**Methods and Summary Data for Limnology and Food Web Structure in Osoyoos Lake, B.C. (2014-2021)**

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2022

**Canadian Data Report of**

**Fisheries and Aquatic Sciences XXXX**



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by

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# ABSTRACT

Hyatt, K.D., McQueen, D.J., Rankin, D.P., Stockwell, M.M., Wright, H., Lawrence, S., Stevens, A., Mathieu, C., and Weins, L. 2017. Methods and summary data for limnology and food web structure in Osoyoos Lake, B.C. (2005-2013). Can. Data Rep. Fish. Aquat. Sci. XXXX: vii + 73 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. In the following years, several collaborative habitat and stock restoration projects were initiated to facilitate rebuilding of the Okanagan sockeye salmon population to historic abundance levels. Here we provide a detailed site-description and report on field survey and sample processing methods used on Osoyoos Lake to assess: (1) limnological conditions (temperature, oxygen, water transparency, nutrient concentrations, plankton community structure etc.) in the principal nursery lake, (2) annual to seasonal changes of abundance and biological traits of juvenile sockeye salmon, and (3) abundance of other limnetic fish species. Monthly or sub-monthly survey work was especially intensive during the years 2005-2013 when detailed field observations were required to serve as: (a) critical response variable observations to determine whether DFO recommended increases in abundance of adult sockeye spawning in the Okanagan River (Hyatt and Rankin 1999) were accompanied by proportionate increases in abundance levels of fry recruiting to Osoyoos Lake and subsequent production of both smolts and returning adults, (b) “control” observations of seasonal to annual patterns of growth and survival of wild-origin, sockeye fry relative to hatchery-origin fry introduced into either Skaha or Osoyoos lakes as part of an Okanagan Nation Alliance stock restoration project and (c) “test interval” observations to monitor annual production of wild fry and smolts following the 2004 deployment of a fish-and-water management tools (FWMT) decision support system to improve “fish friendly” water management decisions for the Okanagan River and Lake system (Hyatt et al. 2015). Annual to seasonal observations obtained from Osoyoos Lake are documented in the current report while comparative observations from Skaha Lake are published in a companion Data Report (Hyatt et al. 2015).

Note: This document is an updated version of Hyatt, K.D., McQueen, D.J., Rankin, D.P., Stockwell, M.M., Wright, H., Lawrence, S., Stevens, A., Mathieu, C., and Wiens, L. 2015. Methods and summary data for limnology and food web structure in Osoyoos Lake, B.C. (2005-2013). Can. Data Rep. Fish. Aquat. Sci. 1259: vii + 71 p. It now includes error corrections as well as added tables of *Mysis* densities.

# RÉSUMÉ

# ACKNOWLEDGEMENTS

# INTRODUCTION

One hundred years ago, several sockeye salmon (*Oncorhynchus nerka*) populations spawned in the Columbia River watershed (Fryer 1995). Since that time, dams, overfishing and habitat destruction have reduced the number of self-sustaining populations to two. One population remains in the Wenatchee River, Washington State and the other in the Okanagan River, British Columbia. Adult sockeye bound for the Okanagan Valley, begin their up-stream migration during May-June, negotiate 10 fishways placed at dams in the Columbia and Okanagan rivers, and arrive at Osoyoos Lake during late June through early September (Allen and Meekin 1980, Chapman et al. 1995, reviewed in Hyatt and Rankin 1999)**.** They generally hold in the lake until late September when they move north into the Okanagan River where peak spawning generally occurs by mid-October (Stockwell and Hyatt 2003). In April-May, newly hatched age 0+ juveniles move down-stream to Osoyoos Lake where they rear for one summer, over-winter, and leave as age 1+ smolts in April-May of the next year.

During the period 1953-1972 total sockeye salmon returns (potential spawners plus catch) to the Okanagan River averaged 72,368. During 1973-2004, average returns declined to 35,687. During 1953-72, average annual exploitation by the commercial fishery and First Nations averaged 57 %. After 1972, exploitation was reduced to 11 % (Chapman et al. 1995, Hyatt and Rankin 1999, Hyatt et al. 2003) but stock declines continued such that fewer than 10,000 adult fish returned in 4 of 6 years from1994-1999. In response to these declining returns, the three-party (Fisheries and Oceans Canada, Okanagan Nation Alliance, BC Forests Lands and Natural Resource Operations) Canadian Okanagan Basin Technical Working Group (COBTWG) was formed in 1996-97 to coordinate stock assessment and restoration projects. Both types of projects required standardized assessments of annual to seasonal changes in environmental conditions along with biological traits of adult sockeye spawning in the Okanagan River (Stockwell and Hyatt 2001, 2003) and juvenile sockeye rearing in Osoyoos Lake (Hyatt and Rankin 1999). The Okanagan Nation Alliance also embarked on a program designed to re-establish sockeye salmon in the upper Okanagan River and Skaha Lake. After several years of project design and risk assessment (Okanagan Nation Alliance 2001, 2002, 2003), the COBTWG concluded that sockeye salmon should be stocked, on an experimental basis, into Skaha Lake (Peters et al. 1998). One of the objectives of this program was to quantify rates of growth and rates of egg-to-smolt survival for hatchery-origin sockeye in Skaha Lake relative to their wild-origin siblings in Osoyoos Lake.

Data originating from the most recent decade of field surveys of biophysical and chemical conditions in Osoyoos Lake are highly relevant to assessments associated with several ongoing projects (Okanagan sockeye management, Okanagan Lake and River System water management, Sockeye reintroduction to Skaha Lake, Okanagan River Restoration Initiative) and are documented in the tables of the current report. Similar data originating from field surveys of Skaha Lake are published in a companion Data Report (Hyatt et al. 2015).

# OSOYOOS LAKE SITE DESCRIPTION

## PHYSICAL DESCRIPTION

Osoyoos Lake (Figures 1, 2 and 3), measures 16 km in length, has a surface area of 23 km2, a volume of 0.40 km3, maximum depth of 63 m, mean depth of 14 m, and an average water residence time that is very short (weeks) and varies greatly depending on the amount of snowpack plus summer rainfall in the Okanagan Valley. The North Basin of Osoyoos Lake measures 7.5 km in length, has a surface area of 990 ha (933 ha of usable limnetic fish habitat), a volume of 0.25 km3, a maximum depth of 63 m, mean depth of 21 m, and an average water residence time measured in weeks. The North Basin of Osoyoos Lake is entirely within Canadian territory and is the only section of the lake where age-0 sockeye can survive during the summer (Hyatt and Rankin 1999; Rensel 1995, 1996, 1997, and 1998).

## WATER CHEMISTRY

## OSOYOOS LAKE FISH HISTORY AND METHODS 1997-2005

In the early 1970’s the Osoyoos Lake fish community comprised 20 species (Northcote et al. 1972). By 2004, the total had increased to approximately 28 species including several species of bass, bullheads, suckers, chub, perch, dace, sculpins, and carp (COBTWG 2004). Anadromous salmonids include chinook (*Oncorhynchus tshawytscha*), steelhead (*O. mykiss*), and sockeye (*O. nerka*). Sockeye are orders of magnitude more common than the other two species, and cohabit with small numbers (< 2% of the total) of kokanee (*O. nerka*).

During 1997-2001 pelagic fish (principally juvenile sockeye salmon) densities were estimated at night using a Simrad EY-M, 70 kHz, single beam, echosounder with 75 W of power output, pulse width 0.6 ms and a Time Varied Gain circuit to control for attenuation losses due to increasing target depth. During 2002-05, pelagic fish densities were estimated at night using a Simrad EY-500, 70 KHz sounder with 50 W power output with pulse width at 0.2 ms and a Time Varied Gain circuit. During 2006-13 pelagic fish densities were estimated at night using a split-beam Biosonics DT-X, 200kHz sounder with 300 W power, pulse width at 1 ms and a 6.6° transducer. The methods used during 2006-13 will be detailed later in this data report. Cross-calibration of the two Simrad machines showed that they produced similar results. Comparisons of pelagic fish abundance estimates from the Simrad and Biosonics (“Sonar 5”) echosounders were conducted during 2005-06. Survey data were collected on 14 sampling dates from four lakes (Skaha Lake = 4 dates, Osoyoos Lake = 5, Woss Lake = 2 and Vernon Lake = 2). During each sampling date, complete lake surveys were conducted simultaneously by two survey crews following identical survey transects. Total density estimates ranged from 300-4000 fish ha-1. The relationship between total densities derived from Simrad versus Biosonics was:

Simrad = 111+0.9\*Biosonics (n = 14, R2 = 0.94)

From this, we concluded that density estimates from Simrad and Biosonics units were correlated over a wide density range (100-4000 fish ha-1). Additional details regarding transducer design and counting methods are provided in, Hyatt et al. (1984), Hyatt and Stockner (1985), Gjernes et al. (1986), and Hyatt et al. (2000).

During 1997-2005, fish biosamples were collected throughout the sampling period using a mid-water trawl net (2 m x 2 m mouth opening x 7.5 m long) (stretch mesh ranging from 5.0 cm at the mouth to 1.3 cm knotless nylon at the cod end). The nets were towed only at night, and surveys were based on 5-15 trawls per sampling session. Numbers of seasonal biosamples were the same as for echosounding. On some dates after each trawl set, fish were immediately removed from the net, held on ice, and then weighed at the end of the sampling session. On two dates, fish were frozen before processing. Weights were corrected for the effects of freezing using the expression [fresh weight = 0.124 + 1.0077 \* thawed weight] (Shields and Carlson 1996). On four dates, fish were preserved in ethanol before processing. Weights were corrected for the effects of ethanol using the expression [fresh weight = preserved weight/0.868429] (P. Rankin, Pacific Biological Station, unpublished data). On two dates, fish were preserved in formalin and weights were corrected using the expression [(preserved weight) / 1.1151].

# METHODS 2005 - 2013

## WATER CHEMISTRY

Osoyoos Lake water chemistry was sampled at two stations located at (Stations 1 and 6, Figure 3). Samples were taken at monthly intervals from May-October. At each station, Secchi depth was recorded and oxygen-temperature profiles were measured in 1 m intervals to 24 m depth then at 4 m intervals to 50 m or 4 m from bottom (depending on the water depth). In the epilimnion, water chemistry samples were collected using a Van Dorn bottle at 1, 5, 10 m depths. Water from the three depths was integrated and then sub-sampled to yield: 1 nutrient (nitrogen) sample stored in a clear 250 mL bottle, 1 TP sample stored in the clear 250 mL bottle, 2 chlorophyll a samples stored in 1 L brown bottles and 1 phytoplankton sample stored in a 500 mL clear plastic bottle and treated with Lugol’s solution. During collection, all water samples were held in coolers in the dark. In summary, at the end of the day for each lake, the field crews had collected a total of 4 chlorophyll samples and 2 phytoplankton samples (one epilimnetic sample from each station), 6 TP samples and 6 nutrient samples (three from each station). Osoyoos Lake hypolimnetic samples were collected at 20 and 45 m. Samples were treated as above. At the laboratory, 500 mL of each chlorophyll a sample was passed through a 0.45 μm filter. Details are in Lawrence et al. (2007). All samples were couriered to the provincial water chemistry laboratories in Burnaby, B.C. (PSC Analytical Services laboratory, Burnaby, British Columbia). The analytical protocol followed the methods of Bran and Luebbe Inc. (1987) and Eaton et al. (1995, 1998).

## PHYTOPLANKTON

All samples were collected at the two water chemistry sites (stations 1 and 6, Figure 3). All phytoplankton samples were treated with Lugol’s solution and stored in the dark. At the laboratory, the Osoyoos Lake samples were combined and processed using the Utermöhl technique. Through the season, 6-7 samples were collected at monthly intervals. All taxa were identified to genus (many to species). Densities, cell sizes, cell shapes, and biovolumes were recorded. One of the objectives of the phytoplankton counting procedure was to assess the relative availabilities of edible (grazable) and non-edible (non-grazable) algae. We quantified "edibility" based on size, toxicity, and digestibility. Single cells or colonies < 30 µm width or length were considered edible (Cyr 1998; Cottingham 1999) unless they were classified as being either "toxic" or "digestion-resistant" (defined below). *Microcystis* was always classified as being "toxic". Other genera were assumed to be non-toxic. Algae with thick gelatinous sheaths can pass through *Daphnia* guts undigested (Stutzman 1995) and were considered to be digestion-resistant, independent of size. More methodological detail is given in Hyatt et al. (2005) and McQueen et al. (2007).

## ZOOLANKTON

In Osoyoos Lake, zooplankton were sampled at stations 2, 4, 6, 8, 10 (Figure 3) using a vertical haul net (0-30 m night-time hauls, 100 µm mesh, 0.5 m net diameter, net length 3 m, Rigosha flow-metered). Samples were collected every 2-3 weeks. Each sample was washed out of the plankton net using water saturated with carbon dioxide and were then preserved in 5.5% buffered and sugared formalin and returned to the laboratory. In the laboratory, the five samples were combined to produce one volume-weighted “combined” sample for each lake for each sampling date (Lawrence et al. 2007). Because each of the samples had different sampling efficiencies (measured with a Rigosha flow-meter), each station sample was suspended in water so that each one mL of sample contained water from 10 L of lake water. For each station, 10 mL (containing plankton from 100 L of lake water) from each sample jar was then added to a “combined” sample jar. Since there were 5 stations in each lake, the combined sample jar contained 50 mL of sample representing the zooplankton found in 500 L of lake water (100 L collected at each of five stations). The original samples were then re-filtered to remove excess water, re-suspended in 5.5 % formalin and relabelled to record the loss of a certain percentage of the sample.

All zooplankton were identified to species, measured and eggs counted. Dry weight length-weight regressions were used to calculate biomass for each individual (Allen et al. 1994). Cladocera and copepods (adults and copepodids) were identified to species. Edmondson (1959) was the principal taxonomic reference, but also Dussart and Fernando (1990) for Cyclopoida, Korinek (1981) for *Diaphanosoma*, and Lieder (1983) for bosminids. Eggs per female were counted for all species. To calculate biomass, body lengths of all animals were measured using a semi-automated counting and measuring system (Allen et al. 1994). Because *Holopedium* *gibberum* (Yan and Mackie 1987) was not found, corrections for contraction due to preservative were not applied to any of the species encountered in Skaha or Osoyoos lakes (Campbell and Chow-Fraser 1995). Animal weights were estimated using length-weight regressions summarized in Girard & Reid (1990).

### *Mysis relicta*

In Osoyoos Lake, *M. relicta* were sampled every 3-6 weeks (depending on the time of year) at stations 1-10 (Figure 3) by means of a vertical haul net (0-30 m night-time hauls, 300 µm mesh, 1.0 m net diameter, net length 3 m, Rigosha metered). Samples were preserved in 5.5% buffered and sugared formalin. In the laboratory, each individual animal was measured for total length (measured as the distance from the tip of the rostrum to the end of the telson), sex, and developmental stage. Embryos from gravid females were counted. From these counts, we calculated densities and wet weight biomasses. We also calculated length and weight frequencies which to be used for production analysis.

Mysid diets were assessed from direct inspection of gut contents of juveniles (2-10 mm length) and adults (11-22 mm) collected from each sample. During 2006-08, only 30 specimens were examined on each sampling date. During 2009-13, we attempted to examine at least 100 specimens on each sampling date. The foregut of each mysid was removed to a glass dish, dissected, and examined under a light microscope. Each identifiable zooplankton part was scored as one individual consumed. Mean weights for each prey type were taken from zooplankton field samples collected at the same time as the *Mysis*. Average proportion of prey found per *Mysis* gut was calculated as the relative biomass (prey counts \* mean prey weight) of each prey type per gut.

## OSOYOOS LAKE SOCKEYE AND KOKANEE

### In Lake Sampling

Osoyoos Lake fry were sampled 5-7 times (depending on the year) between June and March of the following year. In Osoyoos Lake the age-0 fry were comprised of very few resident kokanee and large numbers of wild (2005-13) sockeye. Hatchery-origin sockeye fry were also present in samples during 2010, 2012 and 2013. Biosamples were collected using a 3m x 7m mid-water trawl designed by Enzenhofer and Hume (1989). The net was towed only at night, at up to 6 depth strata exhibiting significant numbers of acoustics targets, and surveys were based on 5-15 trawls per sampling session. On each night, the trawl target was 300+ fish comprising juvenile sockeye and various age classes of other nerkids. After each trawl set, fish were immediately removed from the net and held on ice.

### Laboratory Processing

All hatchery-origin sockeye fry were subjected to thermal treatments to induce a unique, identifiable mark on their otoliths prior to release in all years. Consequently, during years when age-0 hatchery fry were known to be in the lake (2010, 2012, 2013), otoliths were removed and placed in dry vials from all fish within size groups likely to contain hatchery-origin fish (i.e. <5cm in June, <6cm in July and August, <6.5 cm in September, <7.5 cm in October, <8 cm in November and winter). During all years, (2005-13) stomach contents were removed from approximately 30 age-0 sockeye and from all of the other nerkids larger than the size classes noted above. For all fish selected for diet analysis, stomachs were removed and placed in vials with ethanol, scales were removed and placed in a scale book, otoliths were removed and placed in dry vials, and the fish body was placed in a plastic bag in ethanol.

From 2006-12, all identifiable zooplankton in each of the selected stomachs were counted as species or genus. During 2013, the stomach contents from two groups of 30 age-0 fish were combined (i.e. contents from the first group of 30 and contents from the second group of 30 were treated separately) and a plankton splitter was used to subsample the zooplankton in each group. This procedure resulted in higher stomach counts per fish and perhaps improved accuracy. The stomachs from larger nerkids were individually sampled as in previous years. In all years, the taxonomic counts were transformed into % biomass for each taxonomic group based on the assumption that mean taxonomic weight for each group of zooplankton was equal to the average taxonomic weight for individuals captured in zooplankton samples taken on each sampling date. After processing, data from each fish were associated with a unique fresh length, fresh weight, age (scales), diet (stomach analysis), and sockeye or kokanee designation (otolith).

### Assessment of Age-Specific Fish Densities

During 2005, acoustic surveys of Osoyoos Lake for fish abundance were conducted on fives dates using a Simrad EY-500, 70 KHz sounder with 50 W power output with pulse width at 0.2 ms and a Time Varied Gain circuit. During 2006-13, acoustic surveys were completed on 5-7 dates (depending on the year) using a Biosonics DT-X echosounder (200 kHz sounder with 300 W power, pulse width at 1 ms and a 6.60.transducer). Density estimates from echo-integration analysis were used to determine numbers of fish and these data were later used to estimate fish mortality throughout the late summer, fall, and winter periods.

Combined data from echosounding, otolith, and scale-age analysis provided estimates of wild (all years) and hatchery-origin (2010, 2012, 2013) age-0 sockeye and older nerkid densities. Because densities of larger fish were relatively low, our concern was that biosamples alone could not be reliably used to estimate densities of larger kokanee. Even though the trawl net was large (mouth opening 3 x 7 m), some of the larger fish may have escaped so that proportions based on trawl estimates would be biased in favour of age-0 sockeye. To correct for this problem, we combined the acoustic and trawl data to estimate fish densities.

The methods used to assign each fish to the appropriate “taxonomic” category (age-0 sockeye or older nerkid length, weight, age), were as follows: (1) Total fish densities were assessed from acoustics data collected using a Biosonics DT-X sounder. (2) Fish size-frequency distributions were estimated using Sonar5-Pro software. (3) Lengths and weights were recorded from each fish caught in 3m x 7m trawl net sets. (4) During 2010, 2012, 2013, “taxonomic” designations for small fish were based on the presence or absence of marked otoliths (marked = hatchery sockeye and absence = wild sockeye). (5) During all years, ages of larger fish (larger nerkids) were assessed from scales. (6) For each sampling date, length frequencies based on Sonar-5 analysis, trawl-based lengths plus weights and trawl-based ages were combined to assign all pelagic targets to one of 4 groups (i) nerkids <15 cm known from the trawl samples to be almost entirely age-0 sockeye, (ii) age-1 smolts or kokanee known to be age-1 from scale data, (iii) larger nerkids length 15-33 cm known from scale samples to be nerkids age 2 and 3, and (iv) fish larger than 33 cm which we assume to be a mixture of lake whitefish and returning adult sockeye. (6) For each group, the trawl-based data combined with echosounder-based density estimates, were used to calculate densities and biomasses of all size classes of fish.

### Fish Density and Echosounder Sampling Errors

Most field samples collected from a single lake over a period of time (i.e. time series) raise an inferential statistics issue around the calculation of confidence intervals. Even when each sample in the time series is represented by several subsamples taken from different locations in the lake, inferential statistics and confidence intervals may have limited utility due to pseudo-replication (Hurlbert 1984, Millar and Anderson 2004). In Osoyoos Lake this applies to all of our samples for water chemistry (n = 2 samples per time period), phytoplankton (n = 2), zooplankton (n = 5), Mysis (n = 10), but is especially important for fish (n = 14 transects).

When estimating fish density we acoustically sampled 14 transects per nightly sample period, calculated average fish density per transect and combined the weighted averages (numbers per ha) accounting for the effects of depth and transect length (Hyatt and Stockner 1985, Gjernes et al. 1986, MacLennan and Simmonds 1992, Hyatt et al. 2000). This method allowed us to calculate both mean density and a confidence interval. However, the confidence interval may not apply to our estimate of μ the population mean. This is because lake is the experimental unit and the between-transect confidence interval reflects between-transect variability (i.e. transect is the experimental unit). On each sampling date we calculated these between-transect CIs and they have all been reported in the 2005-2013 annual reports. Typically, CIs around the lake-wide mean abundance on all transects ranged from 10-30% of the mean.

For fish, we recognize that it may be possible to use techniques such as Monte Carlo simulations to apply confidence intervals to our daily estimates, but we decided 9 years ago that these methods would contribute little to our ultimate goal of estimating population densities at key times in the year. There were several reasons for this decision. Density estimates obtained on any one day are strongly influenced by fish distribution on a given set of fixed transects which we have assumed are representative of the lake-wide population. Previous experience (McQueen et al. 2007) shows that when a lake is surveyed on successive days or when two boats sample the same lake on the same day, the results are almost identical. This is to be expected and does not deal with the underlying issue of potential pseudo-replication because areal distributions of fish observed within the lake over such a short interval will be relatively static. However, consecutive surveys repeated within a given year at intervals of several days to a few weeks also generate estimates that are usually similar. Because the limnetic fish that are the subject of our ATS work are highly mobile and undertake not only diel vertical migrations but also maintain horizontal movements of a few body lengths per second, it is virtually certain that their distributions on survey transects involving relatively small between-transect distances (tens of meters to a few hundred meters) will differ after periods of several days to a few weeks. Accordingly, the absence of significant differences in limnetic fish abundance between these surveys is interpreted by us to suggest that the all-transect mean of abundance, identified on a given date, is representative of the lake-wide abundance of limnetic fish. If so, the confidence intervals determined around the all-transect means from surveys are applicable as estimates of uncertainty in our estimates of the lake-wide abundance of limnetic fish.

The above noted results contrast with those obtained from sequential acoustic surveys crossing seasonal boundaries beginning in late May to early June, when estimates of mean density separated by two or more months of time often exhibit statistically significant differences. Inspection of the density data shown in Table 11 reveals that age-0 population densities achieve peak abundance between spring to early summer as age-0 fry recruit offshore from river and nearshore areas of the lake. Significant seasonal declines in numbers commonly occur by late summer to fall (August to November) and then remain relatively stable through to late winter (i.e. February). This pattern is almost certainly due to the dynamic interaction of ongoing recruitment and high mortality rates that are known to affect resultant fry abundance during the early part of their life-history allowing us to conclude that the data are generally “well-behaved” with respect to an underlying biological model of expected recruitment-and-mortality over time. Given the dynamic changes observed between spring and summer, we largely rely on two density estimates per lake-year to characterize annual to seasonal changes in *O. nerka* abundance. The first is a “summer-fall density” estimate based on the average of all samples collected from August-November after full recruitment to the limnetic zone is certain to have occurred. The second estimate is “presmolt density” based on the average of all samples collected from October-winter after which both spring recruitment and spring-summer mortality outcomes are complete. We have chosen these time periods because the August-November estimate is useful for assessments of the impacts of the fish on their zooplankton prey over the summer production interval. By contrast, the October-winter average of juvenile sockeye density is our most reliable index of annual production of smolts destined to migrate seaward at age-2 in May-June after a single summer and winter of lake residence. When calculating survival, our recommended starting point is always to estimates of total egg “deposition” or hatchery fry releases, and for Osoyoos Lake our recommended standardized survival estimates are egg-to-fall fry (average Aug-Nov) and egg-to-presmolt (average Oct-winter).

### Densities of Presmolts versus Smolts

Because there are no explicit counts or estimates of smolts as they leave Osoyoos Lake in the spring of each year, we recommend the use of presmolt density as a surrogate for smolt density. The relationship between acoustically derived presmolt densities and weir-based smolt densities has been a continuing challenge for fish biologists, and what little published work there is, suggests that the relationships may be lake-specific (Hyatt et al. 2005). In response to this concern, Hyatt and Stockwell, DFO, Nanaimo (pers. com.) compared presmolt data from Osoyoos Lake with smolt data gathered at Rocky Reach Dam. Of the several dams on the Columbia, only Wells Dam and Rocky Reach Dam involve passage of sockeye that are solely of Okanagan origin. Rocky Reach Dam personnel have conducted a sampling program each spring since 2004, to assess relative abundance of sockeye smolts. For brood years 2002-10, Hyatt and Stockwell (unpub. data) found a highly significant relationship between pre-smolt abundance estimates based on annual acoustic surveys of juvenile sockeye in Osoyoos Lake versus those based on cumulative seasonal sampling each year at Rocky Reach Dam (Osoyoos presmolt abundance = 0.0924\*RRH cumulative smolt count – 53703) (R2 = 0.98, n=9). This relationship is based on data derived from two sampling programs run entirely independently of each other, employing radically different sampling techniques. However, the units of abundance are different. At Rocky Reach Dam, a cumulative smolt count is obtained over several weeks of daily sub-sampling of smolts that utilize a fish-bypass structure. Although this provides a relative index of annual abundance the index was not designed to be confidently scaled up into estimates of the actual number of smolts moving past the dam each year. By contrast, the acoustic and trawl-survey (ATS) based abundance estimates of presmolts are obtained from surveys typically completed in 1-2 nights and designed to inform us of the instantaneous, mean abundance of juvenile sockeye present in the lake on each date. Transect locations were selected to be representative of all limnetic regions of the lake anticipated to contain juvenile sockeye. Thus, mean abundance estimates from all transects, when expanded to account for the entire volume of the limnetic zone, are assumed to represent the entire in-lake population of juvenile sockeye. Thus, we suggest late season (fall-winter) ATS estimates of abundance are likely useful not only as relative abundance indicators but also as reasonable approximations of the total numbers of smolts produced each year.

### Units and Conversions

To facilitate comparisons with other studies, we have presented data for phytoplankton (mm3·m-3), zooplankton (μg·L-1 dry weight), *Mysis* (mg·m-3 wet weight) and fish (kg·ha-1 wet weight) in units that are traditionally used by limnologists and fisheries biologists. However, to simplify between trophic-level comparisons our conversions are based on the following assumptions and conventions. (1) To convert from μg·L-1 to g·ha-1 it is known that μg·L-1 equals 1 mg·m-3, and 1 ha = 10,000 m2. We sampled zooplankton and *Mysis* using vertical hauls between 0-30 m and assumed that average zooplankton biomasses in this region represented zooplankton biomass at all depths. To convert from mg to g we divided by 1000. Therefore to convert μg·L-1 or mg·m-3 to g·ha-1 we multiplied by (30\*10,000)/1000 = 300. (2) A literature survey suggested that wet:dry ratios for crustaceans and juvenile fish ranged from 10-16% (Downing and Rigler 1984, Hewett and Johnson 1992). Throughout we have assumed dry weight to be 14% of wet weight. (3) Therefore, to convert Osoyoos Lake zooplankton biomasses from μg·L-1 dw to g·ha-1 ww, we multiplied by 2100 and to convert *M. relicta* biomasses from mg·L-1 ww or mg·m-3 ww, to g·ha-1ww we multiplied by 300.

# RESULTS

## OSOYOOS LAKE WATER TEMPERATURES

Table 1.Osoyoos Lake temperature profiles (OC). Profiles are averaged from data collected near the north end of the North Basin and the more southerly Monashee sites (Figure 3, numbers 1 and 5). Shaded area approximates water temperatures generally known to be avoided by juvenile sockeye due to temperature preferences < 17°C (Brett 1952, 1964, Levy 1990, 1991) and/or oxygen preferences > 4ppm (Davis 1975, Brett and Blackburn 1981). No data available for blank cells.

Table 1.0. 1998 Osoyoos Lake Water Temperatures (°C)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Depth (m)** | 10-May-98 | 25-Jul-98 | 15-Sep-98 | 4-Oct-98 |
|  |  |  |  |  |
| **1** | 14.3 | 26.5 |  | 17.2 |
| **2** | 14.2 | 25.6 | 21.4 | 17.2 |
| **3** | 14.1 | 24.9 |  | 17.2 |
| **4** | 14.1 | 24.5 | 21.3 | 17.2 |
| **5** | 14.1 | 24.2 |  | 17.2 |
| **6** | 14.0 | 23.9 | 21.3 | 17.2 |
| **7** | 14.0 | 23.4 |  | 17.2 |
| **8** | 13.8 | 23.0 | 21.2 | 17.2 |
| **9** | 13.5 | 22.7 |  | 17.2 |
| **10** | 12.8 | 21.7 | 20.6 | 17.2 |
| **11** | 10.9 | 21.2 |  | 17.1 |
| **12** | 9.6 | 20.4 | 16.2 | 16.9 |
| **13** | 8.9 | 19.2 |  | 16.6 |
| **14** | 8.3 | 17.6 | 14.0 | 14.6 |
| **15** | 8.2 | 15.1 |  | 12.5 |
| **16** | 8.0 | 14.4 | 11.7 | 11.3 |
| **17** | 7.9 | 10.2 |  | 10.2 |
| **18** | 7.8 | 9.8 | 9.8 | 10.0 |
| **19** | 7.8 | 9.3 |  | 9.8 |
| **20** | 7.6 | 9.2 | 9.4 | 9.4 |
| **21** | 7.5 | 9.0 |  | 9.3 |
| **22** | 7.5 | 8.8 |  | 9.3 |
| **23** | 7.5 | 8.7 |  | 9.2 |
| **24** | 7.4 | 8.7 | 9.1 | 9.2 |
| **25** | 7.4 | 8.6 |  | 9.1 |
| **26** | 7.3 | 8.5 |  | 9.0 |
| **27** | 7.3 | 8.5 |  | 9.0 |
| **28** | 7.3 | 8.4 | 8.9 | 9.0 |
| **29** | 7.2 | 8.4 |  | 8.9 |
| **30** | 7.2 | 8.4 |  | 8.9 |
| **31** | 7.2 |  |  | 8.9 |
| **32** | 7.1 |  | 8.9 | 8.9 |
| **33** | 7.1 |  |  | 8.9 |
| **34** | 7.1 |  |  | 8.9 |
| **35** | 7.1 |  |  | 8.9 |
| **36** |  |  | 8.8 | 8.9 |
| **40** |  |  | 8.8 | 8.8 |
| **44** |  |  | 8.7 | 8.8 |
| **48** |  |  | 8.7 |  |
| **52** |  |  | 8.7 |  |
| **56** |  |  | 8.6 |  |
|  |  |  |  |  |

Table 1.1. 2001 Osoyoos Lake Water Temperatures (°C)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Depth (m)** | 24-May-01 | 19-Jun-01 | 19-Jul-01 | 15-Aug-01 | 17-Sep-01 | 31-Oct-01 |
|  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **0** | 19.6 | 17.7 | 20.0 | 22.1 | 19.9 | 10.2 |
| **2** | 17.5 | 17.1 | 20.1 | 22.0 | 19.0 | 10.3 |
| **4** | 16.3 | 16.8 | 20.1 | 22.0 | 18.6 | 10.3 |
| **6** | 15.7 | 16.7 | 20.2 | 21.9 | 18.3 | 10.3 |
| **8** | 15.1 | 16.6 | 20.2 | 21.7 | 18.1 | 10.3 |
| **10** | 14.3 | 16.5 | 20.2 | 21.6 | 18.0 | 10.3 |
| **12** | 13.4 | 16.3 | 19.8 | 21.3 | 17.9 | 10.3 |
| **14** | 11.6 | 15.4 | 18.8 | 17.0 | 17.7 | 10.3 |
| **16** | 10.5 | 13.0 | 17.3 | 16.5 | 14.4 | 10.3 |
| **18** | 10.1 | 11.5 | 15.7 | 19.2 | 10.7 | 10.3 |
| **20** | 8.3 | 10.7 | 13.3 | 17.6 | 9.9 | 10.3 |
| **24** | 7.8 | 9.1 | 11.8 | 12.8 | 9.4 | 10.3 |
| **28** | 7.5 | 8.7 | 9.7 | 10.8 | 9.0 | 10.3 |
|  |  |  |  |  |  |  |

Table 1.2 2002 Osoyoos Lake Water Temperatures (°C)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Depth (m)** | 10-Apr-02 | 24-Apr-02 | 8-May-02 | 22-May-02 | 6-Jun-02 | 10-Jun-02 | 18-Jun-02 | 9-Jul-02 | Jul-22-02 | 7-Aug-02 | 8-Aug-02 | 17-Aug-02 | 27-Aug-02 | 5-Sep-02 | 12-Sep-02 | 20-Sep-02 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **0** | 6.4 | 8.1 | 10.3 | 13.4 | 12.4 | 16.1 | 17.4 | 21.5 | 23.4 | 19.8 | 20.9 | 20.4 | 23.7 | 19.5 | 21.2 | 17.9 |
| **2** | 6.0 | 8.0 | 9.6 | 13.2 | 12.9 | 14.8 | 17.2 | 20.8 | 22.0 | 19.6 | 20.8 | 19.9 | 22.8 | 19.5 | 20.3 | 18.0 |
| **4** | 5.5 | 7.9 | 9.5 | 13.0 | 13.4 | 14.5 | 17.1 | 19.5 | 21.7 | 19.6 | 20.1 | 19.6 | 22.0 | 19.5 | 19.5 | 18.1 |
| **6** | 5.3 | 7.9 | 9.4 | 12.9 | 14.0 | 14.4 | 17.0 | 18.9 | 21.6 | 19.6 | 19.8 | 19.5 | 21.4 | 19.5 | 19.2 | 17.9 |
| **8** | 5.1 | 7.9 | 9.4 | 12.7 | 14.5 | 14.4 | 16.2 | 18.4 | 21.1 | 19.4 | 19.6 | 19.4 | 20.3 | 19.4 | 18.9 | 17.9 |
| **10** | 5.0 | 7.9 | 9.3 | 12.5 | 14.7 | 14.3 | 14.1 | 17.9 | 19.3 | 19.1 | 19.4 | 19.4 | 19.5 | 19.2 | 18.8 | 17.4 |
| **12** | 4.9 | 7.9 | 9.1 | 12.4 | 14.7 | 14.2 | 13.2 | 14.8 | 15.1 | 16.6 | 18.6 | 19.2 | 18.4 | 17.8 | 18.5 | 17.6 |
| **14** | 4.8 | 7.6 | 8.3 | 12.0 | 14.5 | 14.1 | 14.9 | 12.7 | 12.5 | 12.0 | 12.8 | 17.4 | 16.8 | 15.5 | 17.8 | 17.2 |
| **16** | 4.7 | 7.4 | 7.3 | 11.6 | 14.3 | 13.9 | 10.7 | 9.8 | 10.0 | 9.8 | 10.3 | 12.4 | 12.2 | 12.1 | 14.9 | 16.0 |
| **18** | 4.6 | 7.3 | 6.8 | 11.3 | 14.1 | 13.7 | 10.6 | 8.7 | 9.0 | 8.8 | 9.4 | 9.0 | 9.7 | 9.8 | 10.3 | 13.0 |
| **20** | 4.6 | 7.2 | 6.6 | 10.8 | 13.6 | 13.1 | 8.8 | 8.3 | 8.6 | 8.7 | 8.9 | 9.0 | 9.1 | 9.0 | 9.4 | 10.4 |
| **24** | 4.5 | 6.9 | 6.3 | 9.9 | 13.0 | 11.1 | 8.1 | 7.9 | 8.2 | 8.4 | 8.4 | 8.7 | 8.6 | 8.8 | 8.9 | 9.3 |
| **28** | 4.4 | 6.9 | 6.4 | 8.6 | 11.8 | 10.8 | 7.8 | 7.8 | 8.0 | 8.2 | 8.2 | 8.5 |  | 8.6 | 8.6 | 8.9 |
| **32** |  |  | 6.4 | 8.2 | 11.1 | 10.0 | 7.6 | 7.8 | 7.9 | 8.1 | 8.1 | 8.4 |  | 8.5 | 8.5 | 8.8 |
| **36** |  |  | 6.2 | 8.0 | 10.2 | 8.5 | 7.6 | 7.7 | 7.9 | 8.0 | 8.0 | 8.3 |  | 8.4 | 8.5 | 8.6 |
| **40** |  |  | 6.1 | 7.8 | 9.8 | 7.8 | 7.5 | 7.6 | 7.9 | 8.1 | 8.0 | 8.3 |  | 8.4 | 8.4 | 8.8 |
| **44** |  |  |  | 8.2 | 9.4 | 7.7 | 7.4 | 7.5 | 7.9 | 8.0 | 8.1 | 8.3 |  | 8.4 | 8.5 | 9.0 |
| **48** |  |  |  | 8.2 | 8.7 | 7.6 | 7.3 |  | 7.8 | 8.0 | 8.0 | 8.3 |  | 8.3 | 8.3 | 9.1 |
| **52** |  |  |  | 7.9 | 8.3 | 7.4 | 7.3 |  | 7.8 | 8.0 | 8.0 | 8.2 |  | 8.3 | 8.3 | 9.0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**Table 1.2 continued.** 2002 Osoyoos Lake Water Temperatures (°C)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Depth (m)** | 1-Oct-02 | 3-Oct-02 | 12-Oct-02 | 17-Oct-02 | 23-Oct-02 | 29-Oct-02 | 12-Nov-02 | 25-Nov-02 |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| **0** | 16.0 | 15.8 | 14.7 | 13.5 | 12.7 | 11.0 | 9.3 | 7.7 |
| **2** | 15.9 | 15.9 | 14.7 | 13.7 | 13.0 | 11.2 | 9.3 | 8.1 |
| **4** | 15.9 | 15.9 | 14.7 | 13.7 | 13.0 | 11.2 | 9.3 | 8.2 |
| **6** | 15.9 | 15.7 | 14.5 | 13.7 | 13.0 | 11.2 | 9.3 | 8.2 |
| **8** | 15.9 | 15.7 | 14.4 | 13.6 | 13.0 | 11.3 | 9.3 | 8.2 |
| **10** | 15.9 | 15.6 | 14.4 | 13.6 | 13.0 | 11.3 | 9.3 | 8.2 |
| **12** | 15.9 | 15.6 | 14.4 | 13.6 | 12.9 | 11.3 | 9.3 | 8.2 |
| **14** | 15.9 | 15.5 | 14.4 | 13.5 | 12.8 | 10.8 | 9.3 | 8.2 |
| **16** | 15.5 | 15.1 | 14.0 | 13.4 | 12.8 | 10.1 | 9.3 | 8.2 |
| **18** | 12.5 | 10.5 | 13.2 | 13.1 | 12.6 | 9.3 | 9.3 | 8.2 |
| **20** | 10.0 | 9.5 | 10.8 | 11.2 | 11.3 | 9.1 | 9.3 | 8.2 |
| **24** | 9.2 | 9.1 | 9.3 | 9.2 | 9.3 | 8.9 | 9.3 | 8.2 |
| **28** | 8.9 | 8.8 | 8.9 | 8.9 | 9.0 | 8.9 | 9.3 | 8.2 |
| **32** | 8.7 | 8.7 | 8.8 | 8.8 | 8.9 | 8.8 | 9.3 | 8.2 |
| **36** | 8.7 | 8.6 | 8.7 | 8.8 | 8.8 | 8.8 | 9.2 | 8.1 |
| **40** | 8.6 | 8.6 | 8.6 | 8.7 | 8.6 |  | 9.1 | 8.3 |
| **44** | 8.6 | 8.6 | 8.6 | 8.7 | 8.6 |  | 8.9 | 8.3 |
| **48** | 8.6 | 8.6 | 8.6 | 8.6 | 8.7 |  | 8.8 | 8.3 |
| **52** | 8.5 | 8.5 | 8.6 | 8.6 | 8.7 |  | 8.8 | 8.3 |
|  |  |  |  |  |  |  |  |  |

Table 1.3. 2003 Osoyoos Lake Water Temperatures (°C)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Depth (m)** | 21-Apr-03 | 14-May-03 | 16-Jun-03 | 27-Aug-03 | 2-Sep-03 | 8-Sep-03 | 15-Sep-03 | 29-Sep-03 | 15-Oct-03 | 22-Oct-03 |
|  |  |  |  |  |  |  |  |  |  |  |
| **0** | 11.6 | 13.6 | 21.6 | 21.3 | 20.8 | 20.4 | 18.7 | 16.8 | 14.5 | 13.8 |
| **2** | 10.9 | 13.5 | 20.2 | 21.3 | 20.7 | 20.5 | 18.7 | 16.8 | 14.5 | 14.1 |
| **4** | 10.3 | 13.5 | 19.7 | 21.4 | 20.7 | 20.6 | 18.7 | 16.8 | 14.5 | 14.1 |
| **6** | 9.7 | 13.5 | 19.1 | 21.3 | 20.6 | 20.6 | 18.7 | 16.7 | 14.5 | 14.0 |
| **8** | 8.9 | 13.4 | 18.1 | 21.2 | 20.5 | 20.5 | 18.6 | 16.7 | 14.5 | 14.0 |
| **10** | 8.6 | 13.2 | 14.8 | 20.8 | 20.4 | 20.4 | 18.5 | 16.7 | 14.4 | 14.0 |
| **12** | 8.0 | 12.0 | 11.2 | 20.3 | 20.0 | 20.2 | 17.8 | 16.5 | 14.4 | 14.0 |
| **14** | 7.5 | 10.2 | 9.2 | 15.0 | 19.5 | 19.0 | 15.3 | 15.8 | 14.4 | 14.0 |
| **16** | 7.2 | 8.4 | 8.6 | 11.7 | 18.0 | 11.1 | 12.8 | 11.8 | 13.9 | 13.8 |
| **18** | 7.0 | 7.5 | 8.2 | 9.5 | 15.3 | 9.4 | 10.5 | 9.4 | 11.9 | 13.2 |
| **20** | 6.9 | 7.3 | 8.0 | 8.9 | 12.8 | 8.8 | 9.2 | 8.9 | 9.4 | 10.4 |
| **24** | 6.8 | 7.2 | 7.8 | 8.4 | 8.8 | 8.5 | 8.6 | 8.6 | 8.4 | 8.9 |
| **28** | 6.6 | 7.2 | 7.7 | 8.3 | 8.5 | 8.4 | 8.4 | 8.4 | 8.5 | 9.0 |
| **32** | 6.5 | 7.1 | 7.6 | 8.2 | 8.4 | 8.3 | 8.3 | 8.4 | 8.5 | 8.9 |
| **36** | 6.6 | 7.0 | 7.7 | 8.2 | 8.3 | 8.2 | 8.3 | 8.4 | 8.4 |  |
| **40** | 6.4 | 7.1 | 7.7 | 8.1 | 8.3 | 8.2 | 8.3 | 8.4 | 8.4 |  |
|  |  |  |  |  |  |  |  |  |  |  |

Table 1.4. 2004 Osoyoos Lake Water Temperatures (°C)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Depth (m)** | 27-May-04 | 2-Jun-04 | 19-Jul-04 | 18-Aug-04 | 31-Aug-04 | 23-Sep-04 | 2-Nov-04 | 15-Nov-04 |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| **0** | 16.2 | 16.8 | 22.8 | 24.3 | 22.6 | 16.3 | 9.6 | 8.2 |
| **2** | 16.2 | 16.2 | 22.8 | 24.2 | 22.5 | 16.4 | 9.9 | 8.3 |
| **4** | 16.1 | 15.8 | 22.7 | 24.0 | 22.0 | 16.4 | 9.9 | 8.3 |
| **6** | 16.1 | 15.5 | 22.4 | 23.6 | 22.3 | 16.4 | 9.9 | 8.3 |
| **8** | 15.8 | 14.9 | 21.3 | 22.4 | 21.1 | 16.4 | 9.9 | 8.3 |
| **10** | 14.9 | 13.3 | 19.5 | 20.8 | 18.0 | 16.3 | 9.8 | 8.3 |
| **12** | 11.4 | 11.0 | 17.1 | 16.7 | 14.2 | 16.2 | 9.8 | 8.3 |
| **14** | 8.4 | 9.0 | 14.3 | 13.1 | 10.8 | 14.6 | 9.8 | 8.3 |
| **16** | 7.7 | 8.0 | 11.0 | 9.7 | 9.0 | 11.5 | 9.8 | 8.3 |
| **18** | 7.4 | 7.5 | 10.4 | 8.5 | 8.3 | 9.4 | 9.8 | 8.3 |
| **20** | 7.2 | 7.3 | 9.8 | 8.2 | 8.0 | 8.7 | 9.6 | 8.3 |
| **24** | 7.1 | 7.1 | 8.0 | 7.9 | 7.8 | 8.3 | 9.4 | 8.3 |
| **28** | 7.0 | 7.1 | 7.7 | 7.8 | 7.8 | 8.0 | 9.0 | 8.3 |
| **32** | 6.9 | 7.0 | 7.6 | 7.7 | 7.7 | 7.9 | 8.7 | 8.2 |
| **36** | 6.9 | 7.0 | 7.5 | 7.6 | 7.6 | 7.8 | 8.7 | 8.3 |
| **40** | 6.9 | 6.9 | 7.5 | 7.6 | 7.6 | 7.8 | 8.6 | 8.3 |
| **44** | 6.8 | 6.9 | 7.4 | 7.7 | 7.6 | 7.8 | 8.0 | 8.3 |
| **48** | 6.8 | 6.9 | 7.4 | 7.8 | 7.5 | 7.8 | 8.0 | 8.3 |
|  |  |  |  |  |  |  |  |  |

Table 1.5. 2014 Osoyoos Lake Water Temperatures (°C)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Depth (m)** | 17-Mar-14 | 14-May-14 | 20-May-14 | 2-Jun-14 | 16-Jun-14 | 23-Jun-14 | 16-Jul-14 | 21-Jul-14 | 29-Jul-14 | 12-Aug-14 | 18-Aug-14 | 27-Aug-14 | 9-Sep-14 | 15-Sep-14 | 14-Oct-14 | 20-Oct-14 | 10-Nov-14 | 15-Dec-14 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **1** | 3.2 | 14.7 | 14.6 | 16.5 | 17.8 | 21.2 | 26.4 | 21.8 | 24.1 | 22.6 | 24.6 | 25.1 | 17.8 | 19.0 | 15.6 | 14.4 | 10.7 | 4.7 |
| **2** | 3.2 | 14.2 | 14.3 | 16.3 | 17.8 | 21.0 | 25.3 | 21.8 | 23.8 | 22.8 | 24.3 | 25.0 | 18.7 | 18.7 | 15.6 | 14.5 | 10.8 | 4.8 |
| **3** | 3.2 | 13.3 | 13.9 | 16.2 | 17.9 | 19.8 | 24.1 | 21.8 | 23.5 | 22.8 | 23.7 | 24.2 | 18.9 | 18.4 | 15.7 | 14.6 | 10.8 | 4.8 |
| **4** | 3.2 | 13.0 | 13.8 | 16.1 | 17.9 | 18.9 | 23.6 | 21.8 | 23.0 | 22.9 | 23.5 | 23.9 | 18.9 | 18.3 | 15.7 | 14.7 | 10.8 | 4.8 |
| **5** | 3.2 | 11.8 | 13.7 | 15.8 | 17.3 | 18.6 | 23.2 | 21.7 | 22.4 | 22.9 | 23.3 | 23.5 | 19.0 | 18.2 | 15.7 | 14.7 | 10.8 | 4.8 |
| **6** | 3.2 | 11.8 | 13.0 | 15.6 | 17.2 | 18.3 | 22.6 | 21.1 | 21.9 | 22.9 | 23.2 | 23.1 | 19.0 | 18.1 | 15.7 | 14.8 | 10.8 | 4.8 |
| **7** | 3.2 | 11.6 | 12.1 | 15.5 | 17.2 | 18.0 | 21.2 | 20.6 | 21.6 | 22.7 | 23.0 | 22.7 | 19.1 | 18.0 | 15.7 | 14.8 | 10.8 | 4.8 |
| **8** | 3.2 | 11.6 | 11.9 | 15.4 | 17.0 | 17.7 | 20.1 | 20.2 | 21.3 | 22.4 | 22.9 | 22.5 | 19.1 | 17.9 | 15.7 | 14.8 | 10.8 | 4.8 |
| **9** | 3.2 | 11.1 | 11.3 | 15.3 | 16.8 | 17.5 | 18.5 | 19.0 | 20.4 | 22.1 | 22.4 | 22.0 | 19.0 | 17.8 | 15.7 | 14.8 | 10.8 | 4.8 |
| **10** | 3.2 | 10.8 | 11.1 | 15.1 | 16.2 | 16.7 | 16.6 | 17.8 | 19.3 | 20.6 | 20.3 | 22.3 | 18.8 | 17.8 | 15.7 | 14.8 | 10.8 | 4.8 |
| **11** | 3.2 | 10.6 | 10.9 | 14.6 | 14.9 | 15.7 | 15.1 | 16.3 | 16.6 | 17.5 | 16.9 | 18.7 | 18.8 | 17.7 | 15.7 | 14.8 | 10.7 | 4.8 |
| **12** | 3.2 | 10.3 | 10.5 | 14.2 | 14.1 | 14.9 | 14.4 | 15.7 | 15.5 | 15.9 | 14.9 | 16.8 | 18.7 | 17.7 | 15.7 | 14.8 | 10.7 | 4.8 |
| **13** | 3.2 | 9.9 | 9.6 | 12.2 | 13.0 | 13.3 | 12.6 | 14.4 | 13.9 | 14.0 | 13.5 | 15.1 | 16.2 | 17.5 | 15.6 | 14.7 | 10.7 | 4.8 |
| **14** | 3.2 | 9.5 | 8.8 | 10.7 | 12.5 | 11.8 | 10.4 | 12.5 | 12.5 | 13.1 | 12.4 | 13.4 | 15.0 | 17.2 | 15.6 | 14.7 | 10.7 | 4.8 |
| **15** | 3.2 | 9.2 | 8.4 | 9.6 | 12.1 | 10.7 | 9.4 | 11.4 | 11.6 | 12.1 | 11.4 | 11.8 | 14.1 | 13.0 | 15.0 | 14.6 | 10.7 | 4.8 |
| **16** | 3.2 | 8.9 | 7.7 | 9.0 | 10.7 | 9.4 | 8.8 | 10.6 | 11.1 | 11.2 | 10.1 | 11.0 | 11.5 | 11.0 | 14.3 | 13.5 | 10.7 | 4.8 |
| **17** | 3.2 | 8.3 | 7.3 | 8.3 | 9.9 | 8.3 | 8.1 | 9.6 | 10.2 | 10.5 | 9.5 | 10.2 | 10.4 | 10.5 | 12.6 | 12.2 | 10.6 | 4.8 |
| **18** | 3.2 | 7.8 | 7.2 | 7.8 | 9.0 | 8.0 | 7.9 | 9.0 | 9.7 | 9.8 | 9.0 | 9.6 | 10.0 | 10.0 | 10.6 | 11.0 | 10.6 | 4.8 |
| **19** | 3.2 | 7.4 | 7.1 | 7.5 | 8.6 | 7.8 | 7.8 | 8.4 | 9.0 | 9.3 | 8.9 | 9.4 | 9.6 | 9.6 | 9.4 | 9.8 | 10.5 | 4.8 |
| **20** | 3.2 | 7.2 | 7.0 | 7.4 | 7.8 | 7.6 | 7.7 | 8.1 | 8.7 | 9.0 | 8.8 | 8.9 | 9.3 | 9.2 | 9.1 | 9.4 | 10.4 | 4.8 |
| **24** | 3.2 | 6.8 | 6.8 | 7.1 | 7.3 | 7.3 | 7.6 | 7.7 | 8.2 | 8.4 | 8.4 | 8.5 | 8.6 | 8.6 | 8.7 | 8.8 | 9.2 | 4.8 |
| **28** | 3.2 | 6.6 | 6.7 | 7.0 | 7.1 | 7.3 | 7.5 | 7.6 | 8.0 | 8.0 | 8.2 | 8.3 | 8.4 | 8.4 | 8.4 | 8.5 | 8.8 | 4.8 |
| **32** | 3.2 | 6.5 | 6.6 | 6.9 | 7.1 | 7.2 | 7.4 | 7.5 | 7.9 | 7.9 | 8.1 | 8.1 | 8.2 | 8.2 | 8.3 | 8.3 | 8.5 | 4.7 |
| **36** | 3.1 | 6.6 | 6.6 | 6.9 | 7.1 | 7.2 | 7.4 | 7.4 | 7.8 | 7.7 | 7.9 | 8.1 | 8.1 | 8.2 | 8.3 | 8.3 | 8.6 | 4.9 |
| **40** | 3.1 | 6.5 | 6.6 | 6.8 | 7.1 | 7.1 | 7.4 | 7.4 | 7.7 | 7.7 | 7.8 | 8.0 | 8.1 | 8.2 | 8.2 | 8.2 | 8.4 | 4.9 |
| **44** | 3.1 | 6.5 | 6.6 | 6.8 | 7.1 | 7.1 | 7.4 | 7.4 | 7.7 | 7.7 | 7.7 | 7.9 | 8.0 | 8.1 | 8.2 | 8.2 | 8.4 | 4.9 |
| **48** | 3.1 | 6.4 | 6.6 | 6.8 | 7.0 | 7.1 | 7.4 | 7.4 | 7.7 | 7.7 | 7.7 | 7.9 | 8.0 | 8.0 | 8.1 | 8.2 | 8.2 | 4.9 |
| **52** | 3.1 | 6.4 | 6.6 | 6.8 | 7.0 | 7.1 | 7.3 | 7.3 | 7.7 | 7.6 | 7.7 | 7.8 | 7.9 | 7.9 | 8.1 | 8.1 | 8.1 | 4.9 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Table 1.6. 2015 Osoyoos Lake Water Temperatures (°C)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Depth (m)** | 21-Apr-15 | 19-May-15 | 25-May-15 | 2-Jun-15 | 17-Jun-15 | 22-Jun-15 | 8-Jul-15 | 15-Jul-15 | 20-Jul-15 | 28-Jul-15 | 10-Aug-15 | 17-Aug-15 | 23-Aug-15 | 31-Aug-15 | 8-Sep-15 | 28-Sep-15 | 13-Oct-15 | 15-Nov-15 | 15-Dec-15 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **1** | 11.7 | 16.6 | 16.6 | 18.9 | 21.3 | 20.4 | 24.5 | 23.1 | 23.9 | 22.2 | 22.9 | 22.2 | 21.6 | 20.1 | 18.1 | 15.5 | 14.3 | 9.7 | 5.2 |
| **2** | 11.3 | 16.5 | 16.2 | 19.0 | 21.3 | 20.2 | 23.9 | 23.1 | 23.9 | 22.2 | 22.9 | 22.1 | 21.6 | 20.2 | 18.1 | 15.6 | 14.4 | 9.7 | 5.4 |
| **3** | 11.0 | 16.3 | 15.8 | 18.9 | 21.3 | 20.1 | 23.8 | 23.1 | 23.4 | 22.0 | 22.9 | 22.1 | 21.5 | 20.2 | 18.1 | 15.6 | 14.4 | 9.7 | 5.4 |
| **4** | 10.8 | 15.5 | 15.3 | 19.0 | 20.9 | 20.0 | 23.7 | 23.1 | 23.3 | 21.8 | 22.9 | 22.0 | 21.5 | 20.2 | 18.0 | 15.7 | 14.5 | 9.8 | 5.4 |
| **5** | 10.6 | 14.9 | 14.8 | 18.9 | 20.7 | 19.9 | 23.5 | 23.1 | 23.0 | 21.7 | 22.9 | 22.0 | 21.5 | 20.2 | 18.0 | 15.7 | 14.5 | 9.8 | 5.4 |
| **6** | 10.5 | 14.5 | 14.7 | 18.8 | 20.4 | 19.9 | 23.1 | 23.1 | 22.8 | 21.6 | 22.9 | 21.9 | 21.5 | 20.2 | 18.0 | 15.8 | 14.5 | 9.8 | 5.4 |
| **7** | 10.3 | 14.0 | 14.6 | 18.7 | 20.0 | 19.8 | 22.9 | 23.0 | 22.7 | 21.5 | 22.8 | 21.8 | 21.5 | 20.2 | 17.9 | 15.8 | 14.6 | 9.8 | 5.4 |
| **8** | 10.0 | 13.6 | 14.3 | 18.3 | 19.3 | 19.6 | 22.7 | 22.6 | 22.4 | 21.5 | 22.7 | 21.6 | 21.5 | 20.2 | 17.9 | 15.8 | 14.5 | 9.8 | 5.4 |
| **9** | 9.6 | 13.2 | 13.5 | 17.2 | 18.2 | 19.2 | 22.5 | 21.3 | 22.3 | 21.4 | 22.1 | 21.4 | 21.4 | 20.1 | 17.9 | 15.8 | 14.5 | 9.8 | 5.4 |
| **10** | 9.4 | 12.9 | 12.7 | 15.6 | 16.4 | 17.7 | 19.3 | 18.3 | 21.8 | 21.1 | 20.8 | 21.0 | 21.3 | 20.1 | 17.9 | 15.8 | 14.5 | 9.8 | 5.4 |
| **11** | 9.2 | 12.6 | 12.0 | 13.2 | 13.9 | 15.8 | 17.0 | 16.1 | 18.6 | 20.7 | 20.2 | 20.2 | 20.9 | 19.9 | 17.8 | 15.8 | 14.5 | 9.8 | 5.5 |
| **12** | 9.2 | 12.3 | 11.5 | 12.6 | 12.3 | 13.6 | 15.4 | 14.2 | 15.6 | 17.3 | 18.1 | 18.4 | 18.6 | 19.4 | 17.8 | 15.8 | 14.5 | 9.8 | 5.5 |
| **13** | 9.0 | 12.1 | 11.1 | 11.7 | 10.9 | 12.5 | 14.2 | 12.3 | 13.9 | 14.5 | 15.5 | 15.5 | 16.1 | 17.7 | 17.7 | 15.8 | 14.5 | 9.8 | 5.5 |
| **14** | 9.0 | 11.8 | 10.9 | 10.7 | 10.5 | 11.4 | 12.5 | 11.5 | 12.9 | 12.5 | 14.4 | 14.4 | 14.9 | 17.1 | 16.4 | 15.7 | 14.5 | 9.8 | 5.5 |
| **15** | 8.8 | 11.2 | 10.8 | 10.2 | 10.0 | 10.5 | 12.0 | 10.5 | 12.1 | 11.5 | 12.9 | 12.8 | 13.2 | 13.5 | 14.5 | 15.2 | 14.4 | 9.8 | 5.5 |
| **16** | 8.7 | 10.4 | 10.2 | 9.9 | 9.5 | 10.1 | 11.3 | 10.0 | 11.3 | 10.7 | 11.6 | 11.2 | 11.9 | 11.9 | 11.6 | 14.7 | 14.4 | 9.8 | 5.5 |
| **17** | 8.7 | 9.9 | 10.0 | 9.6 | 9.3 | 9.7 | 10.7 | 9.7 | 11.0 | 9.9 | 10.7 | 10.3 | 11.1 | 11.0 | 10.7 | 12.9 | 14.2 | 9.8 | 5.5 |
| **18** | 8.5 | 9.6 | 9.3 | 9.4 | 9.3 | 9.5 | 10.2 | 9.6 | 10.5 | 9.7 | 10.5 | 9.9 | 10.6 | 10.4 | 10.0 | 11.7 | 13.9 | 9.8 | 5.5 |
| **19** | 8.4 | 9.3 | 9.1 | 9.3 | 9.1 | 9.4 | 9.7 | 9.5 | 10.2 | 9.5 | 10.3 | 9.6 | 10.1 | 9.9 | 9.9 | 10.8 | 13.0 | 9.8 | 5.5 |
| **20** | 8.3 | 9.0 | 9.1 | 9.2 | 9.1 | 9.3 | 9.6 | 9.3 | 9.9 | 9.4 | 10.0 | 9.4 | 9.8 | 9.7 | 9.7 | 10.2 | 11.8 | 9.8 | 5.5 |
| **24** | 7.7 | 8.6 | 8.8 | 8.8 | 8.8 | 9.0 | 9.3 | 9.1 | 9.4 | 9.2 | 9.4 | 9.3 | 9.4 | 9.4 | 9.4 | 9.7 | 10.2 | 9.7 | 5.5 |
| **28** | 7.4 | 8.5 | 8.7 | 8.7 | 8.7 | 8.9 | 9.1 | 9.0 | 9.3 | 9.1 | 9.2 | 9.1 | 9.2 | 9.3 | 9.3 | 9.5 | 9.8 | 9.7 | 5.5 |
| **32** | 7.2 | 8.3 | 8.5 | 8.6 | 8.6 | 8.8 | 9.0 | 8.9 | 9.1 | 9.0 | 9.1 | 9.0 | 9.1 | 9.1 | 9.2 | 9.3 | 9.4 | 9.7 | 5.5 |
| **36** | 7.1 | 8.2 | 8.5 | 8.5 | 8.6 | 8.8 | 9.0 | 8.9 | 9.0 | 8.9 | 9.0 | 9.0 | 9.1 | 9.1 | 9.1 | 9.3 | 9.3 | 9.8 | 5.6 |
| **40** | 7.0 | 8.1 | 8.3 | 8.4 | 8.5 | 8.7 | 8.9 | 8.8 | 9.0 | 8.8 | 8.9 | 8.9 | 9.0 | 9.0 | 9.1 | 9.2 | 9.3 | 9.8 | 5.6 |
| **44** | 6.9 | 7.9 | 8.2 | 8.3 | 8.5 | 8.7 | 8.8 | 8.8 | 8.9 | 8.8 | 8.9 | 8.8 | 8.9 | 9.0 | 9.0 | 9.1 | 9.2 | 9.5 | 5.6 |
| **48** | 6.7 | 7.8 | 8.1 | 8.2 | 8.4 | 8.6 | 8.7 | 8.7 | 8.8 | 8.8 | 8.8 | 8.9 | 8.9 | 8.9 | 9.0 | 9.1 | 9.1 | 9.2 | 5.6 |
| **52** | 6.5 | 7.7 | 8.0 | 8.1 | 8.3 | 8.6 | 8.7 | 8.6 | 8.8 | 8.7 | 8.8 | 8.8 | 8.9 | 8.9 | 8.9 | 9.0 | 9.1 | 9.1 | 5.6 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Table 1.7. 2016 Osoyoos Lake Water Temperatures (°C)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Depth (m)** | 24-May-16 | 6-Jul-16 | 12-Jul-16 | 6-Aug-16 | 6-Oct-16 | 25-Oct-16 |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **1** | 16.4 | 20.7 | 20.6 | 23.7 | 15.5 | 12.4 |
| **2** | 16.2 | 20.7 | 20.6 | 23.3 | 15.7 | 12.4 |
| **3** | 16.1 | 20.4 | 20.5 | 22.9 | 15.8 | 12.4 |
| **4** | 16.0 | 20.2 | 20.5 | 22.7 | 15.8 | 12.4 |
| **5** | 15.8 | 20.1 | 20.4 | 22.3 | 15.9 | 12.4 |
| **6** | 15.7 | 19.8 | 20.3 | 22.1 | 15.9 | 12.4 |
| **7** | 15.5 | 19.7 | 20.2 | 21.8 | 15.9 | 12.4 |
| **8** | 15.4 | 19.6 | 20.0 | 21.5 | 15.9 | 12.4 |
| **9** | 15.3 | 19.5 | 19.8 | 21.2 | 15.9 | 12.4 |
| **10** | 15.2 | 19.1 | 19.4 | 20.9 | 15.9 | 12.4 |
| **11** | 15.0 | 17.7 | 19.1 | 20.4 | 15.9 | 12.4 |
| **12** | 14.8 | 16.6 | 17.6 | 19.4 | 15.9 | 12.4 |
| **13** | 14.3 | 16.1 | 15.9 | 18.1 | 15.9 | 12.4 |
| **14** | 14.0 | 15.4 | 14.1 | 16.3 | 15.9 | 12.4 |
| **15** | 13.1 | 13.5 | 13.4 | 15.0 | 15.9 | 12.3 |
| **16** | 12.5 | 12.2 | 12.5 | 13.5 | 15.7 | 12.3 |
| **17** | 11.8 | 11.2 | 11.6 | 11.8 | 15.4 | 12.3 |
| **18** | 11.0 | 10.2 | 10.7 | 11.0 | 14.1 | 12.3 |
| **19** | 10.1 | 9.6 | 10.0 | 10.4 | 12.1 | 12.3 |
| **20** | 9.5 | 9.2 | 9.7 | 10.1 | 11.1 | 12.2 |
| **24** | 8.3 | 8.8 | 8.9 | 9.3 | 9.8 | 11.4 |
| **28** | 8.0 | 8.6 | 8.6 | 9.0 | 9.5 | 9.7 |
| **32** | 7.7 | 8.4 | 8.5 | 8.8 | 9.3 | 9.3 |
| **36** | 7.6 | 8.3 | 8.4 | 8.7 | 9.1 | 9.3 |
| **40** | 7.5 | 8.2 | 8.4 | 8.6 | 9.1 | 9.2 |
| **44** | 7.4 | 8.2 | 8.3 | 8.6 | 9.0 | 9.1 |
| **48** | 7.4 | 8.1 | 8.2 | 8.6 | 9.0 | 9.0 |
| **52** | 7.4 | 8.1 | 8.2 | 8.5 | 8.9 | 9.0 |
|  |  |  |  |  |  |  |

Table 1.8. 2017 Osoyoos Lake Water Temperatures (°C)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Depth (m)** | 6-Apr-17 | 24-May-17 | 19-Jun-17 | 18-Jul-17 | 24-Jul-17 | 1-Aug-17 | 15-Aug-17 | 12-Sep-17 | 10-Oct-17 | 16-Nov-17 |
|  |  |  |  |  |  |  |  |  |  |  |
| **1** | 5.6 | 13.6 | 17.0 | 21.5 | 21.3 | 22.3 | 22.0 | 21.0 | 14.2 | 14.2 |
| **2** | 5.4 | 12.9 | 16.9 | 21.5 | 21.3 | 22.3 | 22.0 | 21.2 | 14.2 | 14.2 |
| **3** | 5.4 | 12.5 | 16.7 | 21.5 | 21.3 | 22.3 | 22.0 | 21.3 | 14.2 | 14.2 |
| **4** | 5.3 | 12.3 | 16.6 | 21.5 | 21.3 | 22.3 | 22.0 | 21.4 | 14.2 | 14.2 |
| **5** | 5.3 | 12.2 | 16.3 | 21.5 | 21.3 | 22.3 | 22.0 | 21.0 | 14.2 | 14.2 |
| **6** | 5.2 | 12.0 | 16.1 | 21.4 | 21.3 | 22.3 | 22.0 | 21.0 | 14.2 | 14.2 |
| **7** | 5.1 | 11.7 | 16.0 | 21.4 | 21.3 | 22.2 | 21.9 | 21.0 | 14.2 | 14.2 |
| **8** | 5.1 | 11.6 | 15.9 | 21.3 | 21.2 | 22.1 | 21.9 | 21.0 | 14.2 | 14.2 |
| **9** | 5.0 | 11.5 | 15.8 | 21.3 | 21.2 | 21.6 | 21.8 | 21.0 | 14.2 | 14.2 |
| **10** | 5.0 | 11.4 | 15.6 | 21.3 | 21.1 | 21.4 | 21.7 | 21.0 | 14.2 | 14.2 |
| **11** | 5.0 | 11.3 | 15.6 | 20.9 | 21.1 | 21.3 | 21.6 | 21.0 | 14.2 | 14.2 |
| **12** | 4.9 | 11.2 | 15.5 | 20.2 | 20.7 | 20.8 | 21.3 | 20.9 | 14.2 | 14.2 |
| **13** | 4.9 | 11.1 | 15.2 | 18.2 | 19.7 | 16.9 | 19.9 | 20.0 | 14.2 | 14.2 |
| **14** | 4.8 | 10.9 | 14.7 | 15.6 | 16.9 | 14.4 | 14.3 | 18.8 | 14.2 | 14.2 |
| **15** | 4.8 | 10.7 | 14.3 | 14.2 | 15.6 | 13.5 | 13.2 | 17.5 | 14.2 | 14.2 |
| **16** | 4.8 | 10.2 | 13.5 | 11.9 | 14.3 | 11.6 | 11.5 | 16.4 | 14.2 | 14.2 |
| **17** | 4.8 | 9.8 | 12.2 | 10.7 | 11.9 | 10.7 | 10.4 | 13.6 | 14.2 | 14.2 |
| **18** | 4.8 | 9.6 | 10.7 | 10.0 | 10.5 | 10.1 | 9.5 | 12.0 | 14.2 | 14.2 |
| **19** | 4.8 | 9.5 | 9.9 | 9.4 | 9.9 | 9.2 | 9.1 | 11.2 | 14.2 | 14.2 |
| **20** | 4.7 | 9.1 | 9.0 | 9.1 | 9.3 | 9.0 | 8.8 | 10.1 | 12.8 | 12.8 |
| **24** | 4.7 | 8.2 | 8.3 | 8.5 | 8.6 | 8.7 | 8.6 | 9.3 | 9.6 | 9.6 |
| **28** | 4.6 | 7.9 | 8.1 | 8.3 | 8.4 | 8.4 | 8.4 | 8.9 | 9.2 | 9.2 |
| **32** | 4.6 | 7.6 | 7.9 | 8.2 | 8.3 | 8.3 | 8.3 | 8.7 | 9.0 | 9.0 |
| **36** | 4.5 | 7.2 | 7.8 | 8.2 | 8.2 | 8.2 | 8.3 | 8.6 | 9.0 | 9.0 |
| **40** | 4.5 | 6.9 | 7.7 | 8.1 | 8.1 | 8.1 | 8.1 | 8.5 | 8.7 | 8.7 |
| **44** | 4.5 | 6.8 | 7.5 | 7.9 | 8.0 | 8.0 | 7.9 | 8.4 | 8.6 | 8.6 |
| **48** | 4.5 | 6.5 | 7.2 | 7.7 | 7.9 | 7.8 | 7.8 | 8.3 | 8.5 | 8.5 |
| **52** | 4.5 | 6.3 | 7.3 | 7.5 | 7.7 | 7.6 | 7.7 | 8.0 | 8.3 | 8.3 |
|  |  |  |  |  |  |  |  |  |  |  |

Table 1.9. 2018 Osoyoos Lake Water Temperatures (°C)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Depth (m)** | 15-Feb-18 | 17-May-18 | 12-Jul-18 | 27-Jul-18 | 9-Aug-18 | 5-Sep-18 | 5-Oct-18 | 8-Nov-18 |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| **1** | 2.42 | 13.4 | 22.9 | 23.4 | 25.5 | 18.9 | 14.0 | 9.9 |
| **2** | 2.25 | 13.2 | 22.8 | 22.9 | 25.4 | 18.9 | 14.0 | 10.2 |
| **3** | 2.20 | 13.0 | 22.3 | 22.6 | 24.7 | 18.8 | 14.2 | 10.3 |
| **4** | 2.19 | 12.9 | 21.7 | 22.4 | 24.1 | 18.7 | 14.3 | 10.4 |
| **5** | 2.17 | 12.8 | 21.1 | 22.2 | 23.5 | 18.7 | 14.3 | 10.4 |
| **6** | 2.17 | 12.7 | 20.9 | 22.1 | 23.0 | 18.7 | 14.3 | 10.4 |
| **7** | 2.17 | 12.3 | 20.7 | 22.0 | 22.5 | 18.6 | 14.3 | 10.4 |
| **8** | 2.11 | 12.3 | 20.4 | 21.9 | 22.3 | 18.6 | 14.4 | 10.4 |
| **9** | 2.11 | 12.2 | 20.3 | 21.7 | 22.1 | 18.6 | 14.4 | 10.4 |
| **10** | 2.09 | 12.1 | 20.2 | 21.5 | 21.8 | 18.5 | 14.3 | 10.4 |
| **11** | 2.09 | 12.0 | 20.0 | 21.2 | 21.0 | 18.5 | 14.3 | 10.4 |
| **12** | 2.09 | 11.8 | 19.2 | 18.8 | 19.9 | 18.4 | 14.3 | 10.4 |
| **13** | 2.08 | 11.6 | 17.1 | 16.8 | 18.8 | 18.4 | 14.3 | 10.4 |
| **14** | 2.08 | 11.1 | 15.7 | 15.4 | 16.7 | 18.2 | 14.3 | 10.4 |
| **15** | 2.08 | 11.0 | 14.7 | 14.1 | 15.6 | 17.6 | 14.3 | 10.4 |
| **16** | 2.08 | 10.9 | 12.8 | 12.4 | 14.0 | 15.2 | 14.1 | 10.4 |
| **17** | 2.08 | 10.8 | 12.3 | 11.0 | 12.6 | 13.3 | 14.0 | 10.4 |
| **18** | 2.08 | 10.5 | 11.4 | 10.1 | 11.4 | 12.0 | 13.9 | 10.4 |
| **19** | 2.08 | 10.2 | 10.9 | 9.8 | 10.4 | 11.3 | 13.6 | 10.4 |
| **20** | 2.08 | 10.1 | 10.2 | 9.5 | 9.8 | 10.2 | 13.0 | 10.3 |
| **24** | 2.05 | 8.5 | 9.4 | 9.1 | 9.5 | 9.3 | 10.0 | 10.3 |
| **28** | 2.05 | 8.1 | 8.8 | 8.8 | 9.0 | 9.1 | 9.5 | 10.2 |
| **32** | 2.06 | 8.0 | 8.7 | 8.7 | 8.8 | 9.0 | 9.2 | 9.9 |
| **36** | 2.00 | 7.7 | 8.5 | 8.7 | 8.7 | 8.9 | 9.2 | 9.4 |
| **40** | 2.00 | 7.6 | 8.4 | 8.6 | 8.6 | 8.8 | 9.1 | 9.1 |
| **44** | 2.06 | 7.5 | 8.3 | 8.4 | 8.5 | 8.8 | 9.0 | 9.0 |
| **48** | 2.06 | 7.0 | 8.1 | 8.2 | 8.3 | 8.7 | 9.0 | 8.9 |
| **52** | 2.06 | 6.4 | 8.0 | 8.1 | 8.2 | 8.6 | 8.9 | 8.9 |
|  |  |  |  |  |  |  |  |  |

Table 1.10. 2019 Osoyoos Lake Water Temperatures (°C)

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Depth (m)** | 14-May-19 | 16-Jun-19 | 7-Jul-19 | 1-Aug-19 | 19-Aug-19 | 2-Oct-19 | 22-Oct-19 | 1-Nov-19 | 12-Nov-19 | 22-Nov-19 | 27-Feb-20 |
|  |  |  |  |  |  |  |  |  |  |  |
| **1** | 15.4 | 20.9 | 19.8 | 22.9 | 23.4 | 15.5 | 11.3 | 8.8 | 8.3 | 6.8 | 2.6 |
| **2** | 15.4 | 20.9 | 19.8 | 22.7 | 23.3 | 15.6 | 11.3 | 9.5 | 8.3 | 7.3 | 2.6 |
| **3** | 15.4 | 20.9 | 19.8 | 22.8 | 23.2 | 15.6 | 11.3 | 9.5 | 8.3 | 7.4 | 2.5 |
| **4** | 15.3 | 20.2 | 19.8 | 22.8 | 23.0 | 15.6 | 11.3 | 9.2 | 8.3 | 7.5 | 2.5 |
| **5** | 15.2 | 19.0 | 19.8 | 22.8 | 22.5 | 15.6 | 11.3 | 9.1 | 8.3 | 7.5 | 2.5 |
| **6** | 15.2 | 18.1 | 19.6 | 22.7 | 22.3 | 16.1 | 11.3 | 9.1 | 8.3 | 7.5 | 2.5 |
| **7** | 15.1 | 17.0 | 19.4 | 22.6 | 22.2 | 15.6 | 11.3 | 9.1 | 8.3 | 7.5 | 2.5 |
| **8** | 14.2 | 14.6 | 19.0 | 22.4 | 22.0 | 15.7 | 11.3 | 9.1 | 8.3 | 7.5 | 2.5 |
| **9** | 12.4 | 13.5 | 18.7 | 21.8 | 21.8 | 15.7 | 11.3 | 9.1 | 8.3 | 7.6 | 2.5 |
| **10** | 11.2 | 12.1 | 18.3 | 20.6 | 21.2 | 15.7 | 11.3 | 9.0 | 8.3 | 7.6 | 2.5 |
| **11** | 10.5 | 11.7 | 17.6 | 18.0 | 19.4 | 15.7 | 11.3 | 9.0 | 8.3 | 7.6 | 2.5 |
| **12** | 9.6 | 10.4 | 16.7 | 14.0 | 16.8 | 15.6 | 11.3 | 9.0 | 8.3 | 7.6 | 2.5 |
| **13** | 9.1 | 9.0 | 13.1 | 12.8 | 15.8 | 15.6 | 11.3 | 9.0 | 8.3 | 7.6 | 2.5 |
| **14** | 8.8 | 8.4 | 12.3 | 11.1 | 12.7 | 15.6 | 11.3 | 9.0 | 8.3 | 7.6 | 2.5 |
| **15** | 7.7 | 8.2 | 9.7 | 9.7 | 11.3 | 14.9 | 11.2 | 9.0 | 8.3 | 7.6 | 2.5 |
| **16** | 7.5 | 8.0 | 9.3 | 8.7 | 9.9 | 14.1 | 11.2 | 9.0 | 8.3 | 7.6 | 2.5 |
| **17** | 7.3 | 7.8 | 8.9 | 8.5 | 9.0 | 11.4 | 11.1 | 9.0 | 8.3 | 7.6 | 2.5 |
| **18** | 7.1 | 7.6 | 8.5 | 8.4 | 8.8 | 9.5 | 10.1 | 9.0 | 8.3 | 7.5 | 2.5 |
| **19** | 7.1 | 7.6 | 8.3 | 8.3 | 8.6 | 9.2 | 9.8 | 9.0 | 8.3 | 7.5 | 2.5 |
| **20** | 6.9 | 7.5 | 8.1 | 8.2 | 8.3 | 8.9 | 9.5 | 9.0 | 8.3 | 7.5 | 2.5 |
| **24** | 6.9 | 7.3 | 7.8 | 8.0 | 8.1 | 8.5 | 8.7 | 8.9 | 8.2 | 7.5 | 2.5 |
| **28** | 6.8 | 7.3 | 7.7 | 7.9 | 8.0 | 8.3 | 8.5 | 8.9 | 8.2 | 7.5 | 2.5 |
| **32** | 6.7 | 7.2 | 7.6 | 7.7 | 7.9 | 8.1 | 8.4 | 8.8 | 8.1 | 7.5 | 2.5 |
| **36** | 6.8 | 7.1 | 7.6 | 7.7 | 7.8 | 8.0 | 8.2 | 8.7 | 8.1 | 7.6 | 2.6 |
| **40** | 6.8 | 7.1 | 7.6 | 7.7 | 7.8 | 7.9 | 8.2 | 8.5 | 8.1 | 7.6 | 2.6 |
| **44** | 6.8 | 7.1 | 7.5 | 7.7 | 7.8 | 7.9 | 8.1 | 8.4 | 8.1 | 7.6 | 2.6 |
| **48** | 6.8 | 7.1 | 7.5 | 7.7 | 7.7 | 7.9 | 8.1 | 8.3 | 8.1 | 7.6 | 2.6 |
| **52** | 6.8 | 7.1 | 7.5 | 7.6 | 7.7 | 7.8 | 8.0 | 8.2 | 8.1 | 7.6 | 2.6 |
|  |  |  |  |  |  |  |  |  |  |  |  |

Table 1.11. 2020 Osoyoos Lake Water Temperatures (°C)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Depth( m)** | 27-Feb-20 | 11-Mar-20 | 26-May-20 | 23-Jun-20 | 14-Jul-20 | 12-Aug-20 | 19-Aug-20 | 5-Oct-20 | 10-Nov-20 | 19-Nov-20 |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
| **1** | 2.57 | 3.50 | 14.3 | 19.2 | 21.1 | 22.9 | 23.6 | 17.2 | 8.1 | 7.9 |
| **2** | 2.55 | 3.49 | 14.4 | 19.0 | 20.7 | 22.7 | 23.5 | 17.5 | 8.6 | 8.0 |
| **3** | 2.54 | 3.49 | 14.4 | 18.6 | 20.4 | 22.6 | 23.5 | 17.5 | 8.7 | 7.8 |
| **4** | 2.54 | 3.52 | 14.3 | 18.3 | 19.8 | 22.4 | 22.9 | 17.6 | 8.7 | 7.8 |
| **5** | 2.54 | 3.50 | 14.2 | 17.9 | 19.7 | 22.2 | 22.8 | 17.6 | 8.8 | 7.8 |
| **6** | 2.54 | 3.50 | 14.1 | 17.6 | 19.6 | 22.1 | 22.7 | 17.6 | 8.8 | 7.8 |
| **7** | 2.54 | 3.49 | 13.9 | 17.3 | 19.5 | 22.0 | 22.4 | 17.5 | 8.8 | 7.8 |
| **8** | 2.54 | 3.50 | 13.8 | 16.9 | 19.3 | 22.0 | 22.1 | 17.5 | 8.8 | 7.8 |
| **9** | 2.54 | 3.51 | 13.6 | 16.6 | 19.2 | 21.9 | 21.9 | 17.5 | 8.8 | 7.8 |
| **10** | 2.54 | 3.52 | 12.7 | 16.2 | 19.0 | 21.7 | 21.7 | 17.4 | 8.8 | 7.8 |
| **11** | 2.54 | 3.52 | 12.7 | 16.0 | 19.0 | 21.6 | 21.3 | 17.4 | 8.8 | 7.8 |
| **12** | 2.54 | 3.52 | 12.1 | 15.6 | 18.9 | 21.6 | 20.9 | 17.3 | 8.8 | 7.8 |
| **13** | 2.54 | 3.51 | 11.8 | 15.1 | 18.7 | 21.3 | 20.4 | 17.1 | 8.8 | 7.8 |
| **14** | 2.54 | 3.48 | 10.6 | 14.7 | 17.8 | 19.0 | 19.5 | 16.9 | 8.8 | 7.8 |
| **15** | 2.54 | 3.46 | 10.1 | 14.3 | 15.2 | 17.5 | 17.2 | 16.8 | 8.8 | 7.8 |
| **16** | 2.54 | 3.47 | 9.2 | 13.8 | 13.9 | 14.9 | 15.9 | 16.5 | 8.8 | 7.8 |
| **17** | 2.54 | 3.46 | 8.6 | 13.1 | 12.1 | 12.9 | 14.8 | 15.5 | 8.8 | 7.8 |
| **18** | 2.54 | 3.45 | 8.5 | 12.1 | 10.8 | 11.6 | 13.5 | 15.2 | 8.8 | 7.8 |
| **19** | 2.54 | 3.45 | 8.4 | 10.1 | 9.9 | 10.7 | 12.1 | 13.9 | 8.7 | 7.8 |
| **20** | 2.54 | 3.46 | 8.2 | 9.6 | 9.5 | 9.9 | 11.0 | 12.4 | 8.7 | 7.8 |
| **24** | 2.54 | 3.47 | 7.9 | 8.5 | 8.9 | 9.2 | 9.3 | 9.7 | 8.7 | 7.7 |
| **28** | 2.54 | 3.45 | 7.7 | 8.2 | 8.5 | 8.8 | 8.9 | 9.1 | 8.7 | 7.6 |
| **32** | 2.55 | 3.45 | 7.6 | 8.0 | 8.9 | 8.6 | 8.7 | 8.9 | 8.6 | 7.6 |
| **36** | 2.56 | 3.42 | 7.6 | 8.0 | 8.3 | 8.6 | 8.6 | 8.7 | 8.8 | 7.8 |
| **40** | 2.56 | 3.42 | 7.6 | 7.9 | 8.3 | 8.4 | 8.5 | 8.7 | 8.8 | 7.8 |
| **44** | 2.57 | 3.42 | 7.5 | 7.8 | 8.2 | 8.4 | 8.4 | 8.6 | 8.8 | 7.8 |
| **48** | 2.58 | 3.42 | 7.4 | 7.8 | 8.1 | 8.3 | 8.4 | 8.6 | 8.7 | 7.8 |
| **52** | 2.59 | 3.39 | 7.4 | 7.8 | 8.1 | 8.2 | 8.3 | 8.6 | 8.7 | 7.8 |
|  |  |  |  |  |  |  |  |  |  |  |

Table 1.12. 2021 Osoyoos Lake Water Temperatures (°C)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Depth (m)** | 15-Mar-21 | 10-May-21 | 12-Jul-21 | 16-Aug-21 | 13-Sep-21 | 4-Oct-21 | 31-Oct-21 |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| **1** | 3.54 | 12.97 | 24.8 | 22.2 | 19.7 | 16.0 | 10.8 |
| **2** | 3.48 | 12.97 | 24.8 | 22.5 | 19.7 | 16.0 | 10.8 |
| **3** | 3.51 | 12.93 | 24.7 | 22.5 | 19.6 | 16.0 | 10.9 |
| **4** | 3.51 | 12.89 | 24.6 | 22.5 | 19.6 | 16.0 | 10.9 |
| **5** | 3.46 | 12.86 | 24.5 | 22.5 | 19.4 | 16.0 | 10.9 |
| **6** | 3.47 | 12.79 | 19.3 | 22.5 | 19.3 | 16.0 | 10.9 |
| **7** | 3.47 | 12.47 | 23.3 | 22.5 | 19.2 | 16.0 | 10.9 |
| **8** | 3.46 | 12.16 | 22.8 | 22.3 | 19.1 | 15.9 | 10.9 |
| **9** | 3.44 | 11.53 | 20.9 | 22.0 | 19.1 | 15.9 | 10.9 |
| **10** | 3.43 | 10.93 | 17.9 | 20.8 | 19.0 | 15.9 | 10.9 |
| **11** | 3.45 | 10.60 | 16.4 | 18.5 | 18.8 | 15.8 | 10.8 |
| **12** | 3.44 | 9.57 | 14.9 | 14.5 | 18.4 | 15.8 | 10.8 |
| **13** | 3.42 | 8.47 | 13.5 | 13.0 | 18.1 | 15.5 | 10.8 |
| **14** | 3.41 | 8.21 | 12.3 | 11.3 | 17.3 | 15.3 | 10.8 |
| **15** | 3.41 | 8.03 | 10.8 | 10.3 | 14.3 | 15.0 | 10.7 |
| **16** | 3.40 | 7.80 | 10.1 | 9.7 | 11.0 | 14.3 | 10.7 |
| **17** | 3.40 | 7.74 | 9.5 | 9.4 | 9.8 | 13.5 | 10.7 |
| **18** | 3.40 | 7.54 | 9.2 | 9.1 | 9.4 | 11.7 | 10.6 |
| **19** | 3.40 | 7.44 | 9.0 | 8.9 | 9.1 | 10.6 | 10.4 |
| **20** | 3.40 | 7.36 | 8.7 | 8.7 | 8.9 | 9.6 | 10.3 |
| **24** | 3.41 | 7.23 | 8.4 | 8.5 | 8.7 | 9.0 | 9.5 |
| **28** | 3.40 | 7.14 | 8.3 | 8.4 | 8.5 | 8.7 | 8.9 |
| **32** | 3.39 | 7.08 | 8.2 | 8.3 | 8.4 | 8.6 | 8.7 |
| **36** | 3.22 | 7.05 | 8.2 | 8.3 | 8.4 | 8.5 | 8.7 |
| **40** | 3.25 | 7.02 | 8.1 | 8.3 | 8.3 | 8.5 | 8.7 |
| **44** | 3.25 | 6.96 | 8.1 | 8.2 | 8.3 | 8.4 | 8.6 |
| **48** | 3.25 | 6.93 | 8.0 | 8.2 | 8.2 | 8.4 | 8.5 |
| **52** | 3.25 | 6.90 | 8.0 | 8.2 | 8.2 | 8.4 | 8.5 |
|  |  |  |  |  |  |  |  |

## OSOYOOS LAKE OXYGEN CONCENTRATIONS

Table 2. Osoyoos Lake oxygen profiles (mg/L). Profiles are averaged from data collected at the north end of the North Basin (#1, Figure 3) and the Monashee sites (#5, Figure 3). Shaded area (when present) approximates oxygen concentrations known to be generally avoided by juvenile sockeye (i.e. oxygen < 4µg L-1, Davis 1975, Brett and Blackburn 1981). No data available for blank cells.

Table 2.0. 1998 Osoyoos Lake oxygen concentrations µg L-1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Depth (m)** | 10-May-98 | 25-Jul-98 | 15-Sep-98 | 4-Oct-98 |
|  |  |  |  |  |
| **0** | 10.3 |  | 9.4 | 8.7 |
| **1** | 10.3 | 8.0 |  | 8.6 |
| **2** | 10.2 | 8.7 | 9.4 | 8.6 |
| **3** | 10.1 | 8.7 |  | 8.5 |
| **4** | 10.1 | 8.8 | 9.3 | 8.4 |
| **5** | 10.1 | 8.6 |  | 8.4 |
| **6** | 10.1 | 8.3 | 9.3 | 8.4 |
| **7** | 10.0 | 8.1 |  | 8.3 |
| **8** | 10.0 | 7.2 | 9.1 | 8.3 |
| **9** | 10.0 | 7.0 |  | 8.3 |
| **10** | 10.0 | 7.0 | 7.3 | 8.3 |
| **11** | 10.0 | 6.8 |  | 7.9 |
| **12** | 10.3 | 6.4 | 4.6 | 7.5 |
| **13** | 10.3 | 5.7 |  | 7.2 |
| **14** | 10.3 | 5.4 | 3.8 | 6.0 |
| **15** | 10.4 | 4.9 |  | 5.5 |
| **16** | 10.4 | 6.5 | 4.2 | 4.8 |
| **17** | 10.3 | 6.5 |  | 4.4 |
| **18** | 10.3 | 6.8 | 4.7 | 4.2 |
| **19** | 10.3 | 6.9 |  | 4.1 |
| **20** | 10.3 | 7.0 | 4.6 | 3.9 |
| **21** | 10.3 | 7.0 |  | 3.7 |
| **22** | 10.2 | 7.0 |  | 3.5 |
| **23** | 10.2 | 7.0 |  | 3.4 |
| **24** | 10.2 | 7.0 | 4.3 | 3.3 |
| **25** | 10.2 | 6.9 |  | 3.1 |
| **26** | 10.2 | 6.9 |  | 3.0 |
| **27** | 10.2 | 6.8 |  | 2.9 |
| **28** | 10.2 | 6.8 | 4.1 | 2.8 |
| **29** | 10.2 | 6.7 |  | 2.8 |
| **30** | 10.2 | 6.7 |  | 2.8 |
| **31** | 10.2 |  |  | 2.8 |
| **32** | 10.1 |  | 3.9 |  |
| **33** | 10.0 |  |  | 2.7 |
| **34** | 9.9 |  |  | 2.7 |
| **35** | 9.8 |  |  | 2.6 |
| **36** |  |  | 3.9 | 2.5 |
| **40** |  |  | 3.8 | 2.4 |
| **44** |  |  | 3.7 |  |
| **48** |  |  | 3.7 |  |
| **52** |  |  | 3.5 |  |
| **56** |  |  | 3.3 |  |
|  |  |  |  |  |

Table 2.1. 2001 Osoyoos Lake oxygen concentrations µg L-1

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Depth (m)** | 24-May-01 | 19-Jun-01 | 19-Jul-01 | 15-Aug-01 | 17-Sep-01 | 31-Oct-01 |
|  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **0** | 6.2 | 9.7 | 9.2 | 9.0 | 9.5 | 9.6 |
| **2** | 6.5 | 10.0 | 9.1 | 9.1 | 9.6 | 9.6 |
| **4** | 7.1 | 10.3 | 9.1 | 9.1 | 9.9 | 9.6 |
| **6** | 7.3 | 10.4 | 9.0 | 9.2 | 9.8 | 9.6 |
| **8** | 7.6 | 10.5 | 9.0 | 9.3 | 9.7 | 9.6 |
| **10** | 7.8 | 10.4 | 8.8 | 9.2 | 9.7 | 9.6 |
| **12** | 7.9 | 10.4 | 8.6 | 9.0 | 9.6 | 9.6 |
| **14** | 8.0 | 10.2 | 8.3 | 6.8 | 9.4 | 9.6 |
| **16** | 8.4 | 9.5 | 7.7 | 6.6 | 4.6 | 9.6 |
| **18** | 8.5 | 9.1 | 7.3 | 6.4 | 3.4 | 9.6 |
| **20** | 8.8 | 8.9 | 7.1 | 6.7 | 3.5 | 9.6 |
| **24** | 9.3 | 9.0 | 7.1 | 5.0 | 3.5 | 9.6 |
| **28** |  | 9.1 | 6.8 | 5.1 | 3.3 | 9.6 |
|  |  |  |  |  |  |  |

Table 2.2. 2002 Osoyoos Lake oxygen concentrations µg L-1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Depth (m)** | 10-Apr-02 | 24-Apr-02 | 8-May-02 | 22-May-02 | 6-Jun-02 | 10-Jun-02 | 18-Jun-02 | 9-Jul-02 | Jul-22-02 | 7-Aug-02 | 8-Aug-02 | 17-Aug-02 | 27-Aug-02 | 5-Sep-02 | 12-Sep-02 | 20-Sep-02 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **0** | 12.6 | 11.0 | 10.3 | 11.8 | 11.1 | 10.7 | 9.5 | 8.7 | 8.3 | 8.4 | 9.4 | 9.2 | 8.8 | 7.8 | 8.5 | 8.6 |
| **2** | 12.3 | 11.8 | 9.7 | 11.7 | 13.8 | 10.3 | 9.5 | 9.0 | 8.3 | 8.2 | 9.3 | 9.3 | 9.4 | 8.1 | 8.7 | 8.4 |
| **4** | 13.0 | 12.3 | 10.1 | 12.7 | 14.4 | 10.6 | 9.8 | 9.5 | 8.5 | 8.2 | 9.5 | 9.3 | 9.5 | 7.9 | 9.3 | 8.3 |
| **6** | 13.3 | 12.5 | 10.4 | 12.6 | 13.3 | 10.8 | 10.1 | 9.7 | 8.6 | 8.2 | 9.6 | 9.3 | 9.3 | 8.0 | 9.4 | 8.3 |
| **8** | 13.5 | 12.6 | 10.4 | 12.7 | 13.5 | 10.7 | 9.9 | 9.7 | 8.4 | 8.1 | 9.3 | 9.0 | 9.0 | 7.9 | 9.2 | 8.2 |
| **10** | 13.7 | 12.8 | 10.6 | 12.6 | 12.9 | 10.7 | 9.9 | 9.4 | 7.8 | 7.7 | 8.8 | 9.2 | 8.4 | 7.5 | 9.0 | 8.0 |
| **12** | 13.8 | 12.6 | 10.9 | 12.5 | 13.4 | 10.6 | 9.9 | 9.2 | 6.8 | 6.0 | 8.1 | 8.9 | 7.5 | 6.6 | 8.6 | 7.7 |
| **14** | 13.6 | 12.8 | 10.9 | 13.1 | 13.1 | 10.8 | 10.0 | 8.6 | 6.9 | 5.7 | 6.4 | 8.4 | 6.8 | 5.9 | 8.5 | 7.7 |
| **16** | 13.8 | 12.5 | 10.9 | 13.3 | 13.1 | 10.7 | 10.3 | 9.2 | 7.5 | 6.2 | 6.7 | 7.4 | 5.5 | 5.2 | 7.2 | 7.0 |
| **18** | 13.8 | 12.4 | 10.9 | 12.8 | 13.6 | 10.6 | 10.3 | 9.5 | 7.8 | 6.5 | 6.9 | 7.7 | 5.5 | 5.7 | 6.6 | 6.2 |
| **20** | 13.8 | 12.6 | 10.6 | 13.3 | 12.7 | 10.5 | 10.6 | 9.7 | 7.8 | 6.5 | 7.0 | 6.8 | 5.6 | 5.4 | 5.5 | 4.9 |
| **24** | 13.6 | 12.6 | 9.3 | 13.8 | 13.3 | 10.9 | 11.0 | 9.8 | 7.8 | 6.4 | 7.1 | 6.8 | 5.4 | 4.8 | 5.3 | 4.3 |
| **28** | 13.7 | 12.5 | 6.7 | 14.1 | 13.0 | 11.0 | 10.8 | 9.7 | 7.7 | 6.3 | 7.0 | 6.7 |  | 4.7 | 5.2 | 4.0 |
| **32** |  |  | 6.4 | 14.1 | 13.3 | 11.1 | 10.8 | 9.4 | 7.4 | 6.2 | 6.8 | 6.9 |  | 4.5 | 4.9 | 3.9 |
| **36** |  |  | 10.1 | 13.9 | 14.0 | 11.2 | 10.9 | 8.9 | 6.9 | 5.5 | 4.4 | 5.1 |  | 4.2 | 4.5 | 3.7 |
| **40** |  |  | 9.6 | 12.4 | 15.8 | 11.2 | 10.8 | 7.7 | 6.3 | 6.1 | 4.0 | 6.7 |  | 4.0 | 3.3 | 2.6 |
| **44** |  |  |  | 13.1 | 16.6 | 10.8 | 10.9 | 7.5 | 7.3 | 6.1 | 6.4 | 6.6 |  | 3.9 | 2.8 | 2.3 |
| **48** |  |  |  | 12.9 | 15.9 | 11.8 | 10.7 |  | 7.3 | 6.1 | 6.4 | 6.5 |  | 4.0 | 4.1 | 2.2 |
| **52** |  |  |  | 12.7 | 15.7 | 11.9 | 10.7 |  | 7.3 | 6.0 | 6.2 | 6.4 |  | 4.0 | 3.9 | 2.3 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**Table 2.2 continued.** 2002 Osoyoos Lake oxygen concentrations µg L-1

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Depth (m)** | 1-Oct-02 | 3-Oct-02 | 12-Oct-02 | 17-Oct-02 | 23-Oct-02 | 29-Oct-02 | 12-Nov-02 | 25-Nov-02 |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| **0** | 8.8 | 8.8 | 10.5 | 10.3 | 8.7 | 14.9 | 9.0 | 8.3 |
| **2** | 8.8 | 8.8 | 10.2 | 10.3 | 9.2 | 15.1 | 9.0 | 8.2 |
| **4** | 8.8 | 8.8 | 10.1 | 10.5 | 8.6 | 14.9 | 9.1 | 8.2 |
| **6** | 8.7 | 8.9 | 10.2 | 10.2 | 8.6 | 11.2 | 9.1 | 8.2 |
| **8** | 8.3 | 8.9 | 9.4 | 10.2 | 8.5 | 6.7 | 9.1 | 8.2 |
| **10** | 5.7 | 4.7 | 7.8 | 9.9 | 8.4 | 4.3 | 9.1 | 8.2 |
| **12** | 4.2 | 3.6 | 4.6 | 4.7 | 8.4 | 3.1 | 9.0 | 8.2 |
| **14** | 3.5 | 3.1 | 3.2 | 2.7 | 2.6 | 2.8 | 9.0 | 8.2 |
| **16** | 3.1 | 2.9 | 2.5 | 2.2 | 1.8 | 2.5 | 9.0 | 8.1 |
| **18** | 2.9 | 2.6 | 2.3 | 2.0 | 1.5 | 2.4 | 8.8 | 8.2 |
| **20** | 3.1 | 1.7 | 2.2 | 1.8 | 1.3 | 2.3 | 7.3 | 8.2 |
| **24** | 2.9 | 2.1 | 2.0 | 1.7 | 1.0 |  | 6.4 | 6.8 |
| **28** | 2.8 | 2.0 | 2.0 | 1.5 | 0.9 |  | 1.5 | 6.8 |
| **32** | 2.7 | 2.0 | 1.9 | 1.4 | 1.1 |  | 0.7 | 6.8 |
| **36** | 2.7 | 1.9 | 1.8 | 1.4 | 1.0 |  | 0.6 | 6.8 |
|  |  |  |  |  |  |  |  |  |

Table 2.3. 2003 Osoyoos Lake oxygen concentrations µg L-1

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Depth (m)** | 21-Apr-03 | 14-May-03 | 16-Jun-03 | 27-Aug-03 | 2-Sep-03 | 8-Sep-03 | 15-Sep-03 | 29-Sep-03 | 15-Oct-03 | 22-Oct-03 |
|  |  |  |  |  |  |  |  |  |  |  |
| **0** | 10.3 | 11.8 | 9.0 | 8.1 | 8.9 | 9.0 | 8.2 | 9.5 | 8.1 | 9.8 |
| **2** | 11.0 | 11.8 | 9.9 | 7.9 | 8.7 | 8.2 | 8.2 | 9.2 | 7.6 | 9.8 |
| **4** | 11.1 | 12.1 | 10.1 | 7.9 | 8.6 | 8.1 | 8.5 | 9.1 | 7.6 | 9.8 |
| **6** | 11.5 | 12.1 | 9.9 | 7.8 | 8.6 | 8.1 | 8.0 | 9.1 | 7.6 | 9.8 |
| **8** | 11.9 | 12.6 | 9.4 | 7.8 | 8.5 | 8.1 | 8.0 | 9.1 | 7.5 | 9.8 |
| **10** | 11.8 | 12.1 | 8.9 | 7.1 | 8.4 | 8.1 | 8.2 | 9.0 | 7.4 | 9.8 |
| **12** | 11.9 | 12.0 | 9.1 | 6.8 | 8.0 | 8.0 | 7.6 | 8.5 | 7.3 | 9.8 |
| **14** | 12.0 | 11.9 | 9.3 | 5.2 | 7.5 | 7.6 | 5.2 | 8.8 | 7.2 | 9.8 |
| **16** | 12.1 | 12.5 | 9.5 | 4.2 | 6.1 | 6.2 | 4.3 | 5.1 | 6.7 | 9.7 |
| **18** | 12.2 | 12.8 | 9.7 | 4.5 | 4.8 | 5.4 | 3.6 | 3.7 | 4.6 | 8.9 |
| **20** | 11.7 | 13.0 | 9.7 | 4.7 | 4.0 | 5.2 | 3.6 | 3.1 | 2.8 | 5.2 |
| **24** | 12.2 | 13.2 | 9.8 | 4.7 | 4.8 | 4.9 | 3.6 | 3.0 | 2.2 | 2.2 |
| **28** | 12.1 | 13.2 | 9.6 | 4.6 | 4.8 | 4.6 | 3.9 | 2.4 | 1.9 | 1.4 |
| **32** | 12.1 | 13.2 | 9.4 | 4.5 | 4.6 | 4.4 | 3.7 | 2.3 | 1.6 | 1.1 |
| **36** | 12.1 | 13.3 | 7.7 | 4.4 | 6.4 | 4.0 | 4.0 | 2.5 | 1.7 |  |
| **40** | 12.1 | 11.9 | 9.5 | 4.3 | 4.3 | 4.4 | 3.8 | 2.4 | 1.6 |  |
|  |  |  |  |  |  |  |  |  |  |  |

Table 2.4. 2004 Osoyoos Lake oxygen concentrations µg L-1

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Depth (m)** | 27-May-04 | 2-Jun-04 | 19-Jul-04 | 18-Aug-04 | 31-Aug-04 | 23-Sep-04 | 6-Oct-04 | 2-Nov-04 | 15-Nov-04 |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| **0** | 8.2 | 11.4 | 11.6 | 7.1 | 7.9 | 8.3 | 6.7 | 11.9 | 10.3 |
| **2** | 9.7 | 11.4 | 12.1 | 8.3 | 7.4 | 6.2 | 11.3 | 11.8 | 9.4 |
| **4** | 10.1 | 13.0 | 11.4 | 9.6 | 6.8 | 8.0 | 10.0 | 11.2 | 9.3 |
| **6** | 10.5 | 12.7 | 13.2 | 9.1 | 6.6 | 7.8 | 9.2 | 10.9 | 6.5 |
| **8** | 10.1 | 12.6 | 10.7 | 9.7 | 6.6 | 8.2 | 9.1 | 11.7 | 6.4 |
| **10** | 9.7 | 11.8 | 10.6 | 9.2 | 6.7 | 8.3 | 9.3 | 10.2 | 8.9 |
| **12** | 9.8 | 11.6 | 12.0 | 9.1 | 6.2 | 8.6 | 8.8 | 12.1 | 9.4 |
| **14** | 10.3 | 12.3 | 11.9 | 8.9 | 6.4 | 9.1 | 9.2 | 12.6 | 9.7 |
| **16** | 10.6 | 12.6 | 12.3 | 9.8 | 6.8 | 9.6 | 9.0 | 12.9 | 9.9 |
| **18** | 10.9 | 12.7 | 12.4 | 10.1 | 6.6 | 9.4 | 8.8 | 13.2 | 9.9 |
| **20** | 11.1 | 12.7 | 12.4 | 9.6 | 6.5 | 8.6 | 8.2 | 13.2 | 9.9 |
| **24** | 11.9 | 12.2 | 12.3 | 8.6 | 6.4 | 7.9 | 7.1 | 13.1 | 9.7 |
| **28** | 11.4 | 10.7 | 11.0 | 7.4 | 6.1 | 7.4 | 5.7 | 12.1 | 8.8 |
| **32** | 10.1 | 9.9 | 10.0 | 6.8 | 5.6 | 6.7 | 4.5 | 10.4 | 8.9 |
| **36** | 9.1 | 8.2 | 8.9 | 6.2 | 5.2 | 6.3 | 3.3 | 9.4 | 7.9 |
| **40** | 6.3 | 7.6 | 8.0 | 5.4 | 4.4 | 6.6 | 2.4 | 7.5 | 7.6 |
| **44** | 4.4 | 7.3 | 6.8 | 4.7 | 3.0 | 6.3 |  | 6.1 | 7.4 |
| **48** | 4.1 | 6.9 | 4.8 | 4.2 | 2.6 | 5.9 |  | 5.0 | 7.4 |
|  |  |  |  |  |  |  |  |  |  |

Table 2.5. 2014 Osoyoos Lake oxygen concentrations µg L-1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Depth (m)** | 14-May-14 | 20-May-14 | 2-Jun-14 | 16-Jun-14 | 23-Jun-14 | 16-Jul-14 | 21-Jul-14 | 29-Jul-14 | 12-Aug-14 | 18-Aug-14 | 27-Aug-14 | 9-Sep-14 | 15-Sep-14 | 14-Oct-14 | 20-Oct-14 | 10-Nov-14 | 15-Dec-14 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **1** | 11.8 | 12.2 | 12.0 | 14.6 | 9.4 | 10.2 | 9.3 | 9.4 | 9.0 | 8.9 | 9.0 | 9.4 | 9.2 | 9.4 | 10.0 | 9.6 | 12.0 |
| **2** | 12.2 | 12.3 | 12.0 | 14.6 | 9.5 | 10.4 | 8.8 | 9.4 | 9.0 | 9.0 | 8.9 | 8.8 | 9.3 | 9.3 | 9.8 | 9.5 | 11.9 |
| **3** | 12.3 | 12.3 | 12.0 | 14.7 | 9.8 | 10.6 | 8.7 | 9.4 | 8.9 | 9.0 | 9.1 | 8.6 | 9.2 | 9.2 | 9.7 | 9.4 | 11.9 |
| **4** | 12.1 | 12.2 | 12.0 | 14.7 | 9.7 | 10.6 | 8.7 | 9.3 | 8.9 | 8.9 | 9.1 | 8.6 | 9.1 | 9.2 | 9.6 | 9.3 | 11.8 |
| **5** | 12.2 | 12.2 | 12.0 | 14.8 | 9.5 | 10.4 | 8.7 | 9.3 | 8.8 | 8.8 | 9.0 | 8.5 | 9.1 | 9.2 | 9.5 | 9.3 | 11.8 |
| **6** | 12.0 | 12.3 | 11.9 | 14.5 | 9.3 | 10.0 | 8.5 | 8.8 | 8.8 | 8.7 | 8.8 | 8.5 | 9.0 | 9.2 | 9.5 | 9.3 | 11.8 |
| **7** | 11.9 | 12.5 | 11.9 | 14.5 | 9.1 | 9.6 | 8.2 | 8.7 | 8.5 | 8.7 | 8.5 | 8.4 | 8.9 | 9.2 | 9.5 | 9.2 | 11.7 |
| **8** | 11.9 | 12.3 | 11.9 | 14.3 | 8.9 | 8.8 | 7.9 | 8.3 | 8.2 | 8.4 | 8.2 | 8.4 | 8.7 | 9.1 | 9.4 | 9.2 | 11.7 |
| **9** | 11.9 | 12.4 | 11.9 | 14.3 | 8.8 | 8.3 | 7.7 | 7.1 | 7.8 | 7.7 | 7.5 | 8.3 | 8.6 | 9.1 | 9.4 | 9.1 | 11.7 |
| **10** | 11.9 | 12.3 | 11.9 | 14.0 | 8.8 | 7.8 | 6.8 | 6.3 | 6.8 | 5.6 | 5.6 | 8.0 | 8.6 | 9.1 | 9.4 | 9.0 | 11.7 |
| **11** | 11.9 | 12.4 | 11.9 | 13.6 | 8.5 | 7.3 | 6.6 | 5.2 | 5.0 | 4.3 | 4.6 | 7.9 | 8.5 | 9.1 | 9.4 | 8.9 | 11.6 |
| **12** | 11.9 | 12.4 | 11.8 | 13.3 | 8.2 | 7.1 | 6.3 | 5.0 | 4.4 | 3.8 | 4.2 | 7.6 | 8.5 | 9.1 | 9.4 | 8.7 | 11.6 |
| **13** | 12.0 | 12.6 | 12.0 | 13.4 | 8.1 | 7.1 | 6.4 | 5.0 | 4.2 | 3.8 | 3.5 | 6.1 | 8.5 | 9.1 | 9.3 | 8.6 | 11.6 |
| **14** | 12.0 | 12.7 | 12.2 | 13.3 | 8.1 | 7.4 | 6.3 | 5.1 | 4.2 | 3.9 | 3.4 | 5.6 | 8.2 | 9.0 | 9.3 | 8.6 | 11.6 |
| **15** | 12.0 | 12.8 | 12.3 | 13.3 | 8.2 | 7.8 | 6.9 | 5.2 | 4.3 | 4.2 | 3.5 | 4.4 | 6.1 | 8.7 | 9.2 | 8.5 | 11.6 |
| **16** | 12.0 | 12.9 | 12.4 | 13.7 | 8.4 | 8.4 | 7.3 | 5.3 | 4.6 | 4.6 | 3.8 | 3.8 | 4.6 | 8.1 | 8.6 | 8.4 | 11.5 |
| **17** | 12.1 | 13.0 | 12.6 | 13.9 | 8.7 | 8.6 | 7.8 | 5.6 | 4.9 | 4.9 | 4.0 | 3.8 | 4.5 | 6.4 | 7.3 | 8.2 | 11.5 |
| **18** | 12.2 | 12.9 | 12.7 | 14.2 | 8.8 | 8.7 | 8.2 | 5.8 | 5.0 | 5.3 | 4.3 | 3.8 | 4.2 | 4.8 | 6.6 | 8.0 | 11.5 |
| **19** | 12.3 | 12.9 | 12.7 | 14.2 | 8.9 | 8.8 | 8.4 | 6.1 | 5.3 | 5.3 | 4.5 | 3.9 | 4.1 | 4.0 | 4.7 | 7.9 | 11.5 |
| **20** | 12.3 | 12.9 | 12.7 | 14.5 | 8.9 | 8.9 | 8.6 | 6.3 | 5.5 | 5.4 | 4.7 | 4.1 | 4.2 | 3.6 | 4.2 | 7.6 | 11.5 |
| **24** | 12.3 | 12.9 | 12.8 | 14.7 | 8.9 | 9.0 | 8.8 | 6.3 | 5.6 | 5.4 | 4.8 | 4.3 | 4.2 | 3.4 | 3.7 | 6.1 | 11.5 |
| **28** | 12.2 | 12.8 | 12.8 | 14.6 | 8.8 | 9.0 | 8.7 | 6.3 | 5.6 | 5.4 | 4.9 | 4.4 | 4.3 | 3.2 | 3.4 | 4.3 | 11.5 |
| **32** | 12.1 | 12.8 | 12.7 | 14.4 | 8.7 | 8.9 | 8.6 | 6.2 | 5.6 | 5.4 | 4.8 | 4.4 | 4.2 | 3.1 | 3.1 | 3.3 | 11.4 |
| **36** | 12.1 | 12.6 | 12.5 | 14.4 | 8.7 | 8.5 | 9.0 | 6.3 | 5.6 | 5.4 | 4.9 | 4.4 | 4.2 | 3.0 | 3.0 | 3.4 | 11.5 |
| **40** | 12.0 | 12.6 | 12.5 | 14.4 | 8.7 | 8.5 | 9.0 | 6.2 | 5.5 | 5.3 | 4.9 | 4.4 | 4.2 | 2.9 | 2.8 | 3.1 | 11.4 |
| **44** | 11.9 | 12.5 | 12.5 | 14.3 | 8.7 | 8.4 | 9.2 | 6.1 | 5.4 | 5.2 | 4.8 | 4.4 | 4.1 | 2.9 | 2.7 | 2.5 | 11.4 |
| **48** | 11.9 | 12.5 | 12.4 | 14.3 | 8.6 | 8.4 | 9.2 | 6.1 | 5.4 | 5.2 | 4.8 | 4.3 | 4.0 | 2.8 | 2.6 | 2.3 | 11.3 |
| **52** | 11.8 | 12.5 | 12.3 | 14.3 | 8.6 | 8.4 | 8.8 | 6.1 | 5.3 | 5.1 | 4.7 | 4.3 | 3.9 | 2.7 | 2.5 | 2.1 | 11.2 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Table 2.6. 2015 Osoyoos Lake oxygen concentrations µg L-1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Depth (m)** | 21-Apr-15 | 19-May-15 | 25-May-15 | 2-Jun-15 | 17-Jun-15 | 22-Jun-15 | 8-Jul-15 | 15-Jul-15 | 20-Jul-15 | 28-Jul-15 | 10-Aug-15 | 17-Aug-15 | 23-Aug-15 | 31-Aug-15 | 8-Sep-15 | 28-Sep-15 | 13-Oct-15 | 15-Nov-15 | 15-Dec-15 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **1** | 10.6 | 9.9 | 9.5 | 9.3 | 8.8 | 8.7 | 8.6 | 8.5 | 8.5 | 8.9 | 8.7 | 8.7 | 8.0 | 7.8 | 9.1 | 9.9 | 9.9 | 9.5 | 11.8 |
| **2** | 10.9 | 10.0 | 9.6 | 9.2 | 8.8 | 8.8 | 8.6 | 8.5 | 8.5 | 8.9 | 8.8 | 8.7 | 7.9 | 7.8 | 9.1 | 9.6 | 9.7 | 9.4 | 11.6 |
| **3** | 11.0 | 10.0 | 9.6 | 9.2 | 8.8 | 8.8 | 8.6 | 8.5 | 8.6 | 8.8 | 8.8 | 8.6 | 7.9 | 7.8 | 9.1 | 9.5 | 9.7 | 9.3 | 11.6 |
| **4** | 11.1 | 10.0 | 9.5 | 9.2 | 8.7 | 8.7 | 8.6 | 8.4 | 8.6 | 8.8 | 8.8 | 8.7 | 7.9 | 7.8 | 9.0 | 9.4 | 9.6 | 9.2 | 11.5 |
| **5** | 11.1 | 9.9 | 9.5 | 9.2 | 8.7 | 8.7 | 8.5 | 8.4 | 8.6 | 8.8 | 8.8 | 8.8 | 7.9 | 7.8 | 9.0 | 9.3 | 9.6 | 9.2 | 11.5 |
| **6** | 11.1 | 10.0 | 9.5 | 9.1 | 8.6 | 8.7 | 8.3 | 8.3 | 8.6 | 8.7 | 8.8 | 8.8 | 7.8 | 7.7 | 8.9 | 9.3 | 9.5 | 9.1 | 11.5 |
| **7** | 11.2 | 10.0 | 9.5 | 9.0 | 8.4 | 8.6 | 8.2 | 8.2 | 8.7 | 8.6 | 8.8 | 8.5 | 7.8 | 7.7 | 8.8 | 9.2 | 9.5 | 9.1 | 11.4 |
| **8** | 11.1 | 9.9 | 9.4 | 8.9 | 8.0 | 8.6 | 8.1 | 7.9 | 8.6 | 8.5 | 8.7 | 8.3 | 7.7 | 7.7 | 8.7 | 9.2 | 9.4 | 9.0 | 11.4 |
| **9** | 11.1 | 9.9 | 9.4 | 8.6 | 7.7 | 8.4 | 7.9 | 7.5 | 8.5 | 8.5 | 8.4 | 8.0 | 7.7 | 7.6 | 8.7 | 9.2 | 9.4 | 9.0 | 11.4 |
| **10** | 11.1 | 9.9 | 9.3 | 8.4 | 7.4 | 7.8 | 7.0 | 6.8 | 7.9 | 8.2 | 7.6 | 7.0 | 7.6 | 7.5 | 8.6 | 9.2 | 9.4 | 9.0 | 11.4 |
| **11** | 11.1 | 9.9 | 9.3 | 8.5 | 7.2 | 7.3 | 6.4 | 6.9 | 6.6 | 7.9 | 7.1 | 7.0 | 7.7 | 7.4 | 8.6 | 9.2 | 9.4 | 9.0 | 11.3 |
| **12** | 11.1 | 9.8 | 9.2 | 8.4 | 7.3 | 7.1 | 6.0 | 5.8 | 6.1 | 6.3 | 6.0 | 6.2 | 5.4 | 6.6 | 8.6 | 9.2 | 9.3 | 9.0 | 11.3 |
| **13** | 11.1 | 9.7 | 9.3 | 8.4 | 7.5 | 7.1 | 5.8 | 5.9 | 5.8 | 5.9 | 5.3 | 5.0 | 4.4 | 6.3 | 8.5 | 9.1 | 9.2 | 9.0 | 11.3 |
| **14** | 11.1 | 9.6 | 9.2 | 8.3 | 7.5 | 7.4 | 5.9 | 5.9 | 5.8 | 5.5 | 4.9 | 4.6 | 4.0 | 5.5 | 7.2 | 9.0 | 9.1 | 8.9 | 11.3 |
| **15** | 11.1 | 9.5 | 9.2 | 8.3 | 7.6 | 7.4 | 6.0 | 6.0 | 5.8 | 5.5 | 5.0 | 4.7 | 3.8 | 4.0 | 4.9 | 8.1 | 8.9 | 8.9 | 11.3 |
| **16** | 11.1 | 9.4 | 9.1 | 8.3 | 7.6 | 7.5 | 6.0 | 6.1 | 5.8 | 5.5 | 4.9 | 4.5 | 3.7 | 3.7 | 3.9 | 7.5 | 8.8 | 9.0 | 11.3 |
| **17** | 11.0 | 9.4 | 9.0 | 8.4 | 7.7 | 7.6 | 6.0 | 6.2 | 5.9 | 5.6 | 5.0 | 4.6 | 3.7 | 3.6 | 4.0 | 5.6 | 8.6 | 8.9 | 11.2 |
| **18** | 11.0 | 9.3 | 8.9 | 8.4 | 7.7 | 7.6 | 6.2 | 6.2 | 5.7 | 5.7 | 5.0 | 4.7 | 3.8 | 3.6 | 3.8 | 4.6 | 8.1 | 8.9 | 11.2 |
| **19** | 10.9 | 9.2 | 8.9 | 8.4 | 7.6 | 7.6 | 6.3 | 6.2 | 6.0 | 5.7 | 5.0 | 4.7 | 3.8 | 3.7 | 3.8 | 4.2 | 6.8 | 8.9 | 11.2 |
| **20** | 10.9 | 9.2 | 8.8 | 8.3 | 7.6 | 7.6 | 6.3 | 6.2 | 6.0 | 5.8 | 5.0 | 4.8 | 4.0 | 3.7 | 3.7 | 3.7 | 5.5 | 8.9 | 11.2 |
| **24** | 10.8 | 9.2 | 8.8 | 8.3 | 7.5 | 7.5 | 6.3 | 6.2 | 6.1 | 5.7 | 5.0 | 4.7 | 4.0 | 3.7 | 3.6 | 3.4 | 4.0 | 8.8 | 11.2 |
| **28** | 10.7 | 9.1 | 8.7 | 8.2 | 7.4 | 7.4 | 6.2 | 6.1 | 6.0 | 5.6 | 5.0 | 4.7 | 3.9 | 3.6 | 3.5 | 3.2 | 3.4 | 8.8 | 11.1 |
| **32** | 10.3 | 9.0 | 8.6 | 8.0 | 7.3 | 7.3 | 6.1 | 5.9 | 6.0 | 5.5 | 4.9 | 4.6 | 3.7 | 3.3 | 3.4 | 3.1 | 2.9 | 8.8 | 11.1 |
| **36** | 10.5 | 8.9 | 8.6 | 8.1 | 7.3 | 7.2 | 6.1 | 5.9 | 6.1 | 5.5 | 4.8 | 4.6 | 3.8 | 3.6 | 3.5 | 3.0 | 2.3 | 8.5 | 11.0 |
| **40** | 10.4 | 8.9 | 8.8 | 8.1 | 7.2 | 7.1 | 6.0 | 5.8 | 6.0 | 5.5 | 4.7 | 4.6 | 3.8 | 3.5 | 3.4 | 2.8 | 2.0 | 8.5 | 11.0 |
| **44** | 10.4 | 8.9 | 8.7 | 8.0 | 7.2 | 7.1 | 5.9 | 5.9 | 5.9 | 5.3 | 4.7 | 4.8 | 3.9 | 3.4 | 3.3 | 2.6 | 1.9 | 4.8 | 10.9 |
| **48** | 10.3 | 8.8 | 8.6 | 7.9 | 7.1 | 7.1 | 5.9 | 5.8 | 5.9 | 5.3 | 4.6 | 4.4 | 3.8 | 3.4 | 3.2 | 2.5 | 1.8 | 1.4 | 10.9 |
| **52** | 10.2 | 8.7 | 8.4 | 7.8 | 7.1 | 7.0 | 5.8 | 5.7 | 5.9 | 5.2 | 4.6 | 4.6 | 3.7 | 3.3 | 3.2 | 2.4 | 1.8 | 1.2 | 10.8 |

Table 2.7. 2016 Osoyoos Lake oxygen concentrations µg L-1

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Depth (m)** | 24-May-16 | 6-Jul-16 | 12-Jul-16 | 6-Aug-16 | 6-Oct-16 | 25-Oct-16 |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **1** | 10.1 | 9.2 | 9.0 | 8.4 | 9.7 | 9.8 |
| **2** | 10.1 | 9.1 | 9.0 | 8.3 | 9.4 | 9.7 |
| **3** | 10.1 | 9.0 | 8.9 | 8.3 | 9.3 | 9.7 |
| **4** | 10.1 | 9.0 | 8.8 | 8.3 | 9.3 | 9.6 |
| **5** | 9.9 | 8.9 | 8.7 | 8.1 | 9.2 | 9.6 |
| **6** | 9.9 | 8.8 | 8.7 | 8.0 | 9.2 | 9.6 |
| **7** | 9.8 | 8.6 | 8.5 | 7.8 | 9.2 | 9.6 |
| **8** | 9.8 | 8.5 | 8.2 | 7.6 | 9.2 | 9.6 |
| **9** | 9.6 | 8.4 | 8.1 | 7.2 | 9.2 | 9.5 |
| **10** | 9.5 | 8.1 | 7.8 | 7.0 | 9.1 | 9.5 |
| **11** | 9.3 | 7.2 | 7.5 | 6.7 | 9.1 | 9.5 |
| **12** | 9.2 | 6.4 | 5.9 | 6.0 | 9.1 | 9.5 |
| **13** | 9.1 | 6.1 | 5.3 | 5.1 | 9.2 | 9.5 |
| **14** | 9.0 | 5.8 | 5.1 | 4.4 | 9.1 | 9.4 |
| **15** | 8.8 | 5.6 | 5.1 | 3.9 | 9.1 | 9.4 |
| **16** | 8.7 | 5.6 | 5.2 | 3.8 | 8.9 | 9.4 |
| **17** | 8.7 | 5.6 | 5.3 | 3.8 | 8.7 | 9.3 |
| **18** | 8.7 | 5.8 | 5.4 | 3.8 | 7.0 | 9.3 |
| **19** | 8.7 | 5.9 | 5.5 | 4.0 | 5.2 | 9.2 |
| **20** | 8.8 | 6.2 | 5.6 | 4.2 | 3.8 | 9.1 |
| **24** | 8.7 | 6.1 | 5.7 | 4.2 | 2.9 | 6.9 |
| **28** | 8.8 | 6.1 | 5.7 | 4.2 | 2.4 | 2.0 |
| **32** | 8.8 | 6.1 | 5.6 | 4.2 | 1.9 | 1.4 |
| **36** | 8.8 | 6.1 | 5.7 | 4.3 | 1.6 | 1.7 |
| **40** | 8.8 | 6.1 | 5.7 | 4.2 | 1.5 | 1.4 |
| **44** | 8.7 | 6.1 | 5.7 | 4.2 | 1.4 | 1.2 |
| **48** | 8.7 | 6.1 | 5.7 | 4.2 | 1.6 | 1.1 |
| **52** | 8.7 | 6.1 | 5.6 | 4.2 | 1.4 | 1.0 |
|  |  |  |  |  |  |  |

Table 2.8. 2017 Osoyoos Lake oxygen concentrations µg L-1

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Depth (m)** | 6-Apr-17 | 24-May-17 | 19-Jun-17 | 1-Aug-17 | 15-Aug-17 | 12-Sep-17 | 10-Oct-17 | 16-Nov-17 |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| **1** | 12.5 | 10.5 | 9.7 | 7.7 | 7.8 | 8.9 | 10.2 | 10.2 |
| **2** | 12.5 | 10.5 | 9.8 | 7.5 | 7.7 | 8.7 | 10.1 | 10.1 |
| **3** | 12.6 | 10.5 | 9.6 | 7.5 | 7.7 | 8.8 | 10.0 | 10.0 |
| **4** | 12.6 | 10.6 | 9.5 | 7.4 | 7.7 | 8.7 | 10.0 | 10.0 |
| **5** | 12.6 | 10.6 | 9.3 | 7.4 | 7.7 | 8.7 | 9.9 | 9.9 |
| **6** | 12.6 | 10.6 | 9.3 | 7.4 | 7.7 | 8.7 | 9.6 | 9.6 |
| **7** | 12.6 | 10.5 | 9.3 | 7.4 | 7.7 | 8.6 | 9.8 | 9.8 |
| **8** | 12.6 | 10.6 | 9.4 | 7.3 | 7.6 | 8.6 | 9.5 | 9.5 |
| **9** | 12.6 | 10.6 | 9.4 | 7.2 | 7.6 | 8.6 | 9.7 | 9.7 |
| **10** | 12.6 | 10.6 | 9.4 | 7.0 | 7.5 | 8.5 | 9.7 | 9.7 |
| **11** | 12.6 | 10.6 | 9.5 | 6.9 | 7.4 | 8.5 | 9.7 | 9.7 |
| **12** | 12.6 | 10.6 | 9.5 | 6.8 | 7.2 | 8.4 | 9.6 | 9.6 |
| **13** | 12.6 | 10.5 | 9.4 | 6.2 | 5.7 | 7.7 | 9.6 | 9.6 |
| **14** | 12.5 | 10.5 | 9.3 | 5.8 | 5.6 | 6.5 | 9.6 | 9.6 |
| **15** | 12.5 | 10.5 | 9.2 | 5.6 | 5.5 | 4.7 | 9.6 | 9.6 |
| **16** | 12.6 | 10.5 | 9.0 | 5.7 | 5.7 | 4.1 | 9.6 | 9.6 |
| **17** | 12.6 | 10.5 | 8.6 | 5.9 | 6.1 | 4.0 | 9.6 | 9.6 |
| **18** | 12.6 | 10.5 | 9.0 | 6.0 | 6.4 | 4.0 | 9.6 | 9.6 |
| **19** | 12.6 | 10.5 | 8.7 | 6.1 | 6.4 | 4.1 | 9.5 | 9.5 |
| **20** | 12.5 | 10.5 | 8.7 | 6.1 | 6.4 | 4.3 | 8.8 | 8.8 |
| **24** | 12.5 | 10.4 | 8.6 | 6.1 | 6.4 | 4.4 | 7.9 | 7.9 |
| **28** | 12.4 | 10.4 | 8.5 | 6.0 | 6.3 | 4.4 | 6.9 | 6.9 |
| **32** | 12.4 | 10.3 | 8.4 | 5.7 | 5.6 | 4.2 | 5.9 | 5.9 |
| **36** | 12.4 | 10.2 | 8.4 | 5.7 | 6.0 | 3.9 | 5.3 | 5.3 |
| **40** | 12.3 | 10.1 | 8.5 | 5.6 | 5.9 | 3.8 | 4.9 | 4.9 |
| **44** | 12.3 | 10.1 | 8.3 | 5.6 | 5.9 | 3.9 | 4.6 | 4.6 |
| **48** | 12.3 | 10.1 | 8.2 | 5.7 | 5.8 | 3.9 | 4.8 | 4.8 |
| **52** | 12.2 | 10.0 | 7.7 | 5.5 | 5.8 | 3.8 | 4.1 | 4.1 |
|  |  |  |  |  |  |  |  |  |

Table 2.9. 2018 Osoyoos Lake oxygen concentrations µg L-1

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Depth (m)** | 15-Feb-18 | 17-May-18 | 12-Jul-18 | 27-Jul-18 | 9-Aug-18 | 5-Sep-18 | 5-Oct-18 | 8-Nov-18 |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| **1** | 13.6 | 9.9 | 9.3 | 9.1 | 10.0 | 9.5 | 9.8 | 19.1 |
| **2** | 13.7 | 10.1 | 9.3 | 9.5 | 10.0 | 9.5 | 9.7 | 18.0 |
| **3** | 13.7 | 10.2 | 9.2 | 9.2 | 10.2 | 9.5 | 9.6 | 17.5 |
| **4** | 13.7 | 10.3 | 9.2 | 9.2 | 10.2 | 9.5 | 9.6 | 17.2 |
| **5** | 13.8 | 10.3 | 9.0 | 9.1 | 9.7 | 9.5 | 9.5 | 16.9 |
| **6** | 13.8 | 10.4 | 8.9 | 9.0 | 9.4 | 9.4 | 9.5 | 16.6 |
| **7** | 13.8 | 10.4 | 9.0 | 8.9 | 8.9 | 9.4 | 9.5 | 16.4 |
| **8** | 13.8 | 10.4 | 8.8 | 8.8 | 8.5 | 9.3 | 9.5 | 16.3 |
| **9** | 13.8 | 10.4 | 8.7 | 8.6 | 8.0 | 9.2 | 9.4 | 16.1 |
| **10** | 13.8 | 10.4 | 8.6 | 8.5 | 7.5 | 9.4 | 9.4 | 16.0 |
| **11** | 13.8 | 10.4 | 8.4 | 8.3 | 6.6 | 9.1 | 9.4 | 15.9 |
| **12** | 13.8 | 10.5 | 8.0 | 7.7 | 5.7 | 9.1 | 9.4 | 15.8 |
| **13** | 13.8 | 10.4 | 7.5 | 6.5 | 5.3 | 9.0 | 9.4 | 15.8 |
| **14** | 13.8 | 10.5 | 7.2 | 6.1 | 4.8 | 8.8 | 9.3 | 15.7 |
| **15** | 13.8 | 10.5 | 7.1 | 6.0 | 4.6 | 7.9 | 9.2 | 15.6 |
| **16** | 13.8 | 10.5 | 7.1 | 6.0 | 4.8 | 7.2 | 9.1 | 15.6 |
| **17** | 13.8 | 10.6 | 7.0 | 6.2 | 5.0 | 5.6 | 9.0 | 15.5 |
| **18** | 13.8 | 10.6 | 7.1 | 6.4 | 5.3 | 5.4 | 9.0 | 15.5 |
| **19** | 13.8 | 10.6 | 7.2 | 6.6 | 5.6 | 5.2 | 9.0 | 15.4 |
| **20** | 13.8 | 10.6 | 7.2 | 6.6 | 5.9 | 5.0 | 8.4 | 15.3 |
| **24** | 13.8 | 10.7 | 7.3 | 6.7 | 6.0 | 5.1 | 6.4 | 15.2 |
| **28** | 13.7 | 10.7 | 7.3 | 6.7 | 6.0 | 5.0 | 5.3 | 14.7 |
| **32** | 13.7 | 10.7 | 7.3 | 6.5 | 6.0 | 5.0 | 4.6 | 13.6 |
| **36** | 13.8 | 10.7 | 7.3 | 6.5 | 5.9 | 4.9 | 4.3 | 8.3 |
| **40** | 13.8 | 10.7 | 7.2 | 6.5 | 5.9 | 4.8 | 3.9 | 6.0 |
| **44** | 13.7 | 10.7 | 7.2 | 6.4 | 5.9 | 4.7 | 3.6 | 4.7 |
| **48** | 13.7 | 10.7 | 7.1 | 6.4 | 5.8 | 4.6 | 3.4 | 4.2 |
| **52** | 13.7 | 10.7 | 7.0 | 6.3 | 5.7 | 4.6 | 3.3 | 3.7 |
|  |  |  |  |  |  |  |  |  |

Table 2.10. 2019 Osoyoos Lake oxygen concentrations µg L-1

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Depth (m)** | 14-May-19 | 16-Jun-19 | 7-Jul-19 | 1-Aug-19 | 19-Aug-19 | 2-Oct-19 | 22-Oct-19 | 1-Nov-19 | 12-Nov-19 | 22-Nov-19 | 27-Feb-20 |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| **1** | 10.83 | 9.6 | 10.1 | 9.5 | 9.0 | 10.1 | 10.2 | 10.4 | 9.2 | 10.8 | 13.1 |
| **2** | 10.94 | 9.3 | 10.1 | 9.7 | 9.1 | 9.9 | 10.1 | 9.7 | 9.1 | 10.5 | 13.2 |
| **3** | 11.03 | 9.3 | 10.1 | 9.7 | 9.1 | 9.9 | 10.0 | 9.8 | 9.1 | 10.4 | 13.3 |
| **4** | 11.10 | 9.3 | 10.1 | 9.7 | 9.1 | 9.8 | 10.0 | 9.6 | 9.0 | 10.4 | 13.4 |
| **5** | 11.15 | 9.2 | 10.1 | 9.8 | 9.1 | 9.7 | 9.9 | 9.5 | 9.0 | 10.3 | 13.4 |
| **6** | 11.23 | 9.2 | 10.0 | 9.8 | 9.0 | 9.7 | 9.9 | 9.4 | 8.9 | 10.2 | 13.4 |
| **7** | 11.23 | 9.1 | 9.9 | 9.8 | 8.9 | 9.6 | 9.9 | 9.4 | 8.9 | 10.2 | 13.4 |
| **8** | 11.23 | 9.1 | 9.8 | 9.7 | 8.8 | 9.6 | 9.8 | 9.3 | 8.9 | 10.1 | 13.4 |
| **9** | 11.21 | 8.9 | 9.7 | 9.6 | 8.7 | 9.6 | 9.8 | 9.2 | 8.8 | 10.1 | 13.4 |
| **10** | 11.31 | 9.0 | 9.5 | 9.2 | 8.2 | 9.5 | 9.8 | 9.1 | 8.8 | 10.1 | 13.4 |
| **11** | 11.26 | 8.9 | 9.3 | 8.5 | 7.5 | 9.5 | 9.8 | 9.1 | 8.8 | 10.1 | 13.4 |
| **12** | 11.14 | 8.8 | 9.0 | 7.9 | 6.9 | 9.5 | 9.7 | 9.1 | 8.8 | 10.0 | 13.4 |
| **13** | 11.18 | 8.8 | 9.3 | 7.5 | 6.6 | 9.5 | 9.7 | 9.1 | 8.8 | 10.0 | 13.4 |
| **14** | 11.14 | 8.9 | 8.5 | 7.3 | 6.4 | 9.5 | 9.7 | 9.1 | 8.7 | 10.0 | 13.4 |
| **15** | 11.09 | 8.8 | 8.5 | 7.3 | 6.1 | 8.8 | 9.7 | 9.0 | 8.7 | 9.9 | 13.4 |
| **16** | 11.09 | 8.8 | 8.4 | 7.3 | 6.1 | 8.4 | 9.7 | 9.0 | 8.7 | 9.9 | 13.4 |
| **17** | 11.08 | 8.9 | 8.4 | 7.3 | 6.0 | 7.2 | 9.6 | 8.9 | 8.7 | 9.9 | 13.4 |
| **18** | 11.09 | 8.9 | 8.5 | 7.3 | 6.0 | 6.3 | 9.2 | 8.9 | 8.7 | 9.9 | 13.4 |
| **19** | 11.09 | 8.9 | 8.4 | 7.3 | 6.0 | 5.9 | 8.9 | 8.8 | 8.7 | 9.9 | 13.4 |
| **20** | 11.08 | 8.8 | 8.4 | 7.3 | 6.0 | 5.4 | 8.2 | 8.8 | 8.6 | 9.9 | 13.3 |
| **24** | 11.02 | 8.8 | 8.4 | 7.3 | 6.0 | 5.1 | 7.4 | 8.6 | 8.5 | 9.8 | 13.3 |
| **28** | 10.99 | 8.8 | 8.4 | 7.2 | 5.9 | 4.9 | 5.7 | 8.5 | 8.5 | 9.8 | 13.3 |
| **32** | 10.95 | 8.8 | 8.4 | 7.1 | 5.9 | 4.6 | 5.1 | 8.3 | 8.5 | 9.8 | 13.3 |
| **36** | 10.80 | 8.7 | 8.3 | 7.0 | 5.8 | 4.2 | 5.3 | 6.5 | 8.1 | 9.7 | 13.2 |
| **40** | 10.75 | 8.7 | 8.2 | 7.0 | 5.8 | 4.1 | 4.9 | 5.7 | 7.9 | 9.7 | 13.2 |
| **44** | 10.73 | 8.6 | 8.2 | 6.9 | 5.7 | 4.0 | 4.5 | 5.2 | 7.8 | 9.6 | 13.2 |
| **48** | 10.70 | 8.6 | 8.1 | 6.9 | 5.6 | 3.9 | 4.2 | 4.7 | 7.1 | 9.6 | 13.2 |
| **52** | 10.65 | 8.5 | 8.0 | 6.8 | 5.5 | 3.9 | 4.1 | 4.3 | 6.9 | 9.6 | 13.2 |
|  |  |  |  |  |  |  |  |  |  |  |  |

Table 2.11. 2020 Osoyoos Lake oxygen concentrations µg L-1

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Depth (m)** | 27-Feb-20 | 11-Mar-20 | 26-May-20 | 23-Jun-20 | 14-Jul-20 | 12-Aug-20 | 19-Aug-20 | 5-Oct-20 | 10-Nov-20 | 19-Nov-20 |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
| **1** | 13.1 | 11.7 | 10.3 | 9.7 | 9.1 | 8.7 | 8.9 | 10.1 | 13.1 | 12.9 |
| **2** | 13.2 | 11.8 | 10.4 | 9.8 | 9.2 | 8.7 | 8.8 | 9.9 | 12.7 | 12.8 |
| **3** | 13.3 | 11.7 | 10.4 | 9.8 | 9.2 | 8.8 | 8.8 | 9.8 | 12.3 | 12.7 |
| **4** | 13.4 | 11.7 | 10.4 | 9.7 | 9.1 | 8.8 | 8.7 | 9.7 | 12.2 | 12.6 |
| **5** | 13.4 | 11.7 | 10.4 | 9.7 | 9.1 | 8.8 | 8.6 | 9.6 | 12.2 | 12.6 |
| **6** | 13.4 | 11.8 | 10.4 | 9.6 | 9.1 | 8.7 | 8.6 | 9.6 | 11.9 | 12.5 |
| **7** | 13.4 | 11.8 | 10.4 | 9.6 | 9.0 | 8.7 | 8.5 | 9.5 | 11.8 | 12.5 |
| **8** | 13.4 | 11.8 | 10.4 | 9.5 | 9.0 | 8.6 | 8.3 | 9.5 | 11.7 | 12.4 |
| **9** | 13.4 | 11.8 | 10.4 | 9.4 | 8.9 | 8.6 | 8.2 | 9.4 | 11.7 | 12.3 |
| **10** | 13.4 | 11.8 | 10.3 | 9.3 | 8.9 | 8.4 | 8.0 | 9.3 | 11.6 | 12.3 |
| **11** | 13.4 | 11.8 | 10.2 | 9.2 | 8.8 | 8.2 | 7.7 | 9.2 | 11.6 | 12.2 |
| **12** | 13.4 | 11.8 | 10.2 | 9.1 | 8.7 | 8.1 | 7.3 | 9.1 | 11.5 | 12.2 |
| **13** | 13.4 | 11.8 | 10.1 | 9.0 | 8.7 | 7.9 | 6.9 | 8.9 | 11.5 | 12.1 |
| **14** | 13.4 | 11.8 | 10.0 | 8.9 | 8.5 | 6.9 | 6.4 | 8.7 | 11.4 | 12.1 |
| **15** | 13.4 | 11.8 | 9.9 | 8.8 | 8.0 | 6.1 | 5.3 | 8.5 | 11.4 | 12.1 |
| **16** | 13.4 | 11.8 | 9.9 | 8.8 | 7.8 | 5.8 | 5.0 | 8.2 | 11.4 | 12.0 |
| **17** | 13.4 | 11.8 | 10.0 | 8.7 | 7.6 | 5.7 | 4.9 | 6.8 | 11.4 | 12.0 |
| **18** | 13.4 | 11.8 | 10.0 | 8.5 | 7.5 | 5.8 | 4.9 | 6.2 | 11.4 | 12.0 |
| **19** | 13.4 | 11.8 | 9.9 | 8.5 | 7.4 | 5.8 | 4.8 | 5.6 | 11.3 | 12.0 |
| **20** | 13.3 | 11.7 | 9.9 | 8.4 | 7.3 | 5.8 | 5.0 | 5.0 | 11.3 | 12.0 |
| **24** | 13.3 | 11.7 | 9.9 | 8.3 | 7.2 | 5.9 | 5.2 | 4.4 | 11.3 | 11.9 |
| **28** | 13.3 | 11.7 | 9.9 | 8.3 | 7.2 | 5.8 | 5.2 | 4.1 | 11.3 | 11.9 |
| **32** | 13.3 | 11.7 | 10.0 | 8.2 | 7.0 | 5.6 | 5.2 | 3.8 | 11.2 | 11.8 |
| **36** | 13.2 | 13.1 | 10.0 | 8.2 | 7.0 | 5.8 | 5.2 | 3.5 | 11.1 | 11.8 |
| **40** | 13.2 | 13.1 | 10.0 | 8.2 | 6.9 | 5.7 | 5.2 | 3.5 | 11.0 | 11.7 |
| **44** | 13.2 | 13.1 | 10.0 | 8.1 | 6.9 | 5.7 | 5.2 | 3.4 | 11.0 | 11.7 |
| **48** | 13.2 | 13.1 | 10.0 | 8.1 | 6.8 | 5.6 | 5.1 | 3.4 | 11.0 | 11.7 |
| **52** | 13.2 | 13.1 | 10.0 | 8.0 | 6.8 | 5.6 | 5.1 | 3.4 | 10.9 | 11.6 |
|  |  |  |  |  |  |  |  |  |  |  |

Table 2.12. 2021 Osoyoos Lake oxygen concentrations µg L-1

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Depth (m)** | 15-Mar-21 | 10-May-21 | 12-Jul-21 | 16-Aug-21 | 13-Sep-21 | 4-Oct-21 | 31-Oct-21 |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| **1** | 13.1 | 10.6 | 9.4 | 8.7 | 10.1 | 9.4 | 11.6 |
| **2** | 13.1 | 10.6 | 9.4 | 8.6 | 10.1 | 9.4 | 11.4 |
| **3** | 13.1 | 10.7 | 9.3 | 8.6 | 10.1 | 9.4 | 11.0 |
| **4** | 13.1 | 10.7 | 9.3 | 8.5 | 10.1 | 9.4 | 11.0 |
| **5** | 13.1 | 10.8 | 9.3 | 8.5 | 10.1 | 9.4 | 10.9 |
| **6** | 13.1 | 10.8 | 9.3 | 8.5 | 10.0 | 9.3 | 10.9 |
| **7** | 13.1 | 10.8 | 9.0 | 8.4 | 9.9 | 9.3 | 10.8 |
| **8** | 13.2 | 10.8 | 8.7 | 8.3 | 9.7 | 9.3 | 10.8 |
| **9** | 13.2 | 11.1 | 8.3 | 8.1 | 9.6 | 9.3 | 10.8 |
| **10** | 13.2 | 10.8 | 7.7 | 7.4 | 9.5 | 9.2 | 10.7 |
| **11** | 13.2 | 10.7 | 7.1 | 6.5 | 9.3 | 9.2 | 10.6 |
| **12** | 13.1 | 10.7 | 7.0 | 5.7 | 8.9 | 9.2 | 10.4 |
| **13** | 13.2 | 10.7 | 6.8 | 5.4 | 8.4 | 9.1 | 10.3 |
| **14** | 13.2 | 10.8 | 6.9 | 5.3 | 7.5 | 9.0 | 10.2 |
| **15** | 13.2 | 10.8 | 6.9 | 5.4 | 6.4 | 8.7 | 10.2 |
| **16** | 13.2 | 10.8 | 7.0 | 5.4 | 5.9 | 8.2 | 10.1 |
| **17** | 13.2 | 10.8 | 7.2 | 5.4 | 6.0 | 7.5 | 10.1 |
| **18** | 13.2 | 10.8 | 7.2 | 5.5 | 5.6 | 6.4 | 10.0 |
| **19** | 13.2 | 10.8 | 7.3 | 5.5 | 5.6 | 5.8 | 9.8 |
| **20** | 13.2 | 10.8 | 7.4 | 5.6 | 5.6 | 5.1 | 9.5 |
| **24** | 13.1 | 10.7 | 7.5 | 5.6 | 5.6 | 4.8 | 8.2 |
| **28** | 13.1 | 10.7 | 7.5 | 5.5 | 5.5 | 4.6 | 6.3 |
| **32** | 13.1 | 10.7 | 7.5 | 5.5 | 5.3 | 4.4 | 5.4 |
| **36** | 12.8 | 10.6 | 7.5 | 5.6 | 5.1 | 4.3 | 5.5 |
| **40** | 12.8 | 10.5 | 7.5 | 5.5 | 5.0 | 4.2 | 4.8 |
| **44** | 12.7 | 10.4 | 7.4 | 5.5 | 5.0 | 4.0 | 4.4 |
| **48** | 12.7 | 10.4 | 7.4 | 5.5 | 5.0 | 3.9 | 4.2 |
| **52** | 12.6 | 10.4 | 7.3 | 5.4 | 4.9 | 3.8 | 3.7 |
|  |  |  |  |  |  |  |  |

## OSOYOOS LAKE WATER CHEMISTRY

Table .0. Osoyoos Lake water chemistry summary. Chla = Chlorophyll a, TP and TN = total phosphorus and total nitrogen, Secchi = Secchi depth, Epi = epilimnion and Hypo = hypolimnion. Blank = no data collected.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sampling Dates** | **Epi TP (μg/L)** | **Epi TN (µg/L)** | **Chla (μg/L)** | **Secchi (m)** | **Hypo TP (μg/L)** | **Hypo TN (µg/L)** |
|  |  |  |  |  |  |  |
| 20-May-14 | 8.0 | 305 | 2.8 | 2.1 | 7 | 267 |
| 17-Mar-94 | 21.0 |  | 24.8 | 3.9 |  |  |
| 25-May-95 |  |  | 2.8 | 3.8 |  |  |
| 7-Jun-94 | 11.0 |  | 6.3 | 5.3 |  |  |
| 22-Jun-94 | 9.6 |  | 3.6 | 4.5 |  |  |
| 20-Jul-94 | 9.3 |  | 3.4 | 3.2 |  |  |
| 3-Aug-94 | 13.6 |  | 5.4 | 3.0 |  |  |
| 17-Aug-94 | 9.0 |  | 8.5 | 2.8 |  |  |
| 31-Aug-94 | 11.6 |  | 8.9 | 2.5 |  |  |
| 15-Sep-94 | 6.8 |  | 6.9 | 3.8 |  |  |
| 27-Sep-94 | 7.7 |  | 7.1 | 4.0 |  |  |
| 17-Oct-94 | 20.3 |  | 7.9 | 4.8 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 18-Apr-95 | 41.5 | 779 | 9.9 | ? | 129.5 | *In Resnel 1997* |
| 16-May-95 | 24.3 | 548 | 10.0 | 2.0 | 13.4 | *In Resnel 1997* |
| 8-Jun-95 | 9.9 | 328 | 2.4 | 4.8 | 17.2 | *In Resnel 1997* |
| 12-Jul-95 | 16.0 | 476 | 5.7 | 3.0 | 29.7 | *In Resnel 1997* |
| 8-Aug-95 | 14.6 | 348 | 6.1 | 3.2 | 33.5 | *In Resnel 1997* |
| 13-Sep-95 | 11.4 | 288 | 4.1 | 3.7 | 37.3 | *In Resnel 1997* |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 17-Apr-96 | 15.11 | 335 | 4.1 | 1.9 | 15.6 | *In Resnel 1997* |
| 14-May-96 | 18.8 | 442 | 2.4 | 3.7 | 27.5 | *In Resnel 1997* |
| 10-Jun-96 | 21.3 | 435 | 2.6 | 2.3 | 20.4 | *In Resnel 1997* |
| 15-Jul-96 | 21.1 | 429 | 1.8 | 4.4 | 35.4 | *In Resnel 1997* |
| 13-Aug-96 | 15.9 | 352 | 3.8 | 5.0 | 30. | *In Resnel 1997* |
| 13-Sep-96 | 17.2 | 347 | 4.0 | 4.1 | 55.8 | *In Resnel 1997* |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 23-Apr-97 | 20.1 | 328 | 3.1 | 2.9 | 25.3 | *In Resnel 1997* |
| 14-May-97 | 30.6 | 379 | 2.5 | 2.0 | 24.1 | *In Resnel 1997* |
| 18-Jun-97 | 20.0 | 337 | 3.9 | 3.2 | 27.7 | *In Resnel 1997* |
| 14-Jul-97 | 12.0 | 218 | 4.0 | 4.2 | 30.0 | *In Resnel 1997* |
| 13-Aug-97 | 25.9 | 376 | 2.9 | 4.6 | 24.0 | *In Resnel 1997* |
| 17-Sep-97 | 22.0 | 342 | 3.3 | 4.5 | 25.1 | *In Resnel 1997* |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

Table 3.0 Continued

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sampling Dates** | **Epi TP (μg/L)** | **Epi TN (µg/L)** | **Chla (μg/L)** | **Secchi (m)** | **Hypo TP (μg/L)** | **Hypo TN (µg/L)** |
|  |  |  |  |  |  |  |
| 15-Jul-98 |  | 230 | 2.1 | 3.4 |  |  |
| 19-Aug-98 |  |  | 1.1 |  |  |  |
| 15-Sep-98 | 13.0 | 280 | 6.4 | 3.5 |  |  |
| 26-Feb-98 | 13.0 | 280 | 5.9 |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 17-Feb-99 | 17.5 | 335 | 1.6 |  |  |  |
| 29-May-99 |  |  |  | 1.2 |  |  |
| 11-Aug-99 |  |  |  | 4.5 |  |  |
| 20-Sep-99 | 12.0 | 260 | 4.6 | 3.5 |  |  |
| 25-Sep-99 |  |  |  | 3.3 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 24-Feb-00 | 16.5 | 290 | 3.5 | 6.5 |  |  |
| 5-Jul-00 |  |  |  | 3.5 |  |  |
| 19-Sep-00 | 16.5 | 305 | 3.8 | 4.8 |  |  |
| 27-Sep-00 |  |  |  | 5.8 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 24-May-01 | 12.0 | 350 | 2.8 | 3.6 |  |  |
| 19-Jun-01 | 10.0 | 19 | 3.2 | 3.6 |  |  |
| 19-Jul-01 | 29.0 | 320 | 2.9 | 3.5 |  |  |
| 15-Aug-01 | 13.0 | 320 | 2.6 | 2.3 |  |  |
| 17-Sep-01 | 14.0 | 140 | 3.2 | 4.5 |  |  |
| 31-Oct-01 | 13.0 |  | 2.1 | 3.3 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 14-Feb-02 | 22.5 | 290 | 2.8 | 5.0 |  |  |
| 10-Apr-02 | 9.0 | 220 | 4.8 | 3.6 |  |  |
| 8-May-02 | 11.0 | 240 | 4.1 | 3.1 |  |  |
| 10-Jun-02 | 16.0 | 235 | 3.4 | 2.8 |  |  |
| 8-Jul-02 | 19.0 | 295 | 3.1 | 2.8 |  |  |
| 7-Aug-02 | 13.0 | 225 |  | 4.6 |  |  |
| 3-Sep-02 | 9.0 | 265 | 5.7 | 3.6 |  |  |
| 11-Sep-02 | 8.0 | 275 | 6.1 | 3.8 |  |  |
| 1-Oct-02 | 11.0 | 245 | 5.8 | 4.4 |  |  |
| 12-Nov-02 | 21.0 | 245 | 7.5 |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 6-Feb-03 | 18.5 | 295 | 5.7 | 5.4 |  |  |
| 21-Apr-03 |  |  |  | 2.5 |  |  |
| 16-Jun-03 | 6 | 220 | 3.0 | 4.7 |  |  |
| 25-Aug-03 |  |  |  | 3.4 |  |  |
| 2-Sep-03 |  |  |  | 3.1 |  |  |
| 10-Sep-03 | 7.5 | 255 | 5.5 | 3.4 |  |  |
| 15-Oct-03 |  |  |  | 3.1 |  |  |
| 14-Nov-03 |  |  |  | 3.0 |  |  |
|  |  |  |  |  |  |  |

Table 3.0 Continued.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sampling Dates** | **Epi TP (μg/L)** | **Epi TN (µg/L)** | **Chla (μg/L)** | **Secchi (m)** | **Hypo TP (μg/L)** | **Hypo TN (µg/L)** |
|  |  |  |  |  |  |  |
| 5-Apr-04 | 15.0 | 280 | 15.4 | 4.7 |  |  |
| 2-Jun-04 | 24.0 | 230 | 2.4 | 4.3 |  |  |
| 19-Jul-04 | 15.0 | 260 | 3.4 | 4.4 |  |  |
| 18-Aug-04 | 20.5 | 285 | 3.5 | 4.3 |  |  |
| 31-Aug-04 | 7.0 | 280 | 6.1 | 4.2 |  |  |
| 6-Oct-04 | 13.0 | 300 | 4.4 | 4.9 |  |  |
| 2-Nov-04 |  |  |  | 4.3 |  |  |
| 15-Nov-04 |  |  |  | 4.3 |  |  |
| 23-Jun-14 | 8 | 249 | 3.4 | 3.7 | 8 | 219 |
| 21-Jul-14 | 7 | 189 | 3.2 | 4.1 | 10 | 223 |
| 12-Aug-14 | 8 | 287 | 3.7 | 2.9 | 11 | 337 |
| 22-Sep-14 | 6 | 346 | 2.6 | 3.7 | 14 | 1459 |
| 20-Oct-14 | 7 | 216 | 4.3 | 3.7 | 15 | 275 |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 25-May-15 | 5 | 222 | 1.2 | 2.6 | 5 | 218 |
| 22-Jun-15 | 8 | 192 | 0.9 | 5.0 | 12 | 213 |
| 20-Jul-15 | 6 | 225 | 2.7 | 4.0 | 11 | 250 |
| 10-Aug-15 | 5 | 231 | 1.1 | 3.5 | 15 | 269 |
| 28-Sep-15 | 7 | 273 | 4.0 | 3.5 | 17 | 313 |
| 13-Oct-15 | 8 | 259 | 4.2 | 4.1 | 18 | 319 |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 25-May-16 | 14 | 261 | 3.0 | 3.2 | 15 | 272 |
| 12-Jul-16 | 12 | 204 | 2.1 | 3.8 | 16 | 211 |
| 6-Oct-16 | 23 | 466 | 1.0 | 4.8 | 22 | 460 |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 24-May-17 | 14 | 314 | 1.7 | 0.5 | 11 | 228 |
| 19-Jun-17 | 8 | 176 | 1.9 | 3.3 | 14 | 275 |
| 18-Jul-17 | 4 | 210 | 1.6 | 4.1 | 14 | 367 |
| 15-Aug-17 | 8 | 223 | 1.0 | 4.3 | 24 | 254 |
| 12-Sep-17 | 5 | 280 | 2.2 | 4.7 | 30 | 311 |
| 10-Oct-17 | 10 | 247 | 1.7 | 3.7 | 37 | 320 |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 23-Jun-20 | 15 | 291 | 2.0 | 3.5 | 14 | 219 |
| 19-Aug-20 | 6 | 222 | 1.7 | 4.4 | 14 | 279 |
| 5-Oct-20 | 14 | 295 | 1.9 | 5.25 | 16 | 213 |
|  |  |  |  |  |  |  |

## OSOYOOS LAKE PHYTOPLANKTON BIOMASS

Table .0. Osoyoos Lake 2014-2021 TOTAL algal standing stock (divisions) expressed as mm3 m-3, which approximates µg·L-1 wet weight.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sampling Date** | *Cyanophyta* | *Dinophyta* | *Cryptophyta* | *Euglenophyta* | *Chrysophyta* | *Haptophyta* | *Tribophyta* | *Chlorophyta* | *Raphidophyta* | *Bacillariophyta* | **Total** |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| 20-May-14 | 301 | 6 | 121 | 0 | 41 | 3 | 2 | 51 | 0 | 452 | 975 |
| 21-Jul-14 | 129 | 3 | 13 | 0 | 27 | 1 | 0 | 42 | 0 | 59 | 274 |
| 22-Sep-14 | 277 | 0 | 2 | 0 | 7 | 13 | 0 | 28 | 0 | 10 | 337 |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| 25-May-15 | 45 | 23 | 34 | 0 | 43 | 1 | 2 | 81 | 0 | 418 | 646 |
| 22-Jun-15 | 48 | 5 | 83 | 0 | 18 | 6 | 0 | 41 | 0 | 95 | 295 |
| 20-Jul-15 | 254 | 8 | 46 | 0 | 31 | 7 | 1 | 70 | 0 | 90 | 507 |
| 10-Aug-15 | 827 | 13 | 55 | 0 | 56 | 7 | 2 | 122 | 0 | 34 | 1115 |
| 28-Sep-15 | 1143 | 6 | 120 | 0 | 17 | 11 | 2 | 103 | 0 | 104 | 1506 |
| 13-Oct-15 | 387 | 4 | 162 | 0 | 45 | 27 | 4 | 24 | 0 | 88 | 741 |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| 24-May-16 | 33 | 43 | 333 | 0 | 54 | 14 | 6 | 69 | 0 | 958 | 1510 |
| 12-Jul-16 | 123 | 20 | 98 | 0 | 88 | 7 | 0 | 81 | 0 | 357 | 774 |
| 6-Oct-16 | 421 | 7 | 55 | 0 | 43 | 9 | 4 | 45 | 0 | 177 | 761 |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| 24-May-17 | 67 | 0 | 70 | 0 | 35 | 2 | 0 | 8 | 0 | 622 | 805 |
| 18-Jul-17 | 85 | 15 | 92 | 0 | 211 | 18 | 1 | 44 | 0 | 69 | 536 |
| 10-Oct-17 | 642 | 0 | 58 | 0 | 18 | 5 | 4 | 25 | 0 | 189 | 941 |
|  |  |  |  |  |  |  |  |  |  |  |  |

Table .0. Osoyoos Lake 2014-2021 EDIBLE algal standing stock (divisions) expressed as mm3 m-3 that approximates µg·L-1 wet weight.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sampling Date** | *Cyanophyta* | *Dinophyta* | *Cryptophyta* | *Euglenophyta* | *Chrysophyta* | *Haptophyta* | *Tribophyta* | *Chlorophyta* | *Raphidophyta* | *Bacillariophyta* | Total |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| 20-May-14 | 0 | 0 | 121 | 0 | 20 | 3 | 2 | 43 | 0 | 162 | 350 |
| 21-Jul-14 | 2 | 1 | 13 | 0 | 24 | 1 | 0 | 18 | 0 | 13 | 71 |
| 22-Sep-14 | 11 | 0 | 2 | 0 | 7 | 13 | 0 | 20 | 0 | 2 | 55 |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| 25-May-15 | 0 | 4 | 34 | 0 | 21 | 1 | 2 | 72 | 0 | 19 | 154 |
| 22-Jun-15 | 0 | 5 | 83 | 0 | 18 | 6 | 0 | 25 | 0 | 14 | 151 |
| 20-Jul-15 | 8 | 8 | 46 | 0 | 28 | 7 | 1 | 44 | 0 | 49 | 192 |
| 10-Aug-15 | 3 | 13 | 55 | 0 | 56 | 7 | 2 | 68 | 0 | 25 | 228 |
| 28-Sep-15 | 0 | 6 | 120 | 0 | 1 | 11 | 2 | 44 | 0 | 49 | 233 |
| 13-Oct-15 | 0 | 4 | 162 | 0 | 45 | 27 | 4 | 17 | 0 | 14 | 275 |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| 24-May-16 | 1 | 31 | 333 | 0 | 54 | 14 | 6 | 53 | 0 | 503 | 993 |
| 12-Jul-16 | 5 | 11 | 98 | 0 | 87 | 7 | 0 | 61 | 0 | 50 | 321 |
| 6-Oct-16 | 8 | 7 | 55 | 0 | 34 | 9 | 4 | 30 | 0 | 97 | 244 |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| 24-May-17 | 0 | 0 | 70 | 0 | 25 | 2 | 0 | 2 | 0 | 375 | 475 |
| 18-Jul-17 | 0 | 10 | 92 | 0 | 64 | 18 | 1 | 29 | 0 | 10 | 226 |
| 10-Oct-17 | 6 | 0 | 58 | 0 | 10 | 5 | 4 | 23 | 0 | 127 | 233 |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |

## OSOYOOS LAKE ZOOPLANKTON BIOMASS

Table .0. Osoyoos Lake zooplankton biomass 2014-2021. Units are µg per L dry weight. Rotifers were not included during the first three years of the study.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sampling Date** | Rotifer total | Nauplii total | *D. thomasi* adults  & copepodids | *L. ashlandi* adults  & copepodids | *Epischura* | *Bosmina* | *Daphnia* | *Diaphanosoma* | *Leptodora* | Other | **Total** |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| 14-May-14 | 8.9 | 3.2 | 35.6 | 5.8 | 0.6 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 54.4 |
| 16-Jun-14 | 3.9 | 5.5 | 59.4 | 7.3 | 3.3 | 17.6 | 0.5 | 1.0 | 0.0 | 0.0 | 98.5 |
| 9-Sep-14 | 0.0 | 1.6 | 21.1 | 14.9 | 5.3 | 0.3 | 4.8 | 3.8 | 0.0 | 0.0 | 51.8 |
| 14-Oct-14 | 0.3 | 2.1 | 20.7 | 20.1 | 0.9 | 1.0 | 14.4 | 1.0 | 0.2 | 0.0 | 60.7 |
| 10-Nov-14 | 1.1 | 3.7 | 14.4 | 16.2 | 0.0 | 0.5 | 0.2 | 0.1 | 0.0 | 0.0 | 36.4 |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| 21-Apr-15 | 8.2 | 5.4 | 22.7 | 34.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 70.9 |
| 19-May-15 | 6.2 | 6.2 | 24.0 | 59.8 | 1.5 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 98.1 |
| 2-Jun-15 | 1.9 | 1.7 | 28.2 | 16.5 | 1.5 | 5.7 | 0.3 | 1.9 | 0.6 | 0.0 | 58.3 |
| 22-Jun-15 | 0.1 | 5.1 | 21.6 | 14.9 | 11.3 | 3.1 | 9.3 | 22.9 | 3.0 | 0.0 | 91.1 |
| 8-Jul-15 | 0.0 | 4.4 | 25.8 | 19.9 | 5.4 | 0.6 | 9.8 | 5.5 | 1.7 | 0.0 | 73.2 |
| 28-Jul-15 | 0.0 | 2.6 | 15.1 | 19.0 | 11.2 | 0.1 | 9.7 | 9.3 | 1.4 |  | 68.4 |
| 12-Aug-15 | 0.0 | 1.0 | 11.0 | 9.4 | 9.9 | 0.5 | 8.2 | 5.5 | 0.0 |  | 45.5 |
| 23-Aug-15 | 0.0 | 1.1 | 10.4 | 8.9 | 7.0 | 0.6 | 2.2 | 5.7 | 0.4 |  | 36.3 |
| 12-Sep-15 | 0.1 | 1.4 | 13.2 | 13.2 | 6.7 | 1.3 | 3.4 | 6.5 | 0.3 |  | 46.0 |
| 19-Oct-15 | 1.3 | 3.6 | 31.9 | 17.4 | 0.1 | 1.2 | 2.3 | 0.2 | 0.0 |  | 57.9 |
| 16-Nov-15 | 0.7 | 1.8 | 25.4 | 10.9 | 0.0 | 4.5 | 0.4 | 0.1 | 0.0 |  | 43.8 |
| 15-Dec-15 | 1.1 | 4.8 | 31.5 | 6.2 | 0.0 | 15.1 | 0.0 | 0.0 | 0.0 |  | 58.9 |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| 7-Mar-16 | 15.2 | 2.6 | 60.6 | 4.7 | 0.0 | 6.7 | 0.0 | 0.0 | 0.0 |  | 89.8 |
| 24-May-16 | 1.5 | 4.6 | 55.9 | 1.4 | 0.7 | 4.7 | 0.1 | 0.0 | 0.0 |  | 69.0 |
| 12-Jul-16 | 0.9 | 1.6 | 71.1 | 31.2 | 1.4 | 0.1 | 1.0 | 3.9 | 3.4 |  | 114.5 |
| 24-Oct-16 | 0.3 | 3.8 | 18.4 | 42.0 | 0.4 | 0.6 | 5.9 | 0.1 | 0.4 |  | 72.0 |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| 6-Apr-17 | 0.7 | 5.1 | 11.5 | 46.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |  | 64.0 |
| 25-May-17 | 4.1 | 2.7 | 23.6 | 5.9 | 0.4 | 0.8 | 0.7 | 0.1 | 0.0 |  | 38.2 |
| 25-Jun-17 | 0.2 | 3.9 | 15.4 | 10.6 | 1.2 | 0.0 | 8.8 | 3.8 | 1.2 |  | 45.2 |
| 18-Jul-17 | 0.0 | 6.7 | 36.2 | 34.0 | 12.6 | 0.0 | 15.9 | 6.1 | 3.0 |  | 114.5 |
| 1-Aug-17 | 0.0 | 3.2 | 19.2 | 17.3 | 6.0 | 0.0 | 7.5 | 6.2 | 1.1 |  | 60.5 |
| 15-Aug-17 | 0.0 | 1.8 | 12.2 | 17.2 | 4.9 | 0.0 | 13.7 | 4.7 | 2.0 |  | 56.5 |
| 9-Sep-17 | 0.0 | 1.2 | 10.5 | 12.8 | 3.4 | 0.0 | 6.9 | 2.3 | 0.0 |  | 37.3 |
| 9-Oct-17 | 0.4 | 1.9 | 16.3 | 41.9 | 0.2 | 1.9 | 4.8 | 2.1 | 0.0 |  | 69.4 |
|  |  |  |  |  |  |  |  |  |  |  |  |
| **Sampling Date** | Rotifer total | Nauplii total | *D. thomasi* adults & copepodids | *L. ashlandi* adults & copepodids | *Epischura* | *Bosmina* | *Daphnia* | *Diaphanosoma* | *Leptodora* | Other | **Total** |
|  |  |  |  |  |  |  |  |  |  |  |  |
| 18-Mar-18 | 3.4 | 1.8 | 16.9 | 17.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |  | 39.5 |
| 17-May-18 | 1.5 | 2.6 | 10.9 | 8.3 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 |  | 24.0 |
| 12-Jul-18 | 0.1 | 1.3 | 12.8 | 41.0 | 6.8 | 0.9 | 8.8 | 0.2 | 0.2 |  | 72.1 |
| 5-Sep-18 | 0.1 | 0.9 | 6.9 | 44.9 | 7.0 | 0.0 | 4.6 | 0.7 | 0.3 |  | 65.3 |
| 5-Oct-18 | 0.1 | 0.9 | 9.7 | 29.0 | 4.1 | 0.1 | 12.0 | 0.7 | 0.2 |  | 56.8 |
| 7-Nov-18 | 1.0 | 2.0 | 10.4 | 52.6 | 0.2 | 0.0 | 0.1 | 0.4 | 0.0 |  | 66.6 |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| 14-May-19 | 3.9 | 4.1 | 32.4 | 41.2 | 8.0 | 0.0 | 0.0 | 0.1 | 0.0 |  | 89.8 |
| 16-Jun-19 | 0.5 | 6.2 | 32.2 | 31.2 | 3.0 | 4.3 | 1.0 | 3.6 | 0.0 |  | 82.1 |
| 7-Jul-19 | 0.1 | 1.9 | 42.6 | 28.9 | 2.0 | 0.1 | 13.8 | 0.7 | 0.5 |  | 90.6 |
| 19-Aug-19 | 0.0 | 1.4 | 13.6 | 37.6 | 4.0 | 0.1 | 2.1 | 5.5 | 0.0 |  | 64.2 |
| 2-Oct-19 | 0.1 | 1.0 | 13.3 | 18.4 | 2.1 | 0.2 | 6.4 | 1.1 | 1.1 |  | 43.8 |
| 22-Oct-19 | 0.0 | 1.7 | 27.1 | 42.9 | 0.4 | 0.1 | 1.5 | 0.1 | 0.0 |  | 73.9 |
| 12-Nov-19 | 0.0 | 0.0 | 6.4 | 25.1 | 0.1 | 0.0 | 0.1 | 0.1 | 0.0 |  | 31.7 |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| 26-May-20 | 1.4 | 3.2 | 15.7 | 17.0 | 0.2 | 0.5 | 0.1 | 0.0 | 0.0 |  | 38.0 |
| 14-Jul-20 | 0.1 | 2.1 | 21.2 | 25.4 | 1.8 | 1.9 | 13.6 | 2.0 | 0.9 |  | 69.0 |
| 10-Sep-20 | 0.0 | 1.5 | 12.5 | 23.3 | 5.3 | 0.0 | 2.5 | 1.5 | 0.0 |  | 46.7 |
| 7-Oct-20 | 0.1 | 0.7 | 6.8 | 21.2 | 2.5 | 0.1 | 1.9 | 0.6 | 0.0 |  | 33.9 |
| 18-Nov-20 | 0.1 | 1.7 | 3.2 | 20.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |  | 25.5 |
|  |  |  |  |  |  |  |  |  |  |  |  |

## OSOYOOS LAKE ZOOPLANKTON DENSITY

Table .0. Osoyoos Lake zooplankton density (individuals L-1) from 2014 to 2021.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sampling Date** | Rotifer total | Nauplii total | *D. thomasi* adults  & copepodids | *L. ashlandi* adults  & copepodids | *Epischura* | *Bosmina* | *Daphnia* | *Diaphanosoma* | *Leptodora* | Other |
|  |  |  |  |  |  |  |  |  |  |  |
| 14-May-14 | 79.5 | 25.0 | 18.1 | 1.3 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 |  |
| 16-Jun-14 | 37.3 | 33.3 | 30.9 | 2.2 | 0.2 | 12.0 | 0.1 | 0.2 | 0.0 |  |
| 18-Aug-14 | 3.0 | 136.0 | 274.7 | 106.7 | 3.7 | 0.3 | 2.2 | 16.0 | 0.1 |  |
| 9-Sep-14 | 0.1 | 8.8 | 11.5 | 5.1 | 0.3 | 0.1 | 0.6 | 0.8 | 0.0 |  |
| 14-Oct-14 | 3.8 | 11.5 | 7.9 | 4.5 | 0.0 | 0.4 | 1.9 | 0.2 | 0.0 |  |
| 10-Nov-14 | 17.0 | 20.7 | 6.3 | 5.2 | 1.0 | 0.3 | 0.0 | 0.0 | 0.0 |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 21-Apr-15 | 78.7 | 32.0 | 7.4 | 10.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |  |
| 19-May-15 | 56.7 | 32.7 | 10.2 | 20.0 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 |  |
| 2-Jun-15 | 19.3 | 10.5 | 11.8 | 3.4 | 0.1 | 4.2 | 0.0 | 0.4 | 0.0 |  |
| 22-Jun-15 | 1.0 | 26.4 | 13.9 | 7.4 | 0.5 | 2.7 | 0.7 | 3.6 | 0.1 |  |
| 8-Jul-15 | 0.3 | 24.0 | 18.9 | 7.8 | 0.5 | 0.4 | 0.9 | 1.0 | 0.0 |  |
| 28-Jul-15 | 0.3 | 15.7 | 13.5 | 6.6 | 1.0 | 0.1 | 1.1 | 1.8 | 0.0 |  |
| 12-Aug-15 | 0.3 | 5.3 | 9.0 | 3.3 | 0.7 | 0.3 | 0.8 | 1.0 | 0.0 |  |
| 23-Aug-15 | 0.3 | 6.3 | 8.3 | 2.7 | 0.4 | 0.4 | 0.3 | 1.1 | 0.0 |  |
| 12-Sep-15 | 1.0 | 6.9 | 6.3 | 5.9 | 0.3 | 0.7 | 0.4 | 1.2 | 0.0 |  |
| 19-Oct-15 | 12.7 | 17.3 | 18.1 | 5.3 | 0.0 | 0.2 | 0.4 | 0.0 | 0.0 |  |
| 16-Nov-15 | 7.3 | 10.9 | 10.6 | 2.2 | 0.0 | 3.1 | 0.1 | 0.0 | 0.0 |  |
| 15-Dec-15 | 14.2 | 28.1 | 12.6 | 1.2 | 0.0 | 9.3 | 0.0 | 0.0 | 0.0 |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 7-Mar-16 | 209.3 | 12.3 | 29.3 | 1.3 | 0.0 | 4.0 | 0.0 | 0.0 | 0.0 |  |
| 24-May-16 | 14.4 | 28.4 | 28.4 | 0.3 | 0.0 | 2.6 | 0.0 | 0.0 | 0.0 |  |
| 12-Jul-16 | 6.4 | 8.7 | 30.7 | 7.0 | 0.1 | 0.0 | 0.1 | 0.7 | 0.1 |  |
| 24-Oct-16 | 4.3 | 22.8 | 7.0 | 16.0 | 0.0 | 0.3 | 0.9 | 0.0 | 0.0 |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 6-Apr-17 | 8.3 | 24.3 | 6.0 | 17.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |  |
| 25-May-17 | 36.0 | 15.5 | 9.0 | 2.0 | 0.0 | 0.5 | 0.1 | 0.0 | 0.0 |  |
| 25-Jun-17 | 2.2 | 21.0 | 6.1 | 3.5 | 0.1 | 0.0 | 1.4 | 0.8 | 0.0 |  |
| 18-Jul-17 | 0.3 | 32.7 | 14.3 | 11.3 | 0.5 | 0.0 | 1.3 | 1.2 | 0.0 |  |
| 1-Aug-17 | 0.2 | 16.3 | 8.2 | 6.1 | 0.3 | 0.0 | 0.7 | 1.2 | 0.0 |  |
| 15-Aug-17 | 0.5 | 10.8 | 6.2 | 4.7 | 0.3 | 0.0 | 1.3 | 1.0 | 0.0 |  |
| 9-Sep-17 | 0.4 | 7.1 | 4.6 | 4.2 | 0.2 | 0.0 | 0.8 | 0.4 | 0.0 |  |
| 9-Oct-17 | 4.3 | 10.0 | 7.0 | 18.3 | 0.0 | 1.3 | 0.8 | 0.4 | 0.0 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| **Sampling Date** | Rotifer total | Nauplii total | *D. thomasi* adults  & copepodids | *L. ashlandi* adults  & copepodids | *Epischura* | *Bosmina* | *Daphnia* | *Diaphanosoma* | *Leptodora* | Other |
|  |  |  |  |  |  |  |  |  |  |  |
| 18-Mar-18 | 36.0 | 8.7 | 6.8 | 5.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |  |
| 17-May-18 | 16.3 | 16.7 | 6.3 | 2.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |  |
| 12-Jul-18 | 1.8 | 7.7 | 4.6 | 12.1 | 0.3 | 0.7 | 0.7 | 0.0 | 0.0 |  |
| 5-Sep-18 | 0.8 | 4.8 | 2.8 | 13.3 | 0.5 | 0.0 | 0.7 | 0.1 | 0.0 |  |
| 5-Oct-18 | 1.8 | 5.7 | 3.7 | 9.6 | 0.2 | 0.0 | 1.2 | 0.1 | 0.0 |  |
| 7-Nov-18 | 13.7 | 9.7 | 4.2 | 12.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 14-May-19 | 54.0 | 24.0 | 18.5 | 9.8 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 |  |
| 16-Jun-19 | 6.1 | 45.3 | 13.3 | 12.7 | 0.2 | 3.3 | 0.0 | 0.8 | 0.0 |  |
| 7-Jul-19 | 1.3 | 16.8 | 15.3 | 12.6 | 0.1 | 0.1 | 0.0 | 0.2 | 0.0 |  |
| 19-Aug-19 | 0.2 | 6.8 | 8.9 | 13.7 | 0.3 | 0.1 | 0.0 | 1.2 | 0.0 |  |
| 2-Oct-19 | 0.7 | 6.1 | 8.6 | 8.3 | 0.1 | 0.2 | 0.0 | 0.2 | 0.0 |  |
| 22-Oct-19 | 0.4 | 9.2 | 13.1 | 14.2 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 |  |
| 12-Nov-19 | 0.0 | 0.0 | 1.8 | 5.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 26-May-20 | 15.3 | 25.3 | 7.8 | 4.8 | 0.0 | 0.5 | 0.0 | 0.0 | 0.0 |  |
| 14-Jul-20 | 0.9 | 14.4 | 10.3 | 12.1 | 0.1 | 0.1 | 0.0 | 0.4 | 0.0 |  |
| 10-Sep-20 | 0.8 | 9.4 | 6.4 | 9.8 | 0.4 | 0.0 | 0.0 | 0.4 | 0.0 |  |
| 7-Oct-20 | 2.1 | 4.8 | 4.0 | 6.8 | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 |  |
| 18-Nov-20 | 1.1 | 12.1 | 3.3 | 10.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 2021 |  |  |  |  |  |  |  |  |  |  |
| 2021 |  |  |  |  |  |  |  |  |  |  |
| 2021 |  |  |  |  |  |  |  |  |  |  |
| 2021 |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |

## OSOYOOS LAKE *MYSIS RELICTA* BIOMASS

Table .0. Osoyoos Lake 2014-2021 *Mysis relicta* biomass. Units are mg wet weight per m3.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sampling Date** | juvenile | immature male | immature female | adult male | adult female | adult female  - released eggs | gravid female | embryos | **Total** |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| 17-Mar-14 | 0.00 | 0.84 | 0.45 | 0.10 | 0.10 | 0.01 | 0.57 |  | **2.06** |
| 2-Jun-14 | 0.28 | 3.05 | 1.17 | 0.17 | 0.25 | 0.80 | 0.95 |  | **6.67** |
| 29-Jul-14 | 1.15 | 2.84 | 2.49 | 0.75 | 1.27 | 0.00 | 0.00 |  | **8.51** |
| 9-Sep-14 | 0.16 | 3.01 | 2.27 | 0.80 | 1.72 | 0.00 | 0.00 |  | **7.96** |
| 15-Dec-14 | 0.00 | 1.47 | 1.10 | 6.05 | 4.19 | 0.00 | 0.00 |  | **12.81** |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| 21-Apr-15 | 0.11 | 2.65 | 1.96 | 0.60 | 0.28 | 0.52 | 4.26 |  | **10.39** |
| 2-Jun-15 | 1.68 | 2.84 | 2.77 | 0.04 | 2.10 | 0.86 | 0.57 |  | **10.85** |
| 8-Jul-15 | 1.58 | 4.07 | 2.59 | 0.00 | 1.61 | 0.00 | 0.00 |  | **9.85** |
| 28-Jul-15 | 0.68 | 3.75 | 2.69 | 0.00 | 1.40 | 0.00 | 0.00 |  | **8.51** |
| 12-Aug-15 | 0.13 | 4.17 | 3.69 | 0.00 | 1.94 | 0.00 | 0.00 |  | **9.94** |
| 12-Sep-15 | 0.00 | 4.48 | 3.60 | 0.33 | 1.25 | 0.00 | 0.00 |  | **9.66** |
| 19-Oct-15 | 0.00 | 1.82 | 2.24 | 0.57 | 0.71 | 0.00 | 0.00 |  | **5.34** |
| 16-Nov-15 | 0.00 | 0.63 | 0.67 | 0.65 | 0.61 | 0.00 | 0.00 |  | **2.56** |
| 15-Dec-15 | 0.00 | 1.06 | 0.94 | 1.34 | 2.53 | 0.00 | 0.00 |  | **5.86** |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 25-May-16 | 1.59 | 7.50 | 5.68 | 0.31 | 7.16 | 0.26 | 0.22 |  | **22.72** |
| 12-Jul-16 | 0.51 | 5.56 | 4.00 | 0.00 | 5.65 | 0.00 | 0.00 |  | **15.73** |
| 25-Oct-16 | 0.00 | 1.24 | 1.54 | 0.20 | 0.26 | 0.00 | 0.00 |  | **3.24** |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| 6-Apr-17 | 0.00 | 0.28 | 0.05 | 0.00 | 0.00 | 0.33 | 0.36 |  | **1.02** |
| 25-May-17 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |  | **0.04** |
| 25-Jun-17 | 1.47 | 0.49 | 0.04 | 0.00 | 1.31 | 0.35 | 0.00 |  | **3.65** |
| 18-Jul-17 | 0.56 | 1.00 | 1.12 | 0.00 | 1.73 | 0.00 | 0.00 |  | **4.41** |
| 15-Aug-17 | 0.04 | 2.34 | 2.40 | 0.00 | 2.82 | 0.00 | 0.00 |  | **7.59** |
| 9-Sep-17 | 0.02 | 2.95 | 3.39 | 0.28 | 1.70 | 0.00 | 0.00 |  | **8.34** |
| 11-Oct-17 | 0.00 | 7.87 | 12.50 | 0.82 | 9.19 | 0.00 | 0.00 |  | **30.37** |
| 18-Nov-17 | 0.00 | 5.69 | 5.30 | 4.01 | 3.90 | 0.00 | 0.22 |  | **19.12** |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| 18-Mar-18 | 0.00 | 2.62 | 2.39 | 2.06 | 0.25 | 2.78 | 5.58 |  | **15.67** |
| 17-May-18 | 0.08 | 0.74 | 0.07 | 0.24 | 0.00 | 0.00 | 0.00 |  | **0.94** |
| 12-Jul-18 | 3.26 | 5.60 | 10.73 | 0.00 | 9.49 | 0.00 | 0.00 |  | **29.08** |
| 5-Sep-18 | 0.00 | 10.53 | 11.86 | 0.66 | 6.01 | 0.00 | 0.00 |  | **29.05** |
| 5-Oct-18 | 0.00 | 12.63 | 26.40 | 1.55 | 7.01 | 0.00 | 0.00 |  | **47.59** |
| 8-Nov-18 | 0.00 | 6.85 | 7.78 | 2.34 | 4.24 | 0.00 | 0.00 |  | **21.21** |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| 14-May-19 | 0.33 | 0.00 | 0.00 | 7.08 | 1.84 | 1.37 | 1.09 |  | **11.72** |
| 7-Jul-19 | 4.24 | 0.00 | 0.00 | 7.89 | 4.38 | 0.09 | 0.15 |  | **16.76** |
| 8-Sep-19 | 2.47 | 0.00 | 0.00 | 2.52 | 1.72 | 0.00 | 0.00 |  | **6.70** |
| 22-Oct-19 | 3.27 | 0.00 | 0.00 | 5.01 | 2.54 | 1.35 | 0.00 |  | **12.18** |
| 12-Nov-19 | 1.22 | 0.00 | 0.00 | 3.24 | 2.60 | 0.19 | 0.00 |  | **7.25** |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| 26-May-20 | 1.19 | 0.00 | 0.00 | 1.16 | 2.65 | 0.80 | 0.04 |  | **5.85** |
| 14-Jul-20 | 6.53 | 0.00 | 0.00 | 3.09 | 3.86 | 0.53 | 0.00 |  | **14.01** |
| 10-Sep-20 | 5.25 | 0.00 | 0.00 | 3.40 | 4.59 | 0.00 | 0.00 |  | **13.24** |
| 7-Oct-20 | 2.68 | 0.00 | 0.00 | 4.27 | 4.44 | 0.00 | 0.00 |  | **11.40** |
| 10-Nov-20 | 5.25 | 0.00 | 0.00 | 5.11 | 5.11 | 0.05 | 0.05 |  | **15.58** |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| -21 |  |  |  |  |  |  |  |  |  |
| -21 |  |  |  |  |  |  |  |  |  |
| -21 |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |

## 

Table . Mysis relicta biomass and density ’97 to 99

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Date** | **Samples** | **Mesh size** | **Density** | **Biomass** |
| May-97 | 1 | 1000 µm | 300.00 | na |
| Aug-97 | 1 | 1000 µm | 470.00 | na |
| Oct-97 | 1 | 1000 µm | 300.00 | na |
| 9-May-98 | 1 | 500 µm | 4.00 | 1.99 |
| 1-Oct-98 | 1 | 500 µm | 28.00 | 637.78 |
| 14-Aug-99 | 3 | 300 µm | 8.88 | 98.73 |
| 25-Sep-99 | 4 | 300 µm | 1.11 | 28.07 |
| 26-Sep-99 | 5 | 300 µm | 9.77 | 145.36 |

## OSOYOOS LAKE *MYSIS RELICTA* DENSITY

Table .0. Osoyoos Lake 2014-2021 *Mysis relicta* density per m³.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sampling Date** | juvenile | immature male | immature female | adult male | adult female | adult female  - released eggs | gravid female | embryos | **Total** |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| 17-Mar-14 | 0.00 | 0.53 | 0.40 | 0.11 | 0.05 | 0.03 | 0.45 | nd | **1.58** |
| 2-Jun-14 | 1.77 | 0.45 | 0.17 | 0.04 | 0.03 | 0.10 | 0.13 | nd | **2.68** |
| 29-Jul-14 | 2.02 | 0.69 | 0.77 | 0.12 | 0.13 | 0.00 | 0.00 | nd | **3.73** |
| 9-Sep-14 | 0.24 | 0.84 | 0.86 | 0.10 | 0.16 | 0.00 | 0.00 | nd | **2.19** |
| 15-Dec-14 | 0.00 | 0.48 | 0.32 | 1.04 | 0.63 | 0.00 | 0.00 | nd | **2.47** |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| 21-Apr-15 | 0.42 | 0.47 | 0.33 | 0.12 | 0.03 | 0.07 | 0.56 | nd | **2.00** |
| 2-Jun-15 | 5.00 | 0.56 | 0.53 | 0.01 | 0.26 | 0.12 | 0.08 | nd | **6.56** |
| 8-Jul-15 | 2.51 | 1.05 | 1.06 | 0.00 | 0.18 | 0.00 | 0.00 | nd | **4.80** |
| 28-Jul-15 | 0.85 | 1.05 | 1.12 | 0.00 | 0.15 | 0.00 | 0.00 | nd | **3.17** |
| 12-Aug-15 | 0.19 | 1.18 | 1.09 | 0.00 | 0.20 | 0.00 | 0.00 | nd | **2.66** |
| 12-Sep-15 | 0.00 | 1.19 | 1.00 | 0.04 | 0.13 | 0.00 | 0.00 | nd | **2.36** |
| 19-Oct-15 | 0.00 | 0.54 | 0.61 | 0.09 | 0.08 | 0.00 | 0.00 | nd | **1.32** |
| 16-Nov-15 | 0.00 | 0.19 | 0.16 | 0.11 | 0.10 | 0.00 | 0.00 | nd | **0.56** |
| 15-Dec-15 | 0.00 | 0.26 | 0.19 | 0.21 | 0.33 | 0.00 | 0.00 | nd | **0.99** |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| 7-Mar-16 | 0.00 | 0.10 | 0.02 | 0.13 | 0.01 | 0.13 | 0.18 | 4.73 | **0.58** |
| 25-May-16 | 4.12 | 2.11 | 2.54 | 0.06 | 0.71 | 0.03 | 0.02 | 0.55 | **9.59** |
| 12-Jul-16 | 0.70 | 1.70 | 2.17 | 0.00 | 0.53 | 0.00 | 0.00 | 0.00 | **5.10** |
| 25-Oct-16 | 0.00 | 0.32 | 0.36 | 0.04 | 0.04 | 0.00 | 0.00 | 0.00 | **0.76** |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| 6-Apr-17 | 0.00 | 0.04 | 0.04 | 0.00 | 0.00 | 0.04 | 0.04 | 1.13 | **0.12** |
| 25-May-17 | 0.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | **0.18** |
| 25-Jun-17 | 3.54 | 0.08 | 0.08 | 0.00 | 0.12 | 0.04 | 0.00 | 0.00 | **3.82** |
| 18-Jul-17 | 0.87 | 0.41 | 0.41 | 0.00 | 0.16 | 0.00 | 0.00 | 0.00 | **2.10** |
| 15-Aug-17 | 0.05 | 0.68 | 0.68 | 0.00 | 0.24 | 0.00 | 0.00 | 0.00 | **2.19** |
| 9-Sep-17 | 0.03 | 0.83 | 0.83 | 0.03 | 0.13 | 0.00 | 0.00 | 0.00 | **2.21** |
| 11-Oct-17 | 0.00 | 1.94 | 1.94 | 0.07 | 0.75 | 0.00 | 0.00 | 0.00 | **6.58** |
| 18-Nov-17 | 0.00 | 1.51 | 1.51 | 0.66 | 0.38 | 0.00 | 0.03 | 0.38 | **3.75** |
| 13-Dec-17 | 0.00 | 0.50 | 0.66 | 1.34 | 1.19 | 0.00 | 0.00 | 0.00 | **3.68** |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| 18-Mar-18 | 0.00 | 0.44 | 0.39 | 0.38 | 0.03 | 0.33 | 0.65 | 11.78 | **14.01** |
| 17-May-18 | 0.16 | 0.08 | 0.01 | 0.04 | 0.00 | 0.00 | 0.00 | 0.16 | **0.45** |
| 12-Jul-18 | 5.71 | 1.56 | 3.50 | 0.00 | 0.91 | 0.00 | 0.00 | 0.00 | **11.68** |
| 5-Sep-18 | 0.00 | 2.34 | 3.84 | 0.06 | 0.54 | 0.00 | 0.00 | 0.00 | **6.78** |
| 5-Oct-18 | 0.00 | 2.87 | 8.06 | 0.14 | 0.61 | 0.00 | 0.00 | 32.52 | **44.20** |
| 8-Nov-18 | 0.00 | 1.80 | 2.05 | 0.40 | 0.50 | 0.00 | 0.00 | 0.00 | **4.74** |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| 14-May-19 | 0.35 | 0.00 | 0.00 | 1.17 | 0.32 | 0.20 | 0.14 | 1.24 | **3.41** |
| 7-Jul-19 | 9.90 | 0.00 | 0.00 | 1.18 | 0.59 | 0.01 | 0.02 | 0.20 | **11.92** |
| 8-Sep-19 | 1.97 | 0.00 | 0.00 | 0.39 | 0.25 | 0.00 | 0.00 | 0.00 | **2.61** |
| 22-Oct-19 | 2.30 | 0.00 | 0.00 | 1.07 | 0.50 | 0.16 | 0.00 | 0.00 | **4.04** |
| 12-Nov-19 | 0.80 | 0.00 | 0.00 | 0.64 | 0.56 | 0.02 | 0.00 | 0.00 | **2.02** |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| 26-May-20 | 3.19 | 0.00 | 0.00 | 0.23 | 0.51 | 0.15 | 0.01 | 0.34 | **4.42** |
| 14-Jul-20 | 7.67 | 0.00 | 0.00 | 0.51 | 0.60 | 0.07 | 0.00 | 0.00 | **8.85** |
| 10-Sep-20 | 3.19 | 0.00 | 0.00 | 0.60 | 0.73 | 0.00 | 0.00 | 0.00 | **4.52** |
| 7-Oct-20 | 1.94 | 0.00 | 0.00 | 0.82 | 0.76 | 0.00 | 0.00 | 0.00 | **3.52** |
| 10-Nov-20 | 2.95 | 0.00 | 0.00 | 1.15 | 1.02 | 0.01 | 0.01 | 0.08 | **5.23** |
|  |  |  |  |  |  |  |  |  |  |

## OSOYOOS LAKE *MYSIS RELICTA* DIETS

Table .0. Osoyoos Lake 2014-2021 *Mysis relicta* diets as average number of prey per *Mysis*.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sampling Date** | **Number Mysis processed** | *Daphnia* | *Bosmina* | Cyclopoid | Calanoid | nauplii | rotifer | *Diaphanosoma* |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| -14 |  |  |  |  |  |  |  |  |
| -14 |  |  |  |  |  |  |  |  |
| -14 |  |  |  |  |  |  |  |  |
| -14 |  |  |  |  |  |  |  |  |
| -14 |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| 2-Jun-15 | **89** | 0.011 | 1.461 | 0.000 | 0.034 | 0.000 | 0.124 | 0.000 |
| 8-Jul-15 | **94** | 0.340 | 0.234 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 28-Jul-15 | **96** | 0.146 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 12-Aug-15 | **91** | 0.593 | 0.022 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 12-Sep-15 | **89** | 0.157 | 0.146 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 19-Oct-15 | **90** | 0.022 | 0.133 | 0.000 | 0.000 | 0.000 | 0.011 | 0.000 |
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## OSOYOOS LAKE FISH LENGTH, WEIGHT, and DENSITY

Table 11.Year 2014-2021 Osoyoos Lake species-specific (sockeye, whitefish) and age-specific [i.e. (i) nerkids <15 cm known from the trawl samples to be almost entirely age-0 sockeye, (ii) age-1 sockeye or kokanee known to be age-1 from scale data, (iii) larger nerkids length 15-33 cm and (iv) fish larger than 33 cm which we assume to be a mixture of lake whitefish and returning adult sockeye], densities, lengths and weights. The numbers in the box include lake-whitefish, adult salmon spawners, and rare occurrences of very large kokanee, very large pike minnow, and large rainbow trout. The single **red** number is the late fall estimate of whitefish densities. The numbers in **green** are 2013, 2012, and 2010 stocking densities and mean weights of stocked sockeye salmon fry. During 2005-09, age-1 juvenile sockeye holdovers (i.e. juvenile sockeye that remained in the lake for a 2nd year) were absent or uncommon and were not separated from the age-0 nerkids. Although mixtures of sockeye and kokanee could be present in samples of all size classes of *O. nerka* comprising our samples, counts of adult sockeye and kokanee in terminal spawning areas suggest that sockeye likely comprise greater than 90% of all sub-adult *O. nerka* samples from Osoyoos Lake. Evidence that annual variations in juvenile sockeye numbers vary in direct proportion to annual variations in adult sockeye returns (see Hyatt and Rankin 1999 and Hyatt, unpublished data) also strongly suggest that kokanee contribute little by way of numbers to the “nerkid” aggregate rearing in Osoyoos Lake during the years of our investigation.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **29-Jul-97** | **9-Sep-97** | **3-Nov-97** |
|  |  |  |  |
|  | Density per ha | |  |
| Nerkids <15cm (age 0 sockeye) | 1557 | 1326 | 1005 |
| Age-1 smolts or Kokanee | nd | nd | nd |
| Nerkids between 15-33 cm | nd | nd | nd |
| Other fish >33cm | nd | nd | nd |
|  |  |  |  |
| Total fish | 1557 | 1326 | 1005 |
| (± 95% CI) | (654) | (384) | (553) |
|  |  | |  |
|  | Length (cm) (SD) | |  |
| Age-0 Nerkids |  |  | 7.0 (0.7) |
| Age-1 smolts or Kokanee |  |  |  |
| Age-2 Kokanee |  |  |  |
| Age-3 Kokanee |  |  |  |
|  |  |  |  |
|  | Weight (g) (SD) | |  |
| Age-0 Nerkids |  |  | 3.8 (1.0) |
| Age-1 smolts or Kokanee |  |  |  |
| Age-2 Kokanee |  |  |  |
| Age-3 Kokanee |  |  |  |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | **8-May-98** | **24-Jul-98** | **2-Oct-98** |
|  |  |  |  |
|  | Density per ha | |  |
| Nerkids <15cm (age 0 sockeye) | 3253 | 2678 | 4039 |
| Age-1 smolts or Kokanee | nd | nd | nd |
| Nerkids between 15-33 cm | nd | nd | nd |
| Other fish >33cm | nd | nd | nd |
|  |  |  |  |
| Total fish | 3253 | 2678 | 4039 |
| (± 95% CI) | (781) | (295) | (646) |
|  |  | |  |
|  | Length (cm) (SD) | |  |
| Age-0 Nerkids | 3.4 (0.6) | 6.1 (0.6) | 8.1 (0.9) |
| Age-1 smolts or Kokanee |  |  |  |
| Age-2 Kokanee |  |  |  |
| Age-3 Kokanee |  |  |  |
|  |  |  |  |
|  | Weight (g) (SD) | |  |
| Age-0 Nerkids | 0.4 (0.6) | 2.6 (0.9) | 4.9 (2.0) |
| Age-1 smolts or Kokanee |  |  |  |
| Age-2 Kokanee |  |  |  |
| Age-3 Kokanee |  |  |  |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | **28-May-99** | **11-Aug-99** | **25-Sep-99** |
|  |  |  |  |
|  | Density per ha | |  |
| Nerkids <15cm (age 0 sockeye) | 274 | 304 | 326 |
| Age-1 smolts or Kokanee | nd | nd | nd |
| Nerkids between 15-33 cm | nd | nd | nd |
| Other fish >33cm | nd | nd | nd |
|  |  |  |  |
| Total fish | 274 | 304 | 326 |
| (± 95% CI) | (55) | (70) | (65) |
|  |  | |  |
|  | Length (cm) (SD) | |  |
| Age-0 Nerkids |  |  |  |
| Age-1 smolts or Kokanee |  |  |  |
| Age-2 Kokanee |  |  |  |
| Age-3 Kokanee |  |  |  |
|  |  |  |  |
|  | Weight (g) (SD) | |  |
| Age-0 Nerkids |  |  |  |
| Age-1 smolts or Kokanee |  |  |  |
| Age-2 Kokanee |  |  |  |
| Age-3 Kokanee |  |  |  |
|  |  |  |  |

|  |  |  |
| --- | --- | --- |
|  | **5-Jul-00** | **28-Sep-00** |
|  |  |  |
|  | Density per ha | |
| Nerkids <15cm (age 0 sockeye) | 1939 | 1162 |
| Age-1 smolts or Kokanee | nd | nd |
| Nerkids between 15-33 cm | nd | nd |
| Other fish >33cm | nd | nd |
|  |  |  |
| Total fish | 1939 | 1162 |
| (± 95% CI) | (388) | (209) |
|  |  |  |
|  | Length (cm) (SD) | |
| Age-0 Nerkids | 6.4 (1.0) | 8.0 (1.0) |
| Age-1 smolts or Kokanee | nd | nd |
| Age-2 Kokanee | nd | nd |
| Age-3 Kokanee | nd | nd |
|  |  |  |
|  | Weight (g) (SD) | |
| Age-0 Nerkids | 3.0 (1.3) | 5.5 (2.2) |
| Age-1 smolts or Kokanee | nd | nd |
| Age-2 Kokanee | nd | nd |
| Age-3 Kokanee | nd | nd |
|  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **11-June-01** | **25-July-01** | **18-Oct-01** | **27-Nov-01** |
|  |  |  |  |  |
|  | Density per ha | | | |
| Nerkids <15cm (age 0 sockeye) | 4330 | 3115 | nd | 3137 |
| Age-1 smolts or Kokanee | nd | nd | nd | nd |
| Nerkids between 15-33 cm | nd | nd | nd | nd |
| Other fish >33cm | nd | nd | nd | nd |
|  |  |  |  |  |
| Total fish | 4330 | 3115 | nd | 3137 |
| (± 95% CI) | (1427) | (686) | nd | (356) |
|  |  | | | |
|  | Length (cm) (SD) | | | |
| Age-0 Nerkids | nd | nd | 7.1 (0.7) | 7.1 (0.3) |
| Age-1 smolts or Kokanee | nd | nd | nd | nd |
| Age-2 Kokanee | nd | nd | nd | nd |
| Age-3 Kokanee | nd | nd | nd | nd |
|  |  |  |  |  |
|  | Weight (g) (SD) | | | |
| Age-0 Nerkids | nd | nd | 3.4 (0.1) | 6.6 (0.1) |
| Age-1 smolts or Kokanee | nd | nd | nd | nd |
| Age-2 Kokanee | nd | nd | nd | nd |
| Age-3 Kokanee | nd | nd | nd | nd |
|  |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **24-Apr-02** | **12-Jul-02** | **25-Jun-02** | **16-Jul-02** | **27-Aug-02** | **25-Sep-02** | **30-Oct-02** | **25-Nov-02** | **24-Feb-03** |
|  |  |  |  |  |  |  |  |  |  |
|  | Density per ha | |  |  |  |  |  |  |  |
| Nerkids <15cm (age 0 sockeye) | 3537 | nd | nd | nd | nd | nd | 1965 | 2230 | 2012 |
| Age-1 smolts or Kokanee | nd | nd | nd | nd | nd | nd | nd | nd | nd |
| Nerkids between 15-33 cm | nd | nd | nd | nd | nd | nd | nd | nd | nd |
| Other fish >33cm | nd | nd | nd | nd | nd | nd | nd | nd | nd |
|  |  |  |  |  |  |  |  |  |  |
| Total fish | 3547 | nd | nd | nd | nd | nd | 1965 | 2230 | 2012 |
| (± 95% CI) | (745) | nd | nd | nd | nd | nd | (354) | (446) | (241) |
|  |  |  |  |  |  |  |  |  |  |
|  | Length (cm) (SD) | |  |  |  |  |  |  |  |
| Age-0 Nerkids | 7.6 (0.9) | 3.6 (0.4) | 4.3 (0.5) | 5.1 (0.9) | 6.5 (0.5) | 6.6 (0.1) | 7.3 (0.6) | 7.2 (0.2) | nd |
| Age-1 smolts or Kokanee | nd | nd | nd | nd | nd | nd | nd | nd | nd |
| Age-2 Kokanee | nd | nd | nd | nd | nd | nd | nd | nd | nd |
| Age-3 Kokanee | nd | nd | nd | nd | nd | nd | Nd | nd | nd |
|  |  |  |  |  |  |  |  |  |  |
|  | Weight (g) (SD) | |  |  |  |  |  |  |  |
| Age-0 Nerkids | 4.3 (1.4) | 0.4 (0.2) | 1.8 (0.5) | 1.4 (0.7) | 2.8 (0.8) | 2.9 (1.6) | 3.7 (1.0) | 6.6 (0.6) | nd |
| Age-1 smolts or Kokanee | nd | nd | nd | nd | nd | nd | nd | nd | nd |
| Age-2 Kokanee | nd | nd | nd | nd | nd | nd | nd | nd | nd |
| Age-3 Kokanee | nd | nd | nd | nd | nd | nd | nd | nd | nd |
|  |  |  |  |  |  |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | **26-May-03** | **21-Sep-03** | **2-Mar-04** |
|  |  |  |  |
|  | Density per ha | |
| Nerkids <15cm (age 0 sockeye) | 2199 | 881 | 465 |
| Age-1 smolts or Kokanee | nd | nd | nd |
| Nerkids between 15-33 cm | nd | nd | nd |
| Other fish >33cm | nd | nd | nd |
|  |  |  |  |
| Total fish (± 95% CI) | 2199 | 881 | 465 |
|  | (484) | (88) | (65) |
|  |  | |
|  | Length (cm) (SD) | |
| Age-0 Nerkids | nd | nd | nd |
| Age-1 smolts or Kokanee | nd | nd | nd |
| Age-2 Kokanee | nd | nd | nd |
| Age-3 Kokanee | nd | nd | nd |
|  |  |  |  |
|  | Weight (g) (SD) | |
| Age-0 Nerkids | nd | nd | nd |
| Age-1 smolts or Kokanee | nd | nd | nd |
| Age-2 Kokanee | nd | nd | nd |
| Age-3 Kokanee | nd | nd | nd |
|  |  |  |  |

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| --- | --- | --- | --- | --- | --- |
|  | **2-Mar-04** | **23-Apr-04** | **21-Jul-04** | **3-Nov-04** | **19-Feb-05** |
|  |  |  |  |  |  |
|  | Density per ha |  |  |  |  |
| Nerkids <15cm (age 0 sockeye) | nd | nd | 1109 | 665 | 912 |
| Age-1 smolts or Kokanee | nd | nd | nd | nd | nd |
| Nerkids between 15-33 cm | nd | nd | nd | nd | nd |
| Other fish >33cm | nd | nd | nd | nd | nd |
|  |  |  |  |  |  |
| Total fish (± 95% CI) | nd | nd | 1109 | 665 | 912 |
|  | nd | nd | (100) | (106) | (374) |
|  |  |  |  |  |  |
|  | Length (cm) (SD) |  |  |  |  |
| Age-0 Nerkids | 3.2 (0.1) | 8.6 (0.5) | 5.4 (0.5) | nd | nd |
| Age-1 smolts or Kokanee | nd | nd | nd | nd | nd |
| Age-2 Kokanee | nd | nd | nd | nd | nd |
| Age-3 Kokanee | nd | nd | nd | nd | nd |
|  |  |  |  |  |  |
|  | Weight (g) (SD) | | |  |  |
| Age-0 Nerkids | 0.7 (1.9) | 5.6 (0.7) | 1.3 (0.4) | nd | nd |
| Age-1 smolts or Kokanee | nd | nd | nd | nd | nd |
| Age-2 Kokanee | nd | nd | nd | nd | nd |
| Age-3 Kokanee | nd | nd | nd | nd | nd |
|  |  |  |  |  |  |

Table .0. Year 2014 (BY2013) Osoyoos Lake fish summary

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **29-May-14** | **25-Jun-14** | **24-Jul-14** | **27-Aug-14** | **24-Sep-14** | **23-Oct-14** | **27-Feb-15** |
|  |  |  |  |  |  |  |  |
|  | Density per ha | |  |  |  |  |  |
| Nerkids <15cm (age 0 sockeye) | 3557 | 3335 | 3423 | 3533 | 2882 | 2109 | 1552 |
| Age-1 smolts or Kokanee | 76 | 89 | 407 | 811 | 798 | 733 | 343 |
| Nerkids between 15-33 cm | 33 | 70 | 70 | 143 | 189 | 78 | 32 |
| Other fish >33cm | 5 | 24 | 35 | 88 | 91 | 10 | 3 |
|  |  |  |  |  |  |  |  |
| Total fish (± 95% CI) |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  | Length (cm) (SD) | |  |  |  |  |  |
| Age-0 Nerkids | 3.2 (0.3) | 4.3 (0.6) | 5.3 (0.5) | 5.9 (0.6) | 6.2 (0.6) | 6.8 (0.6) | 7.5 (0.6) |
| Age-1 smolts or Kokanee | 6.9 (NA) | 10.1 (0.6) | 12.2 (NA) | nd | nd | nd | nd |
| Age-2 Kokanee | 18.6 (NA) | 17.8 (1.3) | 18.4 (0.1) | 19.1 (NA) | 20.5 (NA) | nd | nd |
| Age-3 Kokanee | nd | nd | nd | nd | nd | nd | Nd |
|  |  |  |  |  |  |  |  |
|  | Weight (g) (SD) | |  |  |  |  |  |
| Age-0 Nerkids | 0.3 (0.1) | 0.8 (0.5) | 1.6 (0.5) | 2.0 (0.6) | 2.7 (0.8) | 3.4 (1.0) | 4.4 (1.1) |
| Age-1 smolts or Kokanee | 3.8 (NA) | 12.4 (2.5) | 23.5 (NA) | nd | nd | nd | nd |
| Age-2 Kokanee | 81.2 (NA) | 73.5 (16.4) | 81.6 (2.1) | 89.1 (NA) | 105.5 (NA) | nd | nd |
| Age-3 Kokanee | nd | nd | nd | nd | nd | nd | nd |
|  |  |  |  |  |  |  |  |

Table 11.1. Year 2015 (BY2014) Osoyoos Lake fish summary

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **17-Jun-15** | **15-Jul-15** | **15-Aug-15** | **8-Sep-15** | **8-Oct-15** | **15-Nov-15** | **3-Mar-16** |
|  |  |  |  |  |  |  |  |
|  | Density per ha | |  |  |  |  |  |
| Nerkids <15cm (most age-0 sockeye) | 12888 | 11149 | 7871 | 6641 | 5629 | 5920 | 6109 |
| Age-1 smolts or Kokanee | 4563 | 1810 | 1882 | 1923 | 1829 | 2202 | 996 |
| Nerkids between 15-33 cm | 131 | 295 | 331 | 320 | 449 | 322 | 87 |
| Other fish >33cm | 40 | 30 | 28 | 30 | 15 | 9 | 3 |
|  |  |  |  |  |  |  |  |
| Total fish (± 95% CI) | 17622 | 13284 | 10112 | 8914 | 7922 | 8453 | 7195 |
|  |  |  |  |  |  |  |  |
|  |  | |  |  |  |  |  |
|  | Length (cm) (SD) | |  |  |  |  |  |
| Age-0 Nerkids | 4.0 (0.4) | 4.9 (0.6) | 5.3 (0.7) | 5.5 (0.7) | 5.8 (0.7) | 6.5 (0.6) | 6.6 (0.6) |
| Age-1 smolts or Kokanee | 8.9 (0.4) | nd | nd | nd | nd | nd | nd |
| Age 2 Kokanee | nd | nd | nd | nd | nd | 16.0 (NA) | nd |
| Age 3 Kokanee | 17.3 (0.3) | nd | nd | nd | nd | nd | nd |
|  |  |  |  |  |  |  |  |
|  | Weight (g) (SD) | |  |  |  |  |  |
| Age-0 Nerkids | 0.7 (0.3) | 1.3 (0.5) | 1.7 (0.7) | 1.9 (0.8) | 2.1 (0.8) | 2.8 (0.8) | 2.7 (0.8) |
| Age-1 smolts or Kokanee | 8.1 (1.8) | nd | nd | nd | nd | nd | nd |
| Age 2 Kokanee | nd | nd | nd | nd | nd | 44.7 (NA) | nd |
| Age-3 Kokanee | 68.0 (4.9) | nd | nd | nd | nd | nd | nd |
|  |  |  |  |  |  |  |  |

Table 11.2. Year 2016 (BY2015) Osoyoos Lake fish summary

|  |  |  |  |
| --- | --- | --- | --- |
|  | **6-Jul-2016** | **30-Oct-2016** | **28-Mar-2017** |
|  |  |  |  |
|  | Density per ha | |  |
| Nerkids <15cm (most age-0 sockeye) | 2497 | 2322 | 1104 |
| Age-1 smolts or Kokanee | 490 | 359 | 66 |
| Nerkids between 15-33 cm | 129 | 151 | 31 |
| Other fish >33cm | 35 | 8 | 1 |
|  |  |  |  |
| Total fish (± 95% CI) | 3,152 | 2,840 | 1,202 |
|  |  |  |  |
|  | Length (cm) (SD) | |  |
| Age-0 Nerkids | 5.3 (0.6) | 7.8 (0.7) | 8.4 (0.7) |
| Age-1 smolts or Kokanee | 11.4 (0.9) | 12.6 (1.1) | 13.5 (1.0) |
| Age-2 Kokanee | 19.9 (1.2) | 16.0 (NA) | nd |
| Age-3 Kokanee | 21.4 (1.5) | 21.2 (NA) | nd |
|  |  |  |  |
|  | Weight (g) (SD) | |  |
| Age-0 Nerkids | 1.9 (0.6) | 5.1 (1.4) | 6.1 (1.6) |
| Age-1 smolts or Kokanee | 21.2 (5.3) | 23.3 (6.2) | 26.0 (6.8) |
| Age-2 Kokanee | 111.4 (19.8) | 47.1 (NA) | nd |
| Age-3 Kokanee | 140.0 (30.2) | 127.0 (NA) | nd |
|  |  |  |  |

Table 11.3. Year 2017 (BY2016) Osoyoos Lake Fish Summaries

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **26-Jun-17** | **24-Jul-17** | **12-Sep-17** | **16-Oct-17** | **16-Nov-17** | **15-Feb-18** |
|  |  |  |  |  |  |  |
|  | Density per ha | |  |  |  |  |
| Nerkids <15cm (most age-0 sockeye) | 5754 | 6412 | 4326 | 2913 | 3720 | 3859 |
| Age-1 smolts or Kokanee | 399 | 1839 | 1859 | 944 | 945 | 655 |
| Nerkids between 15-33 cm | 104 | 185 | 248 | 112 | 47 | 48 |
| Other fish >33cm | 15 | 34 | 30 | 9 | 2 | 2 |
|  |  |  |  |  |  |  |
| Total fish (± 95% CI) | 6273 | 8470 | 6463 | 3978 | 4714 | 4564 |
|  |  |  |  |  |  |  |
|  |  | |  |  |  |  |
|  | Length (cm) (SD) | |  |  |  |  |
| Age-0 Nerkids | 4.86 (0.45) | 5.77 (0.50) | 6.58 (0.57) | 7.07 (0.53) | 7.29 (0.51) | 7.57 (0.45) |
| Age-1 smolts or Kokanee | nd | nd | nd | nd | 14.5 (N/A) | nd |
| Age-2 Kokanee | nd | nd | nd | nd | nd | nd |
| Age-3 Kokanee | nd | 20.77 (0.83) | nd | nd | nd | nd |
| Age-4 Kokanee | nd | 26.00 (N/A) | nd | nd | nd | nd |
|  |  |  |  |  |  |  |
|  | Weight (g) (SD) | |  |  |  |  |
| Age-0 Nerkids | 1.14 (0.34) | 2.06 (0.60) | 3.01 (0.95) | 3.70 (0.86) | 3.88 (0.82) | 4.06 (0.73) |
| Age-1 smolts or Kokanee | nd | nd | nd | nd | 35.64 (N/A) | nd |
| Age-2 Kokanee | nd | nd | nd | nd | nd | nd |
| Age-3 Kokanee | nd | 126.61 (9.31) | nd | nd | nd | nd |
| Age-4 Kokanee | nd | 210.95 (N/A) | nd | nd | nd | nd |
|  |  |  |  |  |  |  |

Table 11.4. Year 2018 (BY2017) Osoyoos Lake Fish Summaries

|  |  |  |  |
| --- | --- | --- | --- |
|  | **27-Jul-18** | **9-Aug-18** | **5-Oct-18** |
|  |  |  |  |
|  | Density per ha | |  |
| Nerkids <15cm (most age-0 sockeye) | 1596 | 1478 | 1447 |
| Age-1 smolts or Kokanee | 290 | 315 | 145 |
| Nerkids between 15-33 cm | 68 | 71 | 61 |
| Other fish >33cm | 35 | 32 | 14 |
|  |  |  |  |
| Total fish (± 95% CI) | 1988 | 1896 | 1668 |
|  |  |  |  |
|  |  | |  |
|  | Length (cm) (SD) | |  |
| Age-0 Nerkids | 5.87 (0.68) | 6.56 (0.65) | 7.83 (0.66) |
| Age-1 smolts or Kokanee | 11.54 (0.67) | 12.30 (0.45) | 13.05 (1.49) |
| Age-2 Kokanee | nd | 14.15 (0.64) | 15.80 (0.63) |
| Age-3 Kokanee | nd | nd | Nd |
|  |  |  |  |
|  | Weight (g) (SD) | |  |
| Age-0 Nerkids | 2.19 (0.84) | 3.04 (0.91) | 5.28 (1.38) |
| Age-1 smolts or Kokanee | 19.63 (4.26) | 22.94 (2.73) | 27.43 (8.49) |
| Age-2 Kokanee | nd | 34.20 (2.23) | 50.42 (5.29) |
| Age-3 Kokanee | nd | nd | nd |
|  |  |  |  |

Table 11.5. Year 2019 (BY2018) Osoyoos Lake Fish Summaries

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **1-Aug-19** | **1-Nov-19** | **22-Nov-19** | **27-Feb-20** |
|  |  |  |  |  |
|  | Density per ha | |  |  |
| Nerkids <15cm (most age-0 sockeye) | 7529 | 2455 | 3178 | 2077 |
| Age-1 smolts or Kokanee | 48 | 43 | 111 | 29 |
| Nerkids between 15-33 cm | 79 | 17 | 31 | 17 |
| Other fish >33cm | 12 | 1 | 2 | 0 |
|  |  |  |  |  |
| Total fish (± 95% CI) | 7668 | 2516 | 3322 | 2123 |
|  |  |  |  |  |
|  |  | |  |  |
|  | Length (cm) (SD) | |  |  |
| Age-0 Nerkids | nd | 6.63(1.00) | 6.39 (0.62) | nd |
| Age-1 smolts or Kokanee | 13.50 (n/a) | 14.78 (1.76) | nd | nd |
| Age-2 Kokanee | nd | 19.38 (2.07) | 20.80 (n/a) | nd |
| Age-3 Kokanee | nd | nd | nd | nd |
|  |  |  |  |  |
|  | Weight (g) (SD) | |  |  |
| Age-0 Nerkids | 1.52 (0.48) | 3.24 (1.55) | 2.63 (0.81) | nd |
| Age-1 smolts or Kokanee | 32.29 (n/a) | 37.92 (12.70) | nd | nd |
| Age 2 Kokanee | nd | 87.18 (26.45) | 109.81 (n/a) | nd |
| Age-3 Kokanee | nd | nd | nd | nd |
|  |  |  |  |  |

Table 11.6. Year 2020 (BY2019) Osoyoos Lake Fish Summaries

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **12-Aug-20** | **21-Oct-20** | **19-Nov-20** | **15-Mar-21** |
|  |  |  |  |  |
|  | Density per ha | |  |  |
| Nerkids <15cm (most age-0 sockeye) | 2259 | 1578 | 1343 | 1202 |
| Age-1 smolts or Kokanee | 358 | 247 | 134 | 0 |
| Nerkids between 15-33 cm | 142 | 90 | 42 | 68 |
| Other fish >33cm | 30 | 4 | 1 | 0 |
|  |  |  |  |  |
| Total fish (± 95% CI) | 2788 | 1918 | 1519 | 1270 |
|  |  |  |  |  |
|  |  | |  |  |
|  | Length (cm) (SD) | |  |  |
| Age-0 Nerkids | 6.10 (0.54) | 7.07 (0.69) | 7.14 (0.74) | 7.97 (0.67) |
| Age-1 smolts or Kokanee | 12.19 (1.02) | 13.50 (0.92) | 12.75 (1.50) | nd |
| Age-2 Kokanee | nd | nd | nd | 13.8 (1.26) |
| Age-3 Kokanee | nd | nd | nd | nd |
|  |  |  |  |  |
|  | Weight (g) (SD) | |  |  |
| Age-0 Nerkids | 2.41 (0.67) | 4.91 (1.51) | 3.77 (1.25) | 5.07 (1.24) |
| Age-1 smolts or Kokanee | 23.41 (6.57) | 36.71 (9.43) | 23.06 (8.81) | nd |
| Age-2 Kokanee | nd | nd | nd | 27.6 (7.84) |
| Age-3 Kokanee | nd | nd | nd | nd |
|  |  |  |  |  |

Table 11.7. Year 2021 (BY2020) Osoyoos Lake Fish Summaries

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
|  |  |  |  |  |
|  | Density per ha | |  |  |
| Nerkids <15cm (most age-0 sockeye) |  |  |  |  |
| Age-1 smolts or Kokanee |  |  |  |  |
| Nerkids between 15-33 cm |  |  |  |  |
| Other fish >33cm |  |  |  |  |
|  |  |  |  |  |
| Total fish (± 95% CI) |  |  |  |  |
|  |  |  |  |  |
|  |  | |  |  |
|  | Length (cm) (SD) | |  |  |
| Age-0 Nerkids |  |  |  |  |
| Age-1 smolts or Kokanee |  |  |  |  |
| Age-2 Kokanee |  |  |  |  |
| Age-3 Kokanee |  |  |  |  |
|  |  |  |  |  |
|  | Weight (g) (SD) | |  |  |
| Age-0 Nerkids |  |  |  |  |
| Age-1 smolts or Kokanee |  |  |  |  |
| Age-2 Kokanee |  |  |  |  |
| Age-3 Kokanee |  |  |  |  |
|  |  |  |  |  |

## OSOYOOS LAKE FISH STOMACHS

Table 12.Year 2014-2021 Osoyoos Lake fish stomach summary as average numbers of each prey type found in stomachs collected through the summer-fall from age-0 wild sockeye, age-0 hatchery sockeye stocked in 2010, 2012, 2013, age-1 smolts or kokanee, age-2 smolts of kokanee.

Table .0. 2014 Osoyoos Lake fish diets (average number prey per fish)

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sampling Date** | **Fish Group** | **Number stomachs processed** | *D. thomasi* copepodids & adults | *L. ashlandi* copepodids & adults | *E. nevadensis* copepodid & adults | *Bosmina* | *Daphnia* | *Leptodora* | *Polyphemus* | *Diaphanosoma* | *Mysis* | Chironomid Larva |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| 25-May-06 | Age 0+ sockeye |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids > 15 cm |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| 26-Jul-06 | Age 0+ sockeye |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids > 15 cm |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| 04-Oct-06 | Age 0+ sockeye |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids > 15 cm |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| 06-Dec-06 | Age 0+ sockeye |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids > 15 cm |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |

Table 12.1. 2015 Osoyoos Lake fish diets (average number prey per fish)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Sampling Date** | **Fish Group** | **Number stomachs processed** | *D. thomasi* copepodids & adults | *L. ashlandi* copepodids & adults | *E. nevadensis* copepodid & adults | *Bosmina* | *Daphnia* | *Leptodora* | *Polyphemus* | *Diaphanosoma* | *Mysis* | Chironomid Larva | *Sida* | Mayfly | Adult Fly | fly larva |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 0+ sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids > 15 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 0+ sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids > 15 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 0+ sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids > 15 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 0+ sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids > 15 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 0+ sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids > 15 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 0+ sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids > 15 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Table 12.2. 2016 Osoyoos Lake fish diets (average number prey per fish)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sampling Date** | **Fish Group** | **Number stomachs processed** | *D. thomasi* copepodids & adults | *L. ashlandi* copepodids & adults | *E. nevadensis* copepodid & adults | *Bosmina* | *Daphnia* | *Leptodora* | *Polyphemus* | *Diaphanosoma* | *Mysis* | Chironomid Larva | *Sida* | Mayfly | Adult Fly | fly larva |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 0+ sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids > 15 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 0+ sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids > 15 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 0+ sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids > 15 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 0+ sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids > 15 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 0+ sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids > 15 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 0+ sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids > 15 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Table 12.3. 2017 Osoyoos Lake fish diets (average number prey per fish)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sampling Date** | **Fish Group** | **Number stomachs processed** | *D. thomasi* copepodids & adults | *L. ashlandi* copepodids & adults | *E. nevadensis* copepodid & adults | *Bosmina* | *Daphnia* | *Leptodora* | *Polyphemus* | *Diaphanosoma* | *Mysis* | Chironomid Larva | *Sida* | Mayfly | Adult Fly | fly larva |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 0+ sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids > 15 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 0+ sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids > 15 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 0+ sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids > 15 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 0+ sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids > 15 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 0+ sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids > 15 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 0+ sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids > 15 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Table 12.4. 2018 Osoyoos Lake fish diets (average number prey per fish)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sampling Date** | **Fish Group** | **Number stomachs processed** | *D. thomasi* copepodids & adults | *L. ashlandi* copepodids & adults | *E. nevadensis* copepodid & adults | *Bosmina* | *Daphnia* | *Leptodora* | *Polyphemus* | *Diaphanosoma* | *Mysis* | Chironomid Larva | *Sida* | Mayfly | Adult Fly | fly larva | fly pupa |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 0+ sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids 4-9 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids > 15 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 0+ sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids 4-9 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids > 15 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 0+ sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids 4-9 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids > 15 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 0+ sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids 4-9 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids > 15 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Table 12.5. 2019 Osoyoos Lake fish diets (average number prey per fish)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sampling Date** | **Fish Group** | **Number stomachs processed** | *D. thomasi* copepodids & adults | *L. ashlandi* copepodids & adults | *E. nevadensis* copepodid & adults | *Bosmina* | *Daphnia* | *Leptodora* | *Polyphemus* | *Diaphanosoma* | *Mysis* | Chironomid Larva | *Sida* | Mayfly | Adult Fly | fly larva | fly pupa |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 0+ sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids 4-9 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids > 15 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 0+ sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids 4-9 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids > 15 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 0+ sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids 4-9 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids > 15 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 0+ sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids 4-9 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids > 15 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Table 12.6. 2020 Osoyoos Lake fish diets (average number prey per fish)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sampling Date** | **Fish Group** | **Number stomachs processed** | *D. thomasi* copepodids & adults | *L. ashlandi* copepodids & adults | *E. nevadensis* copepodid & adults | *Bosmina* | *Daphnia* | *Leptodora* | *Polyphemus* | *Diaphanosoma* | *Mysis* | Chironomid Larva | *Sida* | Mayfly | Adult Fly | fly larva | fly pupa |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 0+ sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids 4-9 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 0+ sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids 4-9 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 0+ sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids 4-9 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 0+ sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nerkids 4-9 cm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Table 12.7. 2021 Osoyoos Lake fish diets (average number prey per fish)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sampling Date** | **Fish Group** | **Number stomachs processed** | *D. thomasi* copepodids & adults | *L. ashlandi* copepodids & adults | *E. nevadensis* copepodid & adults | *Bosmina* | *Daphnia* | *Leptodora* | *Polyphemus* | *Diaphanosoma* | *Mysis* | Chironomid Larva | *Sida* | Mayfly | Adult Fly | fly larva | fly pupa | larval fish |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Wild age-0 sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Hatchery age-0 sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 1 nerkids |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 2 nerkids |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Wild age-0 sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Hatchery age-0 sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 1 nerkids |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 2 nerkids |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Wild age-0 sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Hatchery age-0 sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 1 nerkids |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 2 nerkids |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Wild age-0 sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Hatchery age-0 sockeye |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 1 nerkids |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Age 2 nerkids |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  | | | | | | | | | |

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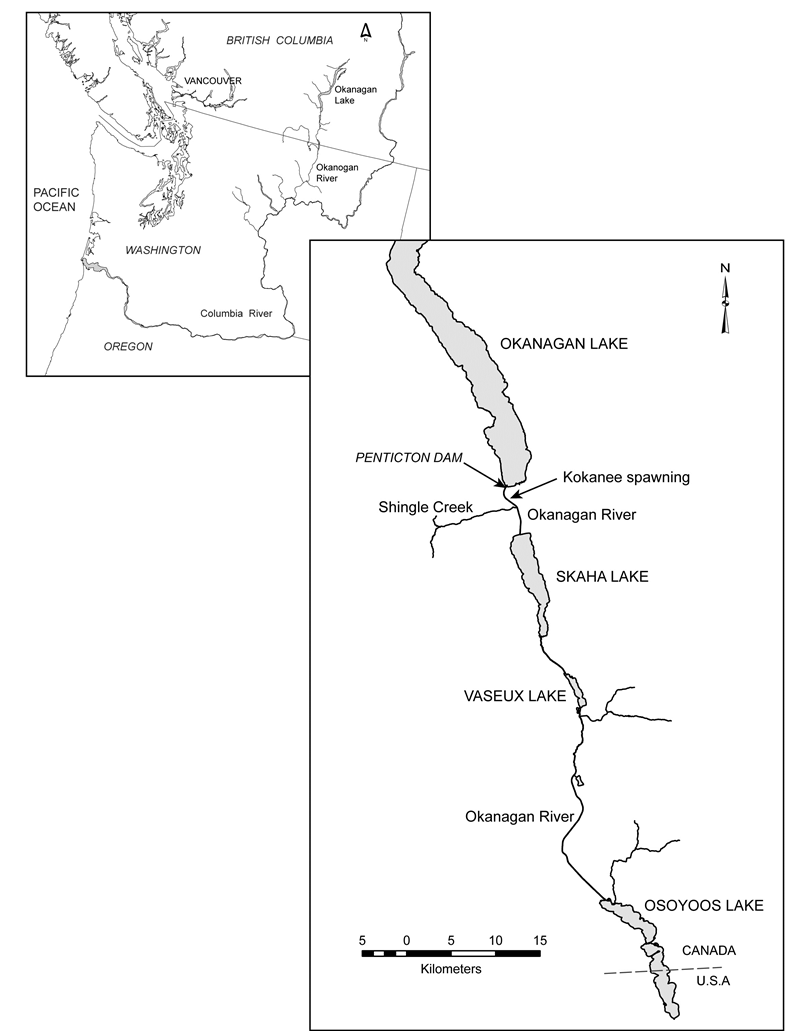


Figure . Location of the Okanagan River, Skaha and Osoyoos Lakes.

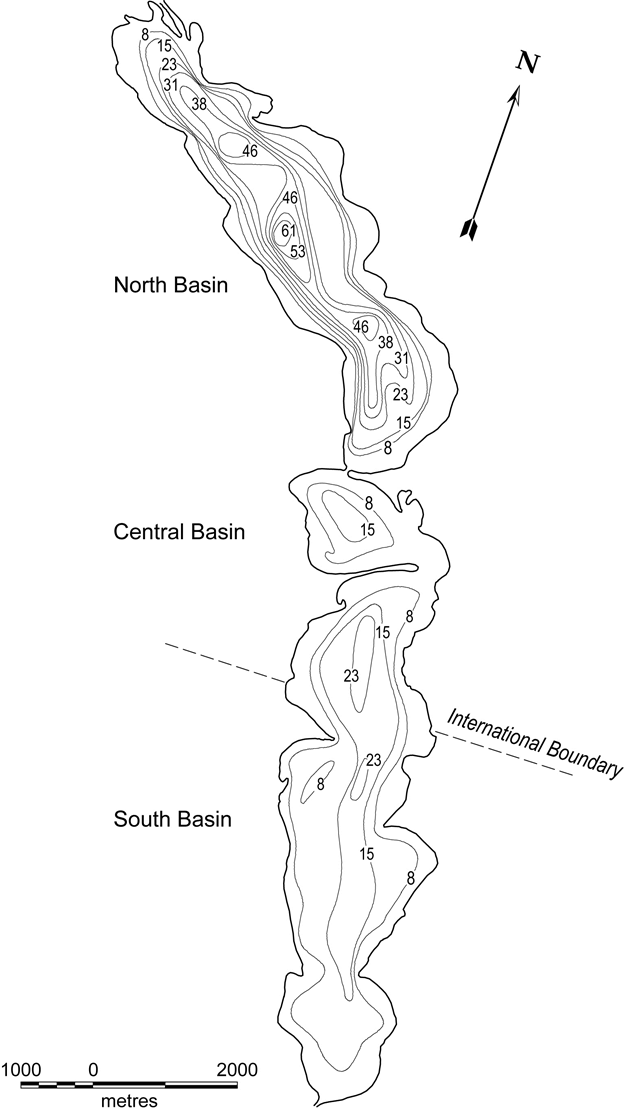


Figure . Osoyoos Lake bathymetric contours. Depth is in metres. Adapted from map by Province of B. C.,Fisheries Branch, Inventory Operations, October 1971. Vector file from <http://www.bcfisheries.gov.bc.ca/fishinv/basemaps-maps.html> (downloaded 9-Jan-06)

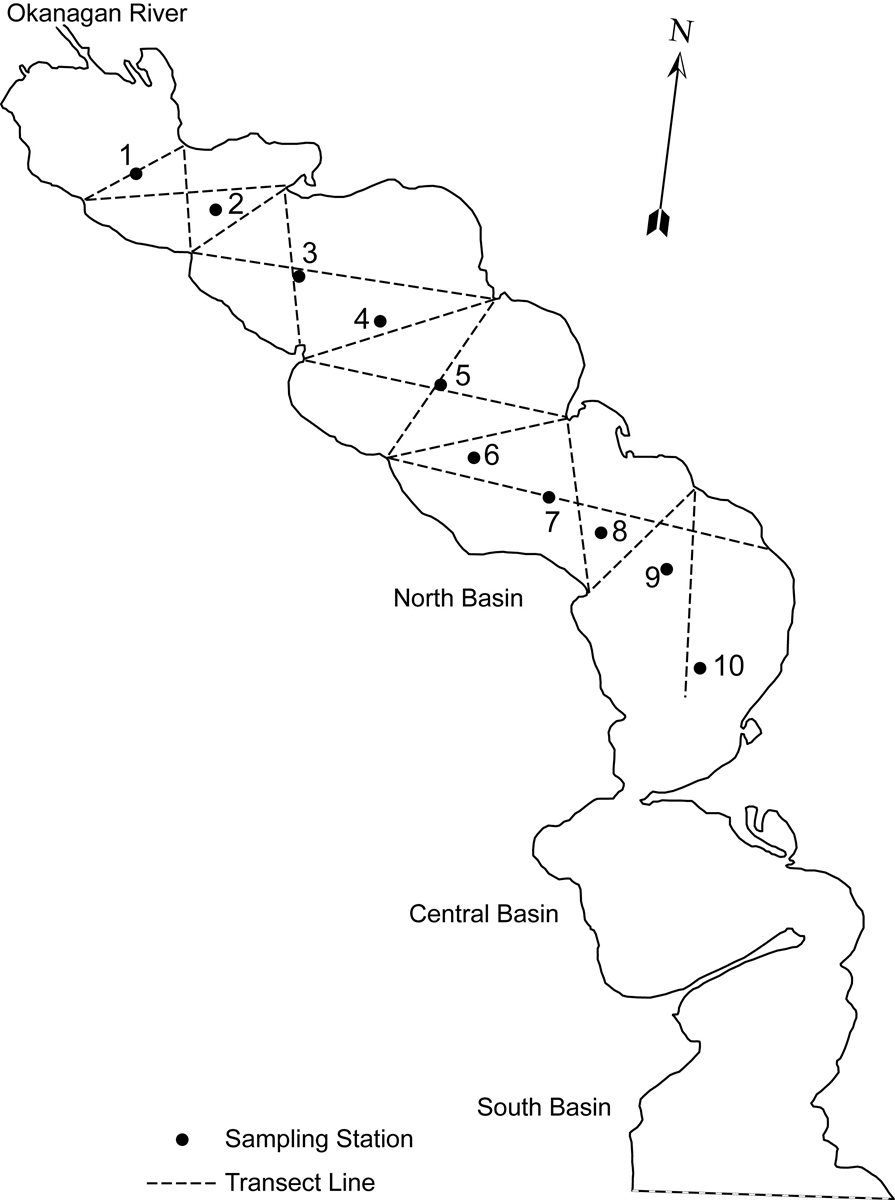


Figure . Osoyoos Lake North Basin, showing hydro-acoustics survey transects and water chemistry sampling stations