9
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R2	2.9	68.8	17.7	13.6
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R3	1.65	91.5	4.2	4.4
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R4	3.28	70.3	21.6	8.1
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R5	1.94	68.4	18.2	13.4
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R1	4.26	1.8	83.3	14.8

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Total Organic Carbon	Sand	Silt	Clay
Units					%	%	%	%
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R2	1.56	66.8	24.9	8.4
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R3	3.45	62.7	32.9	4.4
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R4	5.23	57.4	34.9	7.7
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R5	2.42	61.4	26.9	11.7
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP1	0.36	54.0	18.8	27.2
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP2	2.52	74.1	17.7	8.3
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP3	0.35	90.4	5.4	4.2
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP4	2.15	65.7	27.4	6.9
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP5	0.40	90.1	4.7	5.2
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R1	0.74	16.0	25.1	58.9
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R2	0.90	78.2	15.4	6.4
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R3	0.24	87.4	9.7	2.9
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R4	1.80	72.0	19.5	8.5
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R5	0.53	88.6	7.7	3.7

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Total Organic Carbon	Sand	Silt	Clay
Units					%	%	%	%
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R1	7.11	42.9	35.5	21.6
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R2	-	-	-	-
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R3	0.69	95.7	2.6	1.7
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R4	3.67	65.9	25.8	8.3
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R5	-	-	-	-
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R1	1.50	49.70	46.30	4.00
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R2	1.60	82.30	13.10	4.60
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R3	1.30	83.30	11.50	5.20
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R4	4.40	63.50	26.10	10.40
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R5	1.00	89.20	7.50	3.30
Burntwood River	OFFSH	2014	reference	BURNT-OS-REP1	1.80	7.40	62.70	29.90
Burntwood River	OFFSH	2014	reference	BURNT-OS-REP2	1.79	3.60	62.70	33.80
Burntwood River	OFFSH	2014	reference	BURNT-OS-REP3	1.76	5.30	61.60	33.10
Burntwood River	OFFSH	2014	reference	BURNT-OS-REP4	1.72	5.40	63.10	31.50
Burntwood River	OFFSH	2014	reference	BURNT-OS-REP5	1.34	35.90	39.10	24.90
Burntwood River	OFFSH	2017	reference	BURNT-OS-REP1	2.38	16.50	53.20	30.30
Burntwood River	OFFSH	2017	reference	BURNT-OS-REP2	2.30	8.70	68.30	22.90
Burntwood River	OFFSH	2017	reference	BURNT-OS-REP3	2.28	11.10	57.20	31.60
Burntwood River	OFFSH	2017	reference	BURNT-OS-REP4	2.25	5.30	68.50	26.20
Burntwood River	OFFSH	2017	reference	BURNT-OS-REP5	2.17	5.80	68.40	25.80

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Total Organic Carbon	Sand	Silt	Clay
Units					%	%	%	%
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP1	1.08	17.8	66.0	16.2
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP2	1.15	17.6	79.7	2.7
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP3	1.04	19.0	50.5	30.4
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP4	1.01	19.5	55.2	25.3
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP5	1.05	19.0	55.6	25.4
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP1	1.34	19.5	50.0	30.5
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP2	1.31	14.8	56.6	28.6
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP3	1.32	17.7	53.5	28.8
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP4	1.10	24.2	54.8	20.9
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP5	1.33	16.4	52.2	31.4
Split Lake	OFFSH	2015	reference	SPLIT-OS-R1	1.53	11.9	77.7	10.3
Split Lake	OFFSH	2015	reference	SPLIT-OS-R2	1.31	18.8	58.7	22.5
Split Lake	OFFSH	2015	reference	SPLIT-OS-R3	1.08	22.1	59.0	18.8
Split Lake	OFFSH	2015	reference	SPLIT-OS-R4	1.24	12.9	62.4	24.7
Split Lake	OFFSH	2015	reference	SPLIT-OS-R5	1.24	15.2	71.3	13.5
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP1	2.13	18.4	54.0	27.6
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP2	2.00	14.8	56.2	29.0
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP3	1.90	7.7	53.9	38.4
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP4	2.15	11.5	57.6	30.9
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP5	2.19	13.8	58.4	27.8
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP1	1.99	16.5	53.9	29.7
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP2	2.11	15.7	71.7	12.6
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP3	2.01	17.9	68.9	13.2
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP4	2.02	14.8	54.8	30.3
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP5	2.21	10.2	75.1	14.7
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP1	1.16	1.1	45.3	53.7
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP2	0.75	2.1	40.2	57.6
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP3	1.59	3.5	21.5	75.0
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP4	1.16	1.7	52.3	46.1

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Total Organic Carbon	Sand	Silt	Clay
Units					%	%	%	%
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP5	0.93	1.9	26.7	71.4
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP1	1.67	14.8	46.8	38.5
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP2	2.43	9.6	51.8	38.6
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP3	0.77	45.2	30.6	24.2
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP4	0.96	2.2	61.3	36.5
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP5	1.51	4.1	59.9	36.0
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R1	3.75	0.5	64.6	34.9
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R2	4.98	3.5	65.6	30.8
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R3	2.23	8.8	48.8	42.4
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R4	0.27	0.8	49.5	49.7
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R5	0.59	4.3	27.2	68.6
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R1	2.47	11.8	40.4	47.8
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R2	5.37	6.2	59.9	33.9
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R3	2.53	8.9	50.9	40.2

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Total Organic Carbon	Sand	Silt	Clay
Units					%	%	%	%
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R4	-	2.4	51	46.6
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R5	2.21	33.5	32.1	34.4
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R1	2.17	17.4	58.2	24.5
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R2	2.8	24.3	55.4	20.3
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R3	2	43.8	34.5	21.7
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R4	1.96	20.3	44	35.7
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R5	1.27	10.8	41.7	47.6
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP1	1.11	0.5	73.7	25.8
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP2	1.36	0.5	75.7	23.7
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP3	1.23	0.6	75.1	24.3
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP4	1.20	0.5	69.8	29.7
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP5	1.30	0.3	68.1	31.7
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP1	1.48	0.5	67.4	32.1
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP2	5.71	0.1	59.9	40.0

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Total Organic Carbon	Sand	Silt	Clay
Units					%	%	%	%
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP3	1.30	0.4	67.3	32.3
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP4	1.28	0.3	68.6	31.2
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP5	1.27	0.2	68.2	31.6
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R1	1.38	1.4	97.5	1.1
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R2	1.22	0.9	89.5	9.7
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R3	1.40	1.0	98.5	0.5
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R4	1.19	0.6	84.8	14.6
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R5	1.19	0.6	77.1	22.2
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R1	3.48	1.1	67.2	31.7
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R2	3.51	1.5	70.1	28.5
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R3	3.41	0.5	67.4	31.8
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R4	3.25	0.5	66.7	32.5
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R1	2.98	1.5	74.9	23.6
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R2	2.91	1.8	80.8	17.4

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Total Organic Carbon	Sand	Silt	Clay
Units					%	%	%	%
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R3	2.94	0.5	78.2	21
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R4	2.93	0.5	66	33.1
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R5	3.65	0.5	71.6	27.7
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R5	3.53	0.5	66.7	32.8
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP1	1.88	0.1	76.7	23.1
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP2	1.93	0.2	76.6	23.2
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP3	2.23	0.3	71.5	28.2
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP4	2.01	0.1	66.2	33.6
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP5	2.09	0.1	72.3	27.6
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R1	2.04	0.3	89.1	10.6
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R2	2.09	0.4	94.3	5.4
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R3	2.22	0.2	85.2	14.6
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R4	2.11	0.3	85.9	13.9
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R5	2.00	0.4	82.3	17.3

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Total Organic Carbon	Sand	Silt	Clay
Units					%	%	%	%
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R1	3.68	0.5	60.1	39.6
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R2	3.57	0.5	60.7	38.9
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R3	4.16	4.1	55.7	40.2
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R4	3.85	0.5	63.6	36.1
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R5	3.82	0.5	60.6	39.3
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R1	3.08	0.5	84.5	15
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R2	3	0.5	85	14.7
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R3	2.29	4	69.2	26.7
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R4	2.31	3.3	81.1	15.6
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R5	3	0.5	87	12.4

APPENDIX 3:

SUMMARY STATISTICS FOR ADDITIONAL METRICS BY HABITAT TYPE FOR 2013 (PRE-CONSTRUCTION), 2014 (YEAR 1 CONSTRUCTION), 2015 (YEAR 2 CONSTRUCTION), 2016 (YEAR 3 CONSTRUCTION) AND 2017 (YEAR 4 CONSTRUCTION)

Note: results for each parameter continue over two pages.

Nearshore Habitat

Site	BURNT		SPLIT			STL3KM				
Year	2014	2017	2014	2015	2017	2013	2014	2015	2016	2017
Metric	Total Invertebrate Density (no. per m ²)									
n	5	5	5	5	5	5	5	5	5	5
Mean	1409.40	2008.31	689.64	3119.23	1191.71	1204.99	1480.26	1136.89	1647.62	1148.43
Minimum	762.00	1082.06	403.97	1110.92	735.80	727.15	476.11	216.41	706.95	403.97
Maximum	2000.00	3347.18	865.65	8281.39	1543.74	1523.55	2351.69	3015.35	3202.91	2149.70
Median	1307.00	1486.03	721.38	2221.84	1226.34	1263.85	1514.89	807.94	1428.32	692.52
Standard deviation (n-1)	470.21	961.65	179.74	2926.29	327.51	301.52	851.38	1159.93	949.34	849.79
Standard error of the mean	210.29	430.06	80.38	1308.68	146.47	134.84	380.75	518.74	424.56	380.04
COV (%)	33.36	47.88	26.06	93.81	27.48	25.02	57.52	102.03	57.62	74.00
+50% Mean	2114.10	3012.47	1034.45	4678.84	1787.57	1807.48	2220.39	1705.33	2471.43	1722.65
-50% Mean	704.70	1004.16	344.82	1559.61	595.86	602.49	740.13	568.44	823.81	574.22
Benchmark Exceedance (temporal comparison)	-	No	-	Yes	Yes (both)	-	No	No (both)	No (all)	No (all)
Modified Significance Level	N/A		0.0167			N/A				
Significant Inter-annual Difference ¹	-	N/A	-	Yes 0.0015 (2014)	No 0.090 (2014) 0.138 (2015)	-	N/A	N/A	N/A	N/A

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Total Invertebrate Density (no. per m ²)								
n	5	5	5	5	5	5	5	4	5
Mean	3034.97	1751.50	1321.56	1128.23	1396.58	2461.33	4175.32	302.98	1722.65
Minimum	1566.83	1428.32	1009.93	721.38	764.66	1168.63	1457.18	72.14	779.09
Maximum	4241.69	2495.96	1803.44	1558.17	1861.15	4429.25	8685.36	490.54	2669.09
Median	3298.13	1529.32	1284.05	995.50	1413.90	2669.09	3202.91	324.62	1644.74
Standard deviation (n-1)	1081.24	445.22	320.12	385.43	411.42	1320.63	2725.34	219.44	700.26
Standard error of the mean	483.55	199.11	143.16	172.37	183.99	590.61	1218.81	109.72	313.17
COV (%)	35.63	25.42	24.22	34.16	29.46	53.66	65.27	72.43	40.65
+50% Mean	4552.46	2627.25	1982.34	1692.35	2094.88	3692.00	6262.98	454.47	2583.97
-50% Mean	1517.49	875.75	660.78	564.12	698.29	1230.67	2087.66	151.49	861.32
Benchmark Exceedance (temporal comparison)	-	No	Yes (2013)	Yes (2013)	Yes (2013)	-	Yes	Yes (both)	Yes (2015, 2016)
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	-	N/A	No 0.0077 (2013)	Yes 0.0017 (2013)	No 0.023 (2013)	-	No 0.312	Yes 0.018 (2014) 0.00092 (2015)	No 0.129 (2015) 0.060 (2016)

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

2 - based on application of ±50% benchmark this significant difference was not identified in previous reports.

Nearshore Habitat – continued.

Site	BURNT		SPLIT			STL3KM				
Year	2014	2017	2014	2015	2017	2013	2014	2015	2016	2017
Metric	Total Richness (Family level)									
n	5	5	5	5	5	5	5	5	5	5
Mean	8.80	10.00	7.60	10.60	9.20	9.40	7.80	5.80	8.00	5.60
Minimum	8.00	8.00	6.00	8.00	7.00	8.00	6.00	2.00	7.00	4.00
Maximum	10.00	12.00	10.00	12.00	11.00	11.00	10.00	11.00	9.00	11.00
Median	9.00	9.00	7.00	11.00	9.00	9.00	8.00	5.00	8.00	4.00
Standard deviation (n-1)	0.84	1.87	1.52	1.52	1.48	1.14	1.79	3.70	0.71	3.05
Standard error of the mean	0.37	0.84	0.68	0.68	0.66	0.51	0.80	1.66	0.32	1.36
COV (%)	9.51	18.71	19.95	14.31	16.12	12.13	22.93	63.82	8.84	54.46
+25% Mean	11.00	12.50	9.50	13.25	11.50	11.75	9.75	7.25	10.00	7.00
-25% Mean	6.60	7.50	5.70	7.95	6.90	7.05	5.85	4.35	6.00	4.20
Benchmark Exceedance (temporal comparison)	-	No	-	Yes	No (both)	-	No	Yes (2013, 2014)	Yes (2015)	Yes (2013, 2014, 2016)
Modified Significance Level	N/A		0.0167			0.0050				
Significant Inter-annual Difference ¹	-	N/A	-	Yes 0.0084 ²	N/A	-	N/A	No 0.026 (2013) 0.196 (2014)	No 0.157 (2015)	No 0.020 (2013) 0.157 (2014) 0.124 (2016)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Total Richness (Family level)								
n	5	5	5	5	5	5	5	4	5
Mean	9.40	7.20	7.60	8.20	9.80	8.20	9.40	5.25	7.20
Minimum	8.00	6.00	6.00	5.00	8.00	5.00	7.00	3.00	5.00
Maximum	12.00	9.00	10.00	10.00	12.00	11.00	13.00	6.00	9.00
Median	9.00	7.00	7.00	8.00	9.00	8.00	8.00	6.00	7.00
Standard deviation (n-1)	1.67	1.30	1.52	2.05	2.05	2.39	2.88	1.50	1.79
Standard error of the mean	0.75	0.58	0.68	0.92	0.92	1.07	1.29	0.75	0.80
COV (%)	17.80	18.11	19.95	24.99	20.91	29.12	30.65	28.57	24.85
+25% Mean	11.75	9.00	9.50	10.25	12.25	10.25	11.75	6.56	9.00
-25% Mean	7.05	5.40	5.70	6.15	7.35	6.15	7.05	3.94	5.40
Benchmark Exceedance (temporal comparison)	-	No	No (both)	No (all)	Yes (2014, 2015)	-	No	Yes (2014, 2015)	Yes (2016)
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	-	N/A	N/A	N/A	No 0.046 (2014) 0.073 (2015)	-	N/A	No 0.069 (2014) 0.015 (2015)	No 0.215 (2016)

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

2 – based on application of $\pm 50\%$ benchmark this significant difference was not identified in previous reports.

Nearshore Habitat – continued.

Site	BURNT		SPLIT			STL3KM				
Year	2014	2017	2014	2015	2017	2013	2014	2015	2016	2017
Metric	Simpson's Diversity Index									
n	5	5	5	5	5	5	5	5	5	5
Mean	0.71	0.59	0.73	0.65	0.76	0.69	0.65	0.31	0.64	0.49
Minimum	0.67	0.39	0.64	0.51	0.65	0.57	0.53	0.04	0.45	0.30
Maximum	0.78	0.76	0.81	0.77	0.83	0.79	0.71	0.67	0.78	0.61
Median	0.70	0.62	0.77	0.67	0.77	0.69	0.68	0.24	0.68	0.57
Standard deviation (n-1)	0.04	0.17	0.08	0.09	0.07	0.10	0.07	0.28	0.13	0.14
Standard error of the mean	0.02	0.08	0.04	0.04	0.03	0.04	0.03	0.12	0.06	0.06
COV (%)	5.74	28.72	10.74	14.42	9.28	14.40	10.95	88.93	20.09	29.40
+25% Mean	0.89	0.74	0.92	0.82	0.95	0.86	0.82	0.39	0.80	0.61
-25% Mean	0.54	0.44	0.55	0.49	0.57	0.52	0.49	0.23	0.48	0.37
Benchmark Exceedance (temporal comparison)	-	No	-	No	No (both)	-	No	Yes (both)	Yes (2015)	Yes (2013-2015)
Modified Significance Level	N/A		N/A			0.0050				
Significant Inter-annual Difference ¹	-	N/A	-	N/A	N/A	-	N/A	No 0.0077 (2013) 0.025 (2014)	No 0.028 (2015)	No 0.043 (2013) 0.112 (2014) 0.519 (2015)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Simpson's Diversity Index								
n	5	5	5	5	5	5	5	4	5
Mean	0.57	0.68	0.69	0.71	0.75	0.71	0.74	0.69	0.74
Minimum	0.48	0.62	0.64	0.60	0.64	0.60	0.70	0.65	0.67
Maximum	0.69	0.73	0.76	0.77	0.83	0.76	0.79	0.77	0.80
Median	0.56	0.68	0.67	0.76	0.76	0.73	0.74	0.68	0.74
Standard deviation (n-1)	0.09	0.04	0.05	0.08	0.07	0.07	0.04	0.06	0.05
Standard error of the mean	0.04	0.02	0.02	0.03	0.03	0.03	0.02	0.03	0.02
COV (%)	16.29	6.23	6.89	10.66	9.03	9.45	5.17	7.95	6.32
+25% Mean	0.71	0.85	0.86	0.89	0.93	0.89	0.93	0.87	0.93
-25% Mean	0.43	0.51	0.51	0.53	0.56	0.53	0.56	0.52	0.56
Benchmark Exceedance (temporal comparison)	-	No	No (both)	Yes (2013)	Yes (2013)	-	No	No (both)	No (all)
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	-	N/A	N/A	Yes 0.0034 (2013) ²	Yes 0.00043 (2013)	-	N/A	N/A	N/A

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

2 – based on application of $\pm 50\%$ benchmark this significant difference was not identified in previous reports.

Nearshore Habitat – continued.

Site	BURNT		SPLIT			STL3KM				
Year	2014	2017	2014	2015	2017	2013	2014	2015	2016	2017
Metric	Ephemeroptera Density (no. per m ²)									
n	5	5	5	5	5	5	5	5	5	5
Mean	379.20	132.73	193.33	432.83	331.83	64.06	496.31	11.54	112.53	735.80
Minimum	139.00	57.71	158.70	201.99	245.27	34.63	57.71	0.00	43.28	115.42
Maximum	641.00	259.70	245.27	923.36	389.54	103.88	923.36	43.28	173.13	1673.59
Median	294.00	72.14	187.56	360.69	360.69	69.25	634.81	0.00	115.42	418.40
Standard deviation (n-1)	219.45	97.53	37.62	289.09	62.06	27.10	356.57	18.81	55.32	654.82
Standard error of the mean	98.14	43.62	16.83	129.29	27.75	12.12	159.46	8.41	24.74	292.85
COV (%)	57.87	73.48	19.46	66.79	18.70	42.30	71.84	162.98	49.15	88.99
+50% Mean	568.80	199.10	289.99	649.24	497.75	96.09	744.46	17.31	168.80	1103.70
-50% Mean	189.60	66.37	96.66	216.41	165.92	32.03	248.15	5.77	56.27	367.90
Benchmark Exceedance (temporal comparison)	-	Yes	-	Yes	Yes (2014)	-	Yes	Yes (both)	Yes (all)	Yes (2013, 2015, 2016)
Modified Significance Level	0.050		0.0167			0.0050				
Significant Inter-annual Difference ¹	-	No 0.051	-	No 0.031 (2014)	Yes 0.016 (2014)	-	No 0.039	Yes 0.237 (2013) 0.0012 (2014)	No 0.344 (2013) 0.263 (2014) 0.033 (2015) ³	Yes 0.013 (2013) 0.00026 (2015) 0.127 (2016)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Ephemeroptera Density (no. per m ²)								
n	5	5	5	5	5	5	5	4	5
Mean	1944.25	718.49	432.83	230.84	352.03	346.26	1197.48	57.71	496.31
Minimum	787.74	216.41	259.70	0.00	201.99	201.99	432.83	0.00	230.84
Maximum	3003.81	1226.34	591.53	548.25	562.67	649.24	1587.03	216.41	605.96
Median	2328.60	822.37	461.68	129.85	274.12	245.27	1486.03	7.21	577.10
Standard deviation (n-1)	908.57	416.33	127.01	250.93	169.36	186.72	497.49	106.02	159.88
Standard error of the mean	406.33	186.19	56.80	112.22	75.74	83.51	222.48	53.01	71.50
COV (%)	46.73	57.94	29.34	108.70	48.11	53.93	41.54	183.71	32.21
+50% Mean	2916.38	1077.74	649.24	346.26	528.05	519.39	1796.23	86.57	744.46
-50% Mean	972.13	359.25	216.41	115.42	176.02	173.13	598.74	28.86	248.15
Benchmark Exceedance (temporal comparison)	-	Yes	Yes (2013)	Yes (2013, 2014)	Yes (2013, 2014, 2016)	-	Yes	Yes (both)	Yes (2015, 2016)
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	-	No 0.117 (2013) ²	No 0.020 (2013)	Yes 0.00059 (2013) 0.0062 (2014)	No 0.0056 (2013) 0.229 (2014) 0.505 (2016)	N/A	No 0.035 (2013)	Yes 0.127 (2014) 0.00044 (2015)	No 0.186 (2015) 0.023 (2016)

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Nearshore Habitat – continued.

Site	BURNT		SPLIT			STL3KM				
Year	2014	2017	2014	2015	2017	2013	2014	2015	2016	2017
Metric	Percent EPT (EPT Index)									
n	5	5	5	5	5	5	5	5	5	5
Mean	29.04	15.95	31.11	18.41	34.47	7.43	31.11	0.80	9.73	59.33
Minimum	15.60	8.19	22.00	10.56	23.53	3.80	12.12	0.00	1.35	28.57
Maximum	46.90	29.33	50.00	27.27	52.94	13.10	42.86	3.06	16.25	85.71
Median	22.50	12.00	28.33	20.13	33.00	6.82	32.91	0.00	10.74	58.70
Standard deviation (n-1)	13.13	9.19	10.88	7.22	12.08	3.75	12.14	1.33	5.54	23.28
Standard error of the mean	5.87	4.11	4.87	3.23	5.40	1.68	5.43	0.59	2.48	10.41
COV (%)	45.20	57.61	34.98	39.21	35.03	50.42	39.03	165.29	56.92	39.24
+50% Mean	43.56	23.93	46.67	27.62	51.70	11.15	46.66	1.21	14.60	89.00
-50% Mean	14.52	7.98	15.56	9.21	17.23	3.72	15.55	0.40	4.87	29.67
Benchmark Exceedance (temporal comparison)	-	No	-	No	Yes (2015)	-	Yes	Yes (both)	Yes (2014, 2015)	Yes (all)
Modified Significance Level	N/A		0.0167			0.0050				
Significant Inter-annual Difference ¹	-	N/A	-	N/A	No 0.029 (2015)	-	No 0.085	Yes 0.144 (2013) 0.0015 (2014)	No 0.156 (2014) 0.078 (2015)	Yes 0.0077 (2013) 0.344 (2014) < 0.0001 (2015) 0.018 (2016)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Percent EPT (EPT Index)								
n	5	5	5	5	5	5	5	4	5
Mean	62.14	39.77	35.70	19.60	28.71	19.58	32.28	11.76	31.06
Minimum	51.38	15.69	14.40	4.00	15.38	5.54	17.61	0.00	22.70
Maximum	71.63	53.77	47.30	45.71	41.84	49.45	47.27	44.12	39.47
Median	63.66	49.13	45.71	14.49	31.01	15.34	29.73	1.47	31.37
Standard deviation (n-1)	9.55	16.92	15.09	17.64	11.09	17.32	10.91	21.61	5.95
Standard error of the mean	4.27	7.56	6.75	7.89	4.96	7.74	4.88	10.81	2.66
COV (%)	15.37	42.53	42.26	90.01	38.61	88.45	33.80	183.71	19.15
+50% Mean	93.21	59.65	53.54	29.40	43.06	29.37	48.42	17.65	46.59
-50% Mean	31.07	19.88	17.85	9.80	14.35	9.79	16.14	5.88	15.53
Benchmark Exceedance (temporal comparison)	-	No	No (both)	Yes (2013, 2014)	Yes (2013)	-	Yes	Yes (2015)	Yes (2014, 2016)
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	-	N/A	N/A	Yes 0.00015 (2013) 0.039 (2014)	Yes 0.0015 (2013)	-	No	No 0.054 (2015)	No 0.234 (2014) 0.068 (2016)

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Nearshore Habitat – continued.

Site	BURNT		SPLIT			STL3KM				
Year	2014	2017	2014	2015	2017	2013	2014	2015	2016	2017
Metric	Pisidiidae Density (no. per m ²)									
n	5	5	5	5	5	5	5	5	5	5
Mean	410.40	1108.03	23.08	256.81	190.44	27.70	8.66	8.66	25.97	2.89
Minimum	147.00	418.40	0.00	0.00	0.00	8.66	0.00	0.00	0.00	0.00
Maximum	866.00	1558.17	57.71	1024.35	403.97	51.94	28.86	28.86	57.71	14.43
Median	277.00	1154.20	14.43	72.14	86.57	25.97	0.00	0.00	28.86	0.00
Standard deviation (n-1)	293.75	429.13	21.88	432.27	197.40	16.65	12.90	12.90	25.81	6.45
Standard error of the mean	131.37	191.91	9.79	193.32	88.28	7.45	5.77	5.77	11.54	2.89
COV (%)	71.58	38.73	94.79	168.32	103.65	60.11	149.07	149.07	99.38	223.61
+50% Mean	615.60	1662.05	34.63	385.21	285.66	41.55	12.98	12.98	38.95	4.33
-50% Mean	205.20	554.02	11.54	128.40	95.22	13.85	4.33	4.33	12.98	1.44
Benchmark Exceedance (temporal comparison)	-	Yes	-	Yes	Yes (2014)	-	Yes	Yes (2013)	Yes (2014, 2015)	Yes (all)
Modified Significance Level	0.050		0.0167			0.0050				
Significant Inter-annual Difference ¹	-	Yes 0.017	-	No 0.145	No 0.102 (2014)	-	No 0.072	No 0.072 (2013)	No 0.227 (2014) 0.227 (2015)	No 0.016 (2013) 0.538 (2014) 0.538 (2015) 0.068 (2016)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Pisidiidae Density (no. per m ²)								
n	5	5	5	5	5	5	5	4	5
Mean	119.46	129.85	121.19	150.05	201.99	409.74	458.80	39.68	496.31
Minimum	25.97	28.86	28.86	43.28	0.00	187.56	72.14	0.00	302.98
Maximum	242.38	173.13	274.12	476.11	447.25	1038.78	894.51	100.99	779.09
Median	138.50	144.28	72.14	72.14	230.84	274.12	360.69	28.86	519.39
Standard deviation (n-1)	90.46	57.71	105.82	183.52	167.94	355.98	311.35	44.66	188.28
Standard error of the mean	40.45	25.81	47.33	82.07	75.11	159.20	139.24	22.33	84.20
COV (%)	75.72	44.44	87.32	122.31	83.15	86.88	67.86	112.57	37.94
+50% Mean	179.19	194.77	181.79	225.07	302.98	614.61	688.19	59.51	744.46
-50% Mean	59.73	64.92	60.60	75.02	100.99	204.87	229.40	19.84	248.15
Benchmark Exceedance (temporal comparison)	-	No	No (both)	No (all)	Yes (2013-2015)	-	No	Yes (both)	Yes (2016)
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	-	N/A	N/A	N/A	No 0.402 (2013) 0.677 (2014) 0.491 (2015)	N/A	N/A	No 0.054 (2014) 0.032 (2015)	No 0.021 (2016)

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Nearshore Habitat – continued.

Site	BURNT		SPLIT			STL3KM				
Year	2014	2017	2014	2015	2017	2013	2014	2015	2016	2017
Metric	Water Depth (m)									
n	5	5	5	5	5	5	5	5	5	5
Mean	2.40	2.96	2.60	1.07	1.92	2.79	2.81	2.30	2.50	2.18
Minimum	2.20	1.80	2.40	0.93	1.40	2.50	2.23	1.37	1.80	1.40
Maximum	2.60	5.70	2.90	1.17	2.40	3.08	3.07	2.80	2.80	2.80
Median	2.40	2.40	2.60	1.10	1.80	2.82	3.03	2.40	2.60	2.30
Standard deviation (n-1)	0.16	1.62	0.19	0.09	0.42	0.25	0.36	0.58	0.40	0.51
Standard error of the mean	0.07	0.73	0.08	0.04	0.19	0.11	0.16	0.26	0.18	0.23
COV (%)	6.59	54.82	7.20	8.27	21.91	9.11	12.69	25.06	16.00	23.25
+50% Mean	3.60	4.44	3.90	1.60	2.88	4.18	4.22	3.45	3.75	3.27
-50% Mean	1.20	1.48	1.30	0.53	0.96	1.39	1.41	1.15	1.25	1.09
Benchmark Exceedance (temporal comparison)	-	No	-	Yes	Yes (2015)	-	No	No (both)	No (all)	No (all)
Modified Significance Level	N/A		0.0167			N/A				
Significant Inter-annual Difference ¹	-	N/A	-	Yes < 0.0001	Yes 0.0019 (2014) 0.00032 (2015)	-	N/A	N/A	N/A	N/A

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Water Depth (m)								
n	5	5	5	5	5	5	5	4	5
Mean	2.41	2.18	2.10	1.72	2.12	2.55	1.56	2.35	2.10
Minimum	2.14	1.47	1.13	1.20	1.20	1.90	1.03	1.30	1.30
Maximum	3.00	3.43	3.50	2.70	4.20	3.20	2.40	3.50	3.00
Median	2.18	2.00	1.83	1.60	1.90	2.50	1.27	2.30	1.70
Standard deviation (n-1)	0.37	0.74	0.87	0.62	1.23	0.51	0.62	1.11	0.83
Standard error of the mean	0.17	0.33	0.39	0.28	0.55	0.23	0.28	0.56	0.37
COV (%)	15.36	34.12	41.56	36.17	58.10	19.91	39.73	47.32	39.70
+50% Mean	3.62	3.27	3.15	2.58	3.18	3.82	2.34	3.53	3.15
-50% Mean	1.21	1.09	1.05	0.86	1.06	1.27	0.78	1.18	1.05
Benchmark Exceedance (temporal comparison)	-	No	No (both)	No (all)	No (all)	-	No	Yes (2015)	No (all)
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	-	N/A	N/A	N/A	N/A	-	N/A	No 0.150 (2015)	N/A

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Nearshore Habitat – continued.

Site	BURNT		SPLIT			STL3KM				
Year	2014	2017	2014	2015	2017	2013	2014	2015	2016	2017
Metric	Oligochaeta Density (no. per m ²)									
n	5	5	5	5	5	5	5	5	5	5
Mean	13.80	34.63	40.40	311.63	138.50	79.64	106.76	31.74	72.14	20.20
Minimum	0.00	0.00	0.00	28.86	0.00	17.31	0.00	0.00	0.00	0.00
Maximum	26.00	100.99	144.28	1038.78	375.12	164.47	230.84	100.99	158.70	43.28
Median	17.00	14.43	14.43	158.70	115.42	34.63	100.99	14.43	86.57	14.43
Standard deviation (n-1)	13.12	44.00	58.96	419.71	145.92	73.81	87.52	40.03	61.21	21.88
Standard error of the mean	5.87	19.68	26.37	187.70	65.26	33.01	39.14	17.90	27.37	9.79
COV (%)	95.09	127.07	145.95	134.68	105.36	92.68	81.98	126.13	84.85	108.33
+50% Mean	20.70	51.94	60.60	467.45	207.76	119.46	160.15	47.61	108.21	30.30
-50% Mean	6.90	17.31	20.20	155.82	69.25	39.82	53.38	15.87	36.07	10.10
Benchmark Exceedance (temporal comparison)	-	Yes	-	Yes	Yes (both)	-	No	Yes (both)	Yes (2015)	Yes (2013, 2014, 2016)
Modified Significance Level	0.050		0.0167			0.0050				
Significant Inter-annual Difference ¹	-	No 0.778	-	No 0.043 (2014)	No 0.166 (2014) 0.523 (2015)	-	N/A	No 0.195 (2013) 0.115 (2014)	No 0.290 (2015)	No 0.120 (2013) 0.066 (2014) 0.188 (2016)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Oligochaeta Density (no. per m ²)								
n	5	5	5	5	5	5	5	4	5
Mean	145.43	75.02	40.40	126.96	46.17	277.01	248.15	14.43	40.40
Minimum	77.91	0.00	0.00	14.43	0.00	14.43	43.28	0.00	0.00
Maximum	311.63	144.28	115.42	259.70	158.70	476.11	375.12	43.28	86.57
Median	129.85	57.71	28.86	129.85	14.43	245.27	346.26	7.21	28.86
Standard deviation (n-1)	96.47	56.25	44.93	88.00	64.84	194.74	151.11	20.40	43.76
Standard error of the mean	43.14	25.16	20.10	39.35	29.00	87.09	67.58	10.20	19.57
COV (%)	66.34	74.98	111.23	69.31	140.45	70.30	60.89	141.42	108.33
+50% Mean	218.14	112.53	60.60	190.44	69.25	415.51	372.23	21.64	60.60
-50% Mean	72.71	37.51	20.20	63.48	23.08	138.50	124.08	7.21	20.20
Benchmark Exceedance (temporal comparison)	-	No	Yes (2013)	Yes (2014, 2015)	Yes (2013, 2016)	-	No	Yes (both)	Yes (all)
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	-	N/A	No 0.026 (2013)	No 0.438 (2014) 0.084 (2015)	No 0.040 (2013) 0.120 (2016)	-	N/A	No 0.015 (2014) 0.017 (2015)	No 0.039 (2014) 0.045 (2015) 0.622 (2016)

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Nearshore Habitat – continued.

Site	BURNT		SPLIT			STL3KM				
Year	2014	2017	2014	2015	2017	2013	2014	2015	2016	2017
Metric	Amphipoda Density (no. per m ²)									
n	5	5	5	5	5	5	5	5	5	5
Mean	1.80	2.89	23.08	20.20	8.66	1.73	2.89	2.89	5.77	5.77
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	9.00	14.43	115.42	86.57	28.86	8.66	14.43	14.43	14.43	28.86
Median	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Standard deviation (n-1)	4.02	6.45	51.62	37.62	12.90	3.87	6.45	6.45	7.90	12.90
Standard error of the mean	1.80	2.89	23.08	16.83	5.77	1.73	2.89	2.89	3.53	5.77
COV (%)	223.61	223.61	223.61	186.26	149.07	223.61	223.61	223.61	136.93	223.61
+50% Mean	2.70	4.33	34.63	30.30	12.98	2.60	4.33	4.33	8.66	8.66
-50% Mean	0.90	1.44	11.54	10.10	4.33	0.87	1.44	1.44	2.89	2.89
Benchmark Exceedance (temporal comparison)	-	Yes	-	No	Yes (both)	-	Yes	Yes (2013)	Yes (all)	Yes (2013- 2015)
Modified Significance Level	0.050		0.0167			0.0050				
Significant Inter-annual Difference ¹	-	No 1.000	-	N/A	No 0.736 (2014) 0.933 (2015)	-	No 0.886	No 0.866 (2013)	No 0.388 (2013) 0.472 (2014) 0.472 (2015)	No 0.774 (2013) 0.886 (2014) 0.886 (2015)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Amphipoda Density (no. per m ²)								
n	5	5	5	5	5	5	5	4	5
Mean	1.73	5.77	17.31	11.54	63.48	11.54	8.66	14.43	0.00
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	8.66	28.86	86.57	28.86	259.70	43.28	28.86	28.86	0.00
Median	0.00	0.00	0.00	0.00	14.43	0.00	0.00	14.43	0.00
Standard deviation (n-1)	3.87	12.90	38.71	15.80	111.10	18.81	12.90	11.78	0.00
Standard error of the mean	1.73	5.77	17.31	7.07	49.69	8.41	5.77	5.89	0.00
COV (%)	223.61	223.61	223.61	136.93	175.01	162.98	149.07	81.65	0.00
+50% Mean	2.60	8.66	25.97	17.31	95.22	17.31	12.98	21.64	0.00
-50% Mean	0.87	2.89	8.66	5.77	31.74	5.77	4.33	7.21	0.00
Benchmark Exceedance (temporal comparison)	-	Yes	Yes (both)	Yes (2013, 2014)	Yes (all)	-	No	Yes (2015)	Yes (all)
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	-	No 0.876 (2013)	No 0.755 (2013) 0.867 (2014)	No 0.436 (2013) 0.533 (2014)	No 0.107 (2013) 0.146 (2014) 0.194 (2015) 0.406 (2016)	-	N/A	No 0.363 (2015)	No 0.180 (2014) 0.214 (2015) 0.038 (2016)

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Nearshore Habitat – continued.

Site	BURNT		SPLIT			STL3KM				
Year	2014	2017	2014	2015	2017	2013	2014	2015	2016	2017
Metric	Gastropoda Density (no. per m ²)									
n	5	5	5	5	5	5	5	5	5	5
Mean	410.60	323.18	89.45	173.13	69.25	562.67	167.36	69.25	300.09	23.08
Minimum	139.00	28.86	14.43	28.86	0.00	216.41	43.28	0.00	86.57	0.00
Maximum	710.00	1341.76	201.99	389.54	129.85	882.96	288.55	245.27	851.22	100.99
Median	355.00	86.57	57.71	115.42	72.14	510.73	187.56	14.43	144.28	0.00
Standard deviation (n-1)	255.26	569.90	80.59	159.03	47.19	303.16	101.30	102.22	321.54	44.00
Standard error of the mean	114.16	254.87	36.04	71.12	21.11	135.58	45.30	45.71	143.80	19.68
COV (%)	62.17	176.34	90.09	91.86	68.15	53.88	60.53	147.61	107.15	190.60
+50% Mean	615.90	484.76	134.18	259.70	103.88	844.01	251.04	103.88	450.14	34.63
-50% Mean	205.30	161.59	44.73	86.57	34.63	281.34	83.68	34.63	150.05	11.54
Benchmark Exceedance (temporal comparison)	-	No	-	Yes	Yes (2015)	-	Yes	Yes (both)	Yes (2014, 2015)	Yes (all)
Modified Significance Level	N/A		0.0167			0.0050				
Significant Inter-annual Difference ¹	-	N/A	-	No 0.479 (2014)	No 0.376 (2015)	-	No 0.097 ²	Yes 0.0042 (2013) 0.228 (2014)	No 0.635 (2014) 0.093 (2015)	Yes 0.00038 (2013) 0.058 (2014) 0.491 (2015) 0.018 (2016)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Gastropoda Density (no. per m ²)								
n	5	5	5	5	5	5	5	4	5
Mean	493.42	455.91	167.36	265.47	225.07	1128.23	1335.99	43.28	481.88
Minimum	285.66	43.28	86.57	28.86	14.43	158.70	259.70	0.00	173.13
Maximum	649.24	807.94	274.12	663.67	476.11	2539.24	3347.18	100.99	1240.77
Median	476.11	432.83	144.28	187.56	216.41	1038.78	1067.64	36.07	403.97
Standard deviation (n-1)	154.49	283.57	76.75	255.78	185.77	883.35	1239.66	51.35	440.64
Standard error of the mean	69.09	126.81	34.32	114.39	83.08	395.05	554.39	25.67	197.06
COV (%)	31.31	62.20	45.86	96.35	82.54	78.29	92.79	118.63	91.44
+50% Mean	740.13	683.86	251.04	398.20	337.60	1692.35	2003.98	64.92	722.82
-50% Mean	246.71	227.95	83.68	132.73	112.53	564.12	667.99	21.64	240.94
Benchmark Exceedance (temporal comparison)	-	No	Yes (both)	Yes (2015)	Yes (2013, 2014)	-	No	Yes (both)	Yes (all)
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	-	N/A	No 0.021 (2013) 0.038 (2014)	No 0.458 (2015)	No 0.052 (2013) 0.090 (2014)	-	N/A	Yes 0.0074 (2014) 0.0027 (2015)	No 0.399 (2014) 0.238 (2015) 0.060 (2016)

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Nearshore Habitat – continued.

Site	BURNT		SPLIT			STL3KM				
Year	2014	2017	2014	2015	2017	2013	2014	2015	2016	2017
Metric	Chironomidae Density (no. per m ²)									
n	5	5	5	5	5	5	5	5	5	5
Mean	145.40	196.21	239.50	1682.25	340.49	316.83	643.47	986.84	937.79	305.86
Minimum	69.00	86.57	144.28	360.69	216.41	190.44	245.27	115.42	346.26	57.71
Maximum	225.00	403.97	389.54	4385.96	476.11	398.20	1183.06	2885.50	1962.14	620.38
Median	121.00	158.70	230.84	1240.77	317.41	389.54	490.54	793.51	894.51	302.98
Standard deviation (n-1)	67.83	126.02	99.23	1580.94	111.10	107.70	368.62	1122.69	642.63	205.66
Standard error of the mean	30.33	56.36	44.37	707.02	49.69	48.17	164.85	502.08	287.39	91.97
COV (%)	46.65	64.23	41.43	93.98	32.63	33.99	57.29	113.77	68.53	67.24
+50% Mean	218.10	294.32	359.25	2523.37	510.73	475.24	965.20	1480.26	1406.68	458.80
-50% Mean	72.70	98.11	119.75	841.12	170.24	158.41	321.73	493.42	468.89	152.93
Benchmark Exceedance (temporal comparison)	-	No	-	Yes	Yes (2015)	-	Yes	Yes (both)	Yes (2013)	Yes (2014- 2016)
Modified Significance Level	N/A		0.0167			0.0050				
Significant Inter-annual Difference ¹	-	N/A	-	Yes 0.0047	No 0.066 (2015)	-	No 0.133 (2013)	No 0.302 (2013) 0.636 (2014)	No 0.053 (2013)	No 0.094 (2014) 0.229 (2015) 0.035 (2016)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Chironomidae Density (no. per m ²)								
n	5	5	5	5	5	5	5	4	5
Mean	282.20	334.72	484.76	265.47	435.71	239.50	854.11	129.85	170.24
Minimum	147.16	57.71	86.57	14.43	72.14	0.00	72.14	28.86	14.43
Maximum	718.49	605.96	1038.78	490.54	937.79	504.96	2394.97	259.70	274.12
Median	173.13	216.41	432.83	288.55	346.26	100.99	533.82	115.42	173.13
Standard deviation (n-1)	245.96	254.72	349.49	205.71	325.40	239.38	900.62	106.67	105.73
Standard error of the mean	110.00	113.91	156.30	92.00	145.52	107.06	402.77	53.34	47.28
COV (%)	87.16	76.10	72.10	77.49	74.68	99.95	105.45	82.15	62.10
+50% Mean	423.30	502.08	727.15	398.20	653.57	359.25	1281.16	194.77	255.37
-50% Mean	141.10	167.36	242.38	132.73	217.86	119.75	427.05	64.92	85.12
Benchmark Exceedance (temporal comparison)	-	No	Yes (2013)	No (all)	Yes (2013, 2016)	-	Yes	Yes (2015)	Yes (2015)
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	-	N/A	No 0.268 (2013)	N/A	No 0.398 (2013) 0.350 (2016)	-	No 0.115	No 0.044 (2015)	No 0.103 (2015)

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Nearshore Habitat – continued.

Site	BURNT		SPLIT			STL3KM				
Year	2014	2017	2014	2015	2017	2013	2014	2015	2016	2017
Metric	Plecoptera Density (no. per m ²)									
n	5	5	5	5	5	5	5	5	5	5
Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Median	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Standard deviation (n-1)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Standard error of the mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
COV (%)	-	-	-	-	-	-	-	-	-	-
+50% Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-50% Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Benchmark Exceedance (temporal comparison)	-	No	-	No	No (both)	-	No	No (both)	No (all)	No (all)
Modified Significance Level	N/A		N/A			N/A				
Significant Inter-annual Difference ¹	-	N/A	-	N/A	N/A	-	N/A	N/A	N/A	N/A

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Plecoptera Density (no. per m ²)								
n	5	5	5	5	5	5	5	4	5
Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.89
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.43
Median	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Standard deviation (n-1)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.45
Standard error of the mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.89
COV (%)	-	-	-	-	-	-	-	-	223.61
+50% Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.33
-50% Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.44
Benchmark Exceedance (temporal comparison)	-	N/A	No (both)	No (all)	No (all)	-	No	No (both)	Yes (all)
Modified Significance Level	N/A					0.0083			
Significant Inter-annual Difference ¹	-	N/A	N/A	N/A	N/A	-	N/A	N/A	No 0.168 (2014) 0.168 (2015) 0.194 (2016)

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Nearshore Habitat – continued.

Site	BURNT		SPLIT			STL3KM				
Year	2014	2017	2014	2015	2017	2013	2014	2015	2016	2017
Metric	Trichoptera Density (no. per m ²)									
n	5	5	5	5	5	5	5	5	5	5
Mean	25.80	161.59	8.66	31.74	51.94	19.04	25.97	2.89	11.54	5.77
Minimum	17.00	57.71	0.00	14.43	14.43	0.00	0.00	0.00	0.00	0.00
Maximum	52.00	519.39	14.43	57.71	100.99	43.28	86.57	14.43	28.86	14.43
Median	17.00	57.71	14.43	28.86	43.28	17.31	14.43	0.00	14.43	0.00
Standard deviation (n-1)	15.16	201.57	7.90	18.81	40.29	16.65	34.45	6.45	12.07	7.90
Standard error of the mean	6.78	90.15	3.53	8.41	18.02	7.45	15.40	2.89	5.40	3.53
COV (%)	58.74	124.74	91.29	59.27	77.58	87.43	132.64	223.61	104.58	136.93
+50% Mean	38.70	242.38	12.98	47.61	77.91	28.57	38.95	4.33	17.31	8.66
-50% Mean	12.90	80.79	4.33	15.87	25.97	9.52	12.98	1.44	5.77	2.89
Benchmark Exceedance (temporal comparison)	-	Yes	-	Yes	Yes (both)	-	No	Yes (both)	Yes (2014, 2015)	Yes (all)
Modified Significance Level	0.050		0.0167			0.0050				
Significant Inter-annual Difference ¹	-	Yes 0.011	-	No 0.057	No 0.019 (2014) 0.654 (2015)	-	N/A	No 0.042 (2013) 0.067 (2014)	No 0.568 (2014) 0.209 (2015)	No 0.120 (2013) 0.177 (2014) 0.631 (2015) 0.437 (2016)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Trichoptera Density (no. per m ²)								
n	5	5	5	5	5	5	5	4	5
Mean	15.58	8.66	2.89	40.40	40.40	11.54	8.66	0.00	17.31
Minimum	8.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	34.63	28.86	14.43	144.28	100.99	43.28	28.86	0.00	43.28
Median	8.66	0.00	0.00	14.43	14.43	0.00	0.00	0.00	14.43
Standard deviation (n-1)	11.29	12.90	6.45	58.96	49.35	18.81	12.90	0.00	18.81
Standard error of the mean	5.05	5.77	2.89	26.37	22.07	8.41	5.77	0.00	8.41
COV (%)	72.44	149.07	223.61	145.95	122.16	162.98	149.07	-	108.65
+50% Mean	23.37	12.98	4.33	60.60	60.60	17.31	12.98	0.00	25.97
-50% Mean	7.79	4.33	1.44	20.20	20.20	5.77	4.33	0.00	8.66
Benchmark Exceedance (temporal comparison)	-	No	Yes (both)	Yes (all)	Yes (2013-2015)	-	No	Yes (both)	Yes (all)
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	-	N/A	No 0.082 (2013) 0.503 (2014)	No 0.789 (2013) 0.181 (2014) 0.045 (2015)	No 0.893 (2013) 0.349 (2014) 0.108 (2015)	-	N/A	No 0.219 (2014) 0.283 (2015)	No 0.558 (2014) 0.454 (2015) 0.075 (2016)

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Nearshore Habitat – continued.

Site	BURNT		SPLIT			STL3KM				
Year	2014	2017	2014	2015	2017	2013	2014	2015	2016	2017
Metric	EPT Density (no. per m ²)									
n	5	5	5	5	5	5	5	5	5	5
Mean	405.00	294.32	201.99	464.57	383.77	83.10	522.28	14.43	124.08	741.57
Minimum	164.00	129.85	158.70	245.27	288.55	51.94	57.71	0.00	43.28	115.42
Maximum	658.00	577.10	245.27	952.22	476.11	112.53	937.79	43.28	187.56	1673.59
Median	312.00	274.12	201.99	375.12	389.54	95.22	649.24	0.00	115.42	432.83
Standard deviation (n-1)	212.09	175.10	36.78	282.98	66.59	29.10	370.85	20.40	63.38	655.43
Standard error of the mean	94.85	78.31	16.45	126.55	29.78	13.01	165.85	9.12	28.35	293.12
COV (%)	52.37	59.49	18.21	60.91	17.35	35.02	71.01	141.42	51.08	88.38
+50% Mean	607.50	441.48	302.98	696.85	575.66	124.65	783.41	21.64	186.11	1112.36
-50% Mean	202.50	147.16	100.99	232.28	191.89	41.55	261.14	7.21	62.04	370.79
Benchmark Exceedance (temporal comparison)	-	No	-	Yes	Yes (2014)	-	Yes	Yes (both)	Yes (2014, 2015)	Yes (2013, 2015, 2016)
Modified Significance Level	N/A		0.0167			0.0050				
Significant Inter-annual Difference ¹	-	N/A	-	Yes 0.016	Yes 0.0072 (2014)	-	No 0.071	Yes 0.127 (2013) 0.00086 (2014)	No 0.197 (2014) 0.041 (2015)	Yes 0.027 (2013) 0.00018 (2015) 0.089 (2016)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	EPT Density (no. per m ²)								
n	5	5	5	5	5	5	5	4	5
Mean	1959.83	727.15	435.71	271.24	392.43	357.80	1206.14	57.71	516.51
Minimum	805.06	230.84	259.70	28.86	201.99	201.99	432.83	0.00	245.27
Maximum	3038.43	1226.34	591.53	692.52	591.53	649.24	1615.88	216.41	649.24
Median	2337.26	822.37	461.68	144.28	317.41	274.12	1500.46	7.21	605.96
Standard deviation (n-1)	913.45	406.10	128.80	289.52	180.03	182.04	505.33	106.02	168.07
Standard error of the mean	408.51	181.61	57.60	129.48	80.51	81.41	225.99	53.01	75.16
COV (%)	46.61	55.85	29.56	106.74	45.87	50.88	41.90	183.71	32.54
+50% Mean	2939.75	1090.72	653.57	406.86	588.64	536.70	1809.21	86.57	774.76
-50% Mean	979.92	363.57	217.86	135.62	196.21	178.90	603.07	28.86	258.25
Benchmark Exceedance (temporal comparison)	-	Yes	Yes (2013)	Yes (2013, 2014)	Yes (2013)	-	Yes	Yes (both)	Yes (2015, 2016)
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	-	No 0.112	No 0.015 (2013)	Yes 0.00080 (2013) 0.078 (2014)	No 0.0064 (2013)	-	No 0.032	Yes 0.134 (2014) 0.00044 (2015)	No 0.196 (2015) 0.022 (2016)

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Nearshore Habitat – continued.

Site	BURNT		SPLIT			STL3KM				
Year	2014	2017	2014	2015	2017	2013	2014	2015	2016	2017
Metric	Ratio of EPT to Chironomidae									
n	5	5	5	5	5	5	5	5	5	5
Mean	2.92	1.54	0.96	0.41	1.25	0.28	0.77	0.01	5.92	3.20
Minimum	1.40	1.27	0.41	0.15	0.67	0.13	0.24	0.00	0.02	0.53
Maximum	4.50	2.00	1.40	0.84	1.80	0.46	1.41	0.05	29.00	7.50
Median	2.80	1.50	1.06	0.36	1.50	0.27	0.63	0.00	0.21	1.88
Standard deviation (n-1)	1.11	0.27	0.37	0.27	0.50	0.12	0.48	0.02	12.90	2.97
Standard error of the mean	0.50	0.12	0.16	0.12	0.22	0.05	0.22	0.01	5.77	1.33
COV (%)	38.09	17.85	38.27	66.71	39.60	41.16	63.17	177.55	218.01	92.87
+50% Mean	4.38	2.31	1.44	0.61	1.88	0.42	1.15	0.02	8.88	4.80
-50% Mean	1.46	0.77	0.48	0.20	0.63	0.14	0.38	0.01	2.96	1.60
Benchmark Exceedance (temporal comparison)	-	No	-	Yes	Yes (2015)	-	Yes	Yes (both)	Yes (all)	Yes (2013-2015)
Modified Significance Level	0.050		0.0167			0.0050				
Significant Inter-annual Difference ¹	-	N/A	-	No 0.043	Yes 0.0049 (2015)	-	No 0.306	No 0.162 (2013) 0.030 (2014)	No 0.770 (2013) 0.189 (2014) 0.239 (2015)	Yes 0.041 (2013) 0.306 (2014) 0.0032 (2015)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Ratio of EPT to Chironomidae								
n	5	5	5	5	5	5	5	4	5
Mean	8.44	5.25	1.82	1.88	1.57	42.45	2.70	0.65	5.90
Minimum	4.23	0.38	0.25	0.10	0.34	0.54	0.64	0.06	1.78
Maximum	13.50	14.25	5.33	4.43	3.80	201.99	6.00	1.25	17.00
Median	8.41	4.40	1.37	1.60	1.08	2.43	2.06	0.65	3.75
Standard deviation (n-1)	3.77	5.66	2.03	1.84	1.41	89.22	2.00	0.84	6.32
Standard error of the mean	1.68	2.53	0.91	0.82	0.63	39.90	0.90	0.60	2.83
COV (%)	44.63	107.85	111.26	97.52	89.66	210.18	74.12	129.39	107.04
+50% Mean	12.66	7.87	2.73	2.83	2.36	63.67	4.05	0.98	8.85
-50% Mean	4.22	2.62	0.91	0.94	0.79	21.22	1.35	0.33	2.95
Benchmark Exceedance (temporal comparison)	-	No	Yes (both)	Yes (2013, 2014)	Yes (2013, 2014)	-	Yes	Yes (both)	Yes (all)
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	-	N/A	No 0.018 (2013) 0.283 (2014)	No 0.014 (2013) 0.246 (2014)	No 0.013 (2013) 0.229 (2014)	-	No 0.790	No 0.249 (2014) 0.160 (2015)	No 0.280 (2014) 0.388 (2015) 0.040 (2016)

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Nearshore Habitat – continued.

Site	BURNT		SPLIT			STL3KM				
Year	2014	2017	2014	2015	2017	2013	2014	2015	2016	2017
Metric	Percent Ephemeroptera									
n	5	5	5	5	5	5	5	5	5	5
Mean	29.04	8.29	29.60	16.63	29.98	5.63	29.67	0.71	8.66	58.62
Minimum	15.60	2.15	22.00	8.70	20.00	2.53	12.12	0.00	1.35	28.57
Maximum	46.90	24.00	46.43	22.08	50.98	9.52	41.90	3.06	13.75	82.86
Median	22.50	4.85	26.79	19.48	27.00	5.48	29.11	0.00	9.92	57.97
Standard deviation (n-1)	13.13	8.92	9.71	6.26	12.20	2.72	11.87	1.33	4.57	22.50
Standard error of the mean	5.87	3.99	4.34	2.80	5.46	1.22	5.31	0.60	2.04	10.06
COV (%)	45.20	107.51	32.80	37.66	40.69	48.32	40.03	188.12	52.79	38.38
+50% Mean	43.56	12.44	44.40	24.94	44.97	8.44	44.50	1.06	12.99	87.93
-50% Mean	14.52	4.15	14.80	8.31	14.99	2.81	14.83	0.35	4.33	29.31
Benchmark Exceedance (temporal comparison)	-	Yes	-	No	Yes (2015)	-	Yes	Yes (both)	Yes (all)	Yes (all)
Modified Significance Level	0.050		0.0167			0.0050				
Significant Inter-annual Difference ¹	-	Yes 0.035	-	N/A	No 0.020 (2015)	-	No 0.043	Yes 0.229 (2013) 0.0013 (2014)	No 0.547 (2013) 0.156 (2014) 0.071 (2015)	Yes 0.0040 (2013) 0.390 (2014) < 0.0001 (2015) 0.023 (2016)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Percent Ephemeroptera								
n	5	5	5	5	5	5	5	4	5
Mean	61.58	39.17	35.43	16.27	26.09	19.15	32.06	11.76	29.81
Minimum	50.28	14.71	14.40	0.00	13.27	5.54	17.61	0.00	21.62
Maximum	70.82	53.77	46.07	36.19	35.85	49.45	46.82	44.12	36.84
Median	63.43	49.13	45.71	13.04	30.23	14.81	29.73	1.47	29.63
Standard deviation (n-1)	9.69	17.62	14.84	15.75	11.00	17.58	10.69	21.61	5.46
Standard error of the mean	4.33	7.88	6.64	7.04	4.92	7.86	4.78	10.81	2.44
COV (%)	15.73	44.98	41.88	96.84	42.15	91.81	33.33	183.71	18.30
+50% Mean	92.37	58.75	53.14	24.40	39.14	28.72	48.08	17.65	44.71
-50% Mean	30.79	19.58	17.71	8.13	13.05	9.57	16.03	5.88	14.90
Benchmark Exceedance (temporal comparison)	-	No	No (both)	Yes (all)	Yes (2013, 2016)	-	Yes	Yes (2015)	Yes (2014, 2016)
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	-	N/A	N/A	Yes < 0.0001 (2013) 0.018 (2014) 0.044 (2015)	Yes 0.00074 (2013) 0.283 (2016)	-	No 0.183	No 0.056 (2015)	No 0.267 (2014) 0.086 (2016)

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Nearshore Habitat – continued.

Site	BURNT		SPLIT			STL3KM				
Year	2014	2017	2014	2015	2017	2013	2014	2015	2016	2017
Metric	Percent of Oligochaeta + Chironomidae									
n	5	5	5	5	5	5	5	5	5	5
Mean	12.58	11.24	41.13	61.86	39.60	33.15	53.67	84.94	59.69	32.87
Minimum	4.76	5.83	30.00	52.17	25.71	25.32	40.00	62.50	52.50	11.43
Maximum	19.32	17.20	54.00	70.19	65.88	44.52	63.64	98.21	72.73	53.57
Median	13.20	9.48	39.29	62.99	35.29	30.95	56.33	93.33	56.20	31.88
Standard deviation (n-1)	6.22	4.60	9.39	6.88	15.78	7.74	10.58	15.70	8.60	18.84
Standard error of the mean	2.78	2.06	4.20	3.08	7.06	3.46	4.73	7.02	3.85	8.43
COV (%)	49.39	40.96	22.84	11.12	39.86	23.34	19.72	18.48	14.41	57.34
+50% Mean	18.88	16.85	61.70	92.79	59.40	49.73	80.50	127.41	89.54	49.30
-50% Mean	6.29	5.62	20.57	30.93	19.80	16.58	26.83	42.47	29.85	16.43
Benchmark Exceedance (temporal comparison)	-	No	-	Yes	No	-	Yes	Yes (both)	Yes (2013)	Yes (2015)
Modified Significance Level	N/A		0.0167			0.0050				
Significant Inter-annual Difference ¹	-	N/A	-	Yes 0.013	N/A	-	No 0.022	Yes < 0.0001 (2013) 0.0011 (2014)	Yes 0.0043 (2013)	Yes < 0.0001 (2015)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Percent of Oligochaeta + Chironomidae								
n	5	5	5	5	5	5	5	4	5
Mean	13.64	25.67	36.36	37.37	32.39	19.89	22.57	44.09	11.62
Minimum	7.61	7.55	8.57	3.39	15.09	1.23	7.92	36.36	1.85
Maximum	20.00	52.53	64.00	75.36	57.52	36.22	31.56	55.88	19.61
Median	14.35	14.96	37.00	37.14	29.46	21.98	27.15	42.06	10.56
Standard deviation (n-1)	4.50	19.92	19.61	30.08	16.56	13.38	9.49	8.48	6.70
Standard error of the mean	2.01	8.91	8.77	13.45	7.40	5.98	4.24	4.24	3.00
COV (%)	32.95	77.62	53.94	80.49	51.11	67.29	42.03	19.22	57.67
+50% Mean	20.47	38.50	54.54	56.06	48.59	29.83	33.85	66.14	17.42
-50% Mean	6.82	12.83	18.18	18.69	16.20	9.94	11.28	22.05	5.81
Benchmark Exceedance (temporal comparison)	-	Yes	Yes (2013)	Yes (2013)	Yes (2013)	-	No	Yes (both)	Yes (2016)
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	-	No 0.345	No 0.094 (2013)	No 0.112 (2013)	No 0.071 (2013)	-	N/A	Yes 0.0024 (2014) 0.0055 (2015)	Yes 0.00020 (2016)

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Nearshore Habitat – continued.

Site	BURNT		SPLIT			STL3KM				
Year	2014	2017	2014	2015	2017	2013	2014	2015	2016	2017
Metric	EPT Richness (Family level)									
n	5	5	5	5	5	5	5	5	5	5
Mean	2.60	3.20	1.60	1.60	3.20	2.40	2.20	0.60	1.60	1.40
Minimum	2.00	2.00	1.00	1.00	2.00	1.00	1.00	0.00	1.00	1.00
Maximum	4.00	4.00	2.00	2.00	5.00	3.00	4.00	2.00	2.00	2.00
Median	2.00	3.00	2.00	2.00	3.00	3.00	2.00	0.00	2.00	1.00
Standard deviation (n-1)	0.89	0.84	0.55	0.55	1.30	0.89	1.10	0.89	0.55	0.55
Standard error of the mean	0.40	0.37	0.24	0.24	0.58	0.40	0.49	0.40	0.24	0.24
COV (%)	34.40	26.15	34.23	34.23	40.75	37.27	49.79	149.07	34.23	39.12
+25% Mean	3.25	4.00	2.00	2.00	4.00	3.00	2.75	0.75	2.00	1.75
-25% Mean	1.95	2.40	1.20	1.20	2.40	1.80	1.65	0.45	1.20	1.05
Benchmark Exceedance (temporal comparison)	-	No	-	No	Yes (both)	-	No	Yes (both)	Yes (2013, 2014, 2015)	Yes (2013, 2014, 2015)
Modified Significance Level	N/A		0.017			0.005				
Significant Inter-annual Difference ¹	-	N/A	-	N/A	No 0.652 (2014) 0.072 (2015)	-	N/A	Yes 0.0044 (2013) 0.019 (2014)	No 0.197 (2013) 0.428 (2014) 0.118 (2015)	No 0.090 (2013) 0.230 (2014) 0.248 (2015)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	EPT Richness (Family level)								
n	5	5	5	5	5	5	5	4	5
Mean	3.00	1.80	1.00	2.00	2.60	2.00	1.40	0.75	1.80
Minimum	2.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Maximum	5.00	3.00	1.00	3.00	5.00	4.00	2.00	2.00	2.00
Median	3.00	2.00	1.00	2.00	2.00	2.00	1.00	0.50	2.00
Standard deviation (n-1)	1.22	0.84	0.00	0.71	1.82	1.22	0.55	0.96	0.45
Standard error of the mean	0.55	0.37	0.00	0.32	0.81	0.55	0.24	0.48	0.20
COV (%)	40.82	46.48	0.00	35.36	69.87	61.24	39.12	127.66	24.85
+25% Mean	3.75	2.25	1.25	2.50	3.25	2.50	1.75	0.94	2.25
-25% Mean	2.25	1.35	0.75	1.50	1.95	1.50	1.05	0.56	1.35
Benchmark Exceedance (temporal comparison)	-	Yes	Yes (both)	Yes (2013, 2015)	Yes (2014-2016)	-	Yes	Yes (2014, 2015)	Yes (2015, 2016)
Modified Significance Level	0.005					0.008			
Significant Inter-annual Difference ¹	-	No 0.124 (2013)	Yes 0.0024 (2013) 0.135 (2014)	No 0.258 (2013) 0.057 (2015)	No 0.571 (2014) 0.039 (2015) 0.874 (2016)	-	No 0.427 (2014)	No 0.081 (2014) 0.320 (2015)	No 0.328 (2015) 0.055 (2016)

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Nearshore Habitat – continued.

Site	BURNT		SPLIT			STL3KM				
Year	2014	2017	2014	2015	2017	2013	2014	2015	2016	2017
Metric	Total Organic Carbon (TOC, %)									
n	5	5	5	5	5	5	5	5	5	5
Mean	1.34	2.25	2.17	2.51	3.16	1.28	2.38	3.03	2.46	2.36
Minimum	1.14	1.67	1.51	1.67	2.01	1.13	1.67	0.89	1.49	2.03
Maximum	1.51	2.75	3.97	3.26	4.09	1.48	3.13	6.83	3.43	2.64
Median	1.38	2.30	1.65	2.67	3.29	1.25	2.28	1.36	2.48	2.52
Standard deviation (n-1)	0.14	0.45	1.05	0.61	0.79	0.16	0.61	2.68	0.92	0.28
Standard error of the mean	0.06	0.20	0.47	0.27	0.35	0.07	0.27	1.20	0.41	0.13
COV (%)	10.11	20.05	48.24	24.25	24.87	12.33	25.47	88.62	37.33	12.04
Modified Significance Level	0.050		0.0167			0.0050				
Significant Inter-annual Difference ¹	N/A	Yes 0.0026 (2014)	N/A	No 0.531 (2014)	No 0.084 (2014) 0.239 (2015)	N/A	No 0.020 (2013) ³	No 0.133 (2013) 0.414 (2014)	No 0.018 (2013) 0.966 (2014) 0.390 (2015)	No 0.016 (2013) 0.932 (2014) 0.367 (2015) 0.966 (2016)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Total Organic Carbon (TOC, %)								
n	5	5	5	5	5	5	5	4	5
Mean	1.86	2.51	2.64	2.84	3.38	1.16	0.84	3.82	1.94
Minimum	0.49	1.26	1.04	1.65	1.56	0.35	0.24	0.69	1.00
Maximum	3.61	5.60	3.78	4.42	5.23	2.52	1.80	7.11	4.35
Median	1.68	1.64	2.87	2.90	3.45	0.40	0.74	3.67	1.46
Standard deviation (n-1)	1.13	1.78	1.03	1.11	1.45	1.08	0.59	3.21	1.37
Standard error of the mean	0.50	0.80	0.46	0.50	0.65	0.48	0.26	1.85	0.61
COV (%)	60.39	70.98	39.12	39.08	42.91	93.80	70.04	84.03	70.50
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	N/A	No 0.450 (2013)	No 0.367 (2013) 0.881 (2014)	No 0.261 (2013) 0.703 (2014) 0.816 (2015)	No 0.086 (2013) 0.312 (2014) 0.387 (2015) 0.524 (2016)	N/A	No 0.813 (2014)	No 0.141 (2014) 0.094 (2015)	No 0.214 (2014) 0.139 (2015) 0.694 (2016)

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Nearshore Habitat – continued.

Site	BURNT		SPLIT			STL3KM				
Year	2014	2017	2014	2015	2017	2013	2014	2015	2016	2017
Metric	Sand (%)									
n	5	5	5	5	5	5	5	5	5	5
Mean	27.08	28.84	39.30	36.68	51.96	11.22	10.18	16.10	18.46	12.78
Minimum	6.50	11.10	25.90	24.50	35.80	9.38	3.46	7.40	7.40	6.80
Maximum	39.60	41.40	55.00	58.20	70.30	12.60	18.20	30.60	49.10	17.40
Median	29.80	35.00	40.60	29.60	52.40	11.40	9.60	12.20	11.80	14.30
Standard deviation (n-1)	13.06	14.37	10.78	13.62	15.30	1.41	5.43	9.82	17.27	5.04
Standard error of the mean	5.84	6.43	4.82	6.09	6.84	0.63	2.43	4.39	7.72	2.26
COV (%)	48.24	49.82	27.42	37.14	29.45	12.61	53.33	61.01	93.55	39.46
Modified Significance Level	0.050		0.0167			0.0050				
Significant Inter-annual Difference ¹	N/A	No 0.844 (2014)	N/A	No 0.762 (2014)	No 0.160 (2014) 0.096 (2015)	N/A	No 0.591 (2013)	No 0.683 (2013) 0.344 (2014)	No 0.731 (2013) 0.378 (2014) 0.949 (2015)	No 0.830 (2013) 0.452 (2014) 0.847 (2015) 0.897 (2016)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Sand (%)								
n	5	5	5	5	5	5	5	4	5
Mean	38.84	41.86	25.93	66.90	50.02	74.86	68.44	68.17	73.60
Minimum	4.01	10.60	1.22	35.50	1.80	54.00	16.00	42.90	49.70
Maximum	75.70	55.50	65.00	91.50	66.80	90.40	88.60	95.70	89.20
Median	49.60	52.90	18.80	68.80	61.40	74.10	78.20	65.90	82.30
Standard deviation (n-1)	30.62	19.27	26.92	20.05	27.16	15.76	30.10	26.47	16.48
Standard error of the mean	13.69	8.62	12.04	8.97	12.15	7.05	13.46	15.28	7.37
COV (%)	78.83	46.04	103.81	29.98	54.31	21.05	43.98	38.84	22.39
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	N/A	No 0.932 (2013)	No 0.452 (2013) 0.505 (2014)	No 0.075 (2013) 0.062 (2014) 0.011 (2015)	No 0.505 (2013) 0.452 (2014) 0.156 (2015) 0.264 (2016)	N/A	No 0.659 (2014)	No 0.690 (2014) 0.987 (2015)	No 0.931 (2014) 0.723 (2015) 0.746 (2016)

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Nearshore Habitat – continued.

Site	BURNT		SPLIT			STL3KM				
Year	2014	2017	2014	2015	2017	2013	2014	2015	2016	2017
Metric	Silt (%)									
n	5	5	5	5	5	5	5	5	5	5
Mean	52.84	52.46	41.32	45.76	33.36	41.46	49.96	38.70	29.20	63.08
Minimum	41.60	37.70	30.00	29.80	21.60	38.20	42.10	20.30	15.90	55.20
Maximum	70.50	67.70	49.10	57.60	46.40	42.80	61.20	51.10	41.30	68.00
Median	49.90	49.80	40.20	46.60	30.80	42.80	50.80	40.40	30.70	64.90
Standard deviation (n-1)	11.19	13.92	7.54	10.77	11.95	2.04	7.67	12.53	10.45	5.08
Standard error of the mean	5.00	6.22	3.37	4.82	5.34	0.91	3.43	5.60	4.67	2.27
COV (%)	21.18	26.53	18.25	23.53	35.82	4.91	15.36	32.37	35.78	8.05
Modified Significance Level	0.050		0.0167			0.0050				
Significant Inter-annual Difference ¹	N/A	No 0.963	N/A	No 0.507 (2014)	No 0.242 (2014) 0.080 (2015)	N/A	No 0.126 (2013)	No 0.610 (2013) 0.047 (2014)	Yes 0.032 (2013) 0.00090 (2014)² 0.090 (2015)	Yes 0.00062 (2013) 0.023 (2014) 0.00018 (2015) < 0.0001 (2016)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Silt (%)								
n	5	5	5	5	5	5	5	4	5
Mean	46.58	41.72	62.06	21.66	40.58	14.80	15.48	21.30	20.90
Minimum	16.50	34.90	26.50	4.20	24.90	4.72	7.68	2.60	7.50
Maximum	71.60	51.40	87.70	46.60	83.30	27.40	25.10	35.50	46.30
Median	40.30	36.10	70.30	18.20	32.90	17.70	15.40	25.80	13.10
Standard deviation (n-1)	24.17	8.67	26.49	15.45	24.23	9.66	7.12	16.91	15.82
Standard error of the mean	10.81	3.88	11.85	6.91	10.84	4.32	3.19	9.76	7.07
COV (%)	51.90	20.77	42.69	71.32	59.72	65.29	46.03	79.37	75.69
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	N/A	No 0.717 (2013)	No 0.256 (2013) 0.140 (2014)	No 0.074 (2013) 0.145 (2014) 0.0063 (2015) ³	No 0.655 (2013) 0.932 (2014) 0.120 (2015) 0.168 (2016)	N/A	No 0.932 (2014)	No 0.484 (2014) 0.530 (2015)	No 0.449 (2014) 0.500 (2015) 0.965 (2016)

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

2 – based on application of $\pm 50\%$ benchmark this significant difference was not identified in previous reports.

Nearshore Habitat – continued.

Site	BURNT		SPLIT			STL3KM				
Year	2014	2017	2014	2015	2017	2013	2014	2015	2016	2017
Metric	Clay (%)									
n	5	5	5	5	5	5	5	5	5	5
Mean	20.06	18.68	19.38	17.54	14.66	47.32	39.82	45.22	52.32	24.16
Minimum	17.70	15.20	15.00	12.00	8.10	44.60	35.30	36.80	35.00	17.80
Maximum	23.00	22.80	25.00	24.00	18.90	52.40	48.60	58.30	66.60	30.50
Median	20.30	17.60	19.10	16.40	15.90	45.80	38.20	43.90	52.90	25.20
Standard deviation (n-1)	2.03	3.27	3.60	5.50	4.13	3.37	5.16	8.82	12.72	4.76
Standard error of the mean	0.91	1.46	1.61	2.46	1.85	1.51	2.31	3.94	5.69	2.13
COV (%)	10.10	17.52	18.57	31.33	28.18	7.13	12.96	19.50	24.30	19.70
Modified Significance Level	0.050		0.0167			0.0050				
Significant Inter-annual Difference ¹	N/A	No 0.446	N/A	No 0.528 (2014)	No 0.122 (2014) 0.329 (2015)	N/A	No 0.142 (2013)	No 0.673 (2013) 0.283 (2014)	No 0.320 (2013) 0.019 (2014) 0.163 (2015)	Yes 0.00013 (2013) 0.0045 (2014) 0.00035 (2015) < 0.0001 (2016)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Clay (%)								
n	5	5	5	5	5	5	5	4	5
Mean	14.58	16.39	12.01	11.48	9.40	10.34	16.09	10.53	5.50
Minimum	7.82	8.36	8.46	4.40	4.40	4.18	2.94	1.70	3.30
Maximum	25.00	37.90	16.50	17.90	14.80	27.20	58.90	21.60	10.40
Median	11.90	12.20	10.90	13.40	8.40	6.88	6.43	8.30	4.60
Standard deviation (n-1)	6.96	12.17	3.88	5.27	3.98	9.55	24.04	10.14	2.83
Standard error of the mean	3.11	5.44	1.73	2.36	1.78	4.27	10.75	5.85	1.26
COV (%)	47.74	74.25	32.27	45.88	42.33	92.42	149.42	96.23	51.43
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	N/A	No 0.932 (2013)	No 0.830 (2013) 0.897 (2014)	No 0.621 (2013) 0.683 (2014) 0.780 (2015)	No 0.176 (2013) 0.205 (2014) 0.255 (2015) 0.390 (2016)	N/A	No 0.722 (2014)	No 0.837 (2014) 0.918 (2015)	No 0.374 (2014) 0.594 (2015) 0.573 (2016)

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Offshore Habitat

Site	BURNT		SPLIT					STL3KM				
Year	2014	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Metric	Total Invertebrate Density (no. per m ²)											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	515.80	972.41	7978.42	8973.92	3433.75	2392.08	2394.97	1101.11	1465.84	184.67	675.21	1229.22
Minimum	199.00	692.52	4039.70	6174.98	3000.92	1962.14	1370.61	709.83	403.97	43.28	447.25	173.13
Maximum	970.00	1298.48	10806.21	11311.17	3938.71	2957.64	3852.15	1679.36	2683.52	346.26	1197.48	2481.53
Median	441.00	836.80	8281.39	9060.48	3477.03	2221.84	2207.41	900.28	1428.32	158.70	577.10	923.36
Standard deviation (n-1)	303.45	271.38	2521.25	2377.87	348.06	423.64	1074.05	415.67	841.05	135.50	301.67	1016.83
Standard error of the mean	135.71	121.36	1127.54	1063.42	155.66	189.46	480.33	185.89	376.13	60.60	134.91	454.74
COV (%)	58.83	27.91	31.60	26.50	10.14	17.71	44.85	37.75	57.38	73.37	44.68	82.72
+50% Mean	773.70	1458.62	11967.62	13460.87	5150.62	3588.12	3592.45	1651.66	2198.75	277.01	1012.81	1843.84
-50% Mean	257.90	486.21	3989.21	4486.96	1716.87	1196.04	1197.48	550.55	732.92	92.34	337.60	614.61
Benchmark Exceedance (temporal comparison)	-	Yes	-	No	Yes (both)	Yes (2013, 2014)	Yes (2013, 2014)	-	No	Yes (both)	Yes (2014, 2015)	Yes (2015, 2016)
Modified Significance Level	0.050		0.0050					0.0050				
Significant Inter-annual Difference ¹	-	Yes 0.036	-	N/A	No 0.086 (2013) 0.053 (2014)	Yes 0.0020 (2013) 0.00094 (2014)	Yes 0.0035 (2013) 0.0017 (2014)	-	N/A	Yes 0.0052 (2013) 0.0015 (2014)	No 0.169 (2014) 0.071 (2015)	No 0.011 (2015) 0.465 (2016)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Total Invertebrate Density (no. per m ²)								
n	5	5	5	5	5	5	5	5	5
Mean	1878.46	1488.92	1249.42	1073.41	2242.04	2767.20	2594.07	2014.08	2285.32
Minimum	0.00	1139.77	894.51	504.96	1471.61	2135.27	1255.19	995.50	1327.33
Maximum	2778.74	1890.00	1702.45	1976.57	3231.76	3231.76	3433.75	2871.08	3433.75
Median	2198.75	1312.90	1125.35	865.65	2077.56	2856.65	2452.68	2293.98	1904.43
Standard deviation (n-1)	1079.20	340.56	313.38	578.87	676.68	447.53	899.00	848.14	933.09
Standard error of the mean	482.63	152.30	140.15	258.88	302.62	200.14	402.04	379.30	417.29
COV (%)	57.45	22.87	25.08	53.93	30.18	16.17	34.66	42.11	40.83
+50% Mean	2817.69	2233.38	1874.13	1610.11	3363.05	4150.80	3891.10	3021.12	3427.98
-50% Mean	939.23	744.46	624.71	536.70	1121.02	1383.60	1297.03	1007.04	1142.66
Benchmark Exceedance (temporal comparison)	-	No	No (both)	No (all)	Yes (2014-2016)	-	No	No (both)	No (all)
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	-	N/A	N/A	N/A	No 0.086 (2014) 0.027 (2015) 0.011 (2016)	-	N/A	N/A	N/A

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Offshore Habitat – continued.

Site	BURNT		SPLIT					STL3KM				
Year	2014	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Metric	Total Richness (Family level)											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	6.80	7.00	8.60	8.80	9.60	7.80	8.20	7.40	5.40	2.80	5.20	5.80
Minimum	5.00	6.00	7.00	7.00	8.00	6.00	5.00	5.00	3.00	2.00	3.00	4.00
Maximum	9.00	9.00	10.00	10.00	11.00	10.00	11.00	10.00	7.00	5.00	9.00	8.00
Median	7.00	7.00	9.00	9.00	9.00	8.00	8.00	8.00	6.00	2.00	4.00	6.00
Standard deviation (n-1)	1.48	1.22	1.52	1.30	1.34	1.79	2.39	2.30	1.52	1.30	2.39	1.48
Standard error of the mean	0.66	0.55	0.68	0.58	0.60	0.80	1.07	1.03	0.68	0.58	1.07	0.66
COV (%)	21.81	17.50	17.63	14.82	13.98	22.93	29.12	31.11	28.08	46.57	45.91	25.57
+25% Mean	8.50	8.75	10.75	11.00	12.00	9.75	10.25	9.25	6.75	3.50	6.50	7.25
-25% Mean	5.10	5.25	6.45	6.60	7.20	5.85	6.15	5.55	4.05	2.10	3.90	4.35
Benchmark Exceedance (temporal comparison)	-	No	-	No	No (both)	No (all)	No (all)	-	Yes	Yes (both)	Yes (2013, 2015)	Yes (2015)
Modified Significance Level	N/A		N/A					0.0050				
Significant Inter-annual Difference ¹	-	No	-	N/A	N/A	N/A	N/A	-	No 0.088	Yes 0.00052 (2013) 0.030 (2014)	No 0.044 (2013) 0.062 (2015)	No 0.014 (2015)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Total Richness (Family level)								
n	5	5	5	5	5	5	5	5	5
Mean	4.80	5.00	4.20	6.00	6.20	4.20	4.00	5.00	5.60
Minimum	0.00	3.00	3.00	3.00	4.00	3.00	3.00	4.00	5.00
Maximum	6.00	6.00	6.00	9.00	9.00	5.00	5.00	6.00	7.00
Median	6.00	5.00	4.00	7.00	6.00	5.00	4.00	5.00	5.00
Standard deviation (n-1)	2.68	1.22	1.10	2.45	1.79	1.10	0.71	1.00	0.89
Standard error of the mean	1.20	0.55	0.49	1.10	0.80	0.49	0.32	0.45	0.40
COV (%)	55.90	24.49	26.08	40.82	28.85	26.08	17.68	20.00	15.97
+25% Mean	6.00	6.25	5.25	7.50	7.75	5.25	5.00	6.25	7.00
-25% Mean	3.60	3.75	3.15	4.50	4.65	3.15	3.00	3.75	4.20
Benchmark Exceedance (temporal comparison)	-	No	No	Yes (2015)	Yes (2013, 2015)	-	No	Yes (2015)	Yes (2014, 2015)
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	-	N/A	N/A	No 0.086 (2015)	No 0.517 (2013) 0.067 (2015)	-	N/A	No 0.11 (2015)	No 0.031 (2014) 0.016 (2015)

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Offshore Habitat – continued.

Site	BURNT		SPLIT					STL3KM				
Year	2014	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Metric	Simpson's Diversity Index											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	0.58	0.52	0.64	0.57	0.55	0.54	0.50	0.50	0.53	0.35	0.52	0.65
Minimum	0.40	0.38	0.48	0.48	0.36	0.30	0.35	0.37	0.51	0.09	0.26	0.49
Maximum	0.72	0.69	0.76	0.61	0.71	0.66	0.59	0.59	0.57	0.60	0.71	0.79
Median	0.61	0.48	0.69	0.59	0.64	0.58	0.52	0.54	0.52	0.32	0.54	0.72
Standard deviation (n-1)	0.14	0.13	0.12	0.05	0.16	0.15	0.09	0.11	0.02	0.19	0.20	0.14
Standard error of the mean	0.06	0.06	0.05	0.02	0.07	0.07	0.04	0.05	0.01	0.08	0.09	0.06
COV (%)	24.72	24.59	18.67	9.05	29.89	26.97	18.81	21.36	4.61	53.47	37.61	21.73
+25% Mean	0.72	0.64	0.80	0.71	0.69	0.68	0.63	0.62	0.66	0.44	0.65	0.82
-25% Mean	0.43	0.39	0.48	0.43	0.41	0.41	0.38	0.37	0.40	0.27	0.39	0.49
Benchmark Exceedance (temporal comparison)	-	No	-	No	No (both)	No (all)	No (all)	-	No	Yes (2013, 2014)	Yes (2015)	Yes (2013, 2015, 2016)
Modified Significance Level	N/A		N/A					0.0050				
Significant Inter-annual Difference ¹	-	N/A	-	N/A	N/A	N/A	N/A	-	N/A	No 0.135 (2013) 0.074 (2014)	No 0.085 (2015)	Yes 0.105 (2013) 0.0040 (2015) 0.164 (2016)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Simpson's Diversity Index								
n	5	5	5	5	5	5	5	5	5
Mean	0.30	0.40	0.59	0.54	0.52	0.53	0.40	0.60	0.55
Minimum	0.24	0.16	0.48	0.36	0.43	0.50	0.29	0.51	0.49
Maximum	0.32	0.52	0.64	0.64	0.72	0.56	0.59	0.65	0.61
Median	0.31	0.44	0.60	0.54	0.46	0.53	0.31	0.61	0.54
Standard deviation (n-1)	0.04	0.14	0.07	0.11	0.12	0.02	0.13	0.06	0.04
Standard error of the mean	0.02	0.06	0.03	0.05	0.05	0.01	0.06	0.03	0.02
COV (%)	11.92	35.73	11.46	20.62	23.67	4.12	33.16	9.37	7.87
+25% Mean	0.37	0.50	0.73	0.67	0.65	0.66	0.50	0.75	0.68
-25% Mean	0.22	0.30	0.44	0.40	0.39	0.40	0.30	0.45	0.41
Benchmark Exceedance (temporal comparison)	-	Yes	Yes (both)	Yes (2013, 2014)	Yes (2013, 2014)	-	Yes (2014)	Yes (2015)	Yes (2015)
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	-	No 0.168	Yes 0.00060 (2013) 0.011 (2014)	Yes 0.0027 (2013) 0.047 (2014)	No 0.0056 (2013) 0.089 (2014)	-	No 0.219	Yes 0.0046 (2015)	No 0.109 (2015)

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Offshore Habitat – continued.

Site	BURNT		SPLIT					STL3KM				
Year	2014	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Metric	Ephemeroptera Density (no. per m ²)											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	38.00	23.08	1281.16	643.47	219.30	493.42	403.97	64.06	54.82	0.00	72.14	554.02
Minimum	17.00	0.00	375.12	346.26	129.85	274.12	288.55	8.66	0.00	0.00	14.43	0.00
Maximum	69.00	43.28	1587.03	1038.78	360.69	649.24	548.25	95.22	100.99	0.00	187.56	1428.32
Median	35.00	28.86	1558.17	533.82	173.13	490.54	418.40	69.25	43.28	0.00	28.86	274.12
Standard deviation (n-1)	19.87	21.88	520.83	277.07	95.92	144.06	109.40	36.01	40.03	0.00	77.02	612.50
Standard error of the mean	8.89	9.79	232.92	123.91	42.90	64.42	48.93	16.10	17.90	0.00	34.45	273.92
COV (%)	52.30	94.79	40.65	43.06	43.74	29.20	27.08	56.21	73.02	-	106.77	110.56
+50% Mean	57.00	34.63	1921.75	965.20	328.95	740.13	605.96	96.09	82.24	0.00	108.21	831.02
-50% Mean	19.00	11.54	640.58	321.73	109.65	246.71	201.99	32.03	27.41	0.00	36.07	277.01
Benchmark Exceedance (temporal comparison)	-	No	-	No	Yes (both)	Yes (2013, 2015)	Yes (2013, 2015)	-	No	Yes (both)	Yes (2015)	Yes (all)
Modified Significance Level	N/A		0.0050					0.0050				
Significant Inter-annual Difference ¹	-	N/A	N/A	N/A	Yes 0.00028 (2013) 0.010 (2014)	No 0.132 (2013) 0.033 (2015)	No 0.028 (2013) 0.150 (2015)	N/A	N/A	No 0.024 (2013) 0.056 (2014)	No 0.022 (2015)	Yes 0.287 (2013) 0.158 (2014) 0.00088 (2015) 0.297 (2016)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Ephemeroptera Density (no. per m ²)								
n	5	5	5	5	5	5	5	5	5
Mean	1563.37	1093.61	605.96	655.01	559.79	831.02	282.78	577.10	631.93
Minimum	0.00	937.79	490.54	331.83	274.12	692.52	187.56	375.12	461.68
Maximum	2276.66	1240.77	663.67	1082.06	807.94	966.64	375.12	807.94	836.80
Median	1817.87	1038.78	620.38	678.09	620.38	851.22	331.83	562.67	678.09
Standard deviation (n-1)	894.76	133.56	68.44	311.88	204.65	115.24	88.70	193.30	160.46
Standard error of the mean	400.15	59.73	30.61	139.48	91.52	51.54	39.67	86.44	71.76
COV (%)	57.23	12.21	11.29	47.61	36.56	13.87	31.37	33.49	25.39
+50% Mean	2345.05	1640.41	908.93	982.51	839.68	1246.54	424.17	865.65	947.89
-50% Mean	781.68	546.80	302.98	327.50	279.89	415.51	141.39	288.55	315.96
Benchmark Exceedance (temporal comparison)	-	No	Yes (2013)	Yes (2013)	Yes (2013)	-	Yes	Yes (2015)	Yes (2015)
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	N/A	N/A	No 0.028 (2013)	No 0.074 (2013)	No 0.019 (2013)	N/A	Yes < 0.0001	Yes 0.0055 (2015)	Yes 0.0016 (2015)

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Offshore Habitat – continued.

Site	BURNT		SPLIT					STL3KM				
Year	2014	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Metric	Percent EPT (EPT Index)											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	19.68	13.70	19.60	8.09	8.14	23.09	24.69	8.34	5.14	23.62	12.23	34.16
Minimum	4.00	5.17	5.23	4.14	6.58	13.70	20.26	2.11	0.00	0.00	2.22	0.00
Maximum	34.80	32.14	41.79	13.08	10.26	29.87	28.42	14.63	10.67	66.67	29.03	67.81
Median	16.20	10.42	17.47	8.44	7.11	23.94	24.72	8.25	5.83	20.00	5.71	32.81
Standard deviation (n-1)	11.90	10.88	13.44	3.61	1.87	6.10	2.99	4.43	4.19	26.53	12.34	24.15
Standard error of the mean	5.32	4.86	6.01	1.61	0.84	2.73	1.34	1.98	1.87	11.87	5.52	10.80
COV (%)	60.48	79.38	68.57	44.63	23.02	26.43	12.13	53.15	81.38	112.32	100.88	70.68
+50% Mean	29.52	20.55	29.40	12.14	12.21	34.63	37.03	12.51	7.72	35.43	18.35	51.25
-50% Mean	9.84	6.85	9.80	4.05	4.07	11.54	12.34	4.17	2.57	11.81	6.12	17.08
Benchmark Exceedance (temporal comparison)	-	No	-	Yes	Yes (2013)	Yes (2014, 2015)	Yes (2014, 2015)	-	No	Yes (both)	Yes (2014)	Yes (2013, 2014, 2016)
Modified Significance Level	N/A		0.0050					0.0050				
Significant Inter-annual Difference ¹	-	N/A	N/A	No 0.017	No 0.017 (2013)	Yes 0.0029 (2014) 0.0029 (2015)	Yes 0.0012 (2014) 0.0013 (2015)	-	N/A	No 0.636 (2013) 0.246 (2014)	No 0.465 (2014)	No 0.144 (2013) 0.032 (2014) 0.156 (2016)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Percent EPT (EPT Index)								
n	5	5	5	5	5	5	5	5	5
Mean	66.65	75.29	50.75	62.76	27.07	30.29	13.20	30.99	30.62
Minimum	0.00	64.89	35.59	50.98	17.51	27.44	5.49	20.10	22.22
Maximum	87.40	91.14	69.35	78.33	41.67	34.46	27.59	37.68	38.64
Median	81.93	74.16	46.94	64.04	21.57	28.13	10.92	32.08	31.58
Standard deviation (n-1)	37.33	10.22	13.06	10.68	10.79	3.54	8.72	6.56	7.02
Standard error of the mean	16.70	4.57	5.84	4.77	4.83	1.58	3.90	2.93	3.14
COV (%)	56.01	13.57	25.73	17.01	39.87	11.68	66.02	21.17	22.93
+50% Mean	99.98	112.94	76.12	94.15	40.60	45.44	19.80	46.48	45.93
-50% Mean	33.33	37.65	25.37	31.38	13.53	15.15	6.60	15.49	15.31
Benchmark Exceedance (temporal comparison)	-	No	No (both)	No (all)	Yes (2013, 2014, 2016)	-	Yes	Yes (2015)	Yes (2015)
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	N/A	N/A	N/A	N/A	Yes 0.0044 (2013) 0.00086 (2014) 0.0089 (2016)	N/A	No 0.022 ¹	No 0.014 (2015)	No 0.016 (2015)

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Offshore Habitat – continued.

Site	BURNT		SPLIT					STL3KM				
Year	2014	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Metric	Pisidiidae Density (no. per m ²)											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	302.80	643.47	888.73	753.12	352.03	86.57	0.00	1.73	11.54	0.00	23.08	8.66
Minimum	0.00	360.69	331.83	259.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	545.00	952.22	1125.35	1240.77	750.23	302.98	0.00	8.66	43.28	0.00	57.71	14.43
Median	320.00	649.24	981.07	649.24	447.25	0.00	0.00	0.00	0.00	0.00	14.43	14.43
Standard deviation (n-1)	228.24	268.87	325.60	418.20	327.51	133.41	0.00	3.87	18.81	0.00	26.21	7.90
Standard error of the mean	102.07	120.24	145.61	187.02	146.47	59.66	0.00	1.73	8.41	0.00	11.72	3.53
COV (%)	75.38	41.78	36.64	55.53	93.03	154.11	-	223.61	162.98	-	113.54	91.29
+50% Mean	454.20	965.20	1333.10	1129.67	528.05	129.85	0.00	2.60	17.31	0.00	34.63	12.98
-50% Mean	151.40	321.73	444.37	376.56	176.02	43.28	0.00	0.87	5.77	0.00	11.54	4.33
Benchmark Exceedance (temporal comparison)	-	Yes	-	No	Yes (both)	Yes (all)	Yes (all)	-	Yes	Yes (both)	Yes (all)	Yes (2013, 2015, 2016)
Modified Significance Level	0.05		0.0050					0.0050				
Significant Inter-annual Difference ¹	-	No 0.063	-	N/A	No 0.129 (2013) 0.210 (2014)	No 0.0068 (2013) 0.015 (2014) 0.235 (2013)	Yes 0.00089 (2013) 0.0022 (2014) 0.071 (2015) 0.538 (2016)	-	No 0.365	No 0.669 (2013) 0.407 (2014)	No 0.083 (2013) 0.407 (2014) 0.031 (2015)	No 0.191 (2013) 0.083 (2015) 0.669 (2016)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Pisidiidae Density (no. per m ²)								
n	5	5	5	5	5	5	5	5	5
Mean	0.00	0.00	0.00	0.00	0.00	2.89	0.00	0.00	0.00
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	0.00	0.00	0.00	0.00	0.00	14.43	0.00	0.00	0.00
Median	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Standard deviation (n-1)	0.00	0.00	0.00	0.00	0.00	6.45	0.00	0.00	0.00
Standard error of the mean	0.00	0.00	0.00	0.00	0.00	2.89	0.00	0.00	0.00
COV (%)	-	-	-	-	-	223.61	-	-	-
+50% Mean	0.00	0.00	0.00	0.00	0.00	4.33	0.00	0.00	0.00
-50% Mean	0.00	0.00	0.00	0.00	0.00	1.44	0.00	0.00	0.00
Benchmark Exceedance (temporal comparison)	-	No	No (both)	No (all)	No (all)	-	Yes	Yes (2014)	Yes (2014)
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	-	N/A	N/A	N/A	N/A	-	No 0.157	No 0.157 (2014)	No 0.157 (2014)

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Offshore Habitat – continued.

Site	BURNT		SPLIT					STL3KM				
Year	2014	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Metric	Water Depth (m)											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	8.26	7.68	7.42	7.82	5.91	7.00	7.26	6.14	6.02	5.31	5.56	5.28
Minimum	7.50	6.50	6.30	6.80	5.40	6.20	6.30	5.98	5.10	4.90	4.90	4.50
Maximum	8.60	8.70	9.10	9.30	6.47	9.40	9.40	6.30	6.47	5.73	6.00	6.20
Median	8.40	8.20	7.00	7.20	5.90	6.30	6.70	6.16	6.13	5.33	5.70	5.30
Standard deviation (n-1)	0.46	0.97	1.23	1.19	0.41	1.37	1.29	0.13	0.53	0.30	0.49	0.61
Standard error of the mean	0.20	0.43	0.55	0.53	0.18	0.61	0.57	0.06	0.24	0.13	0.22	0.27
COV (%)	5.52	12.60	16.60	15.17	6.90	19.61	17.71	2.12	8.88	5.62	8.87	11.55
+50% Mean	12.39	11.52	11.13	11.73	8.86	10.50	10.89	9.21	9.03	7.97	8.34	7.92
-50% Mean	4.13	3.84	3.71	3.91	2.95	3.50	3.63	3.07	3.01	2.66	2.78	2.64
Benchmark Exceedance (temporal comparison)	-	No	-	No	No (both)	No (all)	No (all)	-	No	No (both)	No (all)	No (all)
Modified Significance Level	N/A		0.0050					0.0050				
Significant Inter-annual Difference ¹	-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Water Depth (m)								
n	5	5	5	5	5	5	5	5	5
Mean	6.95	6.84	6.33	6.76	6.48	9.13	8.84	8.62	9.04
Minimum	6.58	6.40	5.90	6.30	5.80	8.63	8.47	5.80	8.30
Maximum	7.28	7.57	6.77	7.20	6.80	9.53	9.33	9.60	9.70
Median	7.06	6.83	6.33	6.80	6.70	9.17	8.87	9.40	9.10
Standard deviation (n-1)	0.33	0.45	0.35	0.45	0.43	0.32	0.34	1.60	0.53
Standard error of the mean	0.15	0.20	0.16	0.20	0.19	0.14	0.15	0.71	0.24
COV (%)	4.71	6.61	5.49	6.67	6.67	3.54	3.90	18.53	5.83
+50% Mean	10.42	10.26	9.50	10.14	9.72	13.69	13.26	12.93	13.56
-50% Mean	3.47	3.42	3.17	3.38	3.24	4.56	4.42	4.31	4.52
Benchmark Exceedance (temporal comparison)	-	No	No (both)	No (all)	No (all)	-	No	No (both)	No (all)
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Offshore Habitat – continued.

Site	BURNT		SPLIT					STL3KM				
Year	2014	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Metric	Oligochaeta Density (no. per m²)											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	7.00	5.77	25.97	28.86	17.31	34.63	43.28	12.12	8.66	0.00	5.77	28.86
Minimum	0.00	0.00	0.00	0.00	0.00	28.86	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	17.00	14.43	57.71	57.71	28.86	43.28	100.99	34.63	28.86	0.00	28.86	115.42
Median	9.00	0.00	28.86	28.86	14.43	28.86	43.28	8.66	0.00	0.00	0.00	0.00
Standard deviation (n-1)	7.18	7.90	21.40	20.40	12.07	7.90	44.47	14.49	12.90	0.00	12.90	49.98
Standard error of the mean	3.21	3.53	9.57	9.12	5.40	3.53	19.89	6.48	5.77	0.00	5.77	22.35
COV (%)	102.52	136.93	82.40	70.71	69.72	22.82	102.74	119.52	149.07	-	223.61	173.21
+50% Mean	10.50	8.66	38.95	43.28	25.97	51.94	64.92	18.18	12.98	0.00	8.66	43.28
-50% Mean	3.50	2.89	12.98	14.43	8.66	17.31	21.64	6.06	4.33	0.00	2.89	14.43
Benchmark Exceedance (temporal comparison)	-	No	-	No	No (both)	Yes (2015)	Yes (2013, 2015)	-	No	Yes (both)	Yes (2013, 2015)	Yes (all)
Modified Significance Level	N/A		0.0050					0.0050				
Significant Inter-annual Difference ¹	-	N/A	N/A	N/A	N/A	No 0.109 (2015)	No 0.272 (2013) 0.219 (2015)	N/A	N/A	No 0.069 (2013) 0.232 (2014)	No 0.253 (2013) 0.500 (2015)	No 0.755 (2013) 0.755 (2014) 0.132 (2015) 0.406 (2016)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Oligochaeta Density (no. per m ²)								
n	5	5	5	5	5	5	5	5	5
Mean	13.85	5.77	0.00	2.89	5.77	11.54	2.89	0.00	0.00
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	34.63	14.43	0.00	14.43	14.43	43.28	14.43	0.00	0.00
Median	8.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Standard deviation (n-1)	15.73	7.90	0.00	6.45	7.90	18.81	6.45	0.00	0.00
Standard error of the mean	7.03	3.53	0.00	2.89	3.53	8.41	2.89	0.00	0.00
COV (%)	113.54	136.93	-	223.61	136.93	162.98	223.61	-	-
+50% Mean	20.78	8.66	0.00	4.33	8.66	17.31	4.33	0.00	0.00
-50% Mean	6.93	2.89	0.00	1.44	2.89	5.77	1.44	0.00	0.00
Benchmark Exceedance (temporal comparison)	-	Yes	Yes (both)	Yes (2013, 2015)	Yes (2013, 2015, 2016)	-	Yes	Yes (both)	Yes (2014, 2015)
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	N/A	No 0.404	No 0.037 (2013) 0.211 (2014)	No 0.144 (2013) 0.531 (2015)	No 0.404 (2013) 0.211 (2015) 0.531 (2016)	N/A	No 0.344	No 0.078 (2014) 0.414 (2015)	No 0.078 (2014) 0.414 (2015)

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Offshore Habitat – continued.

Site	BURNT		SPLIT					STL3KM				
Year	2014	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Metric	Amphipoda Density (no. per m ²)											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	3.40	8.66	1413.90	1584.14	2135.27	1477.38	1638.97	1.73	20.20	2.89	23.08	2.89
Minimum	0.00	0.00	894.51	1211.91	1601.45	1226.34	822.37	0.00	0.00	0.00	0.00	0.00
Maximum	17.00	14.43	1918.86	2308.40	2683.52	1745.73	2697.95	8.66	43.28	14.43	43.28	14.43
Median	0.00	14.43	1543.74	1370.61	2192.98	1457.18	1731.30	0.00	14.43	0.00	28.86	0.00
Standard deviation (n-1)	7.60	7.90	493.60	465.99	514.46	195.60	773.36	3.87	16.45	6.45	21.88	6.45
Standard error of the mean	3.40	3.53	220.75	208.40	230.07	87.47	345.86	1.73	7.36	2.89	9.79	2.89
COV (%)	223.61	91.29	34.91	29.42	24.09	13.24	47.19	223.61	81.44	223.61	94.79	223.61
+50% Mean	5.10	12.98	2120.84	2376.21	3202.91	2216.07	2458.45	2.60	30.30	4.33	34.63	4.33
-50% Mean	1.70	4.33	706.95	792.07	1067.64	738.69	819.48	0.87	10.10	1.44	11.54	1.44
Benchmark Exceedance (temporal comparison)	-	Yes	-	No	Yes (2013)	No (all)	No (all)	-	Yes	Yes (both)	Yes (2013 and 2015)	Yes (2013, 2014, 2016)
Modified Significance Level	0.050		0.0050					0.0050				
Significant Inter-annual Difference ¹	-	No 0.524	-	N/A	No 0.041 (2013)	N/A	N/A	-	No 0.039	No 0.903 (2013) 0.051 (2014)	No 0.068 (2013) 0.088 (2015)	No 0.903 (2013) 0.051 (2014) 0.088 (2016)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Amphipoda Density (no. per m ²)								
n	5	5	5	5	5	5	5	5	5
Mean	79.64	227.95	392.43	222.18	1376.39	1688.02	2011.20	1108.03	1393.70
Minimum	0.00	72.14	115.42	86.57	533.82	1226.34	706.95	447.25	735.80
Maximum	129.85	432.83	764.66	331.83	2322.83	2034.28	2871.08	1702.45	2279.55
Median	69.25	201.99	432.83	230.84	1110.92	1615.88	2005.42	1298.48	995.50
Standard deviation (n-1)	53.85	164.94	265.13	106.80	714.02	342.48	895.53	576.51	702.86
Standard error of the mean	24.08	73.76	118.57	47.76	319.32	153.16	400.49	257.82	314.33
COV (%)	67.62	72.36	67.56	48.07	51.88	20.29	44.53	52.03	50.43
+50% Mean	119.46	341.93	588.64	333.28	2064.58	2532.03	3016.79	1662.05	2090.55
-50% Mean	39.82	113.98	196.21	111.09	688.19	844.01	1005.60	554.02	696.85
Benchmark Exceedance (temporal comparison)	-	Yes	Yes (both)	Yes (2013)	Yes (all)	-	No	No (both)	No (all)
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	-	No 0.176	No 0.024 (2013) 0.367 (2014)	No 0.132 (2013)	Yes < 0.0001 (2013) 0.011 (2014) 0.098 (2015) 0.016 (2016)	N/A	N/A	N/A	N/A

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Offshore Habitat – continued.

Site	BURNT		SPLIT					STL3KM				
Year	2014	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Metric	Gastropoda Density (no. per m ²)											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	1.80	0.00	3921.40	5606.53	92.34	49.05	2.89	322.02	730.03	8.66	421.28	334.72
Minimum	0.00	0.00	129.85	3505.89	28.86	0.00	0.00	121.19	201.99	0.00	201.99	14.43
Median	0.00	0.00	4068.56	6232.69	86.57	14.43	0.00	164.47	490.54	0.00	432.83	115.42
Standard deviation (n-1)	4.02	0.00	2691.54	1563.89	65.80	73.28	6.45	265.36	623.61	12.90	155.19	496.38
Standard error of the mean	1.80	0.00	1203.69	699.39	29.43	32.77	2.89	118.67	278.89	5.77	69.40	221.99
COV (%)	223.61	-	68.64	27.89	71.26	149.39	223.61	82.40	85.42	149.07	36.84	148.30
+50% Mean	2.70	0.00	5882.10	8409.80	138.50	73.58	4.33	483.03	1095.05	12.98	631.93	502.08
-50% Mean	0.90	0.00	1960.70	2803.27	46.17	24.53	1.44	161.01	365.02	4.33	210.64	167.36
Benchmark Exceedance (temporal comparison)	-	Yes	-	No	Yes (both)	Yes (2013, 2014)	Yes (all)	-	Yes	Yes (both)	Yes (2015)	Yes (2014, 2015)
Modified Significance Level	0.050				0.0050					0.0050		
Significant Inter-annual Difference ¹	-	Yes < 0.0001	-	N/A	No 0.124 (2013) 0.044 (2014)	Yes 0.015 (2013) 0.0037 (2014)	Yes 0.0013 (2013) 0.00022 (2014) 0.091 (2015) 0.423 (2016)	-	No 0.365	No 0.024 (2013) 0.0085 (2014)	Yes 0.0024 (2015)	No 0.127 (2014) 0.071 (2015)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Gastropoda Density (no. per m ²)								
n	5	5	5	5	5	5	5	5	5
Mean	13.85	8.66	5.77	51.94	63.48	0.00	0.00	5.77	2.89
Minimum	0.00	0.00	0.00	0.00	14.43	0.00	0.00	0.00	0.00
Median	8.66	0.00	0.00	14.43	72.14	0.00	0.00	0.00	0.00
Standard deviation (n-1)	21.73	19.36	12.90	58.25	47.41	0.00	0.00	12.90	6.45
Standard error of the mean	9.72	8.66	5.77	26.05	21.20	0.00	0.00	5.77	2.89
COV (%)	156.87	223.61	223.61	112.15	74.69	-	-	223.61	223.61
+50% Mean	20.78	12.98	8.66	77.91	95.22	0.00	0.00	8.66	4.33
-50% Mean	6.93	4.33	2.89	25.97	31.74	0.00	0.00	2.89	1.44
Benchmark Exceedance (temporal comparison)	-	No	Yes (2013)	Yes (all)	Yes (2013-2015)	-	No	Yes (both)	Yes (all)
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	-	N/A	No 0.499 (2013)	No 0.048 (2015)	No 0.072 (2013) 0.015 (2014) 0.013 (2015)	-	N/A	No 0.281 (2014) 0.281 (2015)	No 0.330 (2013) 0.330 (2014) 0.918 (2015)

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Offshore Habitat – continued.

Site	BURNT		SPLIT					STL3KM				
Year	2014	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Metric	Chironomidae Density (no. per m ²)											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	79.60	170.24	317.41	155.82	461.68	132.73	89.45	657.89	620.38	144.28	100.99	239.50
Minimum	26.00	86.57	144.28	72.14	245.27	0.00	14.43	363.57	173.13	0.00	0.00	28.86
Maximum	147.00	245.27	461.68	230.84	591.53	230.84	173.13	1324.45	908.93	288.55	201.99	476.11
Median	69.00	144.28	346.26	158.70	504.96	158.70	86.57	493.42	721.38	86.57	100.99	245.27
Standard deviation (n-1)	43.86	71.70	134.18	57.17	140.62	84.99	59.84	391.56	290.17	135.34	77.69	172.11
Standard error of the mean	19.62	32.07	60.01	25.57	62.89	38.01	26.76	175.11	129.77	60.53	34.75	76.97
COV (%)	55.10	42.12	42.28	36.69	30.46	64.03	66.89	59.52	46.77	93.81	76.93	71.86
+50% Mean	119.40	255.37	476.11	233.73	692.52	199.10	134.18	986.84	930.57	216.41	151.49	359.25
-50% Mean	39.80	85.12	158.70	77.91	230.84	66.37	44.73	328.95	310.19	72.14	50.50	119.75
Benchmark Exceedance (temporal comparison)	-	Yes	-	Yes	Yes (2014)	Yes (2013, 2015)	Yes (2013, 2015)	-	No	Yes (both)	Yes (2013, 2014)	Yes (all)
Modified Significance Level	0.050				0.0050					0.0050		
Significant Inter-annual Difference ¹	-	Yes 0.042	-	No 0.176	No 0.015 (2014)	No 0.102 (2013) 0.007 (2015)	Yes 0.017 (2013) 0.00054 (2015)	-	N/A	No 0.011 (2013) 0.010 (2014)	Yes 0.0052 (2013) 0.0045 (2014)	No 0.071 (2013) 0.065 (2014) 0.465 (2015) 0.323 (2016)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Chironomidae Density (no. per m ²)								
n	5	5	5	5	5	5	5	5	5
Mean	193.91	135.62	230.84	112.53	196.21	227.95	288.55	300.09	219.30
Minimum	0.00	28.86	100.99	14.43	72.14	173.13	187.56	115.42	100.99
Maximum	389.54	216.41	317.41	375.12	490.54	274.12	403.97	706.95	375.12
Median	173.13	173.13	288.55	43.28	158.70	230.84	259.70	245.27	216.41
Standard deviation (n-1)	141.00	80.72	100.48	149.03	170.28	37.34	102.53	236.28	116.05
Standard error of the mean	63.06	36.10	44.93	66.65	76.15	16.70	45.85	105.67	51.90
COV (%)	72.71	59.52	43.53	132.43	86.78	16.38	35.53	78.73	52.92
+50% Mean	290.86	203.43	346.26	168.80	294.32	341.93	432.83	450.14	328.95
-50% Mean	96.95	67.81	115.42	56.27	98.11	113.98	144.28	150.05	109.65
Benchmark Exceedance (temporal comparison)	-	No	Yes (2014)	Yes (2015)	Yes (2016)	-	No	No (both)	No (all)
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	-	N/A	No 0.269 (2014)	No 0.173 (2015)	No 0.330 (2016)	-	N/A	N/A	N/A

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Offshore Habitat – continued.

Site	BURNT		SPLIT					STL3KM				
Year	2014	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Metric	Plecoptera Density (no. per m ²)											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Median	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Standard deviation (n-1)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Standard error of the mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
COV (%)	-	-	-	-	-	-	-	-	-	-	-	-
+50% Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-50% Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Benchmark Exceedance (temporal comparison)	-	No	-	No	No (both)	No (all)	No (all)	-	No	No (both)	No (all)	No (all)
Modified Significance Level	N/A		N/A					N/A				
Significant Inter-annual Difference ¹	-	N/A	-	N/A	N/A	N/A	N/A	-	N/A	N/A	N/A	N/A

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Plecoptera Density (no. per m ²)								
n	5	5	5	5	5	5	5	5	5
Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Median	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Standard deviation (n-1)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Standard error of the mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
COV (%)	-	-	-	-	-	-	-	-	-
+50% Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-50% Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Benchmark Exceedance (temporal comparison)	-	No	No (both)	No (all)	No (all)	-	No	No (both)	No (all)
Modified Significance Level	N/A					N/A			
Significant Inter-annual Difference ¹	-	N/A	N/A	N/A	N/A	-	N/A	N/A	N/A

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Offshore Habitat – continued.

Site	BURNT		SPLIT					STL3KM				
Year	2014	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Metric	Trichoptera Density (no. per m ²)											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	58.80	103.88	72.14	46.17	60.60	57.71	184.67	25.97	20.20	20.20	17.31	14.43
Minimum	0.00	28.86	57.71	0.00	28.86	0.00	28.86	8.66	0.00	0.00	0.00	0.00
Maximum	251.00	259.70	100.99	86.57	100.99	201.99	403.97	43.28	57.71	43.28	72.14	28.86
Median	17.00	43.28	57.71	57.71	57.71	28.86	100.99	25.97	14.43	14.43	0.00	14.43
Standard deviation (n-1)	108.03	98.59	20.40	32.90	27.75	82.25	177.11	17.31	21.88	16.45	31.28	14.43
Standard error of the mean	48.31	44.09	9.12	14.71	12.41	36.78	79.21	7.74	9.79	7.36	13.99	6.45
COV (%)	183.72	94.91	28.28	71.26	45.80	142.52	95.91	66.67	108.33	81.44	180.66	100.00
+50% Mean	88.20	155.82	108.21	69.25	90.89	86.57	277.01	38.95	30.30	30.30	25.97	21.64
-50% Mean	29.40	51.94	36.07	23.08	30.30	28.86	92.34	12.98	10.10	10.10	8.66	7.21
Benchmark Exceedance (temporal comparison)	-	Yes	-	No	No (both)	No (all)	Yes (all)	-	No	No (both)	No (all)	No (all)
Modified Significance Level	0.050		0.0050					0.0050				
Significant Inter-annual Difference ¹	-	No 0.087	-	N/A	N/A	N/A	No 0.714 (2013) 0.161 (2014) 0.400 (2015) 0.055 (2016)	-	N/A	N/A	N/A	N/A

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Trichoptera Density (no. per m ²)								
n	5	5	5	5	5	5	5	5	5
Mean	0.00	2.89	0.00	2.89	23.08	0.00	5.77	11.54	23.08
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.43
Maximum	0.00	14.43	0.00	14.43	57.71	0.00	14.43	28.86	43.28
Median	0.00	0.00	0.00	0.00	14.43	0.00	0.00	14.43	14.43
Standard deviation (n-1)	0.00	6.45	0.00	6.45	26.21	0.00	7.90	12.07	12.90
Standard error of the mean	0.00	2.89	0.00	2.89	11.72	0.00	3.53	5.40	5.77
COV (%)	-	223.61	-	223.61	113.54	-	136.93	104.58	55.90
+50% Mean	0.00	4.33	0.00	4.33	34.63	0.00	8.66	17.31	34.63
-50% Mean	0.00	1.44	0.00	1.44	11.54	0.00	2.89	5.77	11.54
Benchmark Exceedance (temporal comparison)	-	Yes	Yes (2014)	Yes (2013, 2015)	Yes (all)	-	Yes	Yes (both)	Yes (all)
Modified Significance Level			0.0050					0.0083	
Significant Inter-annual Difference ¹	-	No 0.479	No 1.000	No 0.479 (2013) 0.479 (2015)	No 0.015 (2013) 0.085 (2014) 0.015 (2015) 0.085 (2016)	-	No 0.319 ¹	No 0.079 (2014) 0.446 (2015)	Yes 0.0019 (2014) 0.035 (2015) 0.178 (2016)

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Offshore Habitat – continued.

Site	BURNT		SPLIT					STL3KM				
Year	2014	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Metric	EPT Density (no. per m ²)											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	96.80	126.96	1353.30	689.64	279.89	551.13	588.64	90.03	75.02	20.20	89.45	568.44
Minimum	26.00	43.28	432.83	375.12	230.84	288.55	346.26	17.31	0.00	0.00	14.43	0.00
Maximum	268.00	259.70	1688.02	1096.49	403.97	663.67	952.22	138.50	115.42	43.28	259.70	1428.32
Median	69.00	86.57	1615.88	591.53	230.84	634.81	447.25	103.88	100.99	14.43	28.86	302.98
Standard deviation (n-1)	97.31	88.59	531.71	274.20	76.07	157.52	273.25	46.05	47.19	16.45	106.71	606.52
Standard error of the mean	43.52	39.62	237.79	122.63	34.02	70.44	122.20	20.59	21.11	7.36	47.72	271.24
COV (%)	100.52	69.77	39.29	39.76	27.18	28.58	46.42	51.15	62.91	81.44	119.29	106.70
+50% Mean	145.20	190.44	2029.95	1034.45	419.84	826.70	882.96	135.04	112.53	30.30	134.18	852.67
-50% Mean	48.40	63.48	676.65	344.82	139.95	275.57	294.32	45.01	37.51	10.10	44.73	284.22
Benchmark Exceedance (temporal comparison)	-	No	-	No	Yes (both)	Yes (2013, 2015)	Yes (2013, 2015)	-	No	Yes (both)	Yes (2015)	Yes (all)
Modified Significance Level	N/A		0.0050					0.0050				
Significant Inter-annual Difference ¹	-	N/A	-	N/A	Yes 0.00031 (2013) 0.020 (2014)	No 0.086 (2013) 0.059 (2015)	No 0.078 (2013) 0.065 (2015)	-	N/A	No 0.081 (2013) 0.236 (2014)	No 0.228 (2015)	No 0.366 (2013) 0.143 (2014) 0.008 (2015) 0.149 (2016)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	EPT Density (no. per m ²)								
n	5	5	5	5	5	5	5	5	5
Mean	1563.37	1096.49	605.96	657.89	582.87	831.02	288.55	588.64	655.01
Minimum	0.00	952.22	490.54	331.83	317.41	692.52	187.56	375.12	476.11
Maximum	2276.66	1240.77	663.67	1082.06	865.65	966.64	375.12	836.80	851.22
Median	1817.87	1038.78	620.38	678.09	620.38	851.22	346.26	577.10	692.52
Standard deviation (n-1)	894.76	129.45	68.44	313.71	210.22	115.24	92.94	198.71	155.59
Standard error of the mean	400.15	57.89	30.61	140.30	94.01	51.54	41.57	88.87	69.58
COV (%)	57.23	11.81	11.29	47.68	36.07	13.87	32.21	33.76	23.75
+50% Mean	2345.05	1644.74	908.93	986.84	874.31	1246.54	432.83	882.96	982.51
-50% Mean	781.68	548.25	302.98	328.95	291.44	415.51	144.28	294.32	327.50
Benchmark Exceedance (temporal comparison)	-	No	Yes (2013)	Yes (2013)	Yes (2013)	-	Yes	Yes (2015)	Yes (2015)
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	-	N/A	No 0.025 (2013)	No 0.071 (2013)	No 0.023 (2013)	-	Yes < 0.0001	Yes 0.0051 (2015)	Yes 0.0011 (2015)

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Offshore Habitat – continued.

Site	BURNT		SPLIT					STL3KM				
Year	2014	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Metric	Ratio of EPT to Chironomidae											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	1.32	0.87	4.47	4.94	0.64	3.97	11.91	0.15	0.11	0.27	0.94	1.80
Minimum	0.30	0.29	3.00	2.50	0.39	2.75	3.38	0.05	0.00	0.05	0.10	0.00
Maximum	2.70	2.00	7.80	8.20	0.94	5.75	31.00	0.24	0.20	0.50	2.25	3.94
Median	1.00	0.50	3.50	5.09	0.60	3.68	4.67	0.11	0.13	0.25	0.71	1.11
Standard deviation (n-1)	0.94	0.73	1.99	2.45	0.20	1.31	11.97	0.09	0.08	0.23	1.03	1.62
Standard error of the mean	0.42	0.33	0.89	1.10	0.09	0.66	5.35	0.04	0.04	0.13	0.51	0.72
COV (%)	71.35	83.77	44.46	49.56	31.57	33.06	100.54	57.53	72.00	84.55	108.93	89.74
+50% Mean	1.98	1.30	6.71	7.42	0.97	5.95	17.86	0.22	0.17	0.40	1.42	2.70
-50% Mean	0.66	0.43	2.24	2.47	0.32	1.98	5.95	0.07	0.06	0.13	0.47	0.90
Benchmark Exceedance (temporal comparison)	-	No	-	No	Yes (both)	Yes (2015)	Yes (all)	-	No	Yes (both)	Yes (all)	Yes (all)
Modified Significance Level	N/A		0.0050					0.0050				
Significant Inter-annual Difference ¹	-	N/A	-	N/A	No 0.014 (2013) 0.009 (2014)	No 0.031 (2015)	Yes 0.395 (2013) 0.474 (2014) 0.00094 (2015) 0.337 (2016)	-	N/A	No 0.556 (2013) 0.610 (2014)	No 0.254 (2013) 0.305 (2014) 0.660 (2015)	No 0.074 (2013) 0.105 (2014) 0.339 (2015) 0.589 (2016)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Ratio of EPT to Chironomidae								
n	5	5	5	5	5	5	5	5	5
Mean	8.86	13.48	3.10	12.34	4.21	3.72	1.16	2.99	3.48
Minimum	5.84	5.67	2.09	2.88	1.76	2.53	0.46	0.82	1.85
Maximum	11.68	36.00	4.86	26.00	9.20	4.25	2.00	7.25	4.71
Median	8.95	6.62	2.14	9.50	3.58	3.94	0.89	2.36	3.40
Standard deviation (n-1)	2.66	12.97	1.37	8.90	2.89	0.68	0.66	2.52	1.17
Standard error of the mean	1.33	5.80	0.61	3.98	1.29	0.30	0.30	1.13	0.53
COV (%)	30.08	96.20	44.08	72.12	68.80	18.28	57.32	84.25	33.74
+50% Mean	13.29	20.22	4.65	18.52	6.31	5.58	1.74	4.49	5.22
-50% Mean	4.43	6.74	1.55	6.17	2.10	1.86	0.58	1.50	1.74
Benchmark Exceedance (temporal comparison)	-	Yes	Yes (both)	Yes (2015)	Yes (2013, 2014, 2016)	-	Yes	Yes (2015)	Yes (2015)
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	-	No 0.983	No 0.022 (2013) 0.014 (2014)	No 0.011 (2015) ¹	No 0.061 (2013) 0.044 (2014) 0.036 (2016)	-	No 0.014	No 0.066 (2015)	No 0.024 (2015)

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Offshore Habitat – continued.

Site	BURNT		SPLIT					STL3KM				
Year	2014	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Metric	Percent Ephemeroptera											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	12.24	2.39	18.52	7.61	6.38	20.55	18.02	6.18	3.90	0.00	10.38	32.17
Minimum	1.79	0.00	4.53	3.82	3.70	13.01	14.23	1.05	0.00	0.00	2.22	0.00
Maximum	34.78	6.25	39.29	13.08	9.16	25.00	21.05	13.41	9.33	0.00	25.81	67.81
Median	9.80	2.35	16.85	7.61	5.33	20.78	18.95	5.67	2.50	0.00	5.71	29.69
Standard deviation (n-1)	13.16	2.61	12.71	3.79	2.59	4.70	3.28	4.49	3.76	0.00	10.20	24.50
Standard error of the mean	5.89	1.17	5.68	1.70	1.16	2.10	1.47	2.01	1.68	0.00	4.56	10.96
COV (%)	107.58	109.26	68.60	49.84	40.62	22.88	18.22	72.66	96.41	-	98.27	76.15
+50% Mean	18.35	3.58	27.79	11.41	9.57	30.82	27.04	9.26	5.85	0.00	15.57	48.26
-50% Mean	6.12	1.19	9.26	3.80	3.19	10.27	9.01	3.09	1.95	0.00	5.19	16.09
Benchmark Exceedance (temporal comparison)	-	Yes	-	Yes	Yes (2013)	Yes (2014, 2015)	Yes (2014, 2015)	-	No	Yes (both)	Yes (all)	Yes (all)
Modified Significance Level	0.050				0.0050					0.0050		
Significant Inter-annual Difference ¹	-	No 0.087	-	No 0.016	No 0.008	Yes 0.0054 (2014) 0.0028 (2015)	No 0.021 (2014) 0.011 (2015)	-	N/A	No 0.030 (2013) 0.086 (2014)	No 0.712 (2013) 0.409 (2014) 0.011 (2015)	Yes 0.241 (2013) 0.103 (2014) 0.00082 (2015) 0.422 (2016)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Percent Ephemeroptera								
n	5	5	5	5	5	5	5	5	5
Mean	66.65	75.07	50.75	62.54	25.77	30.29	12.85	30.44	29.40
Minimum	0.00	64.89	35.59	50.98	17.51	27.44	5.49	19.60	21.76
Maximum	87.40	91.14	69.35	78.33	38.89	34.46	26.44	37.68	37.12
Median	81.93	73.03	46.94	62.92	19.20	28.13	10.92	32.08	28.95
Standard deviation (n-1)	37.33	10.26	13.06	10.65	10.16	3.54	8.22	6.66	6.57
Standard error of the mean	16.70	4.59	5.84	4.76	4.54	1.58	3.68	2.98	2.94
COV (%)	56.01	13.67	25.73	17.04	39.42	11.68	63.98	21.87	22.34
+50% Mean	99.98	112.60	76.12	93.81	38.65	45.44	19.28	45.65	44.09
-50% Mean	33.33	37.53	25.37	31.27	12.88	15.15	6.43	15.22	14.70
Benchmark Exceedance (temporal comparison)	-	No	No (both)	No (all)	Yes (2013, 2014, 2016)	-	Yes	Yes (2015)	Yes (2015)
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	-	N/A	N/A	N/A	Yes 0.0034 (2013) 0.00086 (2014) 0.0072 (2016)	-	No 0.016	No 0.0088 (2015)	No 0.019 (2015)

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Offshore Habitat – continued.

Site	BURNT		SPLIT					STL3KM				
Year	2014	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Metric	Percent of Oligochaeta + Chironomidae											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	20.34	19.08	4.53	2.08	13.95	6.91	6.09	59.88	46.11	62.62	14.55	24.05
Minimum	5.88	12.07	2.09	1.44	8.00	2.05	0.65	35.40	29.17	0.00	0.00	9.88
Maximum	43.48	35.42	6.33	3.04	17.79	10.29	11.58	80.93	68.00	95.24	25.00	37.50
Median	16.07	16.07	5.30	1.79	14.65	6.91	6.00	60.98	42.86	80.00	15.56	28.08
Standard deviation (n-1)	14.11	9.52	1.80	0.68	3.92	3.11	4.32	20.08	15.74	38.02	9.31	10.83
Standard error of the mean	6.31	4.26	0.81	0.31	1.75	1.39	1.93	8.98	7.04	17.00	4.17	4.84
COV (%)	69.37	49.92	39.75	32.87	28.09	45.03	70.95	33.54	34.13	60.71	64.02	45.02
+50% Mean	30.52	28.62	6.79	3.12	20.93	10.36	9.13	89.82	69.16	93.94	21.82	36.08
-50% Mean	10.17	9.54	2.26	1.04	6.98	3.45	3.04	29.94	23.05	31.31	7.27	12.03
Benchmark Exceedance (temporal comparison)	-	No	-	Yes	Yes (both)	Yes (all)	Yes (2014, 2015)	-	No	No (both)	Yes (all)	Yes (2013, 2015, 2016)
Modified Significance Level	N/A		0.0050					0.0050				
Significant Inter-annual Difference ¹	-	N/A	-	No 0.229	Yes 0.011 (2013) 0.00019 (2014)	No 0.345 (2013) 0.032 (2014) 0.112 (2015)	No 0.086 (2014) 0.043 (2015)	-	N/A	N/A	Yes 0.0032 (2013) 0.031 (2014) 0.0020 (2015)	No 0.016 (2013) 0.010 (2015) 0.492 (2017)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Percent of Oligochaeta + Chironomidae								
n	5	5	5	5	5	5	5	5	5
Mean	8.64	8.93	18.31	8.40	9.21	8.71	12.11	15.53	9.29
Minimum	0.00	2.53	9.09	1.96	3.85	7.44	5.46	4.32	7.02
Maximum	14.95	13.19	26.92	19.71	24.31	10.92	16.17	24.62	12.04
Median	9.06	11.11	16.95	6.74	5.88	8.48	12.24	15.94	8.40
Standard deviation (n-1)	5.53	4.63	6.76	6.78	8.49	1.32	4.44	8.29	2.27
Standard error of the mean	2.47	2.07	3.02	3.03	3.80	0.59	1.99	3.71	1.02
COV (%)	63.98	51.78	36.94	80.71	92.17	15.11	36.66	53.36	24.45
+50% Mean	12.96	13.40	27.46	12.59	13.82	13.06	18.16	23.30	13.93
-50% Mean	4.32	4.47	9.15	4.20	4.61	4.35	6.05	7.77	4.64
Benchmark Exceedance (temporal comparison)	-	No	Yes (both)	Yes (2015)	No (all)	-	No	Yes (2014)	No (all)
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	-	N/A	No 0.031 (2013) 0.035 (2014)	No 0.027 (2015)	N/A	-	N/A	No 0.899 (2014)	N/A

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Offshore Habitat – continued.

Site	BURNT		SPLIT					STL3KM				
Year	2014	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Metric	EPT Richness (Family level)											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	2.40	3.00	2.20	2.20	1.00	2.20	3.80	2.60	1.60	0.00	1.40	1.40
Minimum	1.00	2.00	2.00	1.00	1.00	1.00	2.00	2.00	0.00	0.00	1.00	0.00
Maximum	4.00	4.00	3.00	3.00	1.00	4.00	5.00	3.00	2.00	0.00	2.00	2.00
Median	3.00	3.00	2.00	2.00	1.00	2.00	4.00	3.00	2.00	0.00	1.00	2.00
Standard deviation (n-1)	1.34	0.71	0.45	0.84	0.00	1.10	1.30	0.55	0.89	0.00	0.55	0.89
Standard error of the mean	0.60	0.32	0.20	0.37	0.00	0.49	0.58	0.24	0.40	0.00	0.24	0.40
COV (%)	55.90	23.57	20.33	38.03	0.00	49.79	34.31	21.07	55.90	-	39.12	63.89
+25% Mean	3.00	3.75	2.75	2.75	1.25	2.75	4.75	3.25	2.00	0.00	1.75	1.75
-25% Mean	1.80	2.25	1.65	1.65	0.75	1.65	2.85	1.95	1.20	0.00	1.05	1.05
Benchmark Exceedance (temporal comparison)	-	Yes (2014)	-	No	Yes (both)	Yes (2015)	Yes (all)	-	No	Yes (both)	Yes (2013, 2015)	Yes (2013, 2015)
Modified Significance Level	0.050				0.0050					0.0050		
Significant Inter-annual Difference ¹	-	No 0.556	-	N/A	No 0.026 (2013) 0.031 (2014)	No 0.048 (2015)	Yes 0.126 (2013) 0.110 (2014) 0.00017 (2015) 0.075 (2016)	-	N/A	Yes < 0.0001 (2013) 0.018 (2014)	No 0.047 (2013) 0.053 (2015)	No 0.059 (2013) 0.043 (2015)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	EPT Richness (Family level)								
n	5	5	5	5	5	5	5	5	5
Mean	1.00	1.20	1.00	1.20	1.60	1.00	1.00	1.60	2.20
Minimum	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00
Maximum	2.00	2.00	1.00	2.00	2.00	1.00	1.00	2.00	3.00
Median	1.00	1.00	1.00	1.00	2.00	1.00	1.00	2.00	2.00
Standard deviation (n-1)	0.71	0.45	0.00	0.45	0.55	0.00	0.00	0.55	0.45
Standard error of the mean	0.32	0.20	0.00	0.20	0.24	0.00	0.00	0.24	0.20
COV (%)	70.71	37.27	0.00	37.27	34.23	0.00	0.00	34.23	20.33
+25% Mean	1.25	1.50	1.25	1.50	2.00	1.25	1.25	2.00	2.75
-25% Mean	0.75	0.90	0.75	0.90	1.20	0.75	0.75	1.20	1.65
Benchmark Exceedance (temporal comparison)	-	No	No (both)	No (all)	Yes (all)	-	No	Yes (both)	Yes (all)
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	-	N/A	N/A	N/A	No 0.066 (2013) 0.188 (2014) 0.048 (2015) 0.188 (2016)	-	N/A	No 0.077 (2014) 0.077 (2015)	Yes 0.0014 (2014) 0.0014 (2015) 0.154 (2016)

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Offshore Habitat – continued.

Site	BURNT		SPLIT					STL3KM				
Year	2014	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Metric	Total Organic Carbon (TOC, %)											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	1.68	2.28	1.07	1.28	1.28	2.07	2.07	1.12	1.47	2.36	3.15	2.04
Minimum	1.34	2.17	1.01	1.10	1.08	1.90	1.99	0.75	0.77	0.27	2.21	1.27
Maximum	1.80	2.38	1.15	1.34	1.53	2.19	2.21	1.59	2.43	4.98	5.37	2.80
Median	1.76	2.28	1.05	1.32	1.24	2.13	2.02	1.16	1.51	2.23	2.50	2.00
Standard deviation (n-1)	0.19	0.08	0.05	0.10	0.16	0.12	0.09	0.32	0.65	2.02	1.49	0.55
Standard error of the mean	0.09	0.03	0.02	0.05	0.07	0.05	0.04	0.14	0.29	0.90	0.74	0.24
COV (%)	11.52	3.35	4.99	7.91	12.75	5.81	4.44	28.18	44.58	85.43	47.37	26.80
Modified Significance Level	0.050		0.0050					0.0050				
Significant Inter-annual Difference ¹	-	Yes 0.00021	-	No 0.102	No 0.205 (2013) 0.715 (2014)	Yes 0.00024 (2013) 0.041 (2014) 0.016 (2015) ¹	Yes 0.00028 (2013) 0.046 (2014) 0.018 (2015) 0.966 (2016)	-	No 0.474	No 0.166 (2013) 0.502 (2014)	No 0.0063 (2013) 0.040 (2014) 0.155 (2015)	No 0.089 (2013) 0.325 (2014) 0.754 (2015) 0.259 (2016)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Total Organic Carbon (TOC, %)								
n	5	5	5	5	5	5	5	5	5
Mean	1.24	2.21	1.28	3.44	3.08	2.03	2.09	3.82	2.74
Minimum	1.11	1.27	1.19	3.25	2.91	1.88	2.00	3.57	2.29
Maximum	1.36	5.71	1.40	3.53	3.65	2.23	2.22	4.16	3.08
Median	1.23	1.30	1.22	3.48	2.94	2.01	2.09	3.82	3.00
Standard deviation (n-1)	0.10	1.96	0.11	0.11	0.32	0.14	0.08	0.22	0.40
Standard error of the mean	0.04	0.88	0.05	0.05	0.14	0.06	0.04	0.10	0.18
COV (%)	7.71	88.75	8.23	3.30	10.34	6.82	3.99	5.84	14.60
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	-	No 0.169	No 0.880 (2013) 0.221 (2014)	Yes 0.0016 (2013) 0.074 (2014) 0.0026 (2015)	No 0.012 (2013) 0.255 (2014) 0.018 (2015) 0.519 (2016)	-	No 0.669 (2014)	Yes 0.00037 (2014) 0.0018 (2015)	No 0.026 (2014) 0.073 (2015) 0.181 (2016)

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Offshore Habitat – continued.

Site	BURNT		SPLIT					STL3KM				
Year	2014	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Metric	Sand (%)											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	11.51	9.48	18.58	18.52	16.18	13.24	15.02	2.05	15.17	3.57	12.56	23.32
Minimum	3.55	5.30	17.60	14.80	11.90	7.70	10.20	1.08	2.18	0.51	2.40	10.80
Maximum	35.90	16.50	19.50	24.20	22.10	18.40	17.90	3.51	45.20	8.79	33.50	43.80
Median	5.42	8.70	19.00	17.70	15.20	13.80	15.70	1.90	9.63	3.54	8.90	20.30
Standard deviation (n-1)	13.70	4.57	0.83	3.61	4.24	3.97	2.93	0.90	17.50	3.35	12.21	12.46
Standard error of the mean	6.13	2.04	0.37	1.62	1.90	1.78	1.31	0.40	7.83	1.50	5.46	5.57
COV (%)	119.01	48.20	4.48	19.51	26.21	30.00	19.48	43.99	115.35	93.85	97.20	53.44
Modified Significance Level	0.050		0.0050					0.0050				
Significant Inter-annual Difference ¹	-	No 0.548	-	No 0.978	No 0.271 (2013) 0.282 (2014)	No 0.020 (2013) 0.022 (2014) 0.180 (2015)	No 0.108 (2013) 0.114 (2014) 0.590 (2015) 0.411 (2016)	-	No 0.028	No 0.606 (2013) 0.094 (2014)	No 0.032 (2013) 0.966 (2014) 0.103 (2015)	Yes 0.00094 (2013) 0.264 (2014) 0.0052 (2015) 0.246 (2016)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Sand (%)								
n	5	5	5	5	5	5	5	5	5
Mean	0.47	0.29	0.90	0.82	0.96	0.18	0.30	1.22	1.76
Minimum	0.27	0.11	0.61	0.50	0.50	0.11	0.20	0.50	0.50
Maximum	0.57	0.48	1.43	1.50	1.80	0.31	0.38	4.10	4.00
Median	0.50	0.29	0.88	0.50	0.50	0.14	0.28	0.50	0.50
Standard deviation (n-1)	0.12	0.15	0.33	0.46	0.64	0.08	0.07	1.61	1.74
Standard error of the mean	0.05	0.07	0.15	0.21	0.29	0.04	0.03	0.72	0.78
COV (%)	24.94	52.13	36.88	56.15	66.54	46.98	24.48	131.96	99.03
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	-	No 0.164	Yes 0.051 (2013) 0.00082 (2014)	No 0.250 (2013) 0.011 (2014) 0.422 (2015)	No 0.185 (2013) 0.0066 (2014) 0.529 (2015) 0.862 (2016)	-	No 0.353 (2014)	Yes 0.002 (2013) 0.029 (2014)	Yes 0.0011 (2014) 0.019 (2015) 0.870 (2016)

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

Offshore Habitat – continued.

Site	BURNT		SPLIT					STL3KM				
Year	2014	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Metric	Silt (%)											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	57.84	63.12	61.40	53.42	65.82	56.02	64.88	37.20	50.08	51.14	46.86	46.76
Minimum	39.10	53.20	50.50	50.00	58.70	53.90	53.90	21.50	30.60	27.20	32.10	34.50
Maximum	63.10	68.50	79.70	56.60	77.70	58.40	75.10	52.30	61.30	65.60	59.90	58.20
Median	62.70	68.30	55.60	53.50	62.40	56.20	68.90	40.20	51.80	49.50	50.90	44.00
Standard deviation (n-1)	10.49	7.37	11.69	2.51	8.37	2.05	9.87	12.84	12.40	15.58	10.76	9.86
Standard error of the mean	4.69	3.29	5.23	1.12	3.74	0.92	4.41	5.74	5.55	6.97	4.81	4.41
COV (%)	18.14	11.67	19.04	4.70	12.71	3.65	15.21	34.51	24.77	30.47	22.96	21.09
Modified Significance Level	0.050		0.0050					0.0050				
Significant Inter-annual Difference ¹	-	No 0.397	-	No 0.017	Yes 0.213 (2013) 0.0043 (2014) ²	No 0.562 (2013) 0.302 (2014) 0.068 (2015)	No 0.606 (2013) 0.033 (2014) 0.465 (2015) 0.273 (2016)	-	No 0.117	No 0.092 (2013) 0.894 (2014)	No 0.234 (2013) 0.687 (2014) 0.593 (2015)	No 0.239 (2013) 0.678 (2014) 0.584 (2015) 0.990 (2016)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Silt (%)								
n	5	5	5	5	5	5	5	5	5
Mean	72.48	66.28	89.48	67.62	74.30	72.66	87.36	60.14	81.36
Minimum	68.10	59.90	77.10	66.70	66.00	66.20	82.30	55.70	69.20
Maximum	75.70	68.60	98.50	70.10	80.80	76.70	94.30	63.60	87.00
Median	73.70	67.40	89.50	67.20	74.90	72.30	85.90	60.60	84.50
Standard deviation (n-1)	3.36	3.61	8.96	1.42	5.79	4.33	4.57	2.84	7.12
Standard error of the mean	1.50	1.61	4.01	0.64	2.59	1.94	2.04	1.27	3.18
COV (%)	4.63	5.44	10.01	2.10	7.79	5.96	5.23	4.72	8.75
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	-	No 0.127	Yes 0.071 (2013) 0.00086 (2014) ²	Yes 0.098 (2013) 0.897 (2014) 0.00054 (2015) ²	No 0.931 (2013) 0.107 (2014) 0.086 (2015) 0.082 (2016)	-	Yes 0.00025 ²	Yes 0.0011 (2014) ² < 0.0001 (2015) ²	Yes 0.014 (2014) 0.074 (2015) < 0.0001 (2016)

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

2 – based on application of $\pm 50\%$ benchmark this significant difference was not identified in previous reports.

Offshore Habitat – continued.

Site	BURNT		SPLIT					STL3KM				
Year	2014	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Metric	Clay (%)											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	30.64	27.36	20.00	28.04	17.96	30.74	20.10	60.76	34.76	45.28	40.58	29.96
Minimum	24.90	22.90	2.72	20.90	10.30	27.60	12.60	46.10	24.20	30.80	33.90	20.30
Maximum	33.80	31.60	30.40	31.40	24.70	38.40	30.30	75.00	38.60	68.60	47.80	47.60
Median	31.50	26.20	25.30	28.80	18.80	29.00	14.70	57.60	36.50	42.40	40.20	24.50
Standard deviation (n-1)	3.55	3.55	10.94	4.16	6.03	4.48	9.07	12.15	6.02	14.91	6.54	11.57
Standard error of the mean	1.59	1.59	4.89	1.86	2.70	2.00	4.06	5.43	2.69	6.67	2.93	5.17
COV (%)	11.57	12.96	54.67	14.83	33.56	14.57	45.14	20.00	17.31	32.93	16.13	38.62
Modified Significance Level	0.050		0.0050					0.0050				
Significant Inter-annual Difference ¹	-	No 0.182	-	No 0.102	No 0.668 (2013) 0.044 (2014)	No 0.033 (2013) 0.572 (2014) 0.013 (2015)	No 0.984 (2013) 0.106 (2014) 0.653 (2015) 0.035 (2016)	-	Yes 0.0011 ²	No 0.035 (2013) 0.139 (2014)	No 0.008 (2013) 0.404 (2014) 0.499 (2015)	Yes 0.00021 (2013) 0.490 (2014) 0.036 (2015) 0.136 (2016)

Site	STL11KM					STL25KM			
Year	2013	2014	2015	2016	2017	2014	2015	2016	2017
Metric	Clay (%)								
n	5	5	5	5	5	5	5	5	5
Mean	27.04	33.44	9.62	31.46	24.56	27.14	12.35	38.82	16.88
Minimum	23.70	31.20	0.53	28.50	17.40	23.10	5.36	36.10	12.40
Maximum	31.70	40.00	22.20	32.80	33.10	33.60	17.30	40.20	26.70
Median	25.80	32.10	9.66	31.80	23.60	27.60	13.90	39.30	15.00
Standard deviation (n-1)	3.50	3.69	9.19	1.72	6.08	4.33	4.58	1.59	5.62
Standard error of the mean	1.57	1.65	4.11	0.77	2.72	1.94	2.05	0.71	2.51
COV (%)	12.94	11.04	95.57	5.46	24.74	15.95	37.08	4.10	33.31
Modified Significance Level	0.0050					0.0083			
Significant Inter-annual Difference ¹	-	No 0.127	Yes 0.056 (2013) 0.00059 (2014)	Yes 0.156 (2013) 0.914 (2014) 0.00087 (2015)	No 0.780 (2013) 0.071 (2014) 0.102 (2015) 0.090 (2016)	-	Yes < 0.0001	Yes 0.00055 (2014) ² < 0.0001 (2015)	Yes 0.0017 (2014) 0.115 (2015) < 0.0001 (2016)

1 – due to inclusion of 2017 data, results of statistical comparisons may be different from previous years.

2 – based on application of $\pm 50\%$ benchmark this significant difference was not identified in previous reports.