Methods, Summary Data (2014-2017) and Errata (2005-2013) for Limnology and Food Web Structure in Skaha Lake, B.C.

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METHODS, SUMMARY DATA (2014-2017), AND ERRATA (2005-2013) FOR LIMNOLOGY AND FOOD WEB STRUCTURE IN SKAHA LAKE, B.C.

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CONTENTS

CONTENTS III
LIST OF FIGURES AND TABLES IV
ABSTRACT VI
RÉSUMÉ VII
ACKNOWLEDGEMENTS VIII
INTRODUCTION 1
METHODS 3
SOCKEYE AND KOKANEE IN-LAKE METHODS (ADDENDUM) 3
DAY-NIGHT VERTICAL DISTRIBUTION OF ZOOPLANKTON, *MYSIS* AND NERKIDS 3
SOCKEYE SALMON AND KOKANEE SPAWNER ESTIMATION 4
RESULTS 6
SKAHA LAKE WATER TEMPERATURES 6
SKAHA LAKE OXYGEN CONCENTRATIONS 10
SKAHA LAKE WATER CHEMISTRY 14
SKAHA LAKE PHYTOPLANKTON BIOMASS 15
SKAHA LAKE ZOOPLANKTON 17
SKAHA LAKE *MYSIS DILUVIANA* 28
SKAHA LAKE FISH LENGTH, WEIGHT, AND DENSITY 36
SKAHA LAKE NERKID STOMACHS 42
SKAHA LAKE VERTICAL DISTRIBUTION OF MACRO-ZOOPLANKTON, MYSIS, AND NERKIDS IN THE WATER COLUMN 44
INTERPRETATION OF VERTICAL DISTRIBUTIONS 58
SKAHA LAKE KOKANEE AND SOCKEYE SALMON SPAWNER NUMBERS AND PROPORTION AGE AT SPAWNING 59
REFERENCES 60

LIST OF FIGURES AND TABLES

Figure 1. August 14, 2007 zooplankton density (L^{-1}) based on day (top) and night (bottom) plankton trap samples. 44
Figure 2. July 27, 2009 zooplankton density (L^{-1}) based on day (top) and night (bottom) plankton trap samples. 46
Figure 3. Acoustic scattering layers of *M. diluviana* and pelagic fish sampled on August 14, 2007. (A) During the day, *Mysis* and most fish were concentrated near the lake bottom at 50 m. (B) At dusk *Mysis* and pelagic fish move rapidly into the water column. (C) At night the *Mysis* scattering layer was slightly more concentrated between 10-20 m and 40-50 m while acoustic sampling (Table 14) showed that the pelagic fish were concentrated at 10-30 m depths. Red indicates the substrate, dark blue is *Mysis*, grey shows combinations of *Mysis* and fish, and aquamarine represents schools of fish; analysis of target strengths were used to separate fish and mysids. 53
Figure 4. *Mysis* densities (m^{-3}) at 5 m intervals from 0-50m. The empty plot for August 20, 2012 is not an error. 54

Table 1. Overview of tables included in this report and in Hyatt et al. (2017b), by sampling years covered. 2
Table 2. Skaha Lake temperature profiles (°C). Profiles are averaged from data collected at the Gilles and south basin sites (stations 3 and 11). Shaded area approximates water temperatures generally avoided by juvenile Sockeye due to temperature preferences of < 17°C (Brett 1952, 1964, Levy 1990, 1991). 6
Table 3. Skaha Lake oxygen profiles (µg L^{-1}). Profiles are averaged from data collected at the Gilles and south basin sites (stations 3 and 11). Juvenile Sockeye Salmon tend to prefer waters with oxygen concentrations > 4 µg L^{-1} (Davis 1975, Brett and Blackburn 1981). There were no depths with oxygen concentration <4 µg L^{-1} in years 2014-2017. 10
Table 4. Skaha Lake water chemistry summary. Chla = Chlorophyll a. TP and TN = total phosphorus and total nitrogen, Secchi = Secchi depth, Epi = epilimnion and Hypo = hypolimnion. 14
Table 5. Skaha Lake 2014-17 TOTAL algal standing stock (by major taxonomic group) expressed as $mm^3\ m^{-3}$, which approximates µg·L^{-1} wet weight. 15
Table 6. Skaha Lake 2014-17 EDIBLE algal standing stock (by major taxonomic group) expressed as $mm^3\ m^{-3}$, which approximates µg·L^{-1} wet weight. 16
Table 7. Skaha Lake zooplankton density 2005-2017. Units are numbers L^{-1}. Data from 2005-13 are updated from Hyatt et al. (2017b). Rotifers were not enumerated before 2008. 17
Table 8. Skaha Lake zooplankton biomass 2005-2017. Units are µgL^{-1} dry weight. Data from 2005-13 are updated from Hyatt et al. (2017b). Rotifers were not enumerated before 2008. 21
Table 9. Skaha Lake zooplankton eggs L^{-1} (2005-2017). 24

Table 10. Skaha Lake 2005-2017 *Mysis diluviana* density. Units are numbers m^{-3}. Data from 2005-13 are updated from Hyatt et al. (2017b). nd = no data 28
Table 11. Skaha Lake 2005-2017 *Mysis diluviana* biomass. Units are mg m^{-3} dry weight (dw). Data from 2005-13 are updated from Hyatt et al. (2017b). Biomass of embryos was negligible and was not included. 31
Table 12. Skaha Lake 2006-2013 and 2015 *Mysis diluviana* diets as average number of prey per *Mysis.* Data from 2006-13 are updated from Hyatt et al. (2017b). 34
Table 13. Year 2013-17 species-specific (Sockeye, kokanee, Whitefish) and age-specific (age-1, 2, and 3+ kokanee) densities, lengths and weights. 2013 was updated from Hyatt et al. (2017b). Densities are estimated from echosounding based on target strengths, and mean lengths and weights are estimated from trawl samples. Age-0 nerkids were split into wild Sockeye, kokanee, and hybrids in months and years in which DNA analysis was applied to the trawl samples. Standard deviations were not readily available for 2013, but were very similar to those in other years for which both numbers and SDs are provided below. BY = brood year. 36
Table 14. Year 2015 and 2017 fish stomach summary as average numbers of each prey type found in stomachs collected through the summer-fall from age-0 Sockeye, age-0 kokanee and ages 1, 2, 3+ kokanee. 42
Table 15. Zooplankton density (L^{-1}) from night plankton trap samples only. Rotifers were not enumerated in 2007. 48
Table 16. Year 2006-13, 2015 and 2017 proportion of fish targets at night in each water depth stratum with respect to year and date. There were no data at depths shallower than 5m. 55
Table 17. Kokanee and Sockeye Salmon spawners estimated using AUC and size-cut-offs to separate the two ecotypes, numbers and dates of carcass (dead-pitch) collection, and proportion by age of kokanee spawners as estimated by ageing from otoliths of dead kokanee spawners. 59

ABSTRACT

Hyatt, K.D., D.J. McQueen, A.D. Ogden, R. Benson, N. Yaniw, C. Mathieu M.M. Stockwell, L. Wiens, and H. Wright. 2021. Methods, Summary Data (2014-2017), and Errata (2005-2013) for Limnology and Food Web Structure in Skaha Lake, B.C. Can. Data Rep. Fish. Aquat. Sci. 1327: viii + 61 p.

In 1994, the Okanagan Nation Alliance approached Fisheries and Oceans Canada with a request for assistance in status and trend assessments to support stock and habitat restoration work focused on Okanagan Sockeye Salmon that appeared to have fallen to historic lows of abundance. One of the collaborative projects subsequently undertaken involved an experimental reintroduction of Sockeye Salmon into Skaha Lake after roughly a century of virtually total exclusion of anadromous salmon from the lake. The Okanagan Nation Alliance (ONA), in partnership with Chelan and Grant County Public Utilities in Washington State, are the lead proponents for this project. They, in combination with Fisheries and Oceans Canada (DFO), and BC Forests, Lands and Natural Resource Operations (BC-FLNRO), provide technical advice and regulatory oversight to the project through the three-party (DFO, BC-FLNRO, ONA) Canadian Okanagan Basin Technical Working Group (COBTWG).

Here we report on field surveys of Skaha Lake to assess annual to seasonal changes in: (1) limnological conditions (temperature, oxygen, water transparency, nutrient concentrations, plankton abundance and production, including those of the introduced *Mysis relicta*), (2) abundance and biological traits of kokanee and juvenile Sockeye Salmon, (3) vertical distributions of nerkids, *Mysis relicta*, and zooplankton, (4) annual abundance of spawning kokanee and Sockeye Salmon, and (5) age structure of mature kokanee sampled from terminal spawning areas. The first objective of this 13-year program was to compare rates of growth and rates of egg-to-smolt survival from hatchery-reared Sockeye Salmon, stocked into Skaha Lake, with similar rates from the wild Osoyoos Lake parent stock. A second objective was to investigate the possibility that stocked age-0 Sockeye Salmon might have negative impacts on the food-web and resident kokanee in Skaha Lake. The report that follows supplements an earlier report (Hyatt et al. 2017b). A companion report (Hyatt et al. 2017a) provides a similar summary of observations from Osoyoos Lake (2005-2013).

RÉSUMÉ

Hyatt, K.D., D.J. McQueen, A.D. Ogden, R. Benson, N. Yaniw, C. Mathieu M.M. Stockwell, L. Wiens, and H. Wright. 2021. Methods, Summary Data (2014-2017), and Errata (2005-2013) for Limnology and Food Web Structure in Skaha Lake, B.C. Can. Data Rep. Fish. Aquat. Sci. 1327: viii + 61 p.

En 1994, l'Okanagan Nation Alliance (ONA) a demandé à Pêches et Océans Canada (MPO) de l'aider à évaluer l'état et les tendances des stocks et de l'habitat du saumon rouge de l'Okanagan, dont l'abondance semblait avoir atteint des niveaux historiquement bas. L'un des projets de collaboration entrepris par la suite consistait à réintroduire de manière expérimentale du saumon rouge dans le lac Skaha après environ un siècle d'exclusion quasi totale des saumons anadromes du lac. L'ONA, en partenariat avec l'organisation Chelan et Grant County Public Utilities de l'État de Washington, est le principal promoteur de ce projet. En collaboration avec le MPO et le ministère des Forêts, des Terres et de l'Exploitation des ressources naturelles de la Colombie-Britannique (BC-FLNRO), les deux organisations fournissent des conseils techniques et assurent la surveillance réglementaire du projet par l'intermédiaire du groupe de travail technique tripartite (ONA, MPO, BC-FLNRO) du bassin de l'Okanagan.

Nous présentons ici un rapport sur les levés de terrain effectués dans le lac Skaha pour évaluer les changements annuels et saisonniers en ce qui concerne 1) les conditions limnologiques (température, oxygène, transparence de l'eau, concentrations en nutriments, abondance et production de plancton, et notamment de l'espèce introduite *Mysis relicta*), 2) l'abondance et les caractéristiques biologiques du saumon kokani et du saumon rouge juvénile, 3) la distribution verticale des saumons et kokanis d'âge 0 (« nerkids »), de la *Mysis relicta* et du zooplancton, 4) l'abondance annuelle du kokani et du saumon rouge en période de frai, et 5) la structure selon l'âge des saumons kokanis matures échantillonnés dans les zones de frai terminales. Le premier objectif de ce programme de 13 ans était de comparer les taux de croissance et de survie des saumons rouges élevés en écloserie et ensemencés dans le lac Skaha du stade de l'œuf à celui de saumoneau avec les taux correspondants enregistrés pour la souche parentale sauvage du lac Osoyoos. Un second objectif visait à étudier la possibilité que le saumon rouge d'âge 0 ait des répercussions négatives sur la chaîne alimentaire et les saumons kokanis résidents du lac Skaha. Le rapport qui suit est complémentaire à un rapport précédent (Hyatt et col. 2017b). Un rapport complémentaire (Hyatt et al. 2017a) fournit également un résumé semblable des observations effectuées au lac Osoyoos (2005-2013).

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INTRODUCTION

This report provides limnological and fish population data from Skaha Lake and is an extension and update of the following report: Hyatt, K.D., McQueen, D.J., Rankin, D.P., Stockwell, M.M., Wright, H., Lawrence, S., Stevens, A., Mathieu, C., and Wiens, L. 2017. Methods and summary data for limnology and food web structure in Skaha Lake, B. C. (2005-2013); Revised. Can. Data Rep. Fish. Aquat. Sci. 1275: vii + 78 p.

For a general introduction to Skaha Lake and the Sockeye reintroduction project there, see that report, which is also available at: https://waves-vagues.dfo-mpo.gc.ca/Library/40599619.pdf. The current report extends those time series to 2017 and updates some tables from Hyatt et al. (2017b) to correct a few minor errors or discrepancies in the earlier report.

There are three additional kinds of data included in this report: (1) zooplankton egg counts, (2) vertical distribution data for key taxa making up the pelagic food web (i.e., fish, *Mysis relicta* and micro-zooplankton), and (3) kokanee and Sockeye Salmon spawner abundance data. Methods pertaining to zooplankton egg counts were detailed in Hyatt et al. (2017b) as part of zooplankton sampling methods, but the methods pertaining to (2) and (3) are included here. We provide methods for new tables that summarize data types not detailed in earlier reports.

For a summary of which tables are brand new (“New to this report”), and which tables correct earlier data (“Updates of 2005-2013 (Hyatt et al. 2017b)”), see Table 1. The updated tables included here supplant those reported before.

Table 1. Overview of tables included in this report and in Hyatt et al. (2017b), by sampling years covered.

Table	Updates of 2005-2013 (Hyatt et al. 2017b)	New to this report
2		2014-2017
3		2014-2017
4		2014-2017
5		2014-2017
6		2014-2017
7	2005-2013	2014-2017
8	2005-2013	2014-2017
9		2005-2017
10	2005-2013	2014-2017
11	2005-2013	2014-2017
12	2006-2013	2005, 2015
13	2013	2014-2017
14		2015, 2017
15		2007-2009
16	2006-2013, 2015, 2017	
17	2003-2018	

METHODS

Methods relevant to Tables 2-15 were detailed in Hyatt et al. (2017b). Here we add additional methods that were not available in the earlier report, and also add new observations of the vertical distribution of key taxa (i.e., nerkids, *Mysis relicta* and micro-zooplankton), zooplankton egg densities, and estimation of Sockeye Salmon and kokanee spawner abundance.

SOCKEYE AND KOKANEE IN-LAKE METHODS (ADDENDUM)

See Hyatt et al. (2017b) for in-lake nerkid sampling, lab processing, and estimation methods.

In years 2005 to 2011, 2015 and 2017, hatchery-origin fry were released into Skaha Lake, whereas in 2012 to 2014 and 2016, there were no hatchery-origin fry released there (2005-2012 not shown in this report). In 2013 to 2015, age-0 nerkids (i.e., from the previous year's spawners) were separated into kokanee, natural-origin Sockeye, and natural-origin kokanee x Sockeye hybrids, and in 2015, the breakdown of age-0 nerkids also included hatchery-origin Sockeye. The separation into these categories was accomplished by DNA analysis applied to random sub-samples of the trawl-caught fish; mean numbers of DNA samples taken per day were 349 in 2013[1], 261 in 2014, and 324 in 2015. In 2015, hatchery-origin Sockeye were separated from the natural-origin fry by otolith marks.

DAY-NIGHT VERTICAL DISTRIBUTION OF ZOOPLANKTON, *MYSIS* AND NERKIDS

The objectives of this work were to describe the vertical distribution of Skaha Lake zooplankton, and to estimate the degree of temporal and vertical overlap between zooplanktonic prey and their principal predators (i.e., planktivorous fish and *Mysis*).

During 2007-09, a 30 L Schindler-Patalas trap was used at 2 m depth intervals (0-40 m water depth) to sample zooplankton on five dates. On two dates (i.e., 14 August 2007 and 27 July 2009), the trap was deployed both night and day (Figures 1, 2), and on 3 dates (i.e., 24 June 2008, 23 July 2008 and 25 August 2008), the trap was deployed only at night (Table 15).

During 14 August 2007, we used continuous acoustic samples to record the vertical rise of the *Mysis* population from the sediments into the deep-water column during the evening and up to the thermocline during the night.

[1] What we are calling the "2013 in-lake year" included samples for age-0 from the 2012 brood year, and therefore included the March 2014 trawl; similarly for the other in-lake years reported here.

During 2012, we used a vertical haul net (300 µm mesh size) to quantify Skaha Lake *Mysis* densities (m^{-3}) during the day and night at 5-meter depth intervals (0-5, 5-10, 10-15, 15-20, 20-25, 25-30, 30-35, 35-40, 40-45, 45-50m) on four dates (25 June, 20 August, 24 September, 5 November) (Figure 4).

Acoustic surveys for fish depths were conducted on five dates during 2005 using a Simrad EY-500 echosounder and on 5-7 dates during 2006-15 and 2017 using a Biosonics DT-X echosounder. The methods are detailed in the 2017 data report (Hyatt et al. 2017b). Due to the depth of the hydroacoustic transducer deployment and the beam angle, observations of fish abundance at less than 5 m in depth were not available. However, trends in counts by depth bins and periodic execution of net trawls at the surface suggested that few fish occupied the top 5 m of the water column during intervals when the majority of surveys were conducted

SOCKEYE SALMON AND KOKANEE SPAWNER ESTIMATION

The annual proportion of kokanee spawners at age was estimated from the ageing of otoliths collected from a subsample of dead spawners in Penticton Channel (Benson et al. 2016); they were visually separated from Sockeye in years in which both returned. Dead-pitch (carcass) surveys were conducted by wading in shallow reaches and snorkeling in areas with deep pools and heavy plant growth (Benson et al. 2016). Spawner return-at-age sampling data were presumed to be less reliable prior to 2011 because not all areas of Penticton Channel were systematically sampled prior to 2011.

Note that the in-lake age-3 kokanee reported in Table 14 of Hyatt et al. (2017b) were actually age 3+; some may have been from older age classes.

Area-under-the-curve (AUC) estimates of spawning kokanee were based on equations (1) to (3) in Hilborn et al. (1999). Residence time in terminal spawning areas was not assessed, and so was assumed to be 11 days to be consistent with Osoyoos Lake Sockeye Salmon spawner residence time estimates, which were based on a combination of direct observations in addition to historic data from a Sockeye Salmon population (Early Stuart Sockeye) having similar run-timing and biological traits (Hyatt et al. 2010; Perrin and Irvine 1990). Observer efficiency was assumed to be 100%.

Live counts used for the AUC estimates were from Penticton Channel only, although there were a small number of Skaha Lake-origin spawners seen in Shingle Creek. There is no evidence of shore spawning nerkids in Skaha Lake. Visual count methods have been consistent since 2003, and most members of the ONA and BC-FLNRORD field crews have been the same since 2010. Counting was conducted during floats in an inflatable boat by a two-person team providing count coverage for opposite sides of the channel.

Some Sockeye began to return to Penticton Channel, immediately upstream of Skaha Lake, in 2010 after a retrofit of the water control gates at McIntyre Dam (Stockwell et al. 2020), and, given above average river discharge, even larger numbers of Sockeye

began to return there in 2011. Therefore, Sockeye and kokanee were separated in spawner count data beginning in 2011. The proportion of spawning kokanee was estimated by determining the number of nerkids having <35 cm fork length in post-spawn samples of carcasses. Fork lengths (FL) were estimated from post-orbital hypural (POH) lengths with a POH-FL regression based on measurements of carcasses from the parent population of Osoyoos Lake Sockeye Salmon from return years 2013 to 2018. The all-year relationship was: FL = 1.29 * POH - 1.08 (r^2 = 0.96; n = 541). A range of 0 to 1.6% per year of the Osoyoos Lake Sockeye Salmon were < 35 cm FL, according to DNA analysis from subsamples of dead spawners.

RESULTS

An additional four years of data (2014-2017 where available) are added here to the nine years of data reported in Hyatt et al. (2017b). Some of the earlier tables for 2005-2013 have been revised here as well (see Table 1 in the Introduction).

SKAHA LAKE WATER TEMPERATURES

Table 2. Skaha Lake temperature profiles (°C). Profiles are averaged from data collected at the Gilles and south basin sites (stations 3 and 11). Shaded area approximates water temperatures generally avoided by juvenile Sockeye due to temperature preferences of < 17°C (Brett 1952, 1964, Levy 1990, 1991).

Year 2014 Skaha Lake water temperatures (°C)

Water depth (m)	11-Mar-14	14-May-14	20-May-14	03-Jun-14	16-Jun-14	23-Jun-14	16-Jul-14	21-Jul-14	28-Jul-14	12-Aug-14	18-Aug-14	26-Aug-14	10-Sep-14	14-Oct-14	20-Oct-14	10-Nov-14	15-Dec-14	25-Feb-15
1	2.0	13.1	14.3	16.2	17.4	20.4	24.5	23.4	23.2	23.2	23.9	22.4	19.9	14.8	13.9	9.6	4.8	3.8
2	2.0	12.1	14.2	16.2	17.4	20.0	24.5	23.2	22.9	23.2	23.6	22.5	20.0	15.0	13.9	9.7	4.9	3.8
3	2.0	11.2	13.5	16.2	17.4	19.8	24.5	23.2	22.9	23.3	23.4	22.5	20.0	15.0	13.9	9.7	4.9	3.8
4	2.0	10.6	13.5	16.0	17.3	19.6	24.5	23.1	22.7	23.3	23.2	22.5	20.0	15.0	13.9	9.7	4.9	3.8
5	2.0	10.1	12.7	15.8	17.3	19.4	24.2	23.1	22.6	23.3	23.1	22.4	20.0	15.0	13.9	9.8	4.9	3.7
6	2.0	10.1	11.3	15.4	17.2	18.7	23.6	23.1	22.4	23.2	23.0	22.1	20.0	15.0	13.9	9.8	4.9	3.7
7	2.0	9.8	10.9	15.2	16.9	18.2	22.1	23.0	22.1	23.0	22.9	21.6	20.0	15.0	13.9	9.8	4.9	3.7
8	2.0	9.5	10.4	14.3	16.6	17.5	20.6	19.7	21.0	21.5	22.6	19.9	20.0	15.0	13.9	9.8	4.9	3.7
9	2.0	9.1	9.8	13.4	15.2	16.1	15.6	16.2	19.1	18.3	20.6	17.7	20.0	14.9	13.9	9.8	4.9	3.7
10	2.0	8.5	9.1	12.5	12.7	14.6	13.4	12.6	14.6	16.4	16.6	15.7	20.0	14.7	13.8	9.8	4.9	3.7
11	2.0	8.4	8.8	11.8	10.5	12.7	11.1	11.2	13.3	14.3	13.9	13.5	20.0	14.5	13.7	9.8	4.9	3.7
12	2.0	8.1	8.6	11.1	9.8	10.3	10.0	9.8	12.8	13.5	12.7	11.9	20.0	13.9	13.6	9.8	4.9	3.7
13	2.0	7.8	8.4	10.4	9.2	9.7	8.9	9.2	11.3	11.8	10.8	11.2	20.0	13.5	13.4	9.8	4.9	3.7
14	2.0	7.7	8.2	10.0	8.7	8.8	8.4	8.6	10.1	10.8	9.7	9.9	20.0	13.0	13.1	9.8	4.9	3.7
15	2.0	7.5	7.6	9.4	8.1	8.3	7.8	8.3	9.3	9.8	9.2	9.5	20.0	12.6	12.0	9.8	4.9	3.7
16	2.1	7.3	7.1	9.2	7.7	7.9	7.6	8.0	9.1	9.4	8.8	8.9	19.9	12.2	11.0	9.8	4.9	3.7
17	2.1	7.1	6.8	8.4	7.3	7.6	7.4	7.8	8.8	9.1	8.6	8.2	19.7	11.9	10.6	9.8	4.9	3.7
18	2.1	7.0	6.6	7.5	7.2	7.4	7.2	7.5	8.6	8.8	8.1	8.3	19.6	11.1	9.7	9.8	4.9	3.7
19	2.1	6.7	6.6	7.3	7.1	7.2	7.1	7.3	8.3	8.3	8.0	8.1	18.0	10.5	9.2	9.8	4.9	3.7
20	2.1	6.5	6.4	7.1	7.0	7.0	7.1	7.3	8.1	8.2	7.8	8.0	14.4	9.6	8.7	9.8	4.9	3.7
24	2.1	6.0	6.1	6.4	6.6	6.5	6.9	6.9	7.6	7.7	7.4	7.6	9.0	8.3	7.9	9.8	4.9	3.7
28	2.1	5.8	5.8	6.1	6.3	6.3	6.5	6.6	7.4	7.3	7.1	7.3	8.0	7.8	7.5	8.3	4.9	3.7
32	2.1	5.5	5.6	5.9	6.0	6.1	6.3	6.4	7.1	7.0	6.8	7.0	7.9	7.5	7.2	7.6	4.9	3.7
36	2.1	5.2	5.2	5.4	5.3	5.6	5.7	5.7	6.4	6.3	6.2	6.5		6.9	6.7	7.7	5.2	3.6
40	2.1	5.1	4.9	5.1	5.1	5.2	5.5	5.5	6.2	6.2	5.9	6.1		6.5	6.4	6.9	5.2	3.6
44	2.1	4.9	4.7	4.9	5.1	5.1	5.3	5.3	5.9	5.9	5.8	5.9		6.2	6.1	6.6	5.2	3.6
48	2.1	4.8	4.7	4.8	4.9	5.0	5.1	5.1	5.7	5.8	5.6	5.8		5.9	5.9	6.3	5.2	3.6
52	2.1	4.6	4.7	4.7	4.9	5.0	5.1	5.1	5.6	5.7	5.5	5.7		5.8	6.0	6.2	5.1	3.6

Year 2015 Skaha Lake water temperatures (°C)

Water depth (m)	20-Apr-15	19-May-15	25-May-15	01-Jun-15	15-Jun-15	22-Jun-15	07-Jul-15	13-Jul-15	20-Jul-15	27-Jul-15	10-Aug-15	23-Aug-15	09-Sep-15	28-Sep-15	13-Oct-15	08-Nov-15	17-Nov-15	14-Dec-15
1	9.5	15.6	17.1	19.1	21.2	20.7	24.4	23.8	24.7	22.0	22.5	21.4	17.9	15.3	14.7	10.5	8.5	5.5
2	9.2	15.6	16.7	19.2	21.0	20.6	24.4	24.0	24.3	22.1	22.5	21.4	18.0	15.3	14.5	10.5	8.5	5.5
3	9.1	15.3	16.7	19.2	20.9	20.5	24.5	24.0	24.0	22.1	22.4	21.5	18.0	15.4	14.4	10.5	8.5	5.5
4	9.0	15.0	16.5	19.3	20.7	20.4	24.5	24.0	23.6	22.2	22.4	21.5	18.0	15.4	14.4	10.3	8.5	5.5
5	8.9	14.8	16.4	19.2	20.4	20.3	24.3	23.9	23.2	22.2	22.4	21.5	18.0	15.5	14.3	10.2	8.5	5.5
6	8.8	14.4	16.0	18.3	20.2	20.2	24.0	23.7	22.7	22.2	22.3	21.5	17.9	15.5	14.3	10.1	8.5	5.5
7	8.6	14.2	15.5	17.4	18.6	19.9	23.6	23.6	22.3	22.2	22.3	21.5	17.9	15.5	14.2	10.1	8.5	5.5
8	8.4	13.4	15.2	15.8	16.6	18.9	19.7	22.6	22.0	22.2	22.1	21.2	17.9	15.5	14.2	10.0	8.5	5.5
9	8.3	12.4	14.8	14.4	14.4	17.9	15.3	19.3	20.8	21.6	21.4	20.9	17.9	15.5	14.2	10.0	8.5	5.5
10	8.1	11.7	14.0	13.0	13.1	16.4	13.8	16.9	18.5	17.7	19.1	20.6	17.7	15.5	14.2	9.9	8.5	5.5
11	7.8	11.2	13.0	12.3	12.0	15.2	13.0	14.7	16.2	15.6	16.6	17.8	17.4	15.5	14.2	9.9	8.5	5.5
12	7.7	10.6	12.1	11.7	11.1	13.9	12.0	13.4	13.3	13.7	15.3	15.6	15.9	15.5	14.2	9.9	8.5	5.5
13	7.6	10.0	11.2	11.3	10.3	12.4	10.9	11.8	12.3	11.6	13.7	13.6	15.1	15.4	14.1	9.9	8.5	5.5
14	7.3	9.6	10.6	10.5	9.9	11.1	10.5	10.9	11.3	11.1	12.4	11.5	14.3	14.0	14.1	9.9	8.5	5.5
15	7.0	9.2	10.1	10.0	9.7	10.5	10.1	10.2	10.5	10.8	11.3	10.8	14.1	13.4	13.9	9.9	8.5	5.5
16	6.9	9.1	9.8	9.6	9.4	10.2	9.7	9.9	10.2	10.0	10.4	10.4	13.5	13.1	14.1	9.9	8.5	5.5
17	6.8	8.8	9.5	9.1	9.2	9.9	9.4	9.5	9.8	9.6	10.0	9.9	11.9	12.9	12.0	9.9	8.5	5.5
18	6.8	8.5	9.3	8.7	8.9	9.5	9.2	9.3	9.4	9.4	9.8	9.7	10.3	12.8	10.7	9.9	8.5	5.5
19	6.7	8.3	9.1	8.6	8.7	9.2	9.0	9.1	9.2	9.2	9.5	9.5	9.6	12.3	10.0	9.9	8.5	5.5
20	6.6	8.1	8.7	8.3	8.5	9.0	8.7	8.9	9.1	9.0	9.3	9.4	9.2	11.5	9.6	9.8	8.5	5.5
24	6.4	7.7	8.1	8.0	8.0	8.5	8.4	8.5	8.8	8.6	8.9	8.7	8.7	9.5	9.0	9.5	8.5	5.5
28	6.3	7.3	7.8	7.6	7.8	8.1	8.0	8.1	8.4	8.3	8.5	8.4	8.4	9.1	8.7	9.0	8.5	5.5
32	6.2	7.2	7.6	7.5	7.5	7.8	7.8	7.9	8.1	8.0	8.2	8.1	8.1	8.4	8.4	8.3	8.5	5.5
36	6.2	6.8	7.0	6.9	7.0	7.2	7.2	7.4	7.5	7.4	7.3	7.4	7.4	7.7	7.7	7.8	8.6	5.7
40	6.0	6.7	6.9	6.8	6.8	7.0	7.0	7.2	7.3	7.1	7.1	7.1	7.2	7.4	7.4	7.5	8.6	5.7
44	5.9	6.5	6.7	6.7	6.7	6.8	6.9	6.9	7.1	6.9	7.0	6.9	7.0	7.2	7.3	7.4	8.6	5.7
48	5.8	6.4	6.6	6.5	6.6	6.7	6.8	6.8	6.9	6.8	6.8	6.8	6.9	7.1	7.2	7.2	8.6	5.7
52	5.7	6.3	6.4	6.5	6.6	6.6	6.6	6.9	6.8	6.7	6.7	6.7	6.7	6.9	7.2	7.1	8.6	5.7

Year 2016 Skaha Lake water temperatures (°C)

Water depth (m)	24-May-16	04-Jul-16	12-Jul-16	06-Oct-16	24-Oct-16
1	15.9	20.6	20.7	15.3	11.5
2	15.7	20.6	20.6	15.5	11.5
3	15.4	20.6	20.4	15.6	11.5
4	15.3	20.6	20.2	15.6	11.5
5	15.1	20.6	20.0	15.7	11.5
6	15.0	20.6	19.9	15.7	11.5
7	14.9	20.6	19.7	15.7	11.5
8	14.5	18.7	19.5	15.7	11.5
9	14.3	17.5	18.5	15.7	11.5
10	13.8	16.3	16.1	15.6	11.5
11	13.1	15.0	14.5	15.6	11.5
12	12.2	14.1	13.4	15.5	11.5
13	11.3	13.1	12.5	15.3	11.5
14	10.2	12.1	11.7	14.1	11.5
15	9.2	11.4	10.5	12.8	11.5
16	8.8	10.6	9.8	11.5	11.5
17	8.3	10.2	9.5	10.5	11.2
18	8.1	9.9	9.2	10.0	11.1
19	7.7	9.1	8.7	9.5	11.1
20	7.6	8.7	8.5	9.3	10.9
24	7.0	7.8	7.9	8.7	10.0
28	6.6	7.3	7.6	8.3	8.8
32	6.4	7.1	7.2	8.1	8.2
36	5.9	6.5	6.5	7.5	7.7
40	5.7	6.3	6.4	6.9	7.4
44	5.5	6.1	6.2	6.7	7.0
48	5.5	5.9	6.0	6.5	6.8
52	5.5	5.8	5.8	6.4	6.6

Year 2017 Skaha Lake water temperatures (°C)

Water depth (m)	05-Apr-17	24-May-17	19-Jun-17	18-Jul-17	25-Jul-17	01-Aug-17	15-Aug-17	10-Sep-17	10-Oct-17	16-Nov-17
1	3.7	12.4	15.5	21.3	21.5	22.6	22.0	21.5	13.3	7.1
2	3.6	12.3	15.2	21.3	21.5	22.6	22.0	21.5	13.4	7.1
3	3.6	12.1	15.0	21.2	21.5	22.6	22.0	21.5	13.4	7.1
4	3.6	11.1	14.9	21.2	21.3	22.6	21.9	21.5	13.4	7.1
5	3.6	10.5	14.8	21.1	21.3	22.4	21.9	21.4	13.4	7.1
6	3.6	10.5	14.4	21.0	21.1	22.2	21.9	21.3	13.4	7.1
7	3.6	10.1	13.7	21.0	21.0	22.1	21.9	21.3	13.4	7.1
8	3.6	9.9	13.1	20.9	21.0	22.0	21.8	21.3	13.4	7.1
9	3.6	9.5	12.8	20.5	20.9	19.8	20.5	21.3	13.2	7.1
10	3.5	9.2	12.6	18.4	19.6	16.0	19.0	20.7	12.7	7.1
11	3.5	9.1	12.2	15.4	13.8	13.0	13.3	17.7	12.3	7.1
12	3.5	8.9	12.0	14.3	12.5	11.7	12.1	14.2	12.1	7.1
13	3.5	8.8	11.8	13.1	11.9	10.8	11.1	12.6	12.1	7.1
14	3.5	8.6	11.3	11.6	10.6	9.9	10.0	11.5	12.0	7.1
15	3.5	8.4	10.8	10.9	10.1	9.5	9.6	10.7	11.8	7.1
16	3.5	8.3	10.6	10.1	9.6	9.0	8.9	9.7	11.6	7.1
17	3.5	8.1	10.4	9.6	9.1	8.6	8.6	9.3	11.4	7.1
18	3.5	7.9	9.8	9.2	8.8	8.2	8.3	8.9	9.3	7.1
19	3.5	7.8	8.7	8.5	8.5	7.9	8.1	8.7	9.1	7.1
20	3.5	7.8	7.9	8.0	8.1	7.7	7.9	8.4	8.9	7.1
24	3.5	7.0	6.9	7.3	7.5	7.0	7.2	7.7	8.3	7.1
28	3.5	6.3	6.4	6.8	7.1	6.6	6.8	7.3	7.9	7.1
32	3.5	6.0	6.2	6.4	6.7	6.4	6.6	7.0	7.5	7.1
36	3.3	5.4	5.4	5.8	5.9	5.6	5.7	6.4	6.8	7.2
40	3.3	5.0	5.2	5.5	5.6	5.4	5.4	6.1	6.4	7.2
44	3.4	4.7	5.0	5.3	5.3	5.2	5.2	5.8	6.2	7.2
48	3.4	4.5	4.8	5.1	5.1	5.2	5.2	5.6	5.9	7.2
52	3.4	4.5	4.9	5.0	5.1	5.1	5.2	5.4	5.8	7.2

SKAHA LAKE OXYGEN CONCENTRATIONS

Table 3. Skaha Lake oxygen profiles (µg L^{-1}). Profiles are averaged from data collected at the Gilles and south basin sites (stations 3 and 11). Juvenile Sockeye Salmon tend to prefer waters with oxygen concentrations > 4 µg L^{-1} (Davis 1975, Brett and Blackburn 1981). There were no depths with oxygen concentration <4 µg L^{-1} in years 2014-2017.

Year 2014 Skaha Lake oxygen concentrations µg L^{-1}

Water depth (m)	14-May-14	20-May-14	03-Jun-14	16-Jun-14	23-Jun-14	16-Jul-14	21-Jul-14	28-Jul-14	12-Aug-14	18-Aug-14	26-Aug-14	10-Sep-14	14-Oct-14	20-Oct-14	10-Nov-14	15-Dec-14	25-Feb-15
1	11.8	11.6	12.4	11.0	10.3	9.8	9.1	8.4	8.5	8.6	8.7	9.0	9.5	9.6	10.6	12.5	12.0
2	12.3	11.7	12.5	11.0	10.4	9.6	9.0	8.8	8.5	8.7	8.7	9.0	9.3	9.5	10.5	12.4	12.1
3	12.7	11.8	12.6	11.0	10.4	9.5	9.0	8.8	8.5	8.7	8.7	8.9	9.3	9.5	10.3	12.3	12.2
4	12.8	11.9	12.3	11.0	10.4	9.5	9.0	8.7	8.5	8.7	8.7	8.9	9.3	9.4	10.2	12.3	12.3
5	12.9	12.1	12.7	11.0	10.4	9.5	9.0	8.7	8.5	8.7	8.6	8.8	9.3	9.4	10.1	12.2	12.4
6	12.8	12.4	12.8	11.1	10.5	9.5	9.0	8.7	8.4	8.7	8.5	8.8	9.3	9.4	10.1	12.2	12.4
7	12.9	12.4	12.8	11.1	10.3	9.6	9.0	8.3	8.4	8.6	8.2	8.8	9.3	9.4	10.1	12.1	12.4
8	12.9	12.5	13.0	11.1	10.0	9.5	9.2	8.5	8.1	8.5	8.0	8.8	9.2	9.4	10.0	12.1	12.4
9	12.9	12.6	13.2	11.2	10.2	9.8	9.3	8.3	7.6	7.4	7.7	8.8	9.2	9.3	10.0	12.1	12.5
10	13.0	12.7	13.4	11.6	9.8	9.7	9.7	8.3	7.4	7.3	7.6	8.7	9.1	9.3	10.0	12.0	12.5
11	13.0	12.7	13.5	12.1	10.0	10.0	9.9	7.8	7.4	7.4	7.4	8.7	9.0	9.2	10.0	12.0	12.5
12	13.0	12.8	13.2	12.2	10.8	10.3	10.2	7.8	7.3	7.5	7.4	8.7	8.9	9.1	9.9	12.0	12.5
13	13.0	12.8	13.8	12.4	10.9	10.4	10.3	8.2	7.3	7.8	7.4	8.7	8.8	8.9	9.9	11.9	12.5
14	13.0	12.8	13.9	12.5	11.0	10.6	10.5	8.0	7.5	7.9	7.5	8.7	8.7	8.8	10.0	11.9	12.5
15	13.0	12.9	14.1	12.7	11.0	10.9	10.7	8.2	7.7	8.1	7.6	8.7	8.5	8.4	10.0	11.9	12.6
16	13.0	13.0	14.1	12.9	11.1	11.0	10.9	8.3	7.9	8.1	7.7	8.7	8.4	8.0	9.9	11.9	12.6
17	13.0	13.0	14.3	13.0	11.1	11.2	10.9	8.4	7.9	8.2	7.8	8.5	8.3	7.8	9.9	11.9	12.6
18	13.0	13.0	14.5	13.0	11.2	11.3	11.1	8.5	8.0	8.4	7.8	8.5	8.1	7.7	9.9	11.9	12.6
19	13.0	13.0	14.5	13.0	11.3	11.3	11.2	8.6	8.2	8.4	7.9	8.0	8.0	7.6	9.9	11.8	12.6
20	13.1	13.0	14.6	13.1	11.4	11.3	11.3	8.7	8.3	8.5	7.9	7.6	7.8	7.5	9.9	11.8	12.6
24	13.1	13.1	14.8	13.2	11.5	11.4	11.5	8.9	8.5	8.6	8.1	7.4	7.6	7.4	9.8	11.8	12.5
28	13.1	13.1	14.9	13.3	11.5	11.6	11.6	9.1	8.6	8.7	8.3	7.6	7.6	7.5	8.8	11.8	12.5
32	13.2	13.1	15.0	13.4	11.5	11.7	11.7	9.1	8.6	8.9	8.3	7.8	7.7	7.5	8.2	11.7	12.4
36	13.3	13.4	15.4	13.8	12.2	12.1	12.3	9.6	9.2	9.5	8.8		8.2	7.9	8.2	11.6	12.5
40	13.3	13.4	15.4	13.7	12.5	11.9	12.3	9.7	9.2	9.3	8.8		8.1	7.9	7.7	11.5	12.4
44	13.3	13.3	15.2	13.5	12.2	11.8	12.3	9.6	9.1	9.1	8.6		7.9	7.7	7.5	11.5	12.4
48	13.3	12.9	14.1	13.2	11.9	11.7	12.2	9.3	8.5	8.6	8.2		7.4	7.2	7.3	11.5	12.4
52	13.3	12.6	13.8	12.9	11.5	11.3	12.2	8.8	7.8	7.6	7.8		6.9	6.5	7.0	11.4	12.3

Year 2015 Skaha Lake oxygen concentrations μg L^{-1}

Water depth (m)	20-Apr-15	19-May-15	25-May-15	01-Jun-15	15-Jun-15	22-Jun-15	07-Jul-15	13-Jul-15	20-Jul-15	27-Jul-15	10-Aug-15	23-Aug-15	09-Sep-15	28-Sep-15	13-Oct-15	08-Nov-15	17-Nov-15	14-Dec-15
1	11.5	10.4	10.8	9.6	8.6	8.4	8.0	8.2	7.9	8.7	8.5	7.8	9.0	10.1	9.6	9.7	9.8	11.9
2	11.6	10.4	11.1	9.7	8.7	8.5	8.0	8.1	8.0	8.6	8.5	7.8	9.0	9.9	9.6	9.7	9.7	11.8
3	11.6	10.5	11.2	9.7	8.7	8.5	8.0	8.1	8.1	8.5	8.5	7.8	9.0	9.9	9.6	9.6	9.7	11.7
4	11.6	10.5	11.3	9.7	8.7	8.5	8.0	8.1	8.1	8.5	8.5	7.7	9.0	9.7	9.6	9.5	9.6	11.6
5	11.6	10.6	11.3	9.7	8.7	8.5	8.0	8.1	8.1	8.5	8.5	7.7	9.0	9.7	9.5	9.3	9.6	11.6
6	11.6	10.6	11.3	9.8	8.7	8.5	7.9	8.1	8.1	8.5	8.5	7.7	9.0	9.7	9.5	9.1	9.6	11.6
7	11.6	10.6	11.3	9.9	8.7	8.5	7.9	8.0	8.1	8.4	8.5	7.7	9.0	9.7	9.5	9.0	9.5	11.5
8	11.6	10.5	11.2	9.9	8.9	8.6	8.0	8.1	8.1	8.4	8.5	7.6	9.0	9.6	9.5	9.0	9.5	11.5
9	11.7	10.5	11.2	9.9	9.2	8.7	8.1	8.1	8.0	8.3	8.4	7.6	8.9	9.6	9.5	8.9	9.5	11.5
10	11.6	10.5	11.1	9.9	9.3	8.7	8.3	8.3	8.1	8.1	8.4	7.6	8.9	9.6	9.5	8.8	9.5	11.4
11	11.6	10.5	11.1	9.9	9.4	8.8	8.3	8.5	8.0	8.0	8.5	7.6	8.7	9.6	9.5	8.8	9.5	11.4
12	11.6	10.5	11.1	9.8	9.3	8.8	8.5	8.5	8.1	8.1	8.6	7.6	8.5	9.5	9.4	8.8	9.4	11.4
13	11.7	10.5	11.1	9.8	9.3	8.9	8.6	8.5	8.2	8.3	8.6	7.5	8.3	9.5	9.4	8.8	9.4	11.4
14	11.7	10.4	11.2	9.9	9.3	8.9	8.5	8.5	8.3	8.3	8.6	7.3	8.1	9.0	9.3	8.7	9.4	11.4
15	11.7	10.4	11.1	9.7	9.3	9.0	8.5	8.5	8.4	8.3	8.7	7.3	8.0	8.8	9.2	8.7	9.4	11.3
16	11.6	10.5	11.0	9.7	9.3	9.0	8.5	8.5	8.3	8.3	8.4	7.2	7.8	8.6	9.2	8.7	9.4	11.3
17	11.6	10.5	11.0	9.7	9.2	9.0	8.4	8.4	8.3	8.3	8.2	7.1	7.4	8.5	8.4	8.6	9.4	11.3
18	11.6	10.4	11.0	9.7	9.2	9.0	8.3	8.4	8.2	8.3	8.1	7.0	7.3	8.4	7.7	8.6	9.4	11.3
19	11.5	10.4	11.1	9.7	9.2	9.0	8.3	8.3	8.2	8.2	8.0	6.9	7.1	8.1	7.2	8.5	9.4	11.3
20	11.5	10.4	11.0	9.7	9.2	9.0	8.2	8.3	8.2	8.2	8.0	6.9	7.0	7.9	6.9	8.5	9.4	11.2
24	11.4	10.3	10.9	9.7	9.1	9.0	8.2	8.2	8.1	8.1	7.9	6.8	7.0	7.4	6.6	8.4	9.3	11.2
28	11.4	10.3	10.9	9.7	9.1	9.0	8.2	8.3	8.1	8.0	7.9	6.8	7.0	7.2	6.5	7.8	9.3	11.2
32	11.3	10.3	10.9	9.6	9.1	8.9	8.3	8.3	8.1	8.0	7.9	6.9	6.9	7.2	6.4	6.6	9.3	11.1
36	11.4	10.4	11.1	9.9	9.4	9.2	8.9	8.6	8.5	8.3	8.3	7.3	7.3	7.5	6.8	6.6	9.4	11.0
40	11.3	10.3	11.1	9.9	9.3	9.1	8.5	8.5	8.4	8.3	8.4	7.1	7.2	7.5	6.6	6.1	9.4	11.0
44	11.3	10.2	10.9	9.9	9.4	9.0	8.2	8.4	8.3	8.0	8.3	6.8	6.8	7.1	6.6	5.7	9.3	11.0
48	11.3	10.2	10.7	9.7	9.1	8.7	7.6	8.1	8.3	7.5	7.7	5.9	6.2	6.8	6.1	5.3	9.3	10.9
52	11.3	10.1	10.5	9.4	8.4	8.3	7.1	7.3	7.6	7.0	6.5	4.5	4.2	6.5	5.1	4.7	9.3	10.9

Year 2016 Skaha Lake oxygen concentrations µg L^{-1}

Water depth (m)	24-May-16	04-Jul-16	12-Jul-16	06-Oct-16	24-Oct-16
1	9.7	9.0	8.9	10.0	10.4
2	9.7	9.0	9.0	9.7	10.3
3	9.7	9.0	9.0	9.6	10.3
4	9.7	9.0	9.0	9.5	10.2
5	9.7	9.0	9.0	9.5	10.2
6	9.6	9.0	9.0	9.4	10.2
7	9.6	9.0	8.9	9.4	10.1
8	9.4	8.8	8.8	9.4	10.1
9	9.4	8.7	8.6	9.3	10.1
10	9.3	8.5	8.2	9.3	10.0
11	9.1	8.3	8.0	9.2	10.0
12	9.1	8.1	7.9	9.1	10.0
13	9.2	8.0	7.9	9.0	10.0
14	9.2	8.0	7.8	8.6	9.9
15	9.3	8.0	7.8	7.9	9.9
16	9.3	8.0	7.8	7.3	9.9
17	9.4	8.0	7.9	6.9	9.7
18	9.4	8.0	7.9	6.6	9.7
19	9.6	8.1	8.0	6.5	9.5
20	9.6	8.2	8.1	6.4	9.2
24	9.6	8.3	8.2	6.4	8.3
28	9.7	8.5	8.2	6.5	7.5
32	9.7	8.6	8.4	6.5	6.9
36	10.0	8.9	8.8	6.9	7.1
40	9.9	8.9	8.9	6.9	7.0
44	9.9	8.9	8.9	6.9	6.9
48	9.8	9.1	8.8	6.6	6.7
52	9.4	8.8	8.5	6.3	6.6

Year 2017 Skaha Lake oxygen concentrations μg L^{-1}

Water depth (m)	05-Apr-17	24-May-17	19-Jun-17	01-Aug-17	15-Aug-17	10-Sep-17	10-Oct-17	15-Nov-17
1	13.0	10.9	9.3	8.0	8.0	9.3	11.1	11.2
2	13.2	11.0	9.5	8.0	8.0	9.3	10.9	11.1
3	13.2	11.0	9.6	7.9	8.0	9.3	10.8	11.0
4	13.3	11.0	9.6	7.9	8.0	9.2	10.7	10.9
5	13.3	11.2	9.6	7.9	8.0	9.2	10.7	10.9
6	13.4	11.1	9.6	7.9	8.0	9.2	10.6	10.8
7	13.4	11.1	9.5	7.9	7.9	9.2	10.6	10.8
8	13.4	11.1	9.6	7.8	7.9	9.2	10.5	10.8
9	13.4	11.2	9.6	8.0	7.9	9.1	10.4	10.8
10	13.4	11.3	9.6	8.3	8.0	8.6	10.4	10.8
11	13.5	11.2	9.6	8.5	8.5	7.7	10.3	10.7
12	13.5	11.3	9.6	8.4	8.6	7.5	10.0	10.7
13	13.5	11.3	9.6	8.3	8.6	7.5	9.9	10.7
14	13.5	11.2	9.6	8.3	8.8	7.5	9.8	10.7
15	13.5	11.3	9.7	8.4	9.0	7.5	9.4	10.7
16	13.5	11.3	9.7	8.5	9.2	7.5	9.6	10.7
17	13.6	11.3	9.7	8.7	9.3	7.6	9.6	10.7
18	13.6	11.3	9.7	8.8	9.5	7.8	9.2	10.7
19	13.6	11.3	9.8	8.9	9.6	8.0	8.9	10.7
20	13.5	11.3	10.0	8.9	9.6	8.1	8.8	10.7
24	13.5	11.3	10.2	9.1	9.9	8.3	8.6	10.7
28	13.5	11.4	10.4	9.2	10.3	8.5	8.6	10.6
32	13.4	11.4	10.4	9.3	10.5	8.5	8.6	10.6
36	13.3	11.5	10.8	9.7	11.5	9.1	9.1	10.5
40	13.3	11.6	10.8	9.6	11.6	9.0	9.1	10.5
44	13.2	11.6	10.7	9.2	10.9	8.7	9.1	10.4
48	13.2	11.6	10.4	8.7	9.2	8.7	9.2	10.4
52	13.2	11.5	10.4	4.5	10.0	8.5	9.3	10.4

SKAHA LAKE WATER CHEMISTRY

Table 4. Skaha Lake water chemistry summary. Chla = Chlorophyll a. TP and TN = total phosphorus and total nitrogen, Secchi = Secchi depth, Epi = epilimnion and Hypo = hypolimnion.

Sampling dates	Epi TP (µg/L)	Epi TN (µg /L)	Chla (µg/L)	Secchi (m)	Hypo TP (µg/L)	Hypo TN (µg /L)
Year 2014						
20-May-14	4.1	246	1.99	3.70	4.55	301
23-Jun-14	5.4	232	4.01	3.70	5.6	206
21-Jul-14	4.5	170	2.43	7.20	6.7	161
12-Aug-14	6.1	339	0.92	5.59	10.4	302
22-Sep-14	3.6	297	6.10	5.95	8.15	624
20-Oct-14	7.7	187	2.39	4.83	12.45	378
Year 2015						
25-May-15	3.8	213	2.2	3.0	1.5	178
22-Jun-15	8.7	177	0.6	3.8	8.8	174
20-Jul-15	3.5	195	1.0	8.0	6.3	212
10-Aug-15	4.6	220	0.5	5.3	10.3	203
28-Sep-15	6.6	218	2.2	5.0	13.8	223
13-Oct-15	7.2	217	2.3	5.6	15.7	234
Year 2016						
24-May-16	13.0	264	2.3	3.7	11.5	214
12-Jul-16	15.0	223	1.4	4.6	13.5	182
06-Oct-16	6.0	364	0.9	4.7	9.0	336
Year 2017						
24-May-17	6.8	1030	1.3	1.9	4.2	941
19-Jun-17	7.5	176	1.5		4.2	192
18-Jul-17	4.2	304	1.4	5.3	3.4	232
15-Aug-17	6.5	200	0.8	5.4	6.1	176
12-Sep-17	4.8	193	1.6	6.1	7.2	178
10-Oct-17	2.0	229	1.3	4.9	10.5	223

SKAHA LAKE PHYTOPLANKTON BIOMASS

Table 5. Skaha Lake 2014-17 TOTAL algal standing stock (by major taxonomic group) expressed as $mm^3 m^{-3}$, which approximates $\mu g \cdot L^{-1}$ wet weight.

Date	Cyanophyta	Dinophyta	Cryptophyta	Euglenophyta	Chrysophyta	Haptophyta	Tribophyta	Chlorophyta	Raphidophyta	Bacillariophyta	TOTAL
20-May-14	199.9	1.73	23.15	0	19.84	0.35	8.68	30.11	0	234.3	518.1
21-Jul-14	26.84	0.98	6.81	0	33.46	1.06	0	17.55	0	172	258.7
22-Sep-14	74.33	0	1.56	0	4.5	0.63	0	7.23	0	12.12	100.4
25-May-15	105.3	4.21	20.6	0	194.6	1.79	0.26	41.4	0	147.6	515.7
22-Jun-15	11.5	16.7	33.44	0	14.79	3.15	0.85	21.69	0	118	220.1
20-Jul-15	22.11	2.49	35.47	0	19.97	2.15	0	36.56	0	47.61	166.4
10-Aug-15	47.89	3.25	23.24	0	11.59	1.39	0	27.18	0	44.64	159.2
28-Sep-15	163.1	5.09	48.91	0	9.22	3.8	0.31	45.11	0	83.67	359.2
13-Oct-15	246.3	0	96.83	0	24.37	6.67	3.48	33.61	0	42.11	453.3
24-May-16	102.6	83.6	43.3	0.0	62.6	8.2	1.3	78.4	0.0	927.1	1307.1
12-Jul-16	197.8	9.1	51.7	0.0	45.4	10.1	1.1	35.5	0.0	310.1	660.7
06-Oct-16	479.8	0.0	37.1	0.0	25.2	10.3	7.6	89.7	0.0	109.3	758.9
24-May-17	71.8	7.5	30.1	0.0	15.5	1.5	1.5	59.7	0.0	568.3	755.9
18-Jul-17	84.6	21.8	56.4	0.0	156.0	3.2	0.1	112.9	0.0	258.3	693.4
10-Oct-17	197.8	12.9	33.5	0.0	33.7	7.1	0.8	39.5	0.0	190.4	515.7

Table 6. Skaha Lake 2014-17 EDIBLE algal standing stock (by major taxonomic group) expressed as $mm^3 m^{-3}$, which approximates $\mu g \cdot L^{-1}$ wet weight.

Date	Cyanophyta	Dinophyta	Cryptophyta	Euglenophyta	Chrysophyta	Haptophyta	Tribophyta	Chlorophyta	Raphidophyta	Bacillariophyta	TOTAL
20-May-14	0.7	0.0	23.2	0.0	18.3	0.4	8.7	8.2	0.0	162.4	**221.7**
21-Jul-14	0.0	1.0	6.8	0.0	23.4	1.1	0.0	15.0	0.0	8.2	**55.5**
22-Sep-14	1.5	0.0	1.6	0.0	3.0	0.6	0.0	5.5	0.0	6.5	**18.7**
25-May-15	0.0	4.2	20.6	0.0	194.6	1.8	0.3	15.1	0.0	27.9	**264.4**
22-Jun-15	0.0	9.1	33.4	0.0	14.2	3.2	0.9	16.4	0.0	30.9	**108.0**
20-Jul-15	1.0	2.5	35.5	0.0	18.7	2.2	0.0	32.0	0.0	12.6	**104.5**
10-Aug-15	1.2	2.0	23.2	0.0	11.6	1.4	0.0	20.4	0.0	34.0	**93.8**
28-Sep-15	1.5	5.1	48.9	0.0	9.2	3.8	0.3	38.4	0.0	23.3	**130.6**
13-Oct-15	0.5	0.0	96.8	0.0	24.4	6.7	3.5	23.2	0.0	15.9	**170.9**
24-May-16	0.2	7.8	43.3	0.0	48.6	8.2	1.3	45.3	0.0	588.3	742.9
12-Jul-16	1.1	2.8	51.7	0.0	45.4	10.1	1.1	23.7	0.0	105.7	241.6
06-Oct-16	0.6	0.0	37.1	0.0	25.2	10.3	7.6	55.0	0.0	78.9	214.7
24-May-17	0.0	7.5	30.1	0.0	14.2	1.5	1.5	43.2	0.0	265.6	363.6
18-Jul-17	0.0	1.8	56.4	0.0	156.0	3.2	0.1	44.8	0.0	49.6	312.0
10-Oct-17	1.8	12.9	33.5	0.0	30.1	7.1	0.8	28.9	0.0	158.6	273.7

SKAHA LAKE ZOOPLANKTON

Table 7. Skaha Lake zooplankton density 2005-2017. Units are numbers L^{-1}. Data from 2005-13 are updated from Hyatt et al. (2017b). Rotifers were not enumerated before 2008.

Date	Rotifer total	Nauplii total	D. thomasi adults & copepodids	L. ashlandi adults & copepodids	Epischura	Bosmina	Daphnia	Diaphanosoma	Leptodora	Total
27-Apr-05		8.0	2.1	3.9	0.0	0.0	0.0	0.0	0.0	14.0
19-May-05		38.7	9.3	17.3	0.0	0.0	0.0	0.0	0.0	65.3
09-Jun-05		42.3	7.2	21.2	0.0	1.2	0.0	0.0	0.0	71.9
22-Jun-05		32.3	12.2	17.8	0.1	3.7	0.2	0.8	0.0	67.1
14-Jul-05		40.3	13.3	18.3	0.3	1.0	2.6	0.7	0.0	76.6
03-Aug-05		53.3	14.4	14.7	0.4	0.4	5.4	0.7	0.0	89.4
25-Aug-05		15.0	11.3	13.0	0.4	1.7	2.0	0.2	0.0	43.6
14-Sep-05		9.8	8.9	10.1	0.4	1.3	0.6	0.3	0.0	31.3
07-Oct-05		16.3	8.8	10.3	0.5	0.6	0.4	0.3	0.0	37.3
02-Nov-05		11.9	6.2	7.6	0.0	0.2	0.0	0.0	0.0	25.9
21-Nov-05		9.5	6.0	8.8	0.0	0.3	0.0	0.0	0.0	24.5
26-Apr-06		58.0	9.3	16.5	0.0	0.2	0.0	0.0	0.0	84.0
24-May-06		27.7	8.7	0.8	0.0	0.2	0.0	0.0	0.0	37.4
13-Jun-06		17.7	28.2	3.2	0.0	5.3	0.0	0.0	0.0	54.5
29-Jun-06		24.7	35.0	2.1	0.0	0.9	0.0	0.0	0.0	62.8
24-Jul-06		57.4	39.3	9.1	0.0	0.0	0.0	1.0	0.0	106.8
31-Aug-06		16.7	34.7	8.8	0.9	1.8	0.0	0.1	0.0	63.0
06-Sep-06		12.8	30.0	10.1	0.9	1.9	0.0	0.3	0.0	55.9
28-Sep-06		21.7	27.7	12.6	0.7	3.0	0.0	1.3	0.0	66.9
25-Oct-06		13.2	10.1	8.0	0.3	0.2	0.0	0.1	0.0	32.0
19-Dec-06		6.9	9.2	9.9	0.0	0.4	0.0	0.0	0.0	26.4
13-Mar-07		15.3	5.8	8.0	0.0	0.2	0.0	0.0	0.0	29.3
18-Apr-07		14.0	4.0	7.0	0.0	0.0	0.0	0.0	0.0	25.0
16-May-07		30.0	10.2	21.3	0.0	0.0	0.0	0.0	0.0	61.5
14-Jun-07		30.7	19.9	16.9	0.1	1.2	0.0	0.1	0.0	68.8
26-Jun-07		30.0	24.6	15.1	0.0	3.0	0.0	0.3	0.0	73.0
12-Jul-07		44.7	35.7	10.8	0.7	0.8	0.0	5.8	0.0	98.5
25-Jul-07		21.0	21.3	8.3	0.8	0.1	0.0	1.0	0.0	52.6
15-Aug-07		19.0	12.1	10.9	0.7	0.1	0.0	0.7	0.0	43.5
28-Aug-07		13.8	14.1	8.7	0.9	0.6	0.0	0.9	0.0	38.9
12-Sep-07		21.7	23.2	10.6	0.6	2.9	0.0	1.2	0.0	60.1
24-Sep-07		18.3	17.0	10.8	0.8	4.5	0.0	0.3	0.0	51.7
24-Oct-07		11.2	10.4	9.6	0.1	0.0	0.0	0.1	0.0	31.3
19-Nov-07		10.8	10.4	8.5	0.0	0.2	0.0	0.0	0.0	29.9
08-Jan-08	0.0	19.0	6.1	9.6	0.0	0.1	0.0	0.0	0.0	34.7

26-Mar-08	0.0	9.4	4.2	11.5	0.0	0.0	0.0	0.0	0.0	25.1
08-Apr-08	18.0	18.3	7.4	10.8	0.0	0.1	0.0	0.0	0.0	54.6
13-May-08	51.3	33.3	9.6	19.2	0.0	0.0	0.0	0.0	0.0	113.4
26-May-08	37.0	34.0	10.1	16.6	0.0	0.0	0.0	0.0	0.0	97.7
16-Jun-08	25.3	53.3	16.0	30.3	0.0	0.9	0.0	0.0	0.0	125.8
23-Jun-08	20.0	33.3	13.6	9.2	0.0	2.4	0.0	0.1	0.0	78.7
09-Jul-08	23.2	40.7	14.7	8.5	0.0	4.8	0.2	1.6	0.0	93.7
22-Jul-08	8.2	39.3	21.6	13.5	0.1	0.2	2.3	4.3	0.0	89.4
28-Jul-08	6.9	27.7	17.3	13.3	0.2	0.0	2.0	0.8	0.0	68.3
13-Aug-08	0.5	26.0	18.9	21.3	0.3	0.3	6.7	0.2	0.0	74.2
21-Aug-08	4.7	15.1	12.3	11.2	0.4	0.7	0.6	0.3	0.0	45.2
07-Sep-08	5.8	8.0	13.7	11.3	0.9	1.8	0.6	0.6	0.0	42.6
23-Sep-08	1.7	10.9	6.7	10.2	0.9	2.6	0.6	0.4	0.0	33.9
17-Oct-08	1.5	13.5	6.4	8.9	0.3	0.2	0.5	0.2	0.0	31.4
19-Nov-08	6.7	12.7	6.8	9.3	0.0	0.1	0.0	0.0	0.0	35.5
03-Dec-08	9.1	15.4	7.5	8.4	0.0	0.1	0.0	0.0	0.0	40.5
12-May-09	102.7	38.7	19.6	29.3	0.0	0.0	0.0	0.0	0.0	190.3
25-May-09	28.2	20.0	11.4	13.3	0.0	0.0	0.0	0.0	0.0	73.0
09-Jun-09	42.1	62.7	24.9	32.3	0.0	0.0	0.0	0.0	0.0	162.0
29-Jun-09	50.0	46.7	20.9	20.2	0.0	8.4	0.3	0.5	0.0	147.0
14-Jul-09	25.3	46.7	14.9	15.7	0.2	0.3	1.6	1.6	0.0	106.3
28-Jul-09	15.8	40.7	21.6	14.5	0.3	0.1	4.4	0.6	0.0	98.0
12-Aug-09	5.0	38.9	12.6	16.7	0.4	0.3	3.0	0.7	0.0	77.4
27-Aug-09	2.3	14.6	13.3	14.7	0.5	1.3	3.7	0.5	0.0	50.8
15-Sep-09	0.8	8.3	14.3	11.1	0.4	0.8	0.9	1.2	0.0	37.8
01-Oct-09	0.8	13.3	12.6	10.9	0.5	0.7	0.9	0.5	0.0	40.2
20-Oct-09	3.9	14.3	12.2	18.6	0.5	1.2	0.6	0.2	0.0	51.6
25-Nov-09	7.9	16.3	7.0	13.4	0.0	0.4	0.0	0.0	0.0	45.1
18-Dec-09	17.1	28.3	5.7	17.4	0.0	0.5	0.0	0.0	0.0	69.0
05-Feb-10	44.0	28.0	3.6	11.3	0.0	0.3	0.0	0.0	0.0	87.2
15-Apr-10	34.9	12.8	9.0	10.3	0.0	0.0	0.0	0.0	0.0	67.1
09-May-10	21.7	34.4	7.3	16.3	0.0	0.3	0.0	0.0	0.0	80.1
1-Jun-10	4.3	15.9	7.9	2.1	0.0	0.3	0.0	0.0	0.0	30.5
15-Jun-10	10.5	16.0	19.0	1.3	0.0	4.5	0.0	0.1	0.0	51.4
28-Jun-10	7.6	17.1	36.2	4.3	0.1	0.9	0.2	1.0	0.0	67.3
06-Jul-10	8.2	26.7	30.4	2.6	1.2	0.4	0.5	0.9	0.0	70.9
19-Jul-10	4.6	20.7	31.6	11.7	0.2	0.1	1.7	0.6	0.0	71.1
26-Jul-10	7.7	18.2	31.7	7.9	0.4	0.3	2.3	0.5	0.0	69.1
16-Aug-10	4.6	7.3	22.2	12.2	0.5	0.2	3.3	1.0	0.0	51.5
31-Aug-10	0.7	7.0	18.2	12.0	0.4	0.8	2.5	0.1	0.0	41.9
14-Sep-10	1.6	3.1	9.8	10.1	0.2	0.3	0.8	0.3	0.0	26.4
28-Sep-10	0.6	3.5	14.0	10.0	0.2	0.6	0.3	0.4	0.0	29.5
19-Oct-10	1.3	5.9	5.0	9.4	0.1	0.8	0.2	0.0	0.0	22.8
14-Nov-10	4.0	10.5	6.0	14.0	0.0	0.2	0.0	0.0	0.0	34.7
09-May-11	84.0	26.9	11.5	24.1	0.0	0.0	0.0	0.0	0.0	146.5
30-May-11	126.8	29.5	14.8	8.6	0.0	0.3	0.0	0.0	0.0	180.1
16-Jun-11	78.1	16.7	14.9	6.2	0.0	0.3	0.0	0.0	0.0	116.2
21-Jun-11	41.6	17.8	17.8	0.7	0.0	0.9	0.0	0.0	0.0	78.8
09-Jul-11	20.8	38.7	24.9	4.2	0.0	4.2	0.3	0.3	0.0	93.4
21-Jul-11	9.7	19.3	16.8	3.8	0.0	0.6	1.1	0.8	0.0	52.2
08-Aug-11	2.4	34.0	13.7	7.3	0.0	0.1	3.7	1.6	0.0	62.8
28-Aug-11	1.3	18.2	15.6	9.7	0.2	0.1	1.2	1.2	0.0	47.4
23-Sep-11	0.8	5.4	11.0	4.3	0.6	0.9	1.1	0.3	0.0	24.4
07-Oct-11	3.2	4.4	7.3	3.9	0.7	0.3	0.5	0.1	0.0	20.4

2-Nov-11	3.5	8.1	3.1	4.6	0.1	0.0	0.0	0.0	0.0	19.4
17-Nov-11	11.8	9.2	2.8	5.7	0.1	0.3	0.4	0.0	0.0	30.2
28-Apr-12	21.0	10.3	1.1	20.0	0.0	0.0	0.0	0.0	0.0	52.4
22-May-12	23.3	13.3	2.5	16.7	0.0	0.0	0.0	0.0	0.0	55.9
11-Jun-12	10.0	17.8	6.7	13.2	0.0	0.0	0.0	0.0	0.0	47.7
25-Jun-12	15.6	21.8	16.3	13.8	0.0	1.6	0.0	0.0	0.0	69.0
11-Jul-12	4.5	14.7	7.2	5.9	0.1	2.6	0.1	0.2	0.0	35.2
24-Jul-12	4.7	12.3	8.8	9.8	0.2	0.4	0.8	1.1	0.0	38.2
14-Aug-12	2.5	19.9	4.6	5.2	0.2	0.2	1.7	0.3	0.0	34.6
27-Aug-12	1.8	7.9	8.8	8.1	0.2	0.1	2.4	0.4	0.0	29.7
17-Sep-12	0.3	4.9	12.3	8.9	0.3	0.2	0.6	0.2	0.0	27.9
09-Oct-12	0.1	4.2	7.7	5.9	0.2	0.5	0.6	0.3	0.0	19.4
31-Oct-12	0.9	10.6	8.3	6.6	0.1	0.2	0.1	0.0	0.0	26.7
24-Nov-12	2.7	9.3	7.8	9.2	0.0	0.2	0.0	0.0	0.0	29.3
23-Apr-13	76.3	26.0	7.1	21.7	0.0	0.1	0.0	0.0	0.0	131.3
15-May-13	88.0	31.0	4.5	17.1	0.0	0.1	0.0	0.0	0.0	140.7
27-May-13	27.6	18.7	4.3	7.5	0.0	0.0	0.0	0.0	0.0	58.0
18-Jun-13	16.7	8.7	5.1	4.3	0.0	4.9	0.0	0.5	0.0	40.1
02-Jul-13	10.2	28.0	12.7	7.4	0.1	0.4	0.3	0.7	0.0	59.7
15-Jul-13	7.6	21.0	8.4	10.3	0.1	0.0	1.4	1.7	0.0	50.5
29-Jul-13	1.0	19.7	11.4	7.8	0.2	0.1	3.5	0.7	0.0	44.4
14-Aug-13	1.0	12.0	11.0	7.2	0.2	0.2	1.2	0.1	0.0	32.9
26-Aug-13	0.9	10.9	13.8	10.3	0.5	0.5	1.4	0.4	0.0	38.5
12-Sep-13	0.3	5.7	6.8	5.5	0.3	0.3	0.6	0.9	0.0	20.4
23-Sep-13	0.8	8.2	10.6	11.4	0.3	0.2	0.3	0.5	0.0	32.4
15-Oct-13	0.8	7.0	5.0	4.1	0.3	0.2	0.4	0.0	0.0	17.9
14-May-14	11.3	28.7	5.1	16.2	0.0	0.0	0.0	0.0	0.0	61.2
16-Jun-14	5.1	23.3	8.3	8.5	0.0	0.5	0.0	0.0	0.0	45.9
16-Jul-14	8.7	23.7	8.2	6.6	0.1	0.4	2.8	1.0	0.0	51.4
18-Aug-14	2.6	11.5	7.2	8.7	0.4	0.0	1.9	0.1	0.0	32.2
10-Sep-14	0.9	4.4	8.0	8.6	0.4	0.2	0.9	0.6	0.0	23.9
14-Oct-14	1.4	5.9	4.8	4.8	0.2	1.5	0.6	0.0	0.0	19.2
10-Nov-14	3.3	8.0	3.7	7.8	0.0	0.5	0.0	0.0	0.0	23.3
21-Apr-15	53.0	46.0	58.0	76.0	0.0	0.0	0.0	0.0	0.0	233.0
19-May-15	24.0	29.7	7.6	5.3	0.0	0.1	0.0	0.0	0.0	66.6
01-Jun-15	34.7	32.0	15.3	1.6	0.0	3.0	0.0	0.0	0.0	86.7
22-Jun-15	6.7	45.3	31.2	2.3	0.0	3.3	0.8	0.7	0.0	90.4
07-Jul-15	33.3	60.7	26.0	5.9	0.1	0.2	3.5	1.9	0.0	131.6
27-Jul-15	0.6	38.8	24.6	13.4	0.4	0.0	2.1	0.7	0.0	80.6
11-Aug-15	0.8	18.9	17.6	7.6	0.5	0.0	1.7	0.5	0.0	47.7
23-Aug-15	0.9	9.4	11.1	5.4	0.4	0.2	1.6	1.3	0.0	30.2
10-Sep-15	1.3	4.4	8.8	7.1	0.6	1.7	1.3	0.9	0.0	26.2
28-Sep-15	4.8	4.1	6.6	7.9	0.7	1.9	1.2	0.2	0.0	27.4
20-Oct-15	6.5	8.9	3.8	6.6	0.2	0.9	0.2	0.0	0.0	27.1
17-Nov-15	10.3	10.4	1.9	11.8	0.0	0.2	0.0	0.0	0.0	34.6
14-Dec-15	5.9	8.3	2.6	10.3	0.0	0.0	0.0	0.0	0.0	27.1
08-Mar-16	9.3	23.0	2.9	14.0	0.0	0.2	0.0	0.0	0.0	49.4
24-May-16	33.3	38.3	15.8	2.0	0.0	1.9	0.0	0.0	0.0	91.4
11-Jul-16	12.0	12.3	18.3	7.2	0.1	0.2	1.8	0.0	0.0	51.9
24-Oct-16	3.2	4.7	7.9	4.9	0.0	0.3	0.3	0.1	0.0	21.4
08-Apr-17	14.7	18.0	3.9	7.6	0.0	0.0	0.0	0.0	0.0	44.2

24-May-17	25.0	21.2	5.0	21.0	0.0	0.2	0.0	0.0	0.0	72.5
19-Jun-17	10.3	29.3	9.0	5.0	0.0	0.2	0.1	0.1	0.0	54.0
17-Jul-17	0.5	34.3	9.8	9.2	0.2	0.1	2.5	1.2	0.0	57.9
01-Aug-17	0.7	18.7	9.2	10.6	0.1	0.1	1.9	1.4	0.0	42.6
14-Aug-17	0.4	14.2	9.6	7.1	0.1	0.2	2.1	0.8	0.0	34.3
10-Sep-17	1.1	11.0	8.9	6.7	0.4	0.9	2.2	0.2	0.0	31.4
09-Oct-17	1.0	7.4	6.6	5.1	0.1	0.1	0.7	0.0	0.0	21.2
17-Nov-17	3.7	7.6	6.8	10.0	0.0	0.1	0.0	0.0	0.0	28.1
12-Dec-17	6.7	6.9	6.8	9.2	0.0	0.0	0.0	0.0	0.0	29.5
28-Feb-18	32.0	14.0	2.8	9.8	0.0	0.0	0.0	0.0	0.0	58.7

Table 8. Skaha Lake zooplankton biomass 2005-2017. Units are μgL^{-1} dry weight. Data from 2005-13 are updated from Hyatt et al. (2017b). Rotifers were not enumerated before 2008.

	Rotifer total	Nauplii total	D. thomasi adults & copepodids	L. ashlandi adults & copepodids	Epischura	Bosmina	Daphnia	Diaphanosoma	Leptodora	Total
27-Apr-05		1.2	5.1	11.6	0	0	0	0	0	17.9
19-May-05		5.6	28	48.2	1.2	0	0	0	0	83
09-Jun-05		6.6	16.1	65.7	0.2	1.2	0	0.1	0	90.1
22-Jun-05		5.3	21.2	53.3	1.8	4.9	2.2	3.3	0	92
14-Jul-05		6	29.3	57.8	6.3	1.8	38.3	3.5	1	144
03-Aug-05		8.3	30.7	39.7	5.9	0.7	73.6	3.3	0.3	162.6
25-Aug-05		3.2	25.4	45.7	4.2	2.7	28.8	0.9	0.2	111
14-Sep-05		1.6	17.8	32.9	4.6	1.6	3	1.6	0	63.1
07-Oct-05		2.6	18.8	37.8	6.7	1	2.5	1.8	0	71.3
02-Nov-05		2.4	18	24	0.6	0.3	0.3	0.1	0	45.8
21-Nov-05		1.6	17.7	25.6	0.1	0.5	0	0	0	45.5
26-Apr-06		12.9	23.8	49.4	0.0	0.8	0.0	0.0	0.0	86.9
24-May-06		5.2	19.8	3.7	0.3	0.4	0.0	0.0	0.0	29.4
13-Jun-06		3.5	45.5	7.5	0.1	10.9	0.3	0.0	0.0	67.9
29-Jun-06		4.9	91.0	17.9	1.1	1.6	5.0	0.1	0.1	121.6
24-Jul-06		10.3	105.8	30.0	0.4	0.1	16.6	4.9	0.0	168.1
31-Aug-06		3.0	85.7	37.2	12.9	3.1	7.1	0.6	0.8	150.4
06-Sep-06		2.4	83.2	57.4	16.6	3.7	6.3	1.5	0.1	171.1
28-Sep-06		5.0	81.1	68.4	12.6	5.5	5.0	6.5	0.0	184.2
25-Oct-06		3.4	34.9	31.4	5.3	0.6	1.0	0.6	0.0	77.2
19-Dec-06		2.0	38.4	32.9	0.0	0.9	0.1	0.0	0.0	74.2
13-Mar-07		3.4	27.1	25.3	0.0	0.3	0.0	0.0	0.0	56.2
18-Apr-07		3.9	13.5	20.4	0.0	0.0	0.0	0.0	0.0	37.8
16-May-07		6.0	26.6	61.8	0.0	0.0	0.0	0.0	0.0	94.4
14-Jun-07		7.2	52.2	44.0	1.8	2.7	0.0	0.3	0.0	108.2
26-Jun-07		6.9	66.5	57.8	1.1	5.6	0.6	1.5	0.5	140.6
12-Jul-07		9.5	103.9	58.5	13.6	1.4	10.5	29.0	1.8	228.3
25-Jul-07		4.2	72.5	34.9	13.3	0.4	22.4	5.5	0.4	153.6
15-Aug-07		4.0	33.7	42.8	12.0	0.2	46.3	3.8	0.0	142.7
28-Aug-07		3.3	39.2	37.8	13.9	0.9	5.7	4.5	0.0	105.5
12-Sep-07		4.5	57.2	46.3	10.7	5.4	17.6	6.1	0.0	147.9
24-Sep-07		4.3	46.4	54.2	13.8	7.8	15.2	1.7	0.0	143.4
24-Oct-07		2.6	31.3	43.8	1.9	0.0	0.7	0.5	0.0	80.9
19-Nov-07		2.1	39.5	26.5	0.3	0.3	0.0	0.0	0.0	68.7
08-Jan-08	0.0	3.4	24.4	28.8	0.0	0.3	0.0	0.0	0.0	56.9
26-Mar-08	0.0	2.7	13.1	36.9	0.0	0.0	0.0	0.0	0.0	52.7
08-Apr-08	2.9	4.3	22.5	35.0	0.0	0.3	0.0	0.0	0.0	65.0
13-May-08	7.0	7.5	22.8	75.8	0.0	0.0	0.0	0.0	0.0	113.1
26-May-08	4.4	6.2	24.4	58.3	0.0	0.0	0.0	0.0	0.0	93.4
16-Jun-08	3.4	9.8	36.5	117.8	0.1	1.4	0.0	0.0	0.0	169.0
23-Jun-08	2.8	6.4	29.6	33.7	0.1	4.2	0.1	0.6	0.0	77.5
09-Jul-08	3.1	7.7	36.3	36.7	0.9	6.1	2.1	8.9	0.3	102.0
22-Jul-08	1.1	7.1	60.5	55.9	4.1	0.3	19.7	23.9	1.2	173.7
28-Jul-08	0.9	5.1	50.6	52.4	5.2	0.1	25.7	4.9	1.1	145.9

13-Aug-08	0.1	5.1	53.2	71.2	4.8	0.5	90.0	1.4	0.0	226.4
21-Aug-08	0.5	2.7	34.0	45.1	6.8	1.5	9.9	1.5	0.0	101.9
07-Sep-08	0.6	1.6	36.3	47.1	12.7	3.4	5.8	3.3	0.0	110.8
23-Sep-08	0.2	2.5	18.6	48.0	15.9	4.6	5.6	2.5	0.0	97.9
17-Oct-08	0.2	3.3	18.3	33.3	6.2	0.4	3.4	0.9	0.0	66.0
19-Nov-08	0.7	2.8	22.4	34.2	0.1	0.1	0.0	0.0	0.0	60.3
03-Dec-08	0.9	2.8	29.1	31.7	0.0	0.3	0.0	0.0	0.0	64.7
12-May-09	15.7	8.8	34.8	97.0	0.0	0.0	0.0	0.0	0.0	156.2
25-May-09	4.0	5.5	30.1	63.3	0.0	0.0	0.0	0.0	0.0	102.9
09-Jun-09	5.5	13.4	62.2	116.9	0.1	0.2	0.0	0.0	0.0	198.3
29-Jun-09	6.2	9.1	54.9	79.1	0.4	12.5	1.7	2.7	0.0	166.5
14-Jul-09	3.3	8.6	37.9	64.8	4.1	0.5	16.7	9.6	0.8	146.1
28-Jul-09	2.0	7.8	53.3	62.0	4.8	0.1	54.2	3.6	0.5	188.3
12-Aug-09	0.5	6.7	26.2	73.3	7.2	0.4	40.4	3.9	0.6	159.3
27-Aug-09	0.2	2.5	36.0	63.9	5.6	2.8	48.5	2.7	0.0	162.2
15-Sep-09	0.1	1.6	37.5	54.3	7.1	1.3	11.0	6.8	0.0	119.7
01-Oct-09	0.1	2.3	30.9	50.9	6.9	1.3	8.5	2.7	0.2	103.6
20-Oct-09	0.5	2.2	32.0	71.7	7.7	2.0	5.2	1.0	0.0	122.2
25-Nov-09	0.7	2.6	25.9	39.4	0.2	0.9	0.0	0.0	0.0	69.7
18-Dec-09	1.4	4.0	21.0	43.8	0.0	1.2	0.0	0.0	0.0	71.5
5-Feb-10	5.5	4.1	15.4	22.1	0.0	0.9	0.0	0.0	0.0	48.1
15-Apr-10	6.5	2.6	11.0	28.0	0.0	0.0	0.0	0.0	0.0	48.0
9-May-10	2.8	6.3	9.1	48.9	0.0	0.0	0.0	0.0	0.0	67.0
1-Jun-10	0.5	2.5	10.9	6.6	0.2	0.6	0.1	0.0	0.0	21.3
15-Jun-10	1.2	3.2	33.9	6.5	0.1	8.8	0.2	0.3	0.0	54.1
28-Jun-10	0.9	3.6	63.3	9.5	1.7	2.1	1.1	4.3	0.6	87.1
06-Jul-10	1.0	5.7	59.2	9.4	2.2	0.6	4.3	4.4	0.0	86.8
19-Jul-10	0.8	4.7	77.2	27.9	3.1	0.1	17.3	3.2	0.9	135.2
26-Jul-10	0.9	3.4	77.9	22.4	3.4	0.4	33.1	3.1	1.9	146.5
16-Aug-10	0.5	1.4	51.3	38.5	8.9	0.7	63.3	5.9	0.4	170.8
31-Aug-10	0.1	1.1	49.3	38.3	6.7	1.4	46.3	0.8	0.1	144.2
14-Sep-10	0.2	0.6	24.4	42.4	3.8	0.7	9.2	1.9	0.0	83.2
28-Sep-10	0.0	0.6	36.6	39.7	3.9	1.0	2.4	2.0	0.5	86.8
19-Oct-10	0.1	1.0	12.5	40.9	1.9	1.5	1.3	0.2	0.0	59.2
14-Nov-10	0.3	1.6	21.8	48.8	0.3	0.2	0.2	0.1	0.0	73.1
09-May-11	9.0	5.0	21.4	52.2	0.0	0.0	0.0	0.0	0.0	87.6
30-May-11	13.4	4.1	27.0	25.4	0.0	0.3	0.0	0.0	0.0	70.3
16-Jun-11	7.4	3.0	34.3	34.9	0.0	0.5	0.0	0.1	0.0	80.2
21-Jun-11	4.3	2.9	40.2	4.2	0.0	1.7	0.1	0.0	0.0	53.4
09-Jul-11	2.4	5.6	53.8	13.4	0.8	5.4	1.4	1.2	0.0	83.9
21-Jul-11	0.8	3.2	38.7	11.5	0.3	1.0	7.0	4.1	0.0	66.7
08-Aug-11	0.2	4.8	33.1	20.1	1.2	0.1	36.8	7.7	0.5	104.5
28-Aug-11	0.1	2.9	39.0	31.0	2.4	0.1	17.1	6.4	0.3	99.3
23-Sep-11	0.1	0.8	28.4	14.5	6.9	1.1	16.4	1.9	0.0	70.2
07-Oct-11	0.3	0.6	20.7	17.3	12.3	0.4	5.1	0.8	0.0	57.3
2-Nov-11	0.3	1.2	10.1	17.8	2.4	0.0	0.3	0.1	0.0	32.1
17-Nov-11	0.7	1.4	6.8	17.3	1.3	0.4	1.3	0.1	0.0	29.2
28-Apr-12	3.3	2.9	3.8	56.8	0.0	0.0	0.0	0.0	0.0	66.8
22-May-12	2.8	2.7	4.8	54.2	0.1	0.0	0.0	0.0	0.0	64.6
11-Jun-12	1.2	3.7	12.8	43.1	0.8	0.1	0.0	0.0	0.0	61.6
25-Jun-12	1.7	4.1	40.4	55.1	0.3	3.9	0.1	0.3	0.0	105.9
11-Jul-12	0.5	2.8	22.4	19.6	2.8	3.6	0.7	1.3	0.1	53.8
24-Jul-12	0.4	2.7	27.4	31.6	4.2	0.8	6.6	6.4	0.1	80.0
14-Aug-12	0.2	3.8	13.1	16.8	4.3	0.3	26.3	2.0	0.3	67.2
27-Aug-12	0.2	1.4	20.3	28.2	4.4	0.2	56.0	2.6	0.0	113.3
17-Sep-12	0.0	0.8	32.7	29.7	6.6	0.4	9.5	1.1	0.0	80.7
09-Oct-12	0.0	0.9	16.8	27.9	3.3	1.0	6.7	1.6	0.2	58.4

31-Oct-12	0.1	2.1	22.6	26.3	1.6	0.4	0.8	0.2	0.0	54.1
24-Nov-12	0.2	1.6	29.5	36.5	0.2	0.5	0.0	0.1	0.0	68.5
23-Apr-13	15.0	6.4	17.2	101.8	0.0	0.4	0.0	0.0	0.0	140.9
15-May-13	11.5	6.2	13.9	57.6	0.5	0.1	0.0	0.0	0.0	89.8
27-May-13	3.3	3.2	13.8	33.4	0.2	0.0	0.0	0.0	0.0	53.9
18-Jun-13	1.4	1.3	7.7	8.6	0.3	7.0	0.1	2.3	0.0	28.7
02-Jul-13	1.2	5.9	48.1	19.9	1.8	1.0	2.9	3.7	0.0	84.5
15-Jul-13	0.6	3.2	12.2	13.9	1.2	0.0	7.5	7.3	0.0	46.0
29-Jul-13	0.1	2.9	18.1	15.5	2.9	0.1	37.2	3.9	0.3	80.9
14-Aug-13	0.1	1.6	19.6	13.5	2.7	0.3	16.3	0.4	0.2	54.6
26-Aug-13	0.1	1.5	17.2	20.6	4.0	0.5	14.8	1.5	0.1	60.3
12-Sep-13	0.0	0.7	10.5	11.9	2.8	0.4	5.3	3.6	0.0	35.1
23-Sep-13	0.1	1.1	16.1	30.6	3.5	0.2	3.5	2.6	0.0	57.6
15-Oct-13	0.1	1.3	13.3	14.8	5.8	0.5	3.9	0.2	0.0	39.9
14-May-14	1.7	4.3	10.2	46.3	0.0	0.0	0.0	0.0	0.0	62.5
16-Jun-14	2.5	4.0	15.7	25.3	0.2	0.8	0.3	0.2	0.0	48.9
16-Jul-14	0.9	4.4	22.3	17.6	3.3	0.7	32.7	5.6	0.0	87.6
18-Aug-14	0.3	1.9	16.7	21.6	3.3	0.0	22.2	0.7	0.2	66.9
10-Sep-14	0.1	0.7	16.0	27.7	4.3	0.3	6.8	2.9	0.0	58.8
14-Oct-14	0.1	1.1	12.3	17.7	3.3	3.7	4.2	0.1	0.0	42.4
10-Nov-14	0.4	1.7	11.9	27.5	0.9	1.0	0.0	0.1	0.0	43.4
21-Apr-15	3.6	2.4	11.5	60.2	0.0	0.0	0.0	0.0	0.0	77.7
19-May-15	2.8	4.3	20.5	19.1	0.0	0.2	0.0	0.0	0.0	46.9
01-Jun-15	3.7	5.1	30.9	6.6	0.0	6.6	0.0	0.0	0.0	53.0
22-Jun-15	0.7	7.2	51.2	6.4	0.8	5.0	4.6	2.5	0.0	78.5
07-Jul-15	2.9	9.3	41.3	9.0	1.5	0.3	32.7	8.8	0.1	105.7
27-Jul-15	0.1	5.6	41.5	29.4	7.0	0.0	26.9	3.8	0.0	114.3
11-Aug-15	0.1	3.3	39.3	21.9	4.7	0.1	24.3	2.5	0.0	96.2
23-Aug-15	0.1	1.4	22.7	16.6	3.1	0.4	15.7	6.2	0.0	66.1
10-Sep-15	0.1	0.7	19.4	26.7	6.2	2.6	13.4	4.3	0.0	73.5
28-Sep-15	0.4	0.8	15.5	36.2	9.9	3.0	8.0	1.1	0.0	75.0
20-Oct-15	1.4	1.8	11.3	30.0	3.5	1.5	2.1	0.0	0.0	51.6
17-Nov-15	0.9	2.2	6.7	31.3	0.5	0.4	0.0	0.0	0.0	42.1
14-Dec-15	0.5	1.5	9.1	23.9	0.2	0.0	0.0	0.0	0.0	35.1
08-Mar-16	1.0	5.7	5.8	33.9	0.0	6.8	0.0	0.0	0.0	53.1
24-May-16	3.5	6.7	47.5	9.5	0.0	3.4	0.4	0.0	0.0	71.0
11-Jul-16	1.4	2.3	46.9	21.5	1.4	0.8	18.8	3.8	0.4	97.3
24-Oct-16	0.3	0.9	23.4	18.2	0.5	0.6	2.0	0.4	0.0	46.2
08-Apr-17	1.5	3.9	10.3	25.3	0.0	0.0	0.0	0.0	0.0	41.0
24-May-17	2.3	3.4	8.1	47.5	0.4	0.3	0.0	0.0	0.0	61.9
19-Jun-17	1.1	5.2	17.8	20.0	0.1	0.4	0.4	0.4	0.0	45.4
17-Jul-17	0.1	5.8	28.4	19.1	3.9	0.1	23.0	5.4	0.0	85.8
01-Aug-17	0.2	3.8	26.2	24.2	2.6	0.1	22.3	7.5	0.5	87.3
14-Aug-17	0.0	2.6	22.9	16.7	1.7	0.3	22.6	4.0	0.1	70.8
10-Sep-17	0.1	1.6	20.6	23.1	5.1	1.1	21.4	1.1	0.1	74.2
09-Oct-17	0.1	1.3	16.3	22.6	2.7	0.2	5.9	0.2	0.0	49.3
17-Nov-17	0.2	1.6	20.9	26.9	0.5	0.1	0.1	0.1	0.0	50.4
12-Dec-17	0.6	1.0	21.0	24.3	0.0	0.1	0.0	0.0	0.0	47.1
28-Feb-18	3.8	2.2	9.9	21.7	0.0	0.0	0.0	0.0	0.0	37.5

Table 9. Skaha Lake zooplankton eggs L^{-1} (2005-2017).

Date	Diacyclops	Leptodiaptomus	Bosmina	Diaphanosoma	Daphnia
27-Apr-05	0.6154	1.2302	0.0000	0.0000	0.0000
19-May-05	0.5714	2.1333	0.0000	0.0000	0.0000
09-Jun-05	0.0000	2.5000	0.0000	0.0000	0.0000
22-Jun-05	1.5000	1.3333	0.0000	0.0000	0.0000
14-Jul-05	0.0000	1.6667	0.0000	0.0000	0.0000
03-Aug-05	0.0000	0.7778	0.0000	0.0000	0.0000
25-Aug-05	0.0000	0.8333	0.0000	0.0000	0.0000
14-Sep-05	0.0000	2.8889	0.0000	0.0667	0.0000
07-Oct-05	0.2000	2.6667	0.1250	0.0898	0.0000
02-Nov-05	0.0000	2.5555	0.0000	0.0000	0.0000
21-Nov-05	2.1667	1.6667	0.0556	0.0000	0.0000
26-Apr-06	0.000	2.933	0.067	0.000	0.000
24-May-06	0.143	0.000	0.307	0.000	0.002
13-Jun-06	0.556	0.405	0.667	0.000	0.040
29-Jun-06	2.667	0.000	0.444	0.002	0.750
24-Jul-06	0.000	5.041	0.000	0.082	0.329
31-Aug-06	0.000	0.833	0.667	0.023	0.069
06-Sep-06	2.667	2.000	0.000	0.039	0.098
28-Sep-06	2.000	0.167	0.000	0.100	0.000
25-Oct-06	0.000	0.833	0.074	0.000	0.030
19-Dec-06	0.000	0.000	0.000	0.000	0.000
13-Mar-07	0.889	1.333	0.000	0.000	0.000
18-Apr-07	2.025	0.508	0.000	0.000	0.000
16-May-07	3.583	3.167	0.000	0.000	0.000
14-Jun-07	1.387	0.980	1.145	0.059	0.000
26-Jun-07	2.667	5.111	0.167	0.124	0.072
12-Jul-07	4.000	1.556	0.333	1.167	0.595
25-Jul-07	0.000	0.000	0.083	0.622	0.667
15-Aug-07	0.000	0.000	0.000	0.111	0.111
28-Aug-07	0.000	0.111	0.111	0.000	0.067
12-Sep-07	0.000	1.833	1.333	0.359	0.476
24-Sep-07	0.667	3.500	1.333	0.111	0.194
24-Oct-07	1.111	3.222	0.000	0.006	0.004
19-Nov-07	1.333	0.733	0.056	0.000	0.000
08-Jan-08	2.917	2.333	0.111	0.000	0.000
26-Mar-08	0.000	0.000	0.000	0.000	0.000
08-Apr-08	0.267	1.000	0.042	0.000	0.000

13-May-08	0.286	10.400	0.000	0.000	0.000
26-May-08	1.238	1.333	0.000	0.000	0.000
16-Jun-08	0.800	9.667	0.286	0.020	0.008
23-Jun-08	2.381	0.667	1.600	0.200	0.008
09-Jul-08	0.364	0.000	0.000	1.016	0.047
22-Jul-08	0.889	0.000	0.095	0.667	0.286
28-Jul-08	1.778	0.000	0.000	0.222	0.292
13-Aug-08	0.000	0.000	0.133	0.008	0.000
21-Aug-08	0.000	2.286	0.121	0.056	0.000
07-Sep-08	0.000	2.833	1.000	0.150	0.083
23-Sep-08	0.000	2.667	0.333	0.152	0.182
17-Oct-08	0.000	0.222	0.152	0.000	0.122
19-Nov-08	2.667	0.333	0.019	0.000	0.000
03-Dec-08	3.111	0.000	0.058	0.000	0.000
26-Mar-09	0.000	0.000	0.000	0.000	0.000
14-Apr-09	0.000	0.000	0.000	0.000	0.000
12-May-09	0.000	11.555	0.000	0.000	0.000
25-May-09	1.905	0.800	0.000	0.000	0.000
09-Jun-09	8.444	0.000	0.082	0.000	0.000
29-Jun-09	0.000	2.444	1.333	0.373	0.147
14-Jul-09	0.533	3.556	0.000	0.600	0.400
28-Jul-09	0.400	0.000	0.121	0.216	0.667
12-Aug-09	1.048	0.000	0.095	0.022	0.267
27-Aug-09	0.000	0.000	1.083	0.123	1.000
15-Sep-09	0.000	0.889	0.154	0.111	0.167
01-Oct-09	0.000	3.444	0.095	0.000	0.250
20-Oct-09	1.067	2.667	0.267	0.019	0.076
25-Nov-09	3.444	1.444	0.222	0.000	0.000
18-Dec-09	2.571	0.571	0.762	0.000	0.000
05-Feb-10	9.111	7.809	0.619	0.000	0.000
15-Apr-10	9.861	7.159	0.000	0.000	0.000
09-May-10	1.024	4.500	0.999	0.000	0.000
01-Jun-10	3.614	2.081	0.343	0.012	0.002
15-Jun-10	5.000	4.470	2.722	0.019	0.000
28-Jun-10	1.278	12.871	0.356	0.229	0.024
06-Jul-10	0.419	2.372	0.233	0.658	0.252
19-Jul-10	1.556	1.037	0.000	0.000	0.942
26-Jul-10	0.000	4.704	0.000	0.112	0.476
16-Aug-10	0.000	0.222	0.000	0.214	0.667
31-Aug-10	0.000	0.727	0.364	0.149	0.560
14-Sep-10	0.000	0.000	0.108	0.067	0.051
28-Sep-10	0.000	5.361	0.333	0.052	0.062
19-Oct-10	0.000	7.933	0.000	0.000	0.000
14-Nov-10	0.000	2.000	0.000	0.000	0.000
09-May-11	4.955	5.786	0.000	0.000	0.000
30-May-11	3.615	27.672	0.000	0.000	0.000
16-Jun-11	1.048	1.067	0.410	0.008	0.000

21-Jun-11	4.222	7.556	1.075	0.000	0.000
09-Jul-11	5.000	1.889	0.444	0.056	0.103
21-Jul-11	0.400	7.550	0.185	0.042	0.437
08-Aug-11	5.407	3.037	0.074	0.000	0.267
28-Aug-11	2.274	1.487	0.256	0.051	0.308
23-Sep-11	0.300	0.467	0.048	0.167	0.367
07-Oct-11	0.000	1.167	0.044	0.123	0.000
2-Nov-11	0.000	5.444	0.000	0.000	0.000
17-Nov-11	0.481	6.222	0.099	0.000	0.105
28-Apr-12	3.286	1.462	0.000	0.000	0.000
22-May-12	0.000	12.095	0.000	0.000	0.000
11-Jun-12	3.200	4.367	0.024	0.000	0.000
25-Jun-12	8.500	2.250	2.500	0.034	0.000
11-Jul-12	0.815	0.623	0.778	0.133	0.048
24-Jul-12	8.500	7.333	0.176	0.833	1.583
14-Aug-12	0.783	0.357	0.078	0.226	0.357
27-Aug-12	0.712	0.649	0.111	0.027	0.462
17-Sep-12	0.000	0.000	0.012	0.018	0.155
09-Oct-12	0.000	3.061	0.197	0.032	0.173
31-Oct-12	0.000	0.778	0.078	0.002	0.015
24-Nov-12	2.167	4.958	0.159	0.004	0.000
23-Apr-13	16.593	6.519	0.000	0.000	0.000
15-May-13	3.333	10.444	0.000	0.000	0.000
27-May-13	5.641	8.037	0.000	0.000	0.000
18-Jun-13	3.072	2.851	1.111	1.078	0.000
02-Jul-13	5.532	3.280	0.042	0.725	0.232
15-Jul-13	3.952	4.000	0.012	0.619	0.296
29-Jul-13	1.042	1.450	0.028	0.105	0.709
14-Aug-13	2.105	1.739	0.063	0.020	0.296
26-Aug-13	1.598	0.143	0.167	0.117	0.074
12-Sep-13	0.444	0.806	0.095	0.333	0.194
23-Sep-13	0.000	1.648	0.030	0.037	0.071
15-Oct-13	1.083	7.167	0.058	0.006	0.123
14-May-14	2.143	5.857	0.000	0.000	0.000
16-Jun-14	1.920	1.653	0.000	0.000	0.000
16-Jul-14	0.635	1.000	0.000	0.000	0.288
18-Aug-14	0.000	0.310	0.000	0.000	0.024
10-Sep-14	0.000	0.921	0.000	0.000	0.095
14-Oct-14	0.000	2.621	0.000	0.000	0.034
10-Nov-14	2.033	5.900	0.000	0.000	0.000
21-Apr-15	0.000	0.000	0.000	0.000	0.000
19-May-15	2.000	3.111	0.000	0.000	0.000
01-Jun-15	10.000	2.500	0.000	0.000	0.067
22-Jun-15	0.427	4.080	0.000	0.000	0.462
07-Jul-15	0.497	0.655	0.000	0.000	0.425
27-Jul-15	0.081	0.768	0.000	0.020	0.298

11-Aug-15	0.065	0.992	0.000	0.049	0.232
23-Aug-15	0.000	0.316	0.000	0.026	0.173
10-Sep-15	0.000	0.194	0.056	0.056	0.074
28-Sep-15	0.182	3.818	0.152	0.000	0.000
20-Oct-15	0.278	7.111	0.000	0.000	0.000
17-Nov-15	1.429	7.714	0.000	0.000	0.000
14-Dec-15	1.733	2.667	0.000	0.000	0.000
08-Mar-16	0.000	0.000	0.000	0.000	0.000
24-May-16	2.190	6.571	0.000	0.000	0.105
11-Jul-16	1.400	2.267	0.000	0.033	0.033
24-Oct-16	4.778	8.611	0.000	0.000	0.000
08-Apr-17	2.222	5.333	0.000	0.000	0.000
24-May-17	2.167	7.685	0.000	0.000	0.000
19-Jun-17	3.466	5.600	0.038	0.024	0.107
17-Jul-17	3.176	4.785	0.008	0.314	0.902
01-Aug-17	0.711	1.422	0.000	0.178	0.044
14-Aug-17	0.370	0.611	0.000	0.075	0.204
10-Sep-17	0.709	0.375	0.042	0.066	0.209
09-Oct-17	0.000	3.905	0.000	0.000	0.115
17-Nov-17	2.095	10.518	0.008	0.000	0.000
12-Dec-17	1.857	3.571	0.022	0.000	0.000
28-Feb-18	2.665	2.845	0.000	0.000	0.000

SKAHA LAKE *MYSIS DILUVIANA*

Table 10. Skaha Lake 2005-2017 *Mysis diluviana* density. Units are numbers m^{-3}. Data from 2005-13 are updated from Hyatt et al. (2017b). nd = no data

	embryos	juvenile	immature male	adult male	immature female	adult female	Adult female–released eggs	gravid female	total
06-Jun-05	0.00	1.55	1.34	0.01	0.92	0.07	0.00	0.00	**3.89**
14-Jul-05	0.00	0.17	0.47	0.00	0.55	0.03	0.00	0.00	**1.22**
04-Aug-05	0.00	0.10	0.66	0.26	0.89	0.13	0.00	0.00	**2.04**
14-Sept-05	0.00	0.01	0.39	0.90	0.29	0.46	0.00	0.00	**2.05**
07-Oct-05	0.00	0.01	0.16	0.62	0.33	0.70	0.05	0.02	**1.90**
02-Nov-05	9.12	0.00	0.10	0.90	0.07	0.62	0.13	0.53	**11.46**
21-Nov-05	25.24	0.00	0.20	0.97	0.11	0.23	0.20	1.39	**28.34**
20-Jan-06	0.88	0.16	0.03	0.02	0.00	0.00	0.07	0.07	**1.22**
28-Mar-06	1.00	1.37	0.03	0.01	0.02	0.10	0.07	0.08	**2.68**
26-Apr-06	0.05	1.85	0.03	0.02	0.04	0.23	0.03	0.01	**2.27**
24-May-06	0.08	4.16	1.14	0.02	1.58	0.22	0.02	0.00	**7.22**
29-Jun-06	0.00	0.55	1.53	0.01	1.62	0.15	0.00	0.00	**3.86**
31-Jul-06	0.00	0.03	1.08	0.04	1.20	0.11	0.00	0.00	**2.46**
17-Aug-06	0.00	0.01	0.70	0.16	0.54	0.19	0.00	0.00	**1.60**
28-Sep-06	0.49	0.00	0.09	0.53	0.24	0.56	0.00	0.03	**1.94**
25-Oct-06	2.46	0.00	0.12	0.97	0.12	0.81	0.00	0.23	**4.71**
19-Dec-06	5.73	0.00	0.08	0.08	0.07	0.03	0.05	0.47	**6.51**
07-Mar-07	3.21	0.49	0.04	0.08	0.03	0.09	0.17	0.31	**4.43**
16-May-07	0.25	2.32	0.10	0.01	0.10	0.15	0.02	0.02	**2.95**
14-Jun-07	0.00	1.80	0.90	0.01	1.10	0.17	0.00	0.01	**3.98**
12-Jul-07	0.00	0.41	1.24	0.00	1.30	0.12	0.00	0.00	**3.07**
28-Aug-07	0.00	0.01	0.62	0.18	0.68	0.10	0.00	0.00	**1.59**
24-Sep-07	0.12	0.00	0.38	0.59	0.53	0.43	0.02	0.01	**2.07**
19-Nov-07	16.90	0.00	0.28	1.10	0.14	0.51	0.24	0.97	**20.14**
08-Jan-08	7.22	0.01	0.14	0.23	0.12	0.02	0.16	0.59	**8.49**
23-Mar-08	3.09	1.95	0.12	0.00	0.05	0.14	0.11	0.20	**5.67**
08-Apr-08	0.60	1.85	0.05	0.00	0.04	0.08	0.02	0.05	**2.69**
13-May-08	0.00	1.86	0.10	0.00	0.08	0.11	0.00	0.00	**2.14**
12-Jun-08	0.00	2.10	1.31	0.00	1.47	0.40	0.00	0.00	**5.28**
09-Jul-08	0.00	0.45	1.40	0.01	1.66	0.13	0.00	0.00	**3.64**
13-Aug-08	0.00	0.04	1.16	0.11	1.16	0.12	0.00	0.00	**2.59**
23-Sep-08	0.00	0.02	0.29	0.91	0.42	0.60	0.00	0.00	**2.25**
19-Nov-08	8.69	0.00	0.20	0.85	0.18	0.25	0.06	0.62	**10.85**
12-Dec-08	11.60	0.00	0.18	0.54	0.19	0.18	0.10	0.81	**13.59**
26-Mar-09	2.43	0.39	0.12	0.00	0.05	0.03	0.11	0.19	**3.31**
14-Apr-09	0.56	1.22	0.05	0.00	0.04	0.09	0.05	0.05	**2.06**
12-May-09	0.17	1.36	0.02	0.01	0.02	0.08	0.01	0.01	**1.69**
09-Jun-09	0.07	2.74	0.29	0.00	0.34	0.10	0.01	0.01	**3.56**
14-Jul-09	0.00	1.10	1.42	0.01	1.52	0.17	0.00	0.00	**4.21**
12-Aug-09	0.00	0.18	0.93	0.02	0.92	0.08	0.00	0.00	**2.13**

15-Sep-09	0.00	0.04	0.60	0.42	0.54	0.21	0.00	0.00	**1.79**
20-Oct-09	2.75	0.01	0.35	0.74	0.62	0.93	0.00	0.20	**5.60**
01-Dec-09	7.16	0.00	0.13	0.43	0.13	0.12	0.04	0.53	**8.55**
18-Dec-09	6.58	0.00	0.15	0.37	0.10	0.05	0.01	0.51	**7.78**
15-Feb-10	2.43	0.11	0.03	0.00	0.03	0.00	0.00	0.21	**2.81**
15-Apr-10	0.05	3.30	0.06	0.01	0.10	0.34	0.01	0.01	**3.89**
10-May-10	0.07	3.83	0.19	0.01	0.14	0.10	0.01	0.01	**4.35**
15-Jun-10	0.00	1.13	1.26	0.01	1.44	0.31	0.00	0.00	**4.14**
17-Aug-10	0.00	0.03	1.25	0.20	1.15	0.29	0.00	0.00	**2.92**
28-Sep-10	0.12	0.01	0.32	0.64	0.49	0.67	0.00	0.01	**2.27**
14-Nov-10	12.53	0.00	0.20	1.36	0.23	0.65	0.02	0.90	**15.90**
14-Dec-10	7.57	0.00	0.18	0.30	0.09	0.17	0.18	0.60	**9.08**
07-Mar-11	3.74	0.74	0.08	0.07	0.04	0.03	0.16	0.34	**5.20**
09-May-11	1.45	2.43	0.07	0.01	0.09	0.28	0.01	0.13	**4.46**
15-Jun-11	0.31	5.83	1.81	0.00	2.32	0.45	0.00	0.01	**10.75**
08-Aug-11	0.00	0.26	2.24	0.10	2.23	0.31	0.00	0.00	**5.15**
23-Sep-11	0.00	0.01	0.56	0.46	0.64	0.37	0.00	0.00	**2.03**
17-Nov-11	16.90	0.00	0.60	1.88	0.46	0.61	0.07	1.26	**21.77**
20-Dec-11	17.28	0.00	0.37	0.63	0.32	0.14	0.37	1.33	**20.44**
01-Mar-12	10.78	0.72	0.44	0.01	0.41	0.09	0.50	0.74	**13.69**
11-Jun-12	0.23	3.46	1.35	0.07	1.54	0.64	0.00	0.02	**7.31**
25-Jun-12	0.10	1.86	2.46	0.01	2.68	0.54	0.01	0.01	**7.69**
24-Jul-12	0.07	0.51	2.60	0.01	2.12	0.65	0.00	0.01	**5.97**
21-Aug-12	0.00	0.05	1.58	0.29	1.45	0.46	0.00	0.00	**3.83**
25-Sep-12	0.09	0.02	0.50	0.94	0.76	0.69	0.00	0.01	**3.00**
31-Oct-12	5.04	0.01	0.56	0.72	0.82	1.32	0.03	0.42	**8.93**
26-Jan-13	5.22	0.02	0.23	0.01	0.21	0.02	0.02	0.45	**6.18**
23-Apr-13	0.32	1.82	0.18	0.00	0.16	0.25	0.01	0.04	**2.79**
29-May-13	0.00	3.52	1.65	0.00	1.89	0.24	0.00	0.00	**7.31**
02-Jul-13	0.00	0.72	1.69	0.00	1.74	0.24	0.01	0.00	**4.39**
29-Jul-13	0.00	0.24	2.24	0.11	2.01	0.66	0.00	0.00	**5.26**
11-Sep-13	0.00	0.02	0.44	0.65	0.38	0.38	0.00	0.00	**1.87**
13-Nov-13	7.39	0.00	0.34	0.57	0.13	0.36	0.25	0.32	**9.36**
13-Mar-14	7.32	1.32	0.24	0.01	0.15	0.15	0.08	0.58	**9.85**
03-Jun-14	0.00	4.39	1.70	0.01	1.67	0.48	0.01	0.00	**8.27**
28-Jul-14	0.00	0.17	2.75	0.12	2.57	0.83	0.00	0.00	**6.44**
08-Sep-14	0.00	0.00	0.51	0.55	0.40	0.41	0.00	0.01	**1.88**
15-Dec-14	0.00	0.00	0.37	0.79	0.29	0.07	0.07	1.26	**2.84**
02-Mar-15	nd	0.71	0.32	0.03	0.30	0.17	0.20	0.42	**2.16**
20-Apr-15	nd	2.70	0.17	0.03	0.21	0.37	0.02	0.10	**3.59**
01-Jun-15	nd	1.48	1.07	0.00	0.97	0.32	0.00	0.00	**3.85**
07-Jul-15	nd	0.16	0.89	0.01	1.31	0.23	0.00	0.00	**2.60**
27-Jul-15	nd	0.09	1.27	0.05	1.14	0.16	0.00	0.00	**2.71**
27-Aug-15	nd	0.07	1.17	0.23	0.84	0.26	0.00	0.00	**2.56**
10-Sep-15	nd	0.01	0.11	0.34	0.37	0.17	0.00	0.00	**1.00**
20-Oct-15	nd	0.00	0.15	0.96	0.13	0.92	0.01	0.17	**2.35**
17-Nov-15	nd	0.00	0.15	0.63	0.10	0.45	0.12	0.65	**2.11**
14-Dec-15	nd	0.00	0.07	0.47	0.01	0.17	0.21	0.50	**1.43**
08-Mar-16	4.54	0.92	0.10	0.00	0.04	0.25	0.18	0.27	**6.29**
24-May-16	0.00	1.40	0.52	0.01	0.61	0.12	0.00	0.00	**2.67**
17-Jul-16	0.00	0.49	1.25	0.03	1.22	0.20	0.00	0.00	**3.19**

24-Oct-16	4.08	0.00	0.16	0.61	0.26	1.05	0.01	0.46	**6.64**
19-May-17	0.00	2.79	1.96	0.00	5.36	0.53	0.00	0.00	**10.64**
17-Jul-17	0.00	0.00	0.37	2.22	2.37	0.58	0.00	0.00	**5.54**
14-Aug-17	0.00	0.10	1.21	0.14	1.70	0.31	0.00	0.00	**3.46**
10-Sep-17	0.00	0.04	0.59	0.73	0.69	0.61	0.00	0.00	**2.67**
10-Oct-17	0.13	0.01	0.12	0.31	0.13	0.33	0.01	0.01	**1.06**
05-Nov-17	16.50	0.00	0.31	1.19	0.34	0.41	0.14	1.05	**19.93**
12-Dec-17	12.60	0.00	0.37	0.24	0.24	0.13	0.66	0.66	**14.90**

Table 11. Skaha Lake 2005-2017 *Mysis diluviana* biomass. Units are mg m^{-3} dry weight (dw). Data from 2005-13 are updated from Hyatt et al. (2017b). Biomass of embryos was negligible and was not included.

	juvenile	immature male	adult male	immature female	adult female	adult female - released eggs	gravid female	**Total**
06-Jun-05	0.57	2.25	0.03	1.69	0.73	0.00	0.00	**5.27**
14-Jul-05	0.07	1.34	0.00	1.56	0.19	0.00	0.00	**3.16**
04-Aug-05	0.05	2.64	1.14	3.56	1.28	0.00	0.00	**8.66**
14-Sept-05	0.00	1.14	4.00	0.96	2.80	0.00	0.00	**8.91**
07-Oct-05	0.00	0.62	3.45	1.46	5.10	0.45	0.16	**11.24**
02-Nov-05	0.00	0.35	5.55	0.30	4.72	1.17	4.25	**16.34**
21-Nov-05	0.00	1.09	5.80	0.45	2.00	1.73	12.98	**24.04**
20-Jan-06	0.02	0.10	0.10	0.00	0.00	0.52	0.55	**1.30**
28-Mar-06	0.30	0.17	0.08	0.16	0.88	0.61	0.75	**2.94**
26-Apr-06	0.61	0.16	0.21	0.18	2.31	0.27	0.06	**3.80**
24-May-06	1.82	1.71	0.04	1.96	2.11	0.11	0.00	**7.74**
29-Jun-06	0.28	3.53	0.07	3.51	1.52	0.00	0.00	**8.91**
31-Jul-06	0.02	4.30	0.25	4.91	1.25	0.00	0.00	**10.73**
17-Aug-06	0.01	3.31	1.07	2.55	1.76	0.00	0.00	**8.69**
28-Sep-06	0.00	0.34	2.95	1.05	3.88	0.00	0.25	**8.47**
25-Oct-06	0.00	0.40	4.85	0.46	4.68	0.00	1.45	**11.83**
19-Dec-06	0.00	0.38	0.46	0.38	0.23	0.41	4.36	**6.22**
07-Mar-07	0.09	0.30	0.37	0.18	0.83	1.30	2.35	**5.43**
16-May-07	0.86	0.32	0.05	0.16	1.45	0.11	0.17	**3.12**
14-Jun-07	0.85	1.72	0.04	1.94	1.73	0.00	0.07	**6.36**
12-Jul-07	0.21	3.47	0.00	2.99	1.29	0.00	0.00	**7.96**
28-Aug-07	0.00	2.20	1.04	2.37	1.01	0.00	0.00	**6.62**
24-Sep-07	0.00	1.42	3.08	2.43	3.15	0.12	0.07	**10.27**
19-Nov-07	0.00	0.93	5.66	0.62	3.50	1.84	7.88	**20.43**
08-Jan-08	0.00	0.67	1.12	0.66	0.21	1.46	5.14	**9.25**
23-Mar-08	0.34	0.68	0.00	0.38	1.22	0.97	1.61	**5.20**
08-Apr-08	0.39	0.33	0.00	0.30	0.87	0.21	0.40	**2.51**
13-May-08	0.69	0.52	0.00	0.20	1.03	0.00	0.00	**2.44**
12-Jun-08	1.04	3.10	0.00	2.93	4.35	0.00	0.00	**11.43**
09-Jul-08	0.22	3.83	0.04	4.29	1.39	0.00	0.00	**9.78**
13-Aug-08	0.03	4.57	0.59	4.88	1.31	0.00	0.00	**11.38**
23-Sep-08	0.02	1.06	5.25	1.81	4.85	0.00	0.00	**12.99**
19-Nov-08	0.00	0.62	4.04	0.69	1.51	0.52	4.64	**12.02**
12-Dec-08	0.00	0.56	2.36	0.84	1.17	0.75	6.24	**11.92**
26-Mar-09	0.06	0.53	0.00	0.22	0.19	0.66	1.21	**2.86**
14-Apr-09	0.21	0.27	0.00	0.24	0.71	0.37	0.35	**2.15**
12-May-09	0.35	0.13	0.06	0.17	0.70	0.04	0.12	**1.57**
09-Jun-09	1.24	0.50	0.00	0.72	0.88	0.05	0.06	**3.45**
14-Jul-09	0.60	3.69	0.04	3.66	1.81	0.00	0.00	**9.80**
12-Aug-09	0.09	3.23	0.09	2.97	0.80	0.00	0.00	**7.18**

15-Sep-09	0.02	2.24	2.35	1.94	1.43	0.00	0.00	**7.98**
20-Oct-09	0.01	1.10	3.74	2.44	6.14	0.00	1.39	**14.81**
01-Dec-09	0.00	0.48	2.30	0.54	0.81	0.27	3.92	**8.33**
18-Dec-09	0.00	0.65	1.88	0.42	0.34	0.10	3.77	**7.17**
15-Feb-10	0.02	0.13	0.00	0.14	0.00	0.00	1.52	**1.82**
15-Apr-10	0.69	0.27	0.04	0.51	2.13	0.05	0.05	**3.74**
10-May-10	1.55	0.54	0.02	0.35	0.79	0.09	0.05	**3.40**
15-Jun-10	0.57	2.54	0.04	2.87	2.93	0.00	0.00	**8.94**
17-Aug-10	0.01	4.63	1.01	4.19	2.75	0.00	0.00	**12.59**
28-Sep-10	0.00	1.19	3.28	2.05	4.71	0.00	0.06	**11.31**
14-Nov-10	0.00	0.70	6.49	0.81	4.12	0.19	7.02	**19.33**
14-Dec-10	0.00	0.74	1.43	0.42	1.28	1.39	4.93	**10.20**
07-Mar-11	0.14	0.46	0.31	0.22	0.26	1.34	2.79	**5.52**
09-May-11	0.63	0.43	0.04	0.67	2.67	0.05	1.00	**5.49**
15-Jun-11	2.88	3.42	0.00	4.09	4.69	0.00	0.15	**15.23**
08-Aug-11	0.15	8.10	0.61	7.29	3.44	0.00	0.00	**19.59**
23-Sep-11	0.00	1.96	2.60	2.51	2.65	0.00	0.00	**9.73**
17-Nov-11	0.00	2.18	9.86	1.80	4.28	0.60	10.57	**29.29**
20-Dec-11	0.00	1.45	3.25	1.49	0.88	3.05	11.52	**21.63**
01-Mar-12	0.14	2.01	0.04	2.05	0.63	3.37	5.19	**13.43**
11-Jun-12	1.58	4.53	0.57	4.92	6.25	0.00	0.18	**18.03**
25-Jun-12	0.90	7.35	0.07	6.88	5.44	0.11	0.05	**20.81**
24-Jul-12	0.27	9.74	0.07	7.46	6.73	0.00	0.06	**24.31**
21-Aug-12	0.02	6.73	1.67	6.61	4.83	0.00	0.00	**19.86**
25-Sep-12	0.01	1.55	5.03	3.09	5.17	0.00	0.04	**14.89**
31-Oct-12	0.00	1.82	3.56	3.11	8.92	0.18	2.69	**20.29**
26-Jan-13	0.00	1.06	0.05	1.15	0.14	0.15	3.14	**5.69**
23-Apr-12	0.49	1.23	0.00	1.37	2.34	0.13	0.28	**5.84**
29-May-13	1.84	3.20	0.00	3.61	2.18	0.00	0.00	**10.82**
02-Jul-13	0.33	4.99	0.00	5.10	2.36	0.06	0.00	**12.84**
29-Jul-13	0.11	9.54	0.59	8.88	7.09	0.00	0.00	**26.20**
11-Sep-13	0.01	1.63	3.74	1.56	3.02	0.00	0.00	**9.96**
13-Nov-13	0.00	1.31	3.21	0.58	2.63	2.04	2.73	**12.51**
13-Mar-14	0.22	1.39	0.04	0.91	1.30	0.60	4.96	**9.42**
03-Jun-14	2.18	3.67	0.09	3.08	4.83	0.07	0.00	**13.92**
28-Jul-14	0.09	11.27	0.79	9.69	10.18	0.00	0.00	**32.02**
08-Sep-14	0.00	1.99	2.97	1.49	2.77	0.00	0.04	**9.26**
15-Dec-14	0.00	1.48	3.90	1.34	0.54	0.53	9.94	**17.72**
02-Mar-15	0.15	1.89	0.15	1.94	1.50	1.48	3.33	**10.45**
20-Apr-15	0.83	1.37	0.14	1.71	3.31	0.19	0.67	**8.22**
01-Jun-15	0.63	3.16	0.00	2.62	3.24	0.00	0.00	**9.65**
07-Jul-15	0.07	4.10	0.04	5.65	2.52	0.00	0.00	**12.38**
27-Jul-15	0.05	5.88	0.31	5.56	1.62	0.00	0.00	**13.42**
27-Aug-15	0.04	5.61	1.34	4.12	2.47	0.00	0.00	**13.58**
10-Sep-15	0.01	0.52	2.06	2.04	1.46	0.00	0.00	**6.09**
20-Oct-15	0.00	0.55	6.07	0.66	7.85	0.14	1.45	**16.73**
17-Nov-15	0.00	0.63	3.43	0.46	3.66	0.98	5.39	**14.54**
14-Dec-15	0.00	0.32	2.58	0.07	1.26	1.71	4.24	**10.18**
08-Mar-16	0.26	0.70	0.00	0.29	2.13	1.44	2.33	**7.15**
24-May-16	0.62	1.49	0.04	1.31	1.39	0.00	0.00	**4.84**

17-Jul-16	0.25	5.74	0.20	4.41	2.30	0.00	0.00	**12.89**
24-Oct-16	0.00	0.63	3.52	1.16	8.49	0.13	3.93	**17.86**
19-May-17	1.35	4.89	0.00	9.06	6.57	0.00	0.00	**21.88**
17-Jul-17	0.00	0.23	7.92	8.13	7.82	0.00	0.00	**24.10**
14-Aug-17	0.06	5.16	0.83	7.33	3.70	0.00	0.00	**17.08**
10-Sep-17	0.02	2.52	4.95	3.18	5.13	0.00	0.00	**15.80**
10-Oct-17	0.01	0.51	1.94	0.51	2.42	0.05	0.15	**5.59**
05-Nov-17	0.00	1.50	6.67	1.72	2.97	1.52	9.11	**23.48**
12-Dec-17	0.00	1.96	1.13	1.37	0.89	5.97	5.83	**17.16**

Table 12. Skaha Lake 2006-2013 and 2015 *Mysis diluviana* diets as average number of prey per *Mysis.* Data from 2006-13 are updated from Hyatt et al. (2017b).

	Number *Mysis* processed	Daphnia	Bosmina	Cyclopoid	Calanoid	nauplii	rotifer	Diaphanosoma
09-Jun-05	30	0.00	0.53	0.03	0.03			
14-Jul-05	27	0.15	1.30	0.19	0.00			
3-Aug-05	15	0.73	0.00	0.07	0.00			
14-Sep-05	30	0.27	0.30	0.00	0.00			
7-Oct-05	30	0.13	0.70	0.00	0.03			
2-Nov-05	30	0.07	0.67	0.07	0.00			
21-Nov-05	30	0.00	2.17	0.03	0.10			
24-May-06	30	0.000	0.030	0.270	0.070	0.000	0.000	0.000
31-Jul-06	30	0.530	0.270	0.170	0.000	0.000	0.000	0.000
17-Aug-06	30	0.630	0.000	0.200	0.070	0.000	0.000	0.000
28-Sep-06	21	0.190	0.140	0.100	0.050	0.000	0.000	0.000
25-Oct-06	30	0.100	0.400	0.070	0.170	0.000	0.000	0.000
16-May-07	30	0.000	0.000	0.300	0.000	0.000	0.133	0.000
14-Jun-07	30	0.033	0.067	0.333	0.067	0.000	0.667	0.000
12-Jul-07	30	0.000	0.300	0.100	0.000	0.000	0.233	0.000
28-Aug-07	30	0.033	0.067	0.000	0.033	0.000	0.000	0.000
24-Sep-07	30	0.000	0.300	0.000	0.000	0.000	0.000	0.000
19-Nov-07	30	0.000	0.400	0.033	0.033	0.000	0.033	0.000
08-Jan-08	30	0.000	0.033	0.267	0.000	0.000	0.000	0.000
13-May-08	13	0.000	0.000	0.080	0.000	0.000	0.000	0.000
16-Jun-08	30	0.000	0.000	0.070	0.030	0.000	0.900	0.000
09-Jul-08	30	0.000	0.200	0.000	0.000	0.000	1.030	0.000
13-Aug-08	30	0.000	0.070	0.100	0.000	0.000	0.000	0.000
23-Sep-08	30	0.000	0.370	0.000	0.000	0.000	0.000	0.000
01-Nov-08	30	0.000	0.230	0.200	0.000	0.000	0.000	0.000
12-May-09	40	0.200	0.100	0.130	0.000	0.050	0.200	0.000
09-Jun-09	36	0.000	0.080	0.670	0.060	0.000	0.330	0.000
14-Jul-09	174	0.010	0.060	0.160	0.090	0.010	0.240	0.000
12-Aug-09	103	0.500	0.000	0.120	0.090	0.000	0.020	0.000
15-Sep-09	108	0.200	0.140	0.050	0.010	0.000	0.010	0.010
20-Oct-09	117	0.090	0.490	0.090	0.030	0.000	0.000	0.000
01-Dec-09	86	0.010	0.150	0.300	0.140	0.000	0.010	0.000
15-Jun-10	100	0.000	0.970	0.580	0.000	0.000	0.640	0.000
17-Aug-10	113	1.044	0.027	0.088	0.009	0.000	0.009	0.018

28-Sep-10	68	0.235	0.397	0.103	0.029	0.000	0.015	0.000
19-Oct-10	83	0.301	0.783	0.325	0.000	0.000	0.000	0.000
15-Jun-11	210	0.000	0.020	0.110	0.000	0.000	1.680	0.000
23-Sep-11	97	0.290	0.230	0.070	0.000	0.000	0.010	0.000
07-Oct-11	143	0.380	0.150	0.110	0.010	0.020	0.000	0.000
22-May-12	130	0.000	0.000	0.080	0.000	0.000	0.750	0.000
25-Jun-12	132	0.000	0.090	0.140	0.000	0.000	0.140	0.000
11-Jul-12	98	0.030	1.070	0.090	0.010	0.000	0.180	0.000
21-Aug-12	109	0.880	0.060	0.040	0.010	0.000	0.000	0.000
25-Sep-12	100	0.580	0.040	0.130	0.010	0.000	0.000	0.000
31-Oct-12	100	0.070	0.290	0.260	0.010	0.000	0.030	0.010
29-May-13	100	0.000	0.020	0.210	0.010	0.000	0.160	0.000
02-Jul-13	100	0.010	0.150	0.200	0.020	0.000	0.100	0.000
29-Jul-13	100	0.770	0.000	0.060	0.010	0.000	0.020	0.020
14-Aug-13	100	0.630	0.000	0.060	0.000	0.000	0.000	0.020
11-Sep-13	101	0.330	0.090	0.020	0.010	0.000	0.000	0.020
15-Oct-13	95	0.170	0.150	0.010	0.010	0.000	0.000	0.000
01-Jun-15	77	0.000	0.558	0.039	0.013	0.000	2.026	0.000
07-Jul-15	92	0.370	0.033	0.011	0.022	0.000	0.000	0.033
27-Jul-15	94	0.777	0.011	0.000	0.000	0.000	0.000	0.000
11-Aug-15	94	0.617	0.021	0.000	0.000	0.000	0.000	0.000
10-Sep-15	90	2.478	0.189	0.000	0.000	0.000	0.011	0.000
20-Oct-15	51	0.000	0.745	0.000	0.000	0.000	0.000	0.000

SKAHA LAKE FISH LENGTH, WEIGHT, AND DENSITY

Table 13. Year 2013-17 species-specific (Sockeye, kokanee, Whitefish) and age-specific (age-1, 2, and 3+ kokanee) densities, lengths and weights. 2013 was updated from Hyatt et al. (2017b). Densities are estimated from echosounding based on target strengths, and mean lengths and weights are estimated from trawl samples. Age-0 nerkids were split into wild Sockeye, kokanee, and hybrids in months and years in which DNA analysis was applied to the trawl samples. Standard deviations were not readily available for 2013, but were very similar to those in other years for which both numbers and SDs are provided below. BY = brood year.

In-lake 2013 (no hatchery releases)	**1-Jun-2013**	**9-Jul-2013**	**2-Aug-2013**	**4-Sep-2013**	**4-Oct-2013**	**4-Nov-2013**	**12-Mar-2014**
Density per ha (Area = 1946 ha)							
Age 0 (BY 2012) Nerkids	270	458	528	617	-	-	-
Age 0 (BY 2012) Kokanee	-	-	-	-	230	226	176
Age 0 (BY 2012) Wild Sockeye	-	-	-	-	65	59	53
Age 0 (BY 2012) Hybrids	-	-	-	-	26	30	33
Age 1 (BY 2011) Nerkids	324	125	102	145	114	126	125
Age 2 Kokanee	66	57	36	52	54	15	15
Age 3+ Kokanee	83	56	35	57	59	33	7
Other Fish > 33 cm	7	6	7	24	20	13	6
Total (echosounder):	**750**	**701**	**708**	**279**	**569**	**502**	**416**
Mean Length (cm) (SD)							
Age 0 (BY 2012) Nerkids	3.9	4.8	5.4	5.8	6.1	8.0	8.0
Age 0 (BY 2012) Kokanee	-	-	-	-	5.9	6.7	7.6
Age 0 (BY 2012) Wild Sockeye	-	-	-	-	7.5	8.1	8.9
Age 0 (BY 2012) Hybrids	-	-	-	-	6.4	7.3	8.0
Age 1 (BY 2011) Nerkids	8.3	9.3	10.1	11.7	11.7	13.2	13.1
Age 2 Kokanee	13.4	16.3	16.8	17.5	-	18.5	19.8
Age 3+ Kokanee	26.2	25.5	22.0	22.5	-	29.8	-
Mean Weight (g)							
Age 0 (BY 2012) Nerkids	0.5	1.2	1.7	2.1	2.5	5.4	5.4
Age 0 (BY 2012) Kokanee	-	-	-	-	2.1	3.2	4.5
Age 0 (BY 2012) Wild Sockeye	-	-	-	-	4.7	5.9	7.3
Age 0 (BY 2012) Hybrids	-	-	-	-	2.9	4.2	5.3
Age 1 (BY 2011) Nerkids	6.0	9.2	12.6	19.1	17.4	24.9	23.1
Age 2 Kokanee	25.5	48.5	56.1	62.5	-	66.7	82.7
Age 3+ Kokanee	267.3	190.3	125.3	126.3	-	323.2	-

In-lake 2014 (no hatchery releases)	26-May-2014	23-Jun-2014	22-Jul-2014	25-Aug-2014	22-Sep-2014	21-Oct-2014	25-Feb-2015
Density per ha (Area = 1946 ha)							
Age 0 (BY 2013) Nerkids	492	530	834	-	-	-	-
Age 0 (BY 2013) Kokanee	-	-	-	136	252	188	98
Age 0 (BY 2013) Wild Sockeye	-	-	-	369	228	195	170
Age 0 (BY 2013) Hybrids	-	-	-	62	55	49	43
Age 1 (BY 2012) Nerkids	119	197	182	118	143	77	81
Age 2 Kokanee	104	61	76	17	32	75	25
Age 3+ Kokanee	145	101	133	70	124	101	53
Other Fish > 33 cm	33	24	47	23	48	46	20
Total:	**893**	**913**	**1,271**	**796**	**880**	**731**	**490**
Sample Size from Trawl (n)							
Age 0 (BY 2013) Nerkids	8	5	115	30*	34*	9*	3*
Age 0 (BY 2013) Kokanee	-	-	-	74	170	149	98
Age 0 (BY 2013) Wild Sockeye	-	-	-	198	153	155	169
Age 0 (BY 2013) Hybrids	-	-	-	34	37	39	43
Age 1 (BY 2012) Nerkids	82	245	186	63	37	14	26
Age 2 Kokanee	182	79	42	5	6	7	0
Age 3 Kokanee	24	12	6	6	5	1	1
Age 4 Kokanee	2	2	0	0	0	0	0
Total:	**298**	**343**	**349**	**501**	**510**	**469**	**441**
*Unknown genetic ID and not used for calculations of mean length and mean weight.							
Mean Length (cm) (SD)							
Age 0 (BY 2013) Nerkids	3.4 (0.6)	5.2 (1.1)	5.7 (0.9)	-	-	-	-
Age 0 (BY 2013) Kokanee	-	-	-	5.3 (0.5)	5.5 (0.6)	6.4 (0.6)	7.4 (0.6)
Age 0 (BY 2013) Wild Sockeye	-	-	-	6.9 (0.6)	7.3 (0.6)	8.0 (0.6)	9.1 (0.6)
Age 0 (BY 2013) Hybrids	-	-	-	6.2 (0.5)	6.4 (0.7)	7.0 (0.7)	8.2 (0.6)
Age 1 (BY 2012) Nerkids	8.9 (1.2)	10.5 (1.2)	10.9 (1.7)	10.9 (1.9)	12.3 (1.4)	12.0 (2.4)	14.5 (1.0)
Age 2 Kokanee	15.3 (1.4)	16.1 (1.0)	17.5 (1.0)	19.1 (1.1)	17.9 (2.3)	16.8 (1.8)	-
Age 3 Kokanee	19.7 (1.1)	19.8 (2.0)	20.6 (0.6)	22.0 (2.8)	19.5 (1.5)	24.2 (-)	24.0 (-)
Age 4 Kokanee	24.3 (1.8)	30.2 (13.2)	-	-	-	-	-
Mean Weight (g) (SD)							
Age 0 (BY 2013) Nerkids	0.4 (0.2)	1.5 (1.1)	2.1 (0.9)	-	-	-	-
Age 0 (BY 2013) Kokanee	-	-	-	1.5 (0.5)	1.9 (0.6)	2.8 (0.8)	4.0 (0.9)
Age 0 (BY 2013) Wild Sockeye	-	-	-	3.4 (0.9)	4.5 (1.2)	5.6 (1.3)	7.8 (1.6)
Age 0 (BY 2013) Hybrids	-	-	-	2.4 (0.5)	2.9 (0.9)	3.7 (1.0)	5.7 (1.1)
Age 1 (BY 2012) Nerkids	8.0 (3.4)	12.3 (4.5)	15.8 (8.4)	15.1 (10.2)	21.6 (8.4)	20.4 (11.1)	32.1 (7.1)
Age 2 Kokanee	38.9 (10.1)	43.0 (8.0)	66.1 (11.4)	82.4 (16.3)	71.7 (24.2)	53.3 (18.9)	-
Age 3 Kokanee	83.7 (14.1)	83.5 (27.6)	102.7 (10.5)	126.6 (47.6)	89.9 (19.6)	183.2 (-)	145.3 (-)
Age 4 Kokanee	147.1 (26.8)	432.7 (477)	-	-	-	-	-

In-lake 2015	15-Jun-2015	13-Jul-2015	13-Aug-2015	9-Sep-2015	14-Oct-2015	9-Nov-2015	6-Mar-2016
Density per ha (Area = 1946 ha)							
STOCKED Sockeye	954	586	343	245	294	244	165
Age 0 WILD Nerkid	413	901	1063	-	-	-	-
Age 0 Kokanee	-	-	-	251	149	147	48
Age 0 Wild Sockeye	-	-	-	620	625	428	555
Age 0 (BY 2014) Hybrid	-	-	-	174	126	105	76
Age 1 (BY 2013) Nerkid	325	195	302	244	159	163	189
Age 2 Kokanee	39	74	56	41	40	43	24
Age 3+ Kokanee	257	134	87	116	108	86	52
Other Fish > 33 cm	75	58	67	74	62	44	18
Total:	**2,064**	**1,948**	**1,918**	**1,764**	**1,564**	**1,259**	**1,126**
Sample Size from Trawl (n)							
STOCKED Sockeye	199	125	77	56	77	83	73
Age 0 WILD Nerkid	86	189	239	89*	7*	4*	1*
Age 0 Kokanee	-	-	-	36	38	49	21
Age 0 Wild Sockeye	-	-	-	89	159	143	242
Age 0 (BY 2014) Hybrid	-	-	-	25	32	35	33
Age 0 Unknown**	1	0	0	9	2	2	1
Age 1 (BY 2013) Nerkid	112	17	26	13	27	15	3
Age 2 Kokanee	11	35	22	33	21	18	2
Age 3 Kokanee	17	5	8	6	3	1	1
Age 4 Kokanee	3	1	1	6	0	0	0
Total:	**429**	**372**	**373**	**362**	**366**	**350**	**407**

*Unknown genetic ID and not used for calculations of mean length and mean weight.
**Unable to read otoliths for thermal marks.

Mean Length (cm) (SD)							
STOCKED Sockeye	5.3 (0.4)	6.3 (0.6)	6.9 (0.5)	7.5 (0.7)	8.4 (0.7)	8.6 (0.7)	9.0 (0.6)
Age 0 WILD Nerkid	4.3 (0.7)	5.2 (0.5)	5.8 (0.7)	-	-	-	-
Age 0 Kokanee	-	-	-	5.6 (0.7)	6.1 (0.5)	6.3 (0.7)	7.2 (0.5)
Age 0 Wild Sockeye	-	-	-	6.7 (0.6)	7.6 (0.6)	7.9 (0.6)	8.5 (0.5)
Age 0 (BY 2014) Hybrid	-	-	-	6.0 (0.7)	7.1 (0.7)	7.3 (0.7)	8.0 (0.5)
Age 1 (BY 2013) Nerkid	10.6 (1.3)	11.7 (2.0)	13.2 (1.7)	15.7 (1.9)	15.7 (1.3)	15.3 (1.3)	15.2 (1.8)
Age 2 Kokanee	14.5 (1.3)	17.9 (1.0)	18.1 (1.0)	19.6 (1.0)	18.9 (1.2)	19.0 (1.2)	19.0 (0.0)
Age 3 Kokanee	17.8 (1.2)	20.7 (0.6)	21.2 (0.8)	22.4 (1.0)	21.2 (1.1)	22.0 (N/A)	21.2 (N/A)
Age 4 Kokanee	21.2 (2.0)	26.4 (N/A)	22.2 (N/A0	24.2 (2.2)	-	-	-
Mean Weight (g) (SD)							
STOCKED Sockeye	1.6 (0.4)	2.8 (0.9)	3.4 (0.8)	4.5 (1.2)	6.0 (1.8)	6.7 (1.7)	6.9 (1.5)
Age 0 WILD Nerkid	0.9 (0.4)	1.6 (0.5)	2.0 (0.7)	-	-	-	-
Age 0 Kokanee	-	-	-	1.8 (0.8)	2.2 (0.7)	2.5 (1.0)	3.5 (0.8)
Age 0 Wild Sockeye	-	-	-	3.3 (0.8)	4.4 (1.1)	5.1 (1.3)	6.1 (1.1)
Age 0 (BY 2014) Hybrid	-	-	-	2.3 (0.8)	3.6 (1.3)	4.1 (1.1)	5.1 (0.9)
Age 1 (BY 2013) Nerkid	13.4 (4.8)	19.9 (10.4)	26.7 (11.2)	46.2 (13.0)	42.2 (11.5)	38.9 (10.2)	38.9 (16.1)
Age 2 Kokanee	32.4 (8.6)	67.9 (11.0)	72.3 (11.5)	89.4 (13.8)	75.4 (14.2)	77.4 (15.2)	68.2 (1.3)
Age 3 Kokanee	59.9 (13.4)	101.1 (4.9)	116.1 (17.5)	134.8 (17.3)	104.0 (17.4)	124.6 (N/A)	99.2 (N/A)
Age 4 Kokanee	106.0 (27.9)	224.0 (N/A)	145.3 (N/A)	162.1 (52.1)	-	-	-

In-lake 2016	4-Jul-2016	26-Oct-2016	27-Mar-2017
Density Per Ha (Area = 1946 ha)			
Age 0 STOCKED Sockeye	193	64	30
Age 0 WILD Nerkid	269	334	285
Age 1 Nerkid	172	78	69
Age 2 Kokanee	72	27	20
Age 3+ Kokanee	126	73	32
Other Fish > 33 cm	65	21	7
Total:	**898**	**598**	**442**
Sample Size from Trawl (n)			
Age 0 STOCKED Sockeye	96	37	40
Age 0 WILD Nerkid	131	270	360
Age 0- unknown**	1	-	2
Age 1 Nerkid	286	47	26
Age 2 Kokanee	38	7	1
Age 3 Kokanee	11	6	0
Total:	**563**	**367**	**429**
*Unknown genetic ID and not used for calculations of mean length and mean weight. **Unable to read otoliths for thermal marks.			
Mean Length (cm) (SD)			
Age 0 STOCKED Sockeye	5.7 (0.5)	8.5 (0.6)	9.4 (0.6)
Age 0 WILD Nerkid	4.7 (0.5)	7.1 (0.7)	8.1 (0.8)
Age 1 Nerkid	10.6 (1.2)	13.6 (0.9)	14.7 (0.9)
Age 2 Kokanee	18.2 (1.1)	18.4 (2.4)	19.7 (n/a)
Age 3 Kokanee	20.3 (0.6)	19.7 (1.3)	-
Mean Weight (g) (SD)			
Age 0 STOCKED Sockeye	2.6 (0.8)	6.3 (1.4)	8.5 (1.8)
Age 0 WILD Nerkid	1.3 (0.5)	3.6 (1.1)	5.4 (1.6)
Age 1 Nerkid	15.2 (5.4)	27.0 (5.7)	32.5 (6.8)
Age 2 Kokanee	77.9 (11.4)	72.0 (24.6)	78.6 (n/a)
Age 3 Kokanee	100.6 (13.3)	81.7 (12.2)	-

In-lake 2017	20-Jun-2017	19-Jul-2017	11-Sep-2017	14-Oct-2017	14-Nov-2017	14-Feb-2018
Density per ha (Area = 1946 ha)						
Age 0 Hatchery Sockeye	1611	571	324	157	234	310
Age 0 WILD Nerkid	197	1043	994	1050	735	555
Age 1 Nerkid	224	278	374	38	64	120
Age 2 Kokanee	103	107	73	68	22	24
Age 3+ Kokanee	183	183	117	63	37	41
Other Fish > 33 cm	28	44	42	12	6	8
Total:	**2,346**	**2,225**	**1,924**	**1,388**	**1,098**	**1,058**
Sample Size from Trawl (n)						
Age 0 Hatchery Sockeye	300	114	117	32	107	139
Age 0 WILD Nerkid	20	207	190	279	129	138
Age 0 Unknown**	1	0	1	0	0	0
Age 1 Nerkid	25	14	14	0	2	18
Age 2 Kokanee	26	13	25	5	3	5
Age 3+ Kokanee	6	1	3	1	0	0
Total:	**378**	**349**	**350**	**317**	**241**	**300**
Mean Length (cm) (SD)						
Age 0 Hatchery Sockeye	6.10 (0.39)	6.69 (0.5)	7.33 (0.32)	7.90 (0.48)	8.43 (0.48)	8.66 (0.60)
Age 0 WILD Nerkid	4.27 (0.41)	4.89 (0.65)	5.57 (0.63)	6.02 (0.68)	6.99 (0.85)	7.26 (0.99)
Age 0 unknown	2.70 (N/A)	-	7.80 (N/A)	-	-	-
Age 1 Nerkid	11.48 (1.11)	13.23 (0.89)	14.71 (0.68)	-	16.60 (0.14)	16.49 (0.88)
Age 2 Kokanee	16.76 (1.29)	17.01 (0.47)	18.42 (0.97)	16.96 (1.05)	18.47 (0.50)	18.96 (0.62)
Age 3+ Kokanee	20.37 (0.68)	19.90 (N/A)	21.50 (0.20)	22.00 (N/A)	-	-
Mean Weight (g) (SD)						
Age 0 Hatchery Sockeye	2.18 (0.45)	3.11 (0.81)	4.05 (0.66)	5.32 (1.20)	6.10 (1.50)	6.05 (1.67)
Age 0 WILD Nerkid	0.67 (0.23)	1.22 (0.52)	1.74 (0.70)	2.33 (0.87)	3.50 (1.41)	3.61 (1.58)
Age 0 unknown	0.12 (N/A)	-	4.57 (N/A)	-	-	-
Age 1 Nerkid	16.75 (5.42)	27.71 (5.62)	40.40 (7.10)	-	50.76 (0.64)	48.42 (7.57)
Age 2 Kokanee	49.85 (11.90)	56.36 (4.13)	72.49 (11.58)	60.39 (11.27)	72.71 (7.70)	70.27 (7.17)
Age 3+ Kokanee	88.05 (6.07)	96.13 (N/A)	109.87 (2.95)	122.98 (N/A)	-	-

2017 Continued next page….

……2017 Continued. Hatchery Sockeye, different release strategies. Release months in parentheses.

BY 2016 Stocking Strategy: All into Skaha **March Release - 1,134,620 (H 3.4.1)** **April Release - 1,835,837 (H 3.5)** **May Release - 1,523,120 (H 3.4.2)** ***Plus 683,856 in Okanagan Lake in June***	**20-Jun-2017**	**19-Jul-2017**	**11-Sep-2017**	**14-Oct-2017**	**14-Nov-2017**	**14-Feb-2018**
Average Length of Hatchery Sockeye	**Mean Length (cm)**					
3.4.1 (March)	5.99	6.55	7.25	7.91	8.47	8.57
3.5 (April)	6.12	6.68	7.37	7.99	8.42	8.77
3.4.2 (May)	6.13	6.86	7.33	7.84	8.43	8.52
Average Weight of Hatchery Sockeye	**Mean Weight (g)**					
3.4.1 (March)	2.04	2.93	3.98	5.23	6.39	5.91
3.5 (April)	2.19	3.09	4.09	5.65	6.03	6.35
3.4.2 (May)	2.26	3.37	4.04	5.14	6.07	5.64
Count of Hatchery Sockeye caught in trawl	**(n)**					
3.4.1 (March)	65	34	23	10	16	29
3.5 (April)	128	46	43	9	47	69
3.4.2 (May)	107	34	51	13	44	41
Total	**300**	**114**	**117**	**32**	**107**	**139**
Breakdown age-0 nerkids caught in the trawl (%):						
Wild Nerkid (Sockeye or Kokanee)	6.25%	64.49%	61.89%	89.71%	54.66%	49.82%
Thermal Mark 3.4.1	20.31%	10.59%	7.49%	3.22%	6.78%	10.47%
Thermal Mark 3.5	40.00%	14.33%	14.01%	2.89%	19.92%	24.91%
Thermal Mark 3.4.2	33.44%	10.59%	16.61%	4.18%	18.64%	14.80%
Total	100%	100%	100%	100%	100%	100%

Age-0 wild kokanee, wild Sockeye and wild hybrids. nd = no data.

	20-Jun-2017	**19-Jul-2017**	**11-Sep-2017**	**14-Oct-2017**	**14-Nov-2017**	**13-Feb-2018**
Density per ha of wild age-0 nerkids with known genetic ID						
Kokanee	-	-	589	714	367	271
Wild Sockeye	-	-	405	309	349	267
Hybrid	-	-	0	27	18	16
Total			994	1050	735	555
Length of wild nerkids (cm)						
Kokanee	-	-	5.3	5.8	6.4	6.6
Wild Sockeye	-	-	6.1	6.7	7.5	7.9
Hybrid	-	-	0	6.1	6.9	7.7
Weight of wild nerkids (g)						
Kokanee	-	-	1.4	2.0	2.6	2.5
Wild Sockeye	-	-	2.3	3.3	4.3	4.7
Hybrid	-	-	0	2.2	3.4	4.2

SKAHA LAKE NERKID STOMACHS

Table 14. Year 2015 and 2017 fish stomach summary as average numbers of each prey type found in stomachs collected through the summer-fall from age-0 Sockeye, age-0 kokanee and ages 1, 2, 3+ kokanee.

Date	Age	Sample size	Cyclops	Calanoid	Epischura	Daphnia	Bosmina	Leptodora	Diaphanosoma	Mysis	Chironomid larvae	Adult fly	Fish
17-Jun-15	0	30	142	46	8	3	5	0	2	0	0	0	0
	1	30	737	23	15	26	0	0	113	0	0	0	0
	2	14	1353	12	0	225	6	0	195	0	0	0	0
	3	15	1431	7	2	325	7	0	127	1	1	0	0
13-Jul-15	0	60	0	0	2	125	1	0	30	0	0	0	0
	1	9	7	0	0	1004	0	0	65	0	0	0	0
	2	5	3	3	3	1431	0	0	401	0	0	0	0
	3	35	19	7	6	1928	0	2	128	0	0	0	0
13-Aug-15	0	60	73	21	65	86	0	0	5	0	0	0	0
	1	4	14	4	81	299	0	0	9	0	0	0	0
	2	27	14	5	11	247	0	0	2	1	0	0	0
	3	7	6	3	18	345	0	0	3	6	0	0	0
09-Sep-15	0	60	16	3	42	308	0	0	25	0	0	0	0
	1	13	8	0	11	536	0	0	141	0	0	0	0
	2+	19	6	0	31	1074	0	0	199	0	0	0	0
	3+	23	9	17	29	1536	2	0	249	4	0	1	0
14-Oct-15	0	60	3	8	53	39	1	0	1	0	0	0	0
	1	4	32	24	56	2008	8	0	48	0	0	0	0
	2	20	15	10	243	475	0	0	29	0	0	0	0
	3+	4	9	28	340	344	0	0	37	0	0	1	0
09-Nov-15	0	60	28	147	43	1	0	0	0	0	0	0	0
	1	1	128	1520	1072	0	32	0	16	0	0	0	0
	2	4	229	493	3519	687	0	0	25	13	0	0	0

Date	Age	Sample size	Cyclops	Calanoid	Epischura	Daphnia	Bosmina	Leptodora	Diaphanosoma	Mysis	Chironomid larvae	Adult fly	Fish
22-Jun-17	0	51	107	24	3	16	2	0	8	0	0	0	0
	1	25	237	282	4	86	0	0	16	0	0	2	0
	2	26	135	273	3	34	2	0	16	1	0	17	0
	3	6	5	11	0	5	0	0	1	1	0	0	0
26-Jul-17	0	120	23	4	32	164	0	0	47	0	0	0	0
	1	14	8	4	4	1010	0	0	16	1	0	0	0
	2	13	7	7	14	2093	0	0	132	1	0	0	0
	3	1	1	1	0	9	0	0	2	0	0	0	0
14-Sep-17	0	60	25	9	85	213	0	0	2	1	0	0	0
	1	14	0	0	9	5598	0	0	153	0	0	0	0
	2	24	8	22	49	7230	0	0	312	6	0	0	0
	3	3	2	2	11	4725	0	0	97	0	0	0	0
1-Oct-17	0	60	11	28	182	133	0	0	51	0	0	0	0
	1	0											
	2	4	3	5	24	414	0	0	39	13	0	0	0
	3	1	0	0	2	1	0	0	0	35	0	0	0
15-Nov-17	0	60	9	70	22	0	0	0	1	1	0	0	0
	1	0											
	2	5	407	1295	25	1	0	0	15	0	0	0	0
	3	0											
14-Feb-17	0	60	20	14	0	0	0	0	0	0	0	0	0
	1	0											
	2	16	768	2133	6	0	0	0	0	0	0	0	0
	3	5	480	1334	0	0	0	0	0	0	0	0	0

SKAHA LAKE VERTICAL DISTRIBUTION OF MACRO-ZOOPLANKTON, MYSIS, AND NERKIDS IN THE WATER COLUMN

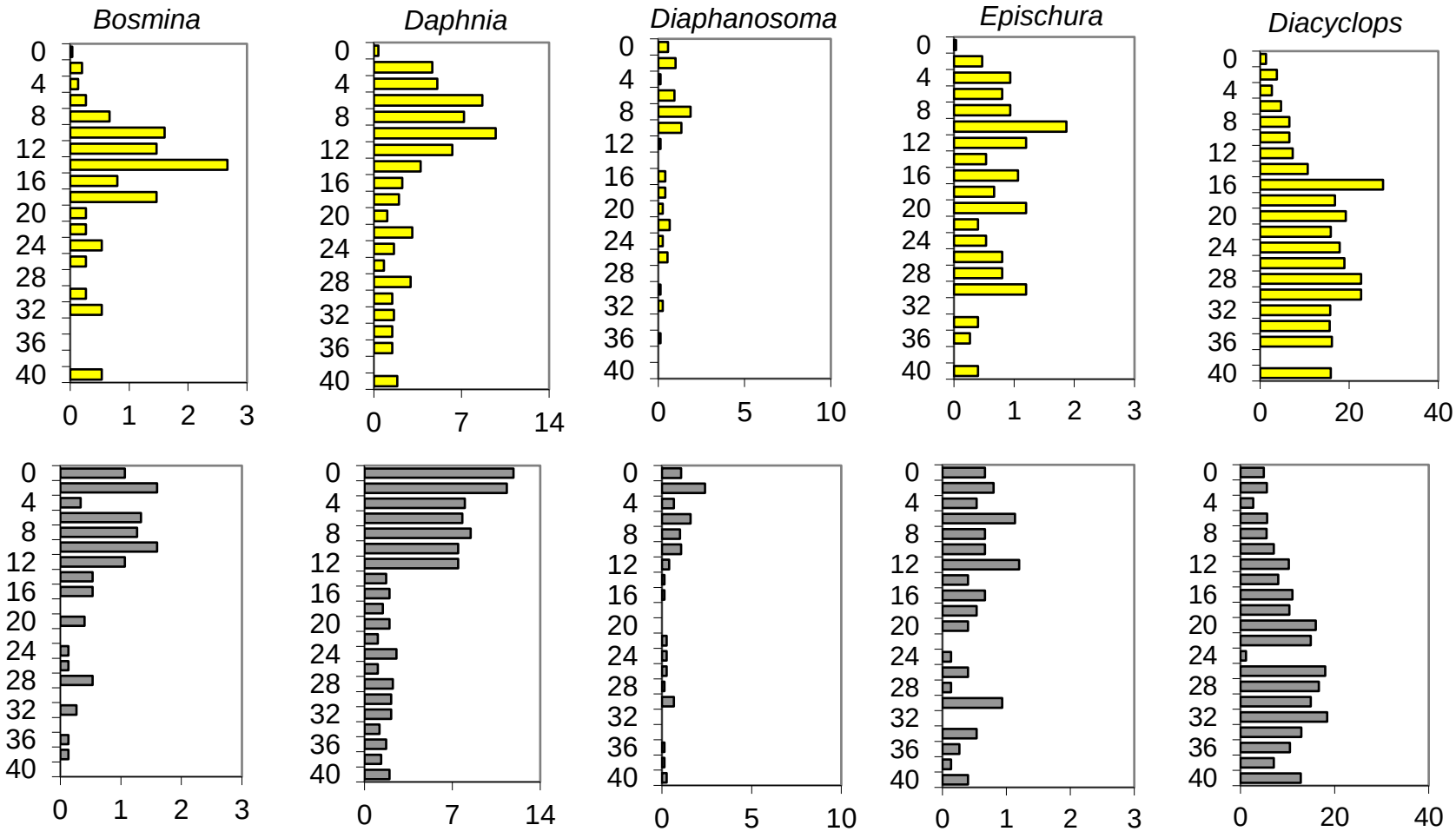

Figure 1. August 14, 2007 zooplankton density (L^{-1}) based on day (top) and night (bottom) plankton trap samples.

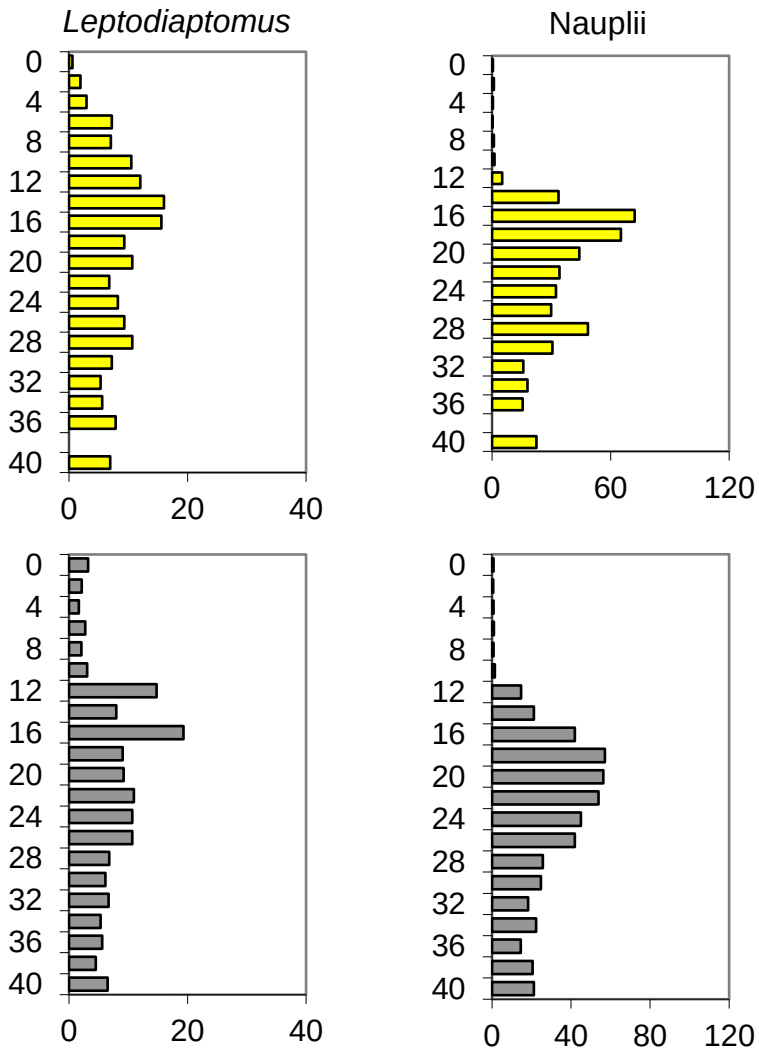

Figure 1 continued. August 14, 2007 zooplankton density (L^{-1}) based on day (top) and night (bottom) plankton trap samples. In 2007, rotifers were not included in the zooplankton counts.

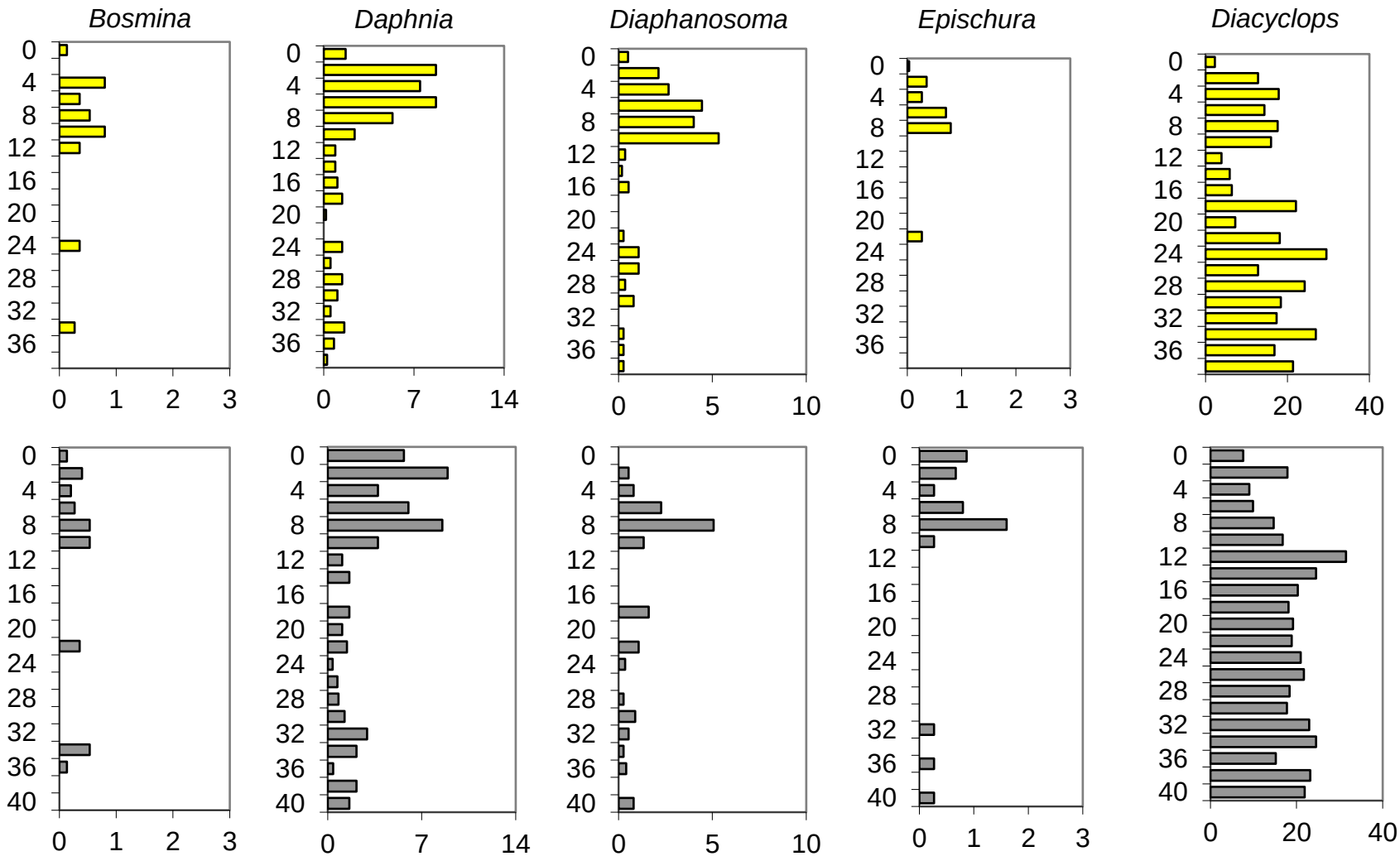

Figure 2. July 27, 2009 zooplankton density (L^{-1}) based on day (top) and night (bottom) plankton trap samples.

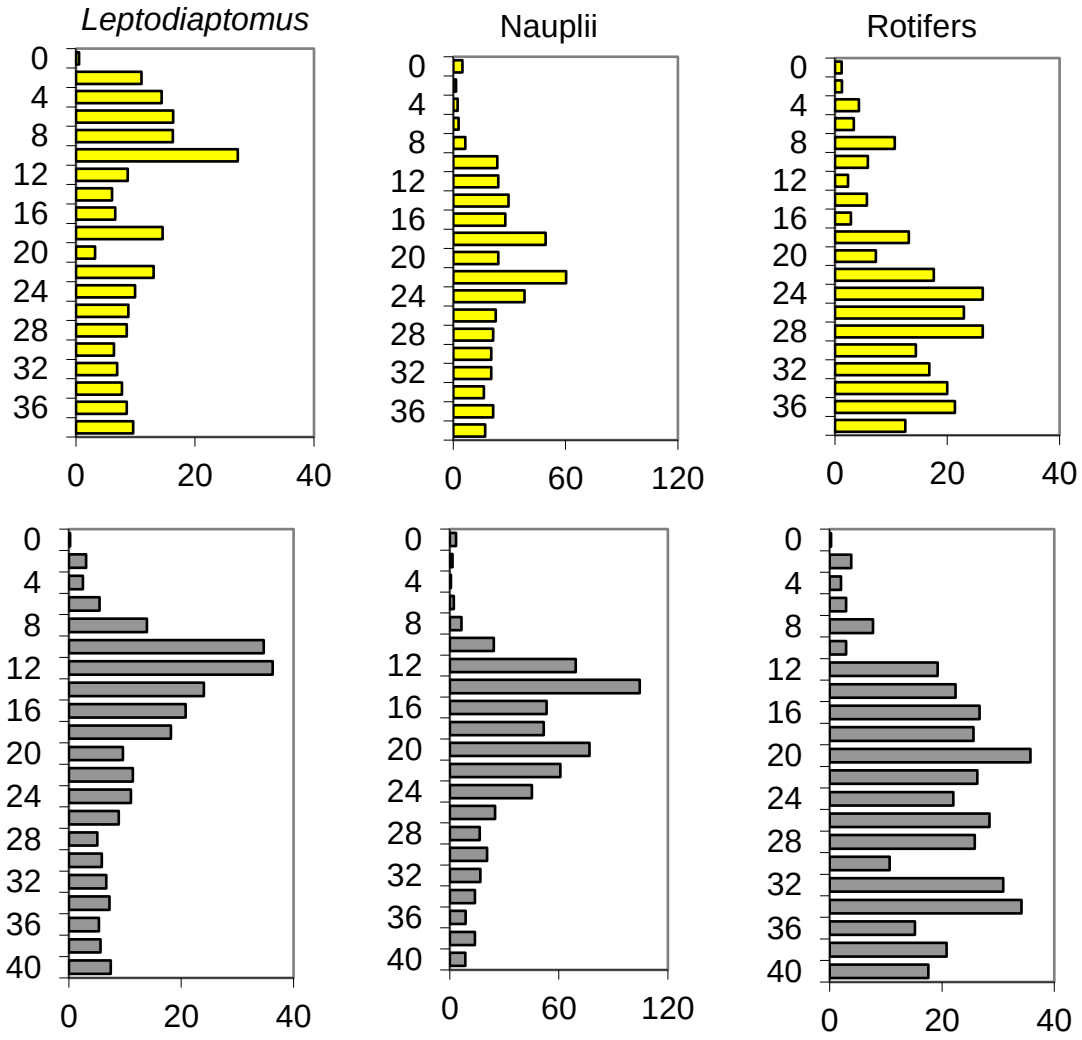

Figure 2 continued. July 27, 2009 zooplankton density (L^{-1}) based on day (top) and night (bottom) plankton trap samples.

Table 15. Zooplankton density (L^{-1}) from night plankton trap samples only. Rotifers were not enumerated in 2007.

August 12, 2007

Depth	Nauplii	Rotifer	*Bosmina*	*Diacyclops*	*Leptodiaptomus*	*Daphnia*	*Epischura*	*Diaphanosoma*	*Leptodora*	*Mysis*
0	1		1	5	3	12	1	1	0	0
2	1		2	6	2	11	1	2	0	0
4	1		0	3	2	8	1	1	0	0
6	1		1	6	3	8	1	2	0	0
8	1		1	6	2	8	1	1	0	0
10	1		2	7	3	7	1	1	0	0
12	15		1	10	15	7	1	0	0	0
14	21		1	8	8	2	0	0	0	0
16	42		1	11	19	2	1	0	0	0
18	57		0	10	9	1	1	0	0	0
20	56		0	16	9	2	0	0	0	0
22	54		0	15	11	1	0	0	0	0
24	45		0	1	11	3	0	0	0	0
26	42		0	18	11	1	0	0	0	0
28	26		1	17	7	2	0	0	0	0
30	25		0	15	6	2	1	1	0	0
32	18		0	18	7	2	0	0	0	0
34	22		0	13	5	1	1	0	0	0
36	15		0	11	6	2	0	0	0	0
38	21		0	7	5	1	0	0	0	0
40	21		0	13	7	2	0	0	0	0

June 23, 2008.

Depth	Nauplii	Rotifer	*Bosmina*	*Diacyclops*	*Leptodiaptomus*	*Daphnia*	*Epischura*	*Diaphanosoma*	*Leptodora*	*Mysis*
0	18	11	2	29	26	0	0	0	0	0
2	23	32	7	31	21	1	0	1	0	0
4	15	33	5	34	30	0	0	1	0	0
6	18	31	4	27	30	1	0	0	0	0
8	50	27	1	45	28	0	0	0	0	0
10	129	47	4	31	34	0	0	0	0	0
12	98	45	1	26	27	0	0	0	0	0
14	81	35	1	26	19	0	0	0	0	0
16	77	36	2	9	11	0	0	0	0	0
18	60	41	0	13	12	1	0	0	0	0
20	21	53	3	19	23	0	0	1	0	0
22	24	22	0	9	13	0	0	0	0	0
24	16	38	2	7	10	0	0	0	0	0
26	17	33	1	7	6	0	0	0	0	0
28	10	22	0	5	5	0	0	0	0	0
30	13	56	0	5	7	0	0	0	0	0
32	12	53	0	3	2	0	0	0	0	0
34	142	155	5	56	62	0	0	1	0	0
36	93	120	6	46	50	0	0	0	0	0
38	11	49	1	5	5	0	0	0	0	0
40	12	44	1	7	6	0	0	0	0	0

July 23, 2008

Depth	Nauplii	Rotifer	*Bosmina*	*Diacyclops*	*Leptodiaptomus*	*Daphnia*	*Epischura*	*Diaphanosoma*	*Leptodora*	*Mysis*
0	2	4	0	7	7	2	0	4	0	0
2	5	9	0	15	13	4	0	5	0	0
4	4	9	1	15	10	4	1	7	0	0
6	2	4	1	11	12	4	0	7	0	0
8	8	8	1	18	18	2	0	5	0	0
10	16	5	0	17	23	1	0	9	0	0
12	78	7	0	14	17	1	0	5	0	0
14	64	7	0	11	11	1	0	2	0	0
16	75	12	0	11	9	0	0	1	0	0
18	71	11	0	12	8	0	0	1	0	0
20	53	11	0	11	4	0	0	1	0	0
22	0	0	0	0	0	0	0	0	0	0
24	49	4	0	10	7	0	0	1	0	0
26	27	7	0	6	6	0	0	0	0	0
28	41	10	1	15	7	0	0	1	0	0
30	30	6	0	9	5	0	0	1	0	0
32	19	8	0	6	4	0	0	0	0	0
34	21	6	0	8	5	0	0	1	0	0
36	29	9	0	11	6	0	0	1	0	0
38	12	7	0	7	2	0	0	0	0	0
40	14	5	0	7	2	0	0	0	0	0

August 25, 2008

Depth	Nauplii	Rotifer	*Bosmina*	*Diacyclops*	*Leptodiaptomus*	*Daphnia*	*Epischura*	*Diaphanosoma*	*Leptodora*	*Mysis*
0	3	9	1	10	14	2	0	1	0	0
2	2	15	1	8	11	1	1	1	0	0
4	4	13	1	10	14	1	1	1	0	0
6	5	10	1	7	8	1	1	1	0	0
8	3	19	1	8	11	1	1	1	0	0
10	5	12	0	8	5	1	0	0	0	0
12	20	13	1	19	18	1	1	1	0	0
14	35	6	0	21	7	1	0	0	0	0
16	35	6	1	13	7	1	0	0	0	0
18	22	2	0	9	5	0	0	0	0	0
20	23	2	0	10	6	0	0	0	0	0
22	9	3	0	6	6	1	0	1	0	0
24	11	3	0	7	9	0	0	0	0	0
26	7	2	0	7	7	0	0	0	0	0
28	5	1	0	8	5	0	0	0	0	0
30	7	2	0	4	6	0	0	0	0	0
32	4	1	0	6	5	0	0	0	0	0
34	5	2	0	4	4	0	0	0	0	0
36	7	7	1	12	17	0	1	0	0	0
38	2	1	0	8	5	0	0	0	0	0
40	4	3	1	9	6	0	1	0	0	0

July 27, 2009

Depth	Nauplii	Rotifer	*Bosmina*	*Diacyclops*	*Leptodiaptomus*	*Daphnia*	*Epischura*	*Diaphanosoma*	*Leptodora*	*Mysis*
0	5	1	0	2	1	2	0	1	0	0
2	1	1	0	13	11	9	0	2	0	0
4	2	4	1	18	14	7	0	3	0	0
6	3	3	0	14	16	9	1	4	0	0
8	6	11	1	18	16	5	1	4	0	0
10	23	6	1	16	27	2	0	5	0	0
12	24	2	0	4	9	1	0	0	0	0
14	30	6	0	6	6	1	0	0	0	0
16	28	3	0	6	7	1	0	1	0	0
18	49	13	0	22	15	1	0	0	0	0
20	24	7	0	7	3	0	0	0	0	0
22	60	18	0	18	13	0	0	0	0	0
24	38	26	0	30	10	1	0	1	0	0
26	23	23	0	13	9	1	0	1	0	0
28	21	26	0	24	9	1	0	0	0	0
30	20	14	0	18	6	1	0	1	0	0
32	20	17	0	17	7	1	0	0	0	0
34	16	20	0	27	8	2	0	0	0	0
36	21	21	0	17	9	1	0	0	0	0
38	17	13	0	21	10	0	0	0	0	0

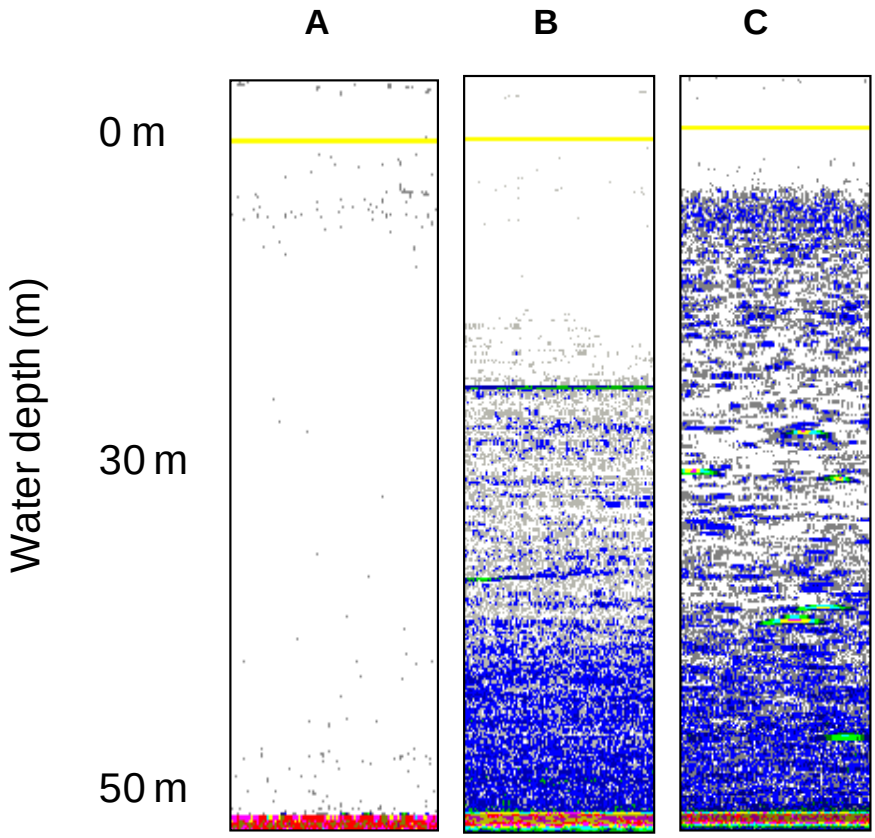

Figure 3. Acoustic scattering layers of *M. diluviana* and pelagic fish sampled on August 14, 2007. (A) During the day, *Mysis* and most fish were concentrated near the lake bottom at 50 m. (B) At dusk *Mysis* and pelagic fish move rapidly into the water column. (C) At night the *Mysis* scattering layer was slightly more concentrated between 10-20 m and 40-50 m while acoustic sampling showed that the pelagic fish were concentrated at 10-30 m depths (Table 16). Red indicates the substrate, dark blue is *Mysis*, grey shows combinations of *Mysis* and fish, and aquamarine represents schools of fish; analysis of target strengths were used to separate fish and mysids.

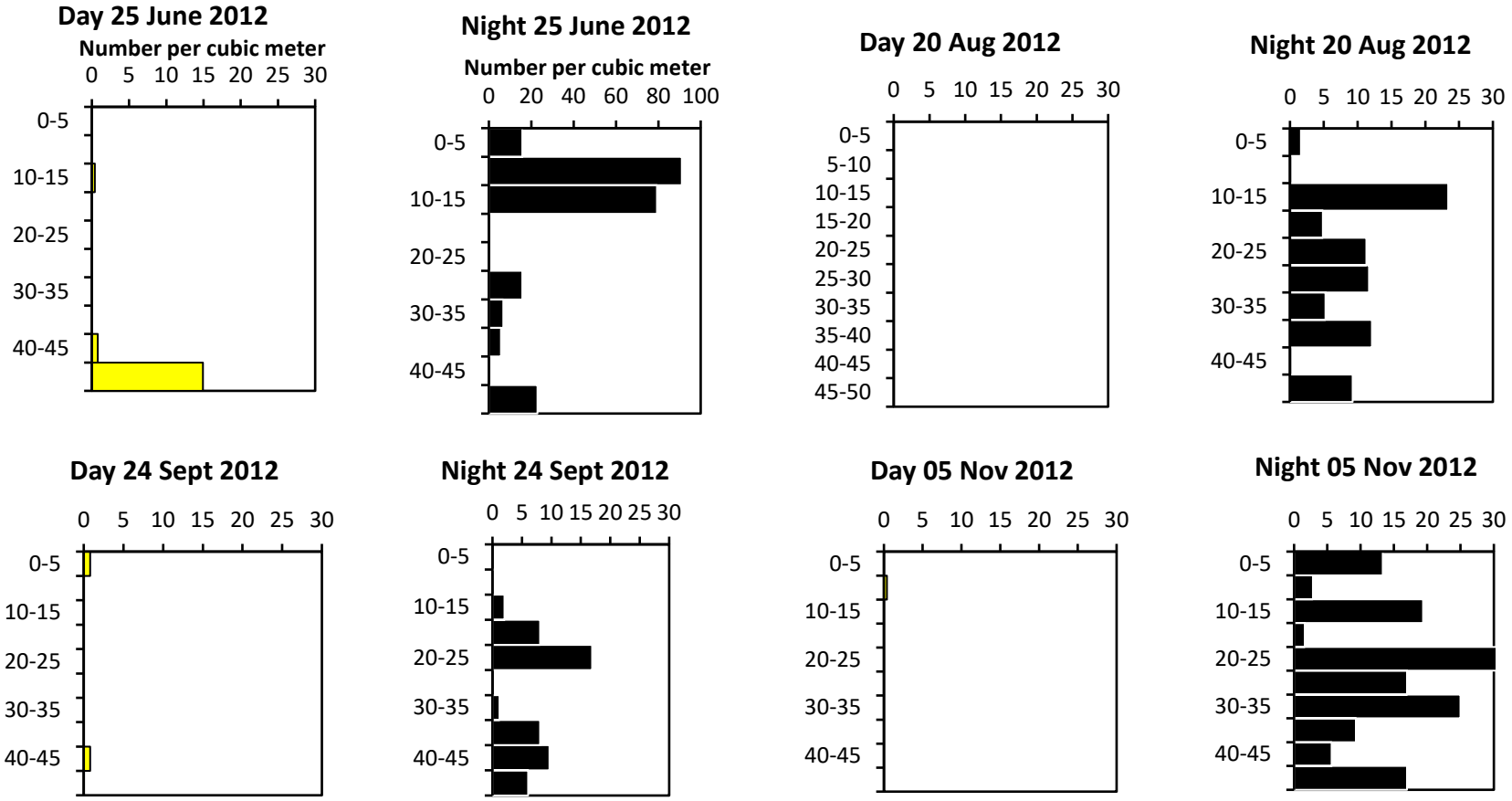

Figure 4. *Mysis* densities (m^{-3}) at 5 m intervals from 0-50m. The empty plot for August 20, 2012 is not an error.

Table 16. Year 2006-13, 2015 and 2017 proportion of fish targets at night in each water depth stratum with respect to year and date. There were no data at depths shallower than 5m.

Depth strata (m)	26-Jun-06	24-Jul-06	03-Sep-06	05-Mar-07
5-10	0.00	0.01	0.00	0.00
10-15	0.03	0.24	0.07	0.00
15-20	0.10	0.34	0.24	0.01
20-30	0.52	0.33	0.51	0.31
30-40	0.27	0.07	0.15	0.51
40-50	0.08	0.02	0.03	0.17

Depth strata (m)	17-Jul-07	13-Aug-07	1-Oct-07	13-Nov-07	20-Dec-07
5-10	0.01	0.00	0.00	0.01	0.01
10-15	0.34	0.24	0.01	0.03	0.04
15-20	0.34	0.37	0.06	0.06	0.06
20-30	0.26	0.35	0.55	0.45	0.40
30-40	0.05	0.04	0.34	0.38	0.43
40-50	0.00	0.00	0.03	0.07	0.07

Depth strata (m)	03-Jul-08	05-Aug-08	31-Aug-08	01-Oct-08	03-Nov-08
5-10	0.16	0.02	0.02	0.01	0.01
10-15	0.27	0.32	0.21	0.05	0.06
15-20	0.16	0.28	0.29	0.17	0.08
20-30	0.32	0.29	0.41	0.51	0.37
30-40	0.07	0.07	0.06	0.23	0.37
40-50	0.02	0.02	0.01	0.03	0.10

Depth strata (m)	15-Jun-09	23-Jul-09	25-Aug-09	25-Sep-09	25-Nov-09	10-Feb-09
5-10	0.22	0.11	0.08	0.01	0.08	0.05
10-15	0.41	0.35	0.15	0.04	0.08	0.05
15-20	0.12	0.23	0.35	0.15	0.07	0.10
20-30	0.17	0.24	0.35	0.49	0.29	0.40
30-40	0.04	0.05	0.06	0.27	0.39	0.23
40-50	0.03	0.02	0.01	0.04	0.10	0.16

Depth strata (m)	23-Jun-10	5-22 July 10	10-18 Aug 10	8-9 Sept 10	4-5 Oct 10	4-9 Nov 11
5-10	0.10	0.10	0.05	0.07	0.04	0.05
10-15	0.33	0.37	0.28	0.14	0.03	0.05
15-20	0.21	0.18	0.31	0.31	0.17	0.15
20-30	0.26	0.24	0.18	0.29	0.26	0.21
30-40	0.08	0.07	0.14	0.15	0.32	0.36
40-50	0.02	0.04	0.04	0.04	0.18	0.19

Depth strata (m)	27-Jun-11	22-Jul-11	30-Aug-11	24-Oct-11	23-Nov-11	04-Mar-12
5-10	0.23	0.11	0.16	0.08	0.09	0.16
10-15	0.39	0.37	0.24	0.07	0.21	0.05
15-20	0.15	0.17	0.27	0.16	0.10	0.06
20-30	0.15	0.19	0.17	0.36	0.34	0.30
30-40	0.04	0.09	0.04	0.22	0.21	0.29
40-50	0.03	0.06	0.13	0.11	0.06	0.14

Depth strata (m)	16-Jun-12	17-Jul-12	06-Sep-12	14-Oct-12	16-Nov-12
5-10	0.43	0.06	0.03	0.03	0.05
10-15	0.41	0.56	0.10	0.03	0.02
15-20	0.06	0.21	0.35	0.11	0.04
20-30	0.08	0.12	0.42	0.51	0.24
30-40	0.02	0.03	0.06	0.26	0.46
40-50	0.01	0.02	0.03	0.05	0.18

Depth strata (m)	04-Jun-13	04-Jul-13	31-Jul-13	03-Sep-13	03-Oct-13	30-Oct-13
5-10	0.37	0.09	0.05	0.08	0.04	0.05
10-15	0.36	0.44	0.17	0.12	0.10	0.06
15-20	0.13	0.32	0.38	0.35	0.24	0.10
20-30	0.11	0.10	0.33	0.31	0.44	0.41
30-40	0.01	0.03	0.04	0.08	0.14	0.29
40-50	0.01	0.02	0.02	0.05	0.04	0.09

Depth strata (m)	17-Jun-15	13-Jul-15	13-Aug-15	09-Sep-15	14-Oct-15	09-Nov-15
5-10	0.11	0.03	0.02	0.54	0.04	0.02
10-15	0.59	0.40	0.09	0.02	0.04	0.05
15-20	0.14	0.33	0.47	0.14	0.11	0.07
20-30	0.10	0.17	0.33	0.25	0.49	0.35
30-40	0.04	0.05	0.07	0.04	0.25	0.38
40-50	0.03	0.02	0.02	0.01	0.07	0.13

Depth strata (m)	06-Jun-17	19-Jul-17	11-Sep-17	14-Oct-17	14-Nov-17	13-Feb-17
5-10	0.12	0.12	0.03	0.03	0.04	0.03
10-15	0.54	0.27	0.05	0.03	0.05	0.07
15-20	0.21	0.44	0.23	0.10	0.07	0.10
20-30	0.09	0.14	0.54	0.43	0.35	0.36
30-40	0.02	0.02	0.11	0.32	0.39	0.33
40-50	0.01	0.01	0.03	0.09	0.09	0.11

INTERPRETATION OF VERTICAL DISTRIBUTIONS

Zooplankton: The 2007 day-night experiments for zooplankton (Figures 1, 2) showed minimal diel change in vertical distribution. Cladocerans (*Daphnia*, *Diaphanosoma* and *Bosmina*) were more common in the warmer epilimnion, and the copepods were spread throughout the water column. Nauplii and rotifers tended to aggregate below the thermocline. This pattern was verified in August 2009. The other 2008 and 2009 trap samples (Table 15) were restricted to the nighttime.

Mysis: The acoustic experiment on 14 August 2017 (Figure 3) suggested that *Mysis* were found in the water column (i.e., above the substrate) only at night. The vertical haul experiments during June and August 2012 (Figure 4) confirmed this conclusion.

Fish: The 2006-15 and 2017 nighttime acoustic data (Table 16) all suggested that during June, before the lake stratified, the nerkids were distributed at all depths below 5 m (not recorded between 0-5 m depth). During July-October, when the lake thermally stratified, the nerkids avoided warm, epilimnetic waters. After destratification in November, the fish remained below 20 m water depth.

Based on these data, we concluded that nighttime samples could be used to estimate the extent of temporal and vertical overlap between zooplanktonic prey and planktivorous fish and *Mysis.* The five nighttime plankton trap samples (Table 15) were used in combination with nerkid vertical distributions (Table 16), *Mysis* vertical distributions (Figures 3, 4) and water temperature profiles (Hyatt et al. 2017b) to estimate the degree of vertical overlap between the various species of zooplankton, *Mysis* and planktivorous nerkids (Hyatt et al. 2021). This analysis showed that (i) nerkid vertical distributions changed through the season as the fish positioned themselves in water with an average temperature of 10-11 ^{O}C, and (ii) *Mysis* vertical distribution followed the same seasonal pattern as the fish. However, in the fall when the lake destratified, the nerkids remained in deeper water, and the *Mysis* redistributed throughout the water column, which may have been due in part to their taking advantage of the cooler surface waters.

SKAHA LAKE KOKANEE AND SOCKEYE SALMON SPAWNER NUMBERS AND PROPORTION AGE AT SPAWNING

Table 17. Kokanee and Sockeye Salmon spawners estimated using AUC and size-cut-offs to separate the two ecotypes, numbers and dates of carcass (dead-pitch) collection, and proportion by age of kokanee spawners as estimated by ageing from otoliths of dead kokanee spawners.

					Proportion kokanee spawning at age			
Spawning year	**Sockeye spawners**	**Dead-pitch sampling**	**Dead-pitch number**	**Kokanee spawners**	**2**	**3**	**4**	**5**
2003				50,296				
2004				66,290				
2005				34,643				
2006				90,150				
2007				40,490				
2008				40,922				
2009				31,086				
2010	1,489	Oct 26 - Oct 31	173	48,146				
2011	12,236	Nov 6 - Nov 14	197	24,399	0.082	0.908	0.010	0
2012	9,110	Oct 15 - Nov 13	1,201	20,277	0.125	0.558	0.292	0.025
2013	49,731	Oct 21 - Nov 14	1,519	10,916	0	0.327	0.593	0.080
2014	10,160	Oct 25 - Nov 5	3,215	47,241	0	0.505	0.465	0.030
2015	33,090	Oct 19 - Nov 9	627	40,443	0.005	0.438	0.542	0.015
2016	25,364	Oct 15 - Nov 8	967	17,481	0	0.719	0.274	0.007
2017	25,420	Oct 12 - Nov 15	704	11,636	0	0.694	0.293	0.013
2018	25,420	Oct 17 - Nov 8	3,743	11,636	0	0.362	0.622	0.016

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