Fatty Acids Profiles of Yellow Perch (*Perca flavescens*) in Lakes of the Outaouais Region With and Without Largemouth Bass (*Micropterus salmoides)* and Smallmouth Bass (*Micropterus dolomieu*)

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Abstract

Fatty acids (FAs) are used as trophic markers in aquatic food web studies, but few studies have quantified individual variability in FAs profiles over several sites in a range of conditions. I investigated whether FAs profiles of yellow perch (YP), *Perca flavescens*, vary with body size and between lakes with and without largemouth (*Micropterus salmoides)*, and smallmouth bass (*Micropterus dolomieu*), the most common and abundant piscivores in lakes of the region. I analyzed the FAs of YP as well as zooplankton, benthic invertebrates, and prey fish collected from eight lakes where bass were either present or absent in the Outaouais region over the summer of 2016. I compared the growth rate of YP between the lakes and the YP in lakes without bass exhibited a slower growth rate. I also compared the FA signatures of YP using redundancy analysis (RDA). 23 FAs could be identified and quantified. FAs profiles were dominated by palmitic- (16:0), oleic- (18:1), stearic- (18:0), and palmitoleic acid (16:1). The RDA analysis based on FAs profiles of YP revealed variation along two main gradients (the presence of bass and the date of capture). The first two eigenvectors accounted for 42.1% of the variation (RDA1=27.6% and 2=14.6%). Arachidonic (20:4) and docosatrienoic (22:3) were the most correlated FAs with RDA1. Due to the sampling period, it was impossible to determine if the observed effects were due to the date of capture, the presence of bass, or a change in metabolism, but the last two were deemed as the most plausible explanations. It was concluded that the utility of FA signatures to quantify diet in natural environments is limited and that FAs might be more successful as markers in primary consumers and other lower trophic levels. It is recommended that a combination of FAs, stable isotopes, and modelling should be used in the future.

Résumé

Les acides gras (AG) sont utilisés en tant que marqueurs trophiques dans les études de chaînes alimentaires aquatiques, mais peu d'études ont traité de la variabilité individuelle des profils d’AG à plusieurs sites selon différentes conditions. J’ai examiné si les profils d’AG de la perchaude, *Perca flavescens*, varient avec la taille et entre les lacs avec et sans achigan à grande bouche (*Micropterus salmoides*) et achigan à petite bouche (*Micropterus dolomieu*), les piscivores les plus communs et abondants dans les lacs de la région. J’ai analysé les AG de perchaudes et de zooplancton, invertébrés benthiques et poissons-proies prélevés dans huit lacs où les achigans étaient présents ou non dans la région de l'Outaouais au cours de l'été 2016. J’ai comparé le taux de croissance des perchaudes entre les lacs et celles provenant des lacs sans achigan présentaient un taux de croissance plus lent. J’ai également comparé les compositions d’AG des perchaudes en utilisant l'analyse de redondance (r*edundancy analysis* - RDA). Vingt-trois AG ont été identifiés et quantifiés. Les AG les plus abondants dans les profils d’AG étaient les acides palmitique (16:0), oléique (18:1), stéarique (18:0) et palmitoléique (16:1). L'analyse RDA des profils d’AG des perchaudes a montré une distribution des échantillons le long de deux gradients principaux (la présence d‘achigan et la date de capture). Les deux premiers vecteurs propres représentaient 42.1% de la variation (RDA1=27.6%, et 2=14.6%). Les acides arachidonique (20:4) et docosatriénoique (22:3) étaient les plus corrélés avec RDA1. En raison des périodes d’échantillonnage, il a été impossible de déterminer si les effets observés étaient dus à la date de capture, à la présence d‘achigan ou à un changement de métabolisme, mais les deux derniers items sont considérés comme les explications les plus plausibles. Il est conclu que l'utilité des signatures d’AG pour quantifier les diètes dans les milieux naturels est limitée et que les AG gras pourraient être plus informatifs comme marqueurs chez les consommateurs primaires et les niveaux trophiques inférieurs. À l'avenir, il est recommandé que les AG soient utilisés en combinaison avec les isotopes stables ainsi que la modélisation.

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1. INTRODUCTION

Understanding foraging patterns is essential for fishery management (Iverson, 2009). However, such information is generally not easily or reliably obtained mostly because of the difficulty of direct observations of species interactions and accurate characterization of diet (Iverson, 2009). Quantification of diet by gut contents analysis is criticized because it reflects only the last meals and is labour intensive (Iverson, 2009; Jo, et al., 2013; Stowasser, et al., 2009; Tucker, et al., 2008). Stable isotope ratios (δ15N/δ14N and δ13C/δ12C) are another method used to determine the relative contribution of food items (Veefkind, 1997). However, like gut content analysis, some problems arise with interpreting these ratios (e.g. differences in assimilation of dietary components may result in inaccurate estimates of the contribution from different food sources and the ratios of the sample obtained may not be representative of the whole animal) (Veefkind, 1997). Therefore, approaches that integrate diet over longer periods and provide better estimate of the diet are desirable.

Trophic markers, such as fatty acids (FAs) signatures (the entire array of FAs in an individual) (Iverson, 2009), are touted to provide such an integration of diet over time. The use of FA signatures as markers was originally developed for marine mammals (Iverson, 2009) and it is based on an idea originally proposed by Lovern (1935) that FAs are conservatively transferred from prey to predator and therefore allow diet inference. FAs are incorporated after consumption and, those of carbon chain length greater than 14, remain largely intact and are transferred from primary producers to higher trophic levels (Alfaro, et al., 2006; Iverson, 2009; Stowasser, et al., 2012; Cappelli, 2012).

In freshwater systems, FA signatures have been utilized for detecting diet shifts and describing diet differences among species and their utility is deemed promising (Stowasser, et al., 2009; Czesny, et al., 2011; Jo, et al., 2013; Hodgson, et al., 1997; Alfaro, et al., 2006). Indeed, numerous studies have demonstrated that FA signatures can be transferred from prey to predator (Budge, et al., 2002). Kirsch et al. (1998) found that only three weeks were required for Atlantic cod (*Gadus morhua*) to completely reflect their dietary FAs. More recently, FA signatures were described for nine species of fish and several species of invertebrates and zooplankton collected in Lake Michigan (Czesny, et al., 2011). These authors found distinct FA signatures for the young and adult yellow perch having different diets. Happel et al. (2015) observed dissimilarities between FA signatures of YP from the two sides of Lake Michigan's main basin and concluded that, in general, YP relied more on Bosminidae and Cercopagidae along the eastern shoreline and more on Chironomidae on the western shoreline.

Although FAs have been used successfully to infer diet, their use requires careful calibration. An ideal trophic marker is a compound whose origin can be easily identified, that is not selectively processed during food assimilation and is predictably transferred from one trophic level to the next (Dalsgaard, et al., 2003). However, these prerequisites are rarely met and FAs are no exceptions due to mainly two processes: FAs synthesis, and metabolism.

One of the prerequisites for the use of FAs as markers is that the FAs are consumed and retained by predators so that the source of certain FAs can be identified easily.

However, in most animals, two categories of polyunsaturated FAs (PUFA) are essential, but the other FAs can be synthesized *de novo* (Ahlgren, et al., 2009; Iverson, 2009). Basically, the most important PUFA in vertebrates are eicosapentaenoic acid (EPA or 20:5), docosahexaenoic acid (DHA or 22:6), arachidonic acid (ARA or 20:0), and their precursors linoleic acid (LIN or 18:2) and linolenic acid (ALA or 18:3) (Halver, 1980). They are called *essential* since they cannot be synthesized *de novo* by most animals in higher trophic levels because they lack the oleate Δ12 and 15-desaturase (Halver, 1980). This means that most animals are not able to initiate the pathway involving sequential addition of double bonds to 18:0 (and 16:0), via the Δ9 and Δ12 desaturases (Monroig, et al., 2013). Therefore, these FAs must be included in the diet (Ahlgren, et al., 2009; Napier, 2002). Once either the precursors (LIN or ALA) or the other essential FAs (EPA, DHA or ARA) are incorporated they can be desaturated and elongated to serve as substrates for the n-6 and n-3 pathways to form the long-chain FAs (Napier, 2002) (Figure 1). For that reason, the FAs signature will be a combination of synthesized FAs and of those that need to be incorporated via the diet rendering the identification of the origin of FAs difficult, especially when transformation of an assimilated FA varies with the source dietary item (Happel, et al., 2015).

Additionally, the identification of the actual diet composition is obscured by metabolic processes (Happel, et al., 2015). FAs constitution is mainly determined by the turnover rate i.e., the coupled processes of anabolism and catabolism (Iverson, et al., 2004). A fish possessing an excess of energy may accumulate lipids either directly, in which case the FAs composition will be similar to the diet, or after modifying the FAs to fulfill particular physiological needs (Dalsgaard, et al., 2003). For example, 16:0, 18:1, 20:1, and 22:1 are predominantly metabolized for metabolic energy for growth and locomotion (β-oxidation of FA which provides ATP) (Tocher, 2003). Furthermore, FAs are the major source of metabolic energy for reproduction. Indeed, to transfer the necessary FAs to the eggs, there is a selective catabolism of 20:5 relative to 22:6 during gonadogenesis (Tocher, 2003). Additionally, ω-6 PUFAs and ω-3 PUFAs are used in the biosynthesis of pro-inflammatory eicosanoids and anti-inflammatory respectively (controlling e.g., immune responses, ovulation, embryonic development, hatching and early larval performance) (Larsson, et al., 2004; Cappelli, 2012). Moreover, the utilization of lipids and FAs during the development varies considerably between species (Cappelli, 2012). Recent laboratory experiments where predators were fed on a single diet, authors could not completely match predators' FA signatures to prey (Taipale, et al., 2015; Budge, et al., 2002; Cappelli, 2012; Happel, et al., 2015). Consequently, the consumer metabolism will almost certainly prevent exact matching of FA signatures and the identification of diet (Iverson, et al., 2004).

Because of FA synthesis and metabolism, fish diet identification and quantification from FA signatures of wild fish is unlikely challenging. Moreover, in natural conditions, activity levels, body condition, and diet variability among individuals are likely to add uncertainty to average FAs profiles. Few studies have quantified individual variability in FAs profiles over several sites in a range of conditions. Therefore, the goal of my study was to investigate the individual variation in FA signatures of naturally occurring fish likely having different diets. The yellow perch (YP), *Perca flavescens*, was studied because it is a common species of commercial interest known to have a varied diet.

YP is a member of the *Percidae* family whose distribution extends over much of northern North America (Brown, et al., 2009). For YP populations to be abundant and grow at a maximum rate, the fish need to feed on increasingly larger food items (because the energetic cost of capture of small preys by large fish exceeds the energy yield of the preys (Quinn, 2005)). Thus, juvenile YP (<55 mm) feed mostly on cladocerans, ostracods, and chironomid larvae and, as they grow bigger, switch to larger prey items such as amphipods until they reach their adult diet (>150 mm) which consist mainly of juvenile fish as well as invertebrates, fish eggs, and crayfish (Brown, et al., 2009; Graeb, et al., 2006; Parker, et al., 2009).

However, growth and abundance may be limited by intra- and/or interspecific interactions as well as the availability of food resources (Brown, et al., 2009). YP diet can be influenced by the presence of bass. Bergman (1990) suggested that the introduction of predatory fishes induced a habitat and diet shift in the European perch (*Perca fluviatilis*) which resulted in their elimination from open-water. It was also suggested that food competition due to the introduction of white perch (*Morone americana*) was partly responsible for the substantial decline in YP populations in Lake Erie (Guzzo, et al., 2013; Savino & Kolar, 1996). Czesny et al. (2011) proposed predation by non-native species as one of the causal factors for the poor recruitment of native YP Lake Michigan. The presence of piscivores can also affect YP's growth by reducing prey density and by inducing predator-avoidance behaviours (Brown, et al., 2009; Olson, et al., 2001). Olsen et al. (2001) showed that YP demonstrated a rapid behavioural response to the presence of walleye (mean growth rate was related to walleye density).

Therefore, YP was a good model since the presence of piscivores is known to alter its diet and physiological parameters like growth. Therefore, differences in growth and diet should be reflected in the FA signatures of YP. Indeed, Iverson (2002) showed that body length and age were useful to observe variation in FAs in Pacific Herring from similar regions.

Here, I assessed the variability in FAs signature of YP in two types of environments (differing by the presence of bass - largemouth (*Micropterus salmoides*) and smallmouth bass (*Micropterus dolomieu*)). Knowing that YP's diet changes as they grow and that the presence of bass can affect its diet and growth, I expected that different FA signatures would be observed as a function of YP's age and length as well as a function of the presence (or absence) of bass.

2. METHODS

2.1 Sampling Area and Morphometric Factors

Lakes in this study were selected based on records of YP presence, records of presence or absence of bass and other piscivores besides perch, and road accessibility. Historical fish community and morphometric data for lakes in Gatineau Park were obtained from previously published studies (Aiken, 2009; Chapleau, et al., 1997; Rother, 1983; Brunet, 1982; Jessiman, 1986). For the lakes outside Gatineau Park, historical fish community data were obtained from multiple biological studies by the Ministry of Forests, Wildlife and Parks (personal communication, Julie Deschênes, 2015). Lakes with piscivores were selected only if one or more individuals of largemouth bass or smallmouth bass were captured in this study or had been captured in the past. Bass and piscivores were considered absent if no individuals of largemouth bass, smallmouth bass, northern pike (*Esox lucius*), or walleye (*Sander vitreus*) were captured in this study or had been captured in the past. Eight lakes were visited between April 30th and August 7th, 2015 (Table 1).

Table 1 - Morphometric measurements of the eight sampled lakes. Most data were obtained from a published study (Chapleau, et al., 1997). The original data were from internal reports of the National Capital Commission and 1:50 000 topographic maps of the park. For the remaining lakes, area and perimeter were measured using Google Maps geodesic-distance-measuring tool (both gave similar results). Surface temperature, surface pH, and surface conductivity were measured with a Hanna Instrument combo pH and EC

tester S66101 calibrated before field work. Additional parameters are available in supplementary material (Appendix 4).

Lake	Coordinates	Area (ha)	Altitude (m)	Perimeter (m)	pH	Elect. Cond. (uS)
			No piscivores			
Périard	45.76°N,-75.53°W	5	191	769	7.8	52
Sam	45.90°N,-75.80°W	186	251	10251	8.4	59
Claude	46.14°N, -76.27°W	15	215	1410	7.2	12
Telfer	46.07°N,-76.36°W	343	261	34338	7.9	38
			Piscivores			
À la Loutre	45.66°N, -76.2°W	15	198	2005	8.5	166
Meech	45.54°N, -75.90°W	304	170.5	17900	8.5	88
Phillipe	45.59°N, -76.02°W	176	171.9	9650	8.6	75
Renaud	45.60°N, -76.02°W	10	203	2057	7.8	77

2.2 Fish Sampling

Fish were collected using four experimental gill nets (two with measurements of 40 X 1.8m with 13, 19, 25, 31, and 38 mm mesh sizes; one with measurements of 25 X 1.8m with 13, 19, 25, 32, and 38 mm mesh sizes; and one with measurements of 7.6X 1.8m with 13, and 19 mm mesh sizes); a 10m beach seine; nine baited (with bread) minnow traps (44.5cm long, 23 cm in diameter with a 1.1cm opening); and by angling using earthworms. One of the experimental gill net (40 X 1.8m) was not used in small lakes. Because YP prefers shallow waters among weeds, floating docks, and other structures (Brown, Runciman, et al., 2009), sampling devices were placed in locations fitting these criteria. If a lake did not contain visible habitats favoured by YP, sampling sites were chosen to include as many different habitats as possible.

All nets were set for 2 to 27 hours depending on the capture rate. Minnow traps were set for 2 to 48 hours depending on the capture rate. Sampling devices were checked repeatedly during the day. This was done to limit the quantity of fish captured and minimize stress for the fish caught. If the number of fish captured was low, the nets and traps were moved after seven to eight hours and reset at other locations within the lake. Seine hauls (depth: 0 to 1 m) were done where the bottom permitted on the largest area possible (ranging from approximately 5 to $50m^2$).

Captured fish were identified, counted, occasionally photographed, and returned to the lake except for retained specimens (a summary of species captured is available in Appendix 1). These included YP and potential preys including minnows, sunfish, and other species specific to each lake. When identification was uncertain, representative specimens were also preserved. If a high number of species of interest were captured (more than 25), the excess fish were returned to the lake. In that case, the healthier-looking individuals (alive and vigorous) were kept to ensure the quality of tissues for later analysis. Special attention was given to keeping a diversity of size rather than multiple YP of the same length. In the opposite case where a low number of species of interest were captured, all specimens were kept.

Specimens destined to FA analysis were kept alive in 10 litres aerated bucket filled with lake water. If too crowded, the fish were kept in a 60-litre tote instead. At the end of the day, fish were immersed in a eugenol solution (1:10:1000mL clove oil: ethanol: lake water) until loss of equilibrium and stopping of gill ventilation (these symptoms normally appeared after 5 seconds). Fish were rinsed three times with lake water after death to remove clove oil/ethanol residue and were then put in plastic freezer bags and put on ice in an insulated cooler for transport. They were then transferred to a -20^{o}C freezer where they were kept for future analyses.

All procedures were approved by the Animal Care Committee of the University of Ottawa and adhered to the guidelines established by the Canadian Council on Animal Care for the use of animals in research and the code of ethics of the World Medical Association (Declaration of Helsinki) for animal experiments (protocol number: BL-2294).

2.3 Invertebrates and Zooplankton Sampling

Littoral benthic macroinvertebrates were collected with a circular-shaped dipnet (0.5 mm mesh size) and in shallow sandy and/or weedy habitats (0–1 m depth) and hand-picked to remove detritus. All found individuals were kept. Specimens were put in a plastic container with water to avoid dehydration of tissues and put on ice in a cooler for transport. They were then transferred to a -20^{o}C freezer where they were kept until further analyses. Invertebrates were later sorted and identified to the lowest possible taxonomic unit (i.e. family or order level).

Zooplankton was sampled by vertical hauls (average of three hauls) from the bottom of the lake (if possible) up to the surface with a plankton net (50 µm). Samples were put in a plastic container and put on ice in a cooler for transport. They were then transferred to a -20^{o}C freezer until analyses were done.

2.4 Fish Mass, Length, and Aging

Immediately after the capture of YP, total length was measured (from the tip of the tail in a “natural” position to the tip of the nose). Other measurements (see below) were taken once the fish were frozen. To do so, the fish were taken out of the freezer and put in warm water to thaw them just enough to facilitate manipulations and to remove ice from skin. They were left to dry in open air for approximately ten minutes to remove surface water.

For length measurements, fish were positioned as straight as possible. Few fish were remeasured for total length to ensure that lengths taken in the field were accurate. Standard length was also measured (length from the tip of the upper jaw to the posterior end of the hypural bones at the level of a crease on the caudal peduncle created by folding the caudal fin).

For mass measurements, two scales were used. Fish under 160 grams were weighed to the nearest 0.0001g on a Mettler AE 163 scale with a range of 0-160 grams. Fish bigger than 160 grams were weighed to the nearest gram on an Acculab Vicon VIC-6KG scale with a range of 0-6100g.

Fulton-type condition factors (K) were calculated for each YP. This morphometric index assumes that, within the same species, heavier fish of the same length are in better nutritional condition. The formula used was:

$$(1)\ K = \frac{W}{L^3}X$$

Where W=mass; L=standard length; and X is an arbitrary scaling varying constant (in this case X=100,000 since the mass was in grams and the length was in millimetres)

Fish age was determined by counting annuli (year marks) on the opercle. The opercles were removed from the fish by slipping the tip of a scalpel under the posterior edge of the bone between the opercular and the sub-opercular regions. The connective tissue was cut until the blade reached the ventral end of the opercle and then the scalpel was twisted to lift up the opercle. The bone was then cut away from its point of attachment to the skull. The opercle were soaked in boiling water and cleaned with a cloth. They were left to dry in open air for a couple of days or until the annuli were clearly visible.

Opercles were examined using an Olympus dissecting microscope under different lightings. Broad, opaque zones correspond to the rapid growth of the summer. Each of these gradually fades into a narrow transparent winter zone, which ends relatively abruptly at the start of next summer. This sharp line marking the end of the winter band was always taken as the end of the year's growth. In well-dried opercles the rings show up most clearly when viewed with reflected light against a dark background. With young and fast-growing fish, age was easily determined. In a few older fish, several different age determinations could be made but, with experience, it was possible to assign an age to all the specimens. A random subsample of opercles was aged independently by a second reader. Any difference in determination were discussed and settled and all opercles were aged in a constant manner using the same logic.

2.5 Yellow Perch Sex Identification

The morphological criteria used to externally determine gender in YP were (1) shape of the urogenital papilla (UGP), (2) colouration of the UGP, and (3) size of the UGP relative to the anus (AN). Of noticeable contrast between each sex is the rounded UGP in males, the V- or U-shaped UGP in females, darker reddish colouration of the UGP in males versus females, and the UGP generally wider than the AN in males and generally narrower than the AN in females (Figure 2) (Shepherd, et al., 2013; Malison, et al., 2011). Note that YP smaller than 110 mm were identified as *juvenile* since the accuracy of this method falls below 90% for YP of that size (Shepherd, et al., 2013; Malison, et al., 2011). For physical characteristics of YP captured in this study, see Appendix 2.

2.6 Fatty Acid Extraction

The FA analysis is based on the protocol of Maillet and Weber (2006). All fish were manually filleted and total lipids were extracted from ~150 mg of dorsal muscle (approximately 10X more tissue was used than recommended in the original protocol since wild YP are leaner than laboratory-fed fish and ~25 mg was not enough to obtain reliable analysis). In the case of small invertebrates and fish where at least 100 mg could not be obtained due to the small size of specimens, individuals of the same species and size (fish) or taxonomic group (invertebrates), collected on the same date and site, were combined to acquire the minimum material necessary for analysis. In the case of zooplankton samples, the entire water sample was decanted to remove debris and filamentous algae and then filtered to remove as much water as possible. Zooplankton was then transferred from the filter into tubes and the filter was rinsed with chloroform:methanol (2:1, v/v) to minimize sample loss. Samples were homogenized for ten seconds (Polytron, Kinematica, Littau, Switzerland) and left to sit for 10 minutes in 15 mL chloroform: methanol (2:1, v/v). Samples were then centrifuged (10 min at 3000 RPM).

Supernatants were filtered and 7.5 mL of 0.25% KCl was added to get rid of hydrosoluble substances. Samples were reextracted and filtered a second and third time with 10 mL and 5 mL of chloroform: methanol (2:1, v/v). Tubes were then centrifuged for 15 minutes (3000 RPM) to separate aqueous and organic phases. The upper aqueous layer was removed with a vacuum. The organic phase was evaporated (70oC, 90-100 RPM) in Rotavapor (Buchi RE 121 Rotavapor, Flawil, Switzerland).

2.7 Solid-phase Extraction

Lipids were resuspended in chloroform and loaded on solid-phase extraction columns (Supelclean 3 mL 500 mg LC-NH2; Sigma–Aldrich; St. Louis, MO, USA) previously loaded with 2 mL hexane to separate the neutral lipids. Rotavapor flasks were rinsed twice with 100µL chloroform and this 200µL was also added to the extraction columns. Separation was achieved by sequential elution of lipid classes – neutral lipids, non-esterified FAs, and phospholipids – using solvents of increasing polarity: 2 mL isopropyl ether: acetic acid (98:2, v/v), 2 mL chloroform: isopropanol (3:2, v/v), and 4 mL methanol, respectively (Maillet and Weber, 2006). Only the neutral lipids fraction was kept for analyses. The neutral lipids fraction was retained for two reasons. First, FAs are most commonly stored in neutral lipids mainly in the form of triglycerides meaning that this fraction will be the one to contain the highest amount of FAs stored from the diet (Iverson, 2009). Also, the composition of neutral lipids should be highly responsive to dietary lipid accumulation. Therefore, the neutral lipids fraction was chosen since its FA composition should have been affected by changes in diet. The other two fractions were not analyzed since the phospholipids tend to be highly conserved relative to diet and the non-esterified FAs do not accumulate in tissues.

Non-esterified fatty acids (NEFAs) or free fatty acids are fatty acids circulating in the plasma not in their glycerol ester form (glycerides). They are the final products of triacylglycerol hydrolysis. Even though they are necessary as fuel and other functions, they do not accumulate in large amounts and would not have been useful for this thesis.

2.8 Fatty Acid Composition by Gas Chromatography

To be detected by the gas chromatograph, the FAs were submitted to transesterification. For this, neutral lipids fractions were evaporated under nitrogen and 2 mL of a 1M solution of acetyl chloride in methanol were added. Tubes were then placed in a heating block (90°C) for two hours and then evaporated under N_2 at 70°C. After, fractions were resuspended in 1 mL methanol to remove residual HCl and H_2O. Before being analyzed in the gas chromatograph, fatty acid methyl esters were dissolved in 75µL of isooctane and transferred into gas chromatography vials. Fatty acid methyl esters were analyzed on an gas chromatograph (Agilent Technologies 6890N, Mississauga, Ontario, Canada) equipped with a fused silica capillary column (Supelco DB-23, 60 m, 0.25 mm i.d.,0.25 um film thickness; Sigma–Aldrich) using hydrogen as carrier gas, hydrogen and air as detector gases, and nitrogen as makeup gas (Magnoni and Weber, 2007). The column temperature was initially at 150°C and was held for one minute and then increased to 170°C at a rate of 6.50°C·min-1. Once this temperature was reached, the column temperature kept increasing at a rate of 2.75 °C·min-1 until it reached to 215°C and this temperature was held for 12 minutes. Once this temperature was reached, the column temperature kept increasing at a rate of 40.00°C·min-1 until it reached to 230°C and this temperature was held for 3 minutes. For these analyses, oleate (16:0) was set to produce a signal at 13.00 minutes for calibration. Individual fatty acid methyl esters retention times were determined with standards (Sigma–Aldrich, St-Louis, MO, USA). The injection volume into the gas chromatograph was of 5uL (instead of 3 uL in the original protocol to increase the quantity of FAs injected). The software used to identify and measure the FAs peaks was Agilent ChemStation B.01.03 (204) with Retention Time Lock software (G8020BA). Using this software, an effort was put into identifying as many peaks as possible using the standard retention times. The size of each peak (the area under the curve) was noted since it is proportional to the mass of that FA that was present in the injected sample. When tiny peaks blended into nearby identified larger peaks, they were included as part of the area of the adjacent large peak rather than being excluded (this happened mostly for 16:1 and 18:1).

2.9 Statistical Analysis

Different models were fitted to the length-mass and age-mass regressions of YP and the best models were determined with the lowest AIC scores. The best-fitted model for the regression of mass on standard length was a mixed-model with interaction, allowing the intercept and slope to vary among the lakes with the formula: $\log_{10} weight \sim \log_{10} Slength * \mathrm{PredationType} + (1 + \log_{10} Slength\,|\mathrm{Lake})$. The best-fitted model for the regression of mass on the age of YP was determined by the AIC score and was a mixed-model with interaction, allowing the intercept and slope to vary among the lakes with the formula: $\sqrt{weight} \sim \mathrm{Age} * \mathrm{PredationType} + (1 + \mathrm{Age}|\mathrm{Lake})$. Maximum likelihood Chi-square tests were performed to interpret the statistical significance of the fixed effects. Statistical analyses were performed using R (version 3.3.0, R core development team, 2008) and the lme4 package version 1.1-12 (Bates, et al., 2016).

The abundance of FAs was converted into a proportion of total FA by dividing the area of each individual peak with the sum of the peak areas of all FAs. Redundancy analysis (RDA) was performed on FA data after the Aitchison log-ratio transformation (Aitchison, 1983). Since this transformation uses a logarithm modification, values of 0 are not permitted. Therefore, 0.1% was added to FAs and the Aitchison transformation was applied to this dataset. RDA was applied to the transformed percentage composition data of YP using the age of the YP, the date of capture, and the predation type of each lake as constraints (constrained RDA). All 23 FAs detected and identified were included in the analyses (FAs that contributed to less than 1.0% of total FAs were not omitted from statistical analyses). The scores of each individual with FAs contributing most to the separation on each axis (first two eigenvectors) were used for different types of graphical representations. A permutation ANOVA was performed to assess statistical significance of the marginal (partial) effect of the constraints. The space generated by the RDA on FA signatures of YP was used to project all FAs observations to obtain graphical comparisons of FA signatures of YP to that of their preys. Statistical analyses were performed using R (version 3.3.0, R core development team, 2008) and the vegan package version 2.3-4 (Oksanen, et al., 2016)).

3. RESULTS

3.1 Identified Fatty Acids

Twenty-three FAs were identified and quantified in all samples (invertebrates = 176, Perch = 201, prey = 86, and zooplankton = 9), out of which 19 FAs had average relative proportions greater than 1% of total FAs. The 23 FAs included eight SFAs: dodecanoic (12:0), tetradecanoic (14:0), pentadecylic-(15:0), hexadecanoic-(16:0), octadecenoic-(18:0), icosanoic-(20:0), docosanoic-(22:0), and tetracosanoic acid (24:0), seven MUFAs: tetradecenoic-(14:1n-5), pentadecenoic-(15:1), palmitoleic-(16:1n-7), oleic-(18:1n-9), eicosenoic-(20:1n-9), docosenoic-(22:1n-11), and tetracosenoic acid (24:1n-9), and eight PUFAs: eicosapentaenoic-(20:5n-3), docosatrienoic-(22:3n-3),docosahexaenoic-(22:6n-3),octadecadienoic-(18:2n-6), octadecatrienoic-(18:3n-6),eicosadienoic-(20:2n-6),eicosatrienoic-(20:3n-6), and eicosatetraenoic acid (20:4n-6) (see appendix for FAs signature of each individuals).

3.2 Redundancy Analysis

The RDA revealed that FAs profiles of YP muscle tissue differed slightly between lakes with or without bass (Figures 3 and 4). The first two eigenvectors (RDA1 and RDA2) accounted for 42.1% of the variation (RDA1=27.6% and 2=14.6%) in FAs composition among the observations. Inclusion of RDA3 (14.4%) increased the cumulative variation explained to 55.7%. Three unsaturated FAs (arachidonic (20:4), docosenoic (22:1), and myristoleic (14:1)) were most important in the positive direction for RDA1, while docosatrienoic (22:3), palmitic (16:0), and pentadecylic (15:0) were the FAs more negatively correlated with RDA1. The FAs myristic (14:0), arachidic (20:0), and palmitic (16:0) (negative); and nervonic (24:1), eicosapentaenoic (20:5), and erucic (22:1) (positive) were more correlated with the second axis (Figure 4).

The RDA analysis (using the age of the YP, the date of capture, and the predation type of each lake as constraints) also showed a distribution of the samples along two main gradients that seemed to account for a comparable proportion of variability (Figure 4). The first gradient followed the presence of bass in each lake with docosatrienoic acid (22:3) being more correlated with samples from lakes with bass. Perpendicular to this first gradient, FA signatures varied with the date of capture with later samples being in higher proportions of eicosapentaenoic (20:5) and lauric (12:0) acids (see Appendix 3 for a complementary graphical representation). Age of the YP accounted for a smaller proportion of variability in FA signatures. The permutation ANOVA confirmed that all three constraints were statistically associated with different FA signatures (P-values=0.021, 0.01, and 0.01, for age, date of capture, and predation type of lakes respectively).

The RDA performed on the entire dataset of 477 samples using the 23 identified FAs failed to reveal a clear difference among taxonomic groups (Figure 5). The first two eigenvectors (RDA1 and RDA2) accounted for 42.1% of the variation (RDA1=27.3% and 2=14.8%) in FAs composition among the observations. Inclusion of RDA3 (13.6%) increased the cumulative explained variation to 55.7%. RDA1 was most strongly correlated with oleic acid (18:1), whereas RDA2 reflected most strongly proportions of eicosatetraenoic acid (20:4), and the third discriminated proportions of palmitic (16:0).

No distinct FAs composition was found for individual taxa and FA signatures of investigated taxonomic groups overlapped between lakes with and without bass (Figure 6).

A large variability was observed in FA signatures of YP as well as other taxonomic groups. The invertebrate samples seemed to have the highest variation between points. Additionally, the variation within and between taxonomic groups seemed lower in lakes with bass than in lakes without bass (cluster of points noticeably more spread-out).

3.3 Variation in RDA Scores

YP's FA signatures varied with their size (measured as standard length), and with the presence of bass in each lake (Figure 7). The mixed-model regression analysis confirmed that smaller YP captured in lakes with bass had a different RDA1 score than YP captured in lakes without bass (intercept was significantly lower by 0.58; P-Value=0.03). The mixed-model regression analysis also confirmed that the relationship between the RDA1 scores and standard length varied with the presence of bass by revealing a statistically higher slope for lakes without bass (P-Value=0.003) (Figure 7a). However, the mixed-model regression analysis confirmed that smaller YP captured in lakes with bass did not have a different RDA2 score than YP captured in lakes without bass (P-Value=0.68). The mixed-model regression analysis also confirmed that the relationship between the RDA2 scores and standard length did not vary with the presence of bass by revealing similar slopes for lakes with and without bass (P-Value=0.43) (Figure 7b).

YP's FA signatures varied slightly with their age, and a pattern was observed as per the presence of bass in each lake (Figure 8). The mixed-model regression analysis confirmed that younger YP captured in lakes with and without bass had similar RDA1 and RDA2 scores (P-Values=0.07 and 0.75 respectively). The analysis also confirmed that the relationship between the RDA1 scores and age varied with the presence of bass by revealing a statistically higher slope for lakes without bass (P-Value=0.043) (Figure 8a). However, the relationship between the RDA2 scores and age did not vary with the presence of bass since lakes with and without bass had similar slopes (P-Value=0.5) (Figure 8b).

3.4 Variation

A high variability for RDA scores was observed between individuals of the same group (prey, invertebrates, zooplankton, and YP) for the observations collected in this study compared to predicted RDA scores for FA signatures of similar organisms published in the literature (Figure 9). This is shown by the fact that an average standard deviation of 5.93% was calculated for FAs relative concentrations of all samples, with palmitic (16:0), oleic (18:1), eicosatrienoic (20:3), eicosadienoic (20:2), and docosahexaenoic (22:6) having the highest variation. The other published studies had an average standard deviation of 0.5%. The standard deviation of YP's FAs relative concentration was almost in lakes with and without bass (5.47% and 5.46% respectively).

3.5 Relations between mass and age; and standard length

Length-mass relation of YP varied with presence of bass in lakes (Figure 12a). The analysis of variance confirmed that the main effect of the presence of bass on mass was nonsignificant (P-Value=0.061), but there was a significant interaction between standard length and the presence of bass (P-Value=0.024). This indicated that the effect of length was different for lakes with and without bass, with smaller perch being heavier in lakes without bass and longer perch being heavier in lakes with bass.

Age-mass relation of YP varied with presence of bass in lakes (Figure 12b). The analysis of variance confirmed that the main effect of the presence of bass on mass was nonsignificant

(P-Value=0.247), but there was a significant interaction between age and the presence of bass (P-Value=3.05e-08). This indicated that, for younger perch, the presence of bass had no effect on mass; while for older perch, the presence of bass led to heavier perch than in lakes without bass.

4. DISCUSSION

4.1 General Trends

FAs profiles of organisms considered in this study were dominated by SFAs, MUFAs, and PUFAs, such as palmitic (16:0), oleic (18:1), stearic (18:0), palmitoleic (16:1), docosahexaenoic (22:6), and linoleic (18:3). These results are consistent with the literature on FAs that predominantly occur in fish lipids (16:0 and 18:0) (Tocher, 2003). Concentration of the major FAs identified (16:0, 16:1, 18:1, and 18:0) were similar to the average concentration (within 3%) in five previous studies (Czesny, et al., 2011; Lau, et al., 2012; Vasconi, et al., 2014; Cappelli, 2012; Gonzalez, et al., 2006). Moderate levels of ω-6 FAs were also noted. Notably, 18:2 and 20:4 were found in concentrations consistent with concentrations reported in the literature as well as the general notion that (n-6) FAs are relatively abundant in freshwater systems (Czesny, et al., 2011; Cappelli, 2012).

4.2 Fatty Acids Signatures

Knowing that YP's diet changes over time and that the presence of piscivores (e.g. bass) can affect its diet, I expected that different FA signatures would be observed as a function of the presence (or absence) of bass. FAs compositions for individual taxa overlapped considerably making the task of tracking YP's diet unpromising. Nevertheless, statistically significant differences in FA signatures were detected based on the presence or absence of piscivores. Unfortunately, the two categories of lakes were sampled at different periods of the summer. The variance accounted for by piscivores presence or date was similar. This means that it is difficult to determine which variable is responsible for the detected effects.

4.3.1 Seasonal Effect

Even if it is difficult to clearly distinguish if it is the piscivores presence or capture date that accounts for FA profile variability, the date of capture is a plausible explanation that can be supported by changes (increase and decrease) in RDA1 and 2 scores over the sampling period (Figure 10) and by existing literature.

Generally, in freshwater lakes, phytoplankton starts blooming in spring and this bloom is followed by an increase in zooplankton. In May and June, as temperatures get warmer, chironomids, trichopterans, and amphipods hatch and are followed, in late August and September, by large populations of small fish of different species. YPs' diet changes coincide with the available species during spring and summer (Keast, 1977). Indeed, Haas and Thomas (1998) showed that, in Lake St. Clair in Michigan, chironomid larva, isopods, and ephemeroptera nymphs occurred in twice as many stomachs of YPs in June while fish were eaten more frequently in September. In Lake Erie, YOY switched from mainly zooplankton to invertebrates during midsummer declines in zooplankton biomass (Post & McQueen, 1994). Schaeffer, et al., (2000) also showed that fish were mainly consumed in August and September.

Because the composition of YP diet is subject to seasonal shifts, and because organisms have different FA signatures, the FA signatures of YPs could be affected by these seasonal changes. Phyto- and zooplankton synthesize and accumulate PUFAs at different rates meaning that availability of FAs, especially PUFAs, at the bottom of the food web varies constantly (Czesny, et al., 2011). For example, diatoms, which bloom early in spring, are rich in EPA (20:5) (Napolitano, et al., 1994). In my study, the RDA analysis indicated that the date of capture was correlated with EPA (20:5). Given that FAs represent diet over the last weeks to months; this could indicate that YPs that fed early in spring had greater EPA availability. This supports the fact that FAs composition varies seasonally.

However, one would expect that if the observed variation in YP's FA signatures is indeed due to seasonal changes, then the signatures of prey items would also differ over the sampling period. When comparing the time trend of FA signatures of other organisms (invertebrates, zooplankton, and fish prey), it can be observed that there is essentially no pattern in RDA1 scores over the sampling period (Figure 11). This is the opposite of what is observed for the YP's scores where they do change over time (especially in July and August).

In conclusion, as zooplankton, invertebrates, and prey fish signatures did not vary much over the summer period, and YP's did, it is unlikely that seasonal variation in FA availability in YP prey items is responsible for the observed YP's FAs seasonal variation during the study period.

4.3.2 Other Possible Factors

The observed covariation of YP FA signatures with date and bass could be attributed either: a) to a "real" association with the presence of bass in lakes or b) to a change in the metabolism of FAs in July and August.

4.3.2.1 Piscivores Effect

Indeed, the presence of bass is a plausible explanation that can be supported by the relative abundance of the different FAs. In fact, when looking at the FA signatures, docosatrienoic acid (22:3) was relatively more abundant in YP from lakes with bass while arachidonic acid (20:4) was relatively more abundant from lakes without bass. Arachidonic acid is a marker found in phytoplankton and their zooplankton predators (Happel, et al., 2015). A higher concentration is expected for YP from lakes without bass that feed mainly on a diet composed of invertebrates and zooplankton.

Moreover, the effect of piscivores on YP's diet is corroborated by studies in the literature. Indeed, the time of the shift to larger preys depends on the relative abundance of invertebrates and zooplankton as well as on the presence of competitors for pelagic prey (Frankiewicz & Wojtal-Frankiewicz, 2012). Frankiewicz & Wojtal-Frankiewicz (2012) suggested that competitors may force YPs to use small size prey or feed on zooplankton instead of shifting to a piscivorous diet. Indeed, YP up to 115 mm shifted habitat (from rock to sand) and diet preferences (decreased consumption of amphipods and chironomid larvae combined with an increase of zooplankton) with the increase abundance of round goby (*Neogobius melanostomus*) (Houghton, 2015). Also, when YP's competitors (white suckers) were removed from a lake, YP fed increasingly on bigger preys (benthic invertebrates rather than zooplankton) (Hayes & Taylor, 1992).

However, other information weakens the argument of the effect of piscivores on YP's diet. Thus, docosahexaenoic acid (22:6) is also known as a good marker of zooplankton (Happel, et al., 2015; Ravet, et al., 2010) and this FA was not strongly correlated to the presence or absence of piscivores. Also, one would expect that if YP in lakes with bass are constrained to feed mostly on zooplankton and invertebrates, their diet (and therefore their FA signatures) would be less variable as they grow, but the RDA1 scores revealed the opposite. Therefore, it seems that the YP in those lakes had a more diverse diet. This was not expected.

4.3.2.2 Metabolism

Secondly, a change in the metabolism of FAs is also a plausible explanation for the observed YP's FAs distribution. This explanation would suggest that the FAs metabolism is regulated seasonally (or more often) for physiological needs which would explain such a variation between the FA profiles.

Schwalme et al. (1993) observed in northern pike (*Esox lucius L.*) that major variations in FAs, happened in preparation for acclimation of cellular membranes to colder temperature (mostly in the fall and winter) and in preparation for reproduction (gonadal growth) (mostly from September to January). Tocher (2003) also showed that there is a selective catabolism of 20:5 relative to 22:6 during gonadogenesis. Therefore, it is possible that a similar reproductive event happened during the sampling period and affected the FA signatures. In a literature review, Thorpe (1977) mentioned that, on average, gonadal growth of YP happened in August for males (testes growth) whereas, for females, it began in July and continued steadily until spawning, usually in April (ovarian growth). These results would entail that, in July and August, the necessary FAs were metabolized for gonadal growth which seems to be consistent with the observed variations in FA signatures at the end of summer.

Also, FAs might be metabolized for other physiological needs since they are also the preferred source of metabolic energy for growth, and swimming. For example, the 16:0 and 18:1, the 20:1 and 22:1 were all consumed in large amounts during the growth of farmed fish species indicating that these FAs must play a major role in growth (Tocher, 2003). The same FAs were found to be important for swimming especially during long migration (Tocher, 2003).

Additionally, it has been shown that ω-6 and ω-3 PUFAs are used in the biosynthesis of eicosanoids (Larsson, et al., 2004; Cappelli, 2012).

Therefore, it is possible that FAs were constantly metabolized and replenished over the sampling period for different physiological needs which would explain the individual variability. However, current knowledge of differential mobilization of FAs is not fully understood and is partly based on experiences in aquaculture (Tocher, 2003; Iverson, 2009).

4.3.3 Conclusion

In summary, the results show conflicting evidence regarding the effect of piscivores on the YP's diet. Due to the absence of change in prey's FA signatures over the summer period, the date of capture seems unlikely as the rationale for the observed YP's FAs distribution. Moreover, the results hint that the presence of bass affected YP's diet and that this was reflected, to some extent, in differences in FA signatures. Combined with the literature studies showing that piscivores do affect YP's diet, the presence of bass as a factor behind differences in FAs cannot be disregarded. However, due to the possible metabolization of FAs for different physiological needs during the sampling period, a change in the metabolism of FAs is also a plausible explanation for the observed YP's FAs distribution.

Therefore, the presence of bass and a change in metabolism were deemed as the most plausible explanations. It is also possible that the FAs distribution observed is due to combined effects of the two variables.

4.3 Variation of Fatty Acids Signatures Within Taxa Studied

A large amount of variability was observed among individual FA signatures in YP as well as in other taxonomic groups. Additionally, the variability in FAs concentrations was generally greater between individuals captured in the same lake (standard variation up to 13% within the same lake) than between lakes with or without bass. Explanations can be put forward to shed light on this interesting variability.

4.3.1 Niche Specialization Influences Feeding Behaviour

The high within-species variability observed could be due to differences in feeding behaviour. Indeed, studies have shown that competition for resources due to the presence of piscivores was an important factor leading to social niche specialization through character displacement (in rainbow trout and guppy) (Montiglio, et al., 2012). Therefore, it is possible that YP have different feeding behaviours and consume different food items; hence, affecting their FAs profiles.

Even though the concept of nice specialization in animals is quite recent, research has established that social interaction resulting from competition can cause a lasting modification of behavioural traits due to social character displacement (Montiglio, et al., 2012; Bergmulller & Taborsky, 2010).

For instance, in cichlids (*Neolamprologus pulcher*), the early social environment affected the social behaviours of juveniles (changes in aggressiveness and submissiveness) (Arnold & Taborsky, 2010). Slagsvold and Wiebe (2007) showed that a cross fostering experiment between two different species of tits (*Parus major and Cyanistes caeruleus*) resulted in lifelong shift in the feeding niche of the tits.

Studies have also shown that differences in diet due to niche specialization can be observed using FAs. In a study with bats, the authors were able to use FA signatures to indicate that two of the species occupied different feeding niches (My-Y Lam, et al., 2013). Svanback and Persson (2004) were able to use FA signatures to determine that with higher density of European perch, there was also a higher specialization in niche and therefore that there was individual diet specialization. Lastly, Sechi, et al. (2014) showed that FAs could be used to observe different diets of springtails due to niche specialization.

These studies bring the possibility that YP have individual niche specialization which could induce variations in feeding behaviour. These differences in feeding behaviour could then result in FA signatures differences which could explain the observed variation. However, it is worth noting that, to date, very few studies have shown a link between personality differences and some aspects of an ecological niche such as diet, habitat use or specialization against predators in fish. This is a research area worth exploring.

4.3.2 Turnover Rate

Complementary to the possible change in metabolism in YP at the end of summer, it is possible that the turnover rate of FAs may explain the high variability in FA profiles.

Indeed, the use of FAs in muscle tissue as was chosen because it is said to represent long-term diet (e.g. ontogenic diet) due to its slow turnover rate. However, it is possible that the turnover rate is faster and therefore that the FAs signature of individuals does not represent the expected period of time of weeks to months. Iverson (2004) does state that, in marine mammals, adipose tissue contains the most direct information about long-term diet.

For this factor to be plausible there would need to be enough variation between individuals to generate the variability in FAs that was observed in this study. Unfortunately, no studies could be found for YP on the incorporation and turnover rate of specific FAs. However, it has been revealed that the turnover rate can be affected by environmental factors (in cultured fish cells), and by the size and age of animals (rainbow trout) (Robin, et al., 2003; Tocher, 2003). Tocher and Sargent (1990) also said that it is difficult to predict the turnover in fish fed a particular diet since it could be relatively short or continue to evolve over a longer period. Additionally, there are several points during metabolism and transportation for FAs to be modified before they are transported to tissues where absorption takes place (Arts, et al., 2009; Iverson, 2009). However, in marine birds and mammals, FAs that were elongated and desaturated before storage were found unlikely to make a significant contribution to their adipose FA stores (Iverson, 2009). In spite of this, the absorption of the FAs has not been studied extensively in fish and this factor cannot be disregarded as a potential reason for the variation.

Therefore, it does seem possible that there could be enough individual variation to generate the observed variability in FAs. However, future studies should explore YP turnover rate since such information could have a significant impact on the utility of FAs as trophic markers in predatory organisms.

3.8 Variation of Fatty Acids Signatures between Lakes and in Other Studies

The observed variability among individual FA signatures seemed larger than the variability reported in the literature for similar organisms (Cappelli, 2012; Czesny, et al., 2011;

Vasconi, et al., 2014; Gonzalez, et al., 2006; Lau, et al., 2012). Additionally, a high variability between lakes was observed.

The reason behind the large variability observed in my study compared to previous studies could be methodological. Indeed, other studies are either laboratory experiments (which allows for the possibility to control for many variables) or are performed in one lake rather than multiple (except for (Lau, et al., 2012)). Since the lakes I sampled are fairly different in size, in species composition, in the presence or absence of piscivores, etc. than the lakes in the previous studies, it is possible that these variables have an effect on trophic relationships which in turn affect FAs. This idea is substantiated by the fact that the differences between lakes were significant and explained a relatively large proportion of variance in the FA signatures (55% for RDA1). However, it is worth noting that the predicted RDA scores for FAs profiles from published studies are also quite variable. Knowing that the majority of these studies were either performed in a laboratory or in a small number of lakes and that the published FAs profiles are also variable, we can assume that the lakes themselves are not the main reason behind this variation.

Therefore, another explanation for that variability could be the seasonal variation in FAs. As mentioned in a previous section, lipid concentrations can be highly variable in the spring and summer compared to the fall and winter due to seasonal changes in organisms' abundance and metabolism. In the present study, due to time limitations and problems with accessing the lakes, lakes without bass were mostly sampled in July while lakes with bass mostly in June and a bit in August. However, in the published studies, samples were mainly collected in all three seasons and over more than one summer (up to four years of sampling in (Czesny, et al., 2011)) which diminished the plausibility of this explanation. Then again, these studies were mostly performed on different sectors of large lakes which could mean that all the different sections were not sampled all year long but rather once or twice like my study.

4.4 Comparison of Growth in Lakes With and Without Bass

Knowing that bass and YP have overlapping diets, I expected that competition for the same food items would entail. Therefore, bass being a top piscivores, the YP would feed mainly on lower-yielding food items to avoid predation. I expected that this would lead to lower growth rates for YP in lakes with bass. In my study, the presence of bass had no significant effect on growth but due to an interaction with that factor, YP from lakes without bass exhibited a slower growth rate, but weighed more during their first year compared to the YP captured in lakes with bass.

The slower growth rate observed in YP from lakes without may well be a result of high population density. This was observed in two studies of populations of YP in lakes without bass where the growth rate of the individuals in the populations was well below the average in other lakes (where it takes approximately three years to attain 18 to 20 cm) (Ridgway & Chapleau, 1994; Grimaldi & Leduc, 1973). It was proposed that the absence of top predators in the population resulted in a high population density, which in turn increased intraspecific competition causing slower growth rate (Ridgway & Chapleau, 1994; Grimaldi & Leduc, 1973). In my study, a higher catch rate was observed in lakes without bass. In fact, the targeted number of YP (approximately 25) was reached in lakes without bass within four hours while nets had to be left in water for more than nine hours in lakes with bass. Moreover, the number of YP caught in lakes without bass not only reached the necessary number but exceeded it by hundreds of specimens. This high-density can be explained by the absence of any other piscivorous species. Indeed, young-of-the-year (YOY) YP are an item in the diet of adult bass (Brown, et al., 2009), and their absence from lakes could mean that YP population levels are not kept in check (Brown, et al., 2009).

The higher mass observed in YP captured in lakes without bass earlier in their development (less than one-year-old) could reflect the fact that this larger size might provide a protection against predation by larger YP. Indeed, it has been observed that larger perch may be cannibalistic when they are the most abundant (or the unique) piscivorous species in small lakes (Keast, 1985; Ridgway & Chapleau, 1994). Therefore, if cannibalism is present in lakes without bass, it may be advantageous for the YOY YP to redirect their energy on their growth to quickly attain a large size protecting them from consumption by their conspecifics. This mechanism was proposed as the rationale in a study of a stunted population of YP in a monospecific lake where the fish aged 0+ to 3+ showed a faster growth rate (compared to data available for other lakes), which slowed down in older YP (Ridgway & Chapleau, 1994).

4.5 Limitations and Recommendations

Some practical issues may have had an impact on the results. Ideally, it would have been preferable to sample lakes that were fairly similar in biotic factors, such as size, depth, etc. Similarly, the seasonal effects might have been nullified if lakes could have been sampled in alternance in terms of presence or absence of piscivores or that fishing and sampling effort could have been the same in each lake. For example, in some lakes I could not use the seine because the type of shoreline did not allow it. In other lakes, invertebrates or a good spectrum of YP sizes were difficult to catch (especially for smaller size fish early in the season).

In the future, it would be interesting to consider the terrestrial contribution to lake food webs by collecting and analyzing organic matter from terrestrial plants (C3 and C4 plants), leaves from dominant tree species as well as from water samples. For example, leaves of terrestrial plants contain high levels of SFAs, and are especially rich in very long-chain SFAs (C20-C30) (Taipale, et al., 2015). Because it seems like long-chain FAs (up to C24) were detected, it would be logical to take into account the terrestrial contribution.

Also, the results show that, in the future, it would be useful to do preliminary checks of FA signatures in the potential food items for study sites to be investigated. A lack of distinct differences between the various food items (as was found here) would prevent an unnecessary analysis of FA signatures in the consumers.

Also, as previously mentioned, dietary FAs consumed in excess of requirements can be metabolized or synthesized by other tissues and organs for physiological process (Iverson, et al., 2004). Therefore, to obtain a more complete overview of the FA signatures, FAs should also be extracted from the liver, visceral fat, and eggs (if possible).

4.5.1 Other Methods Using FAs

Since FAs as markers have limitations, adjustments to the technique are required. Therefore, FAs should be used in conjunction with other quantitative techniques, such as Quantitative Fatty Acid Signature Analysis (QFASA) and/or stable isotopes.

Over the course of this project, articles were published on a novel use of a method using FAs: QFASA. QFASA uses modelling to estimate marine mammals’ diet compositions using controlled feeding experiments to calculate calibration coefficients as a way to account for modifications of FAs concentrations due to metabolism (Iverson, et al., 2004). In the last year, it was established that QFASA can yield accurate estimations of prey composition in fish predators (Happel, et al., 2015). However, this modelling tool is far from perfect and will need to be perfected over the years. Indeed, while highly accurate results were obtained, this method requires predator–prey specific knowledge of metabolism. This limits the use of QFASA to predators that consume a limited number of species and to laboratory experiments to allow such individual calibrations in the model (Happel, et al., 2015). However, this new method is promising and does bring forth the indication that only after adequate incorporation of species metabolism will FAs provide a precise view of the consumer's diets.

Like mentioned in the introduction, stable isotopes are another method that can be used and it is recommended that they should be used in conjunction with FAs. With this approach, naturally occurring stable isotopes of carbon (δ13C) and nitrogen (δ15N) can reveal distinct aspects of a consumer's long-term trophic niche by providing a representation of dietary carbon sources and relative trophic position (Guzzo, et al., 2013). Indeed, studies report a consistent stepwise increase in 15N of 3–4‰ per trophic level increment (Vander Zanden, et al., 1998; Carassou, et al., 2008). Thus, the δ15N of an organism can be used to indicate trophic position of consumers. As for δ13C, it can be used to differentiate between consumption of pelagic and benthic prey for systems in which benthic and pelagic primary producers have distinct δ13C values (Vander Zanden, et al., 1998). A combination of FAs and stable isotopes has been used successfully in fish (Alfaro, et al., 2006; Jo, et al., 2013) and even with YP (Happel, et al., 2015).

4.6 Conclusion

The presence of bass was associated with differences in FA signatures, but unfortunately it was impossible to determine if the observed effects were due to the presence of bass, the date of capture, a change in metabolism, or some other factor. The presence of bass and a change in metabolism were deemed as the most plausible explanations. Moreover, high within-taxa and between-lakes variability was observed. Many possible reasons were brought forth to explain this variability (e.g. differences in feeding behaviour due to personalities, metabolic processes, turnover rates, and temporal variations). Consequently, it is determined that the utility of FA signatures as markers of YP in natural environments is limited.

For future replicate experiments, it is recommended that a combination of FAs, stable isotopes, and modelling (QSAFA) be used to describe the food web dynamics within a lake. Moreover, the sampling period should be long enough to account for seasonal and annual changes in FAs.

Additionally, due to study's limitations, it is recommended that the next step should be to investigate the turnover rate of major FAs in YP tissues as well as well as to measure conversions coefficients between YP and its preys (for QSAFA). Also, studies on feeding behaviours would be valuable in clarifying the effects of other variables (e.g. personalities) on YP's diet.

Of note, FAs studies might be more successful in primary consumers and other lower trophic levels, since the essential FAs originate at these lower trophic levels. Additionally, because of the high individual variability observed, one can imagine that FAs could be best used to track differences within a population rather than between different trophic levels or species.

Nevertheless, it is clear that we need to better understand how predator FA signatures react to fluctuations in diet over longer time periods.

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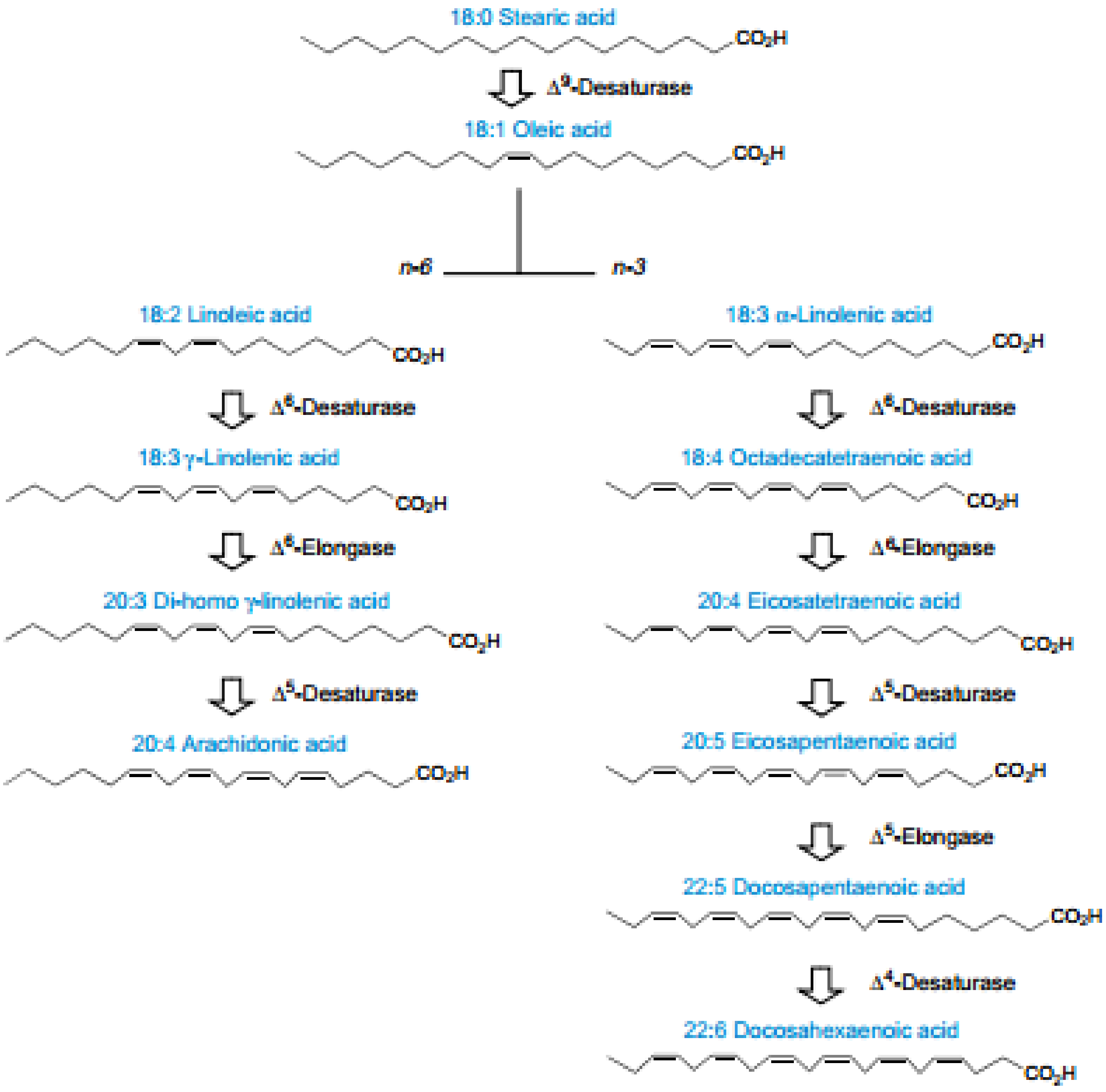

Figure 1 - Generalized pathway for the aerobic synthesis of PUFAs in animals. The different enzymatic reactions required for aerobic PUFA biosynthesis are shown (Napier, 2002).

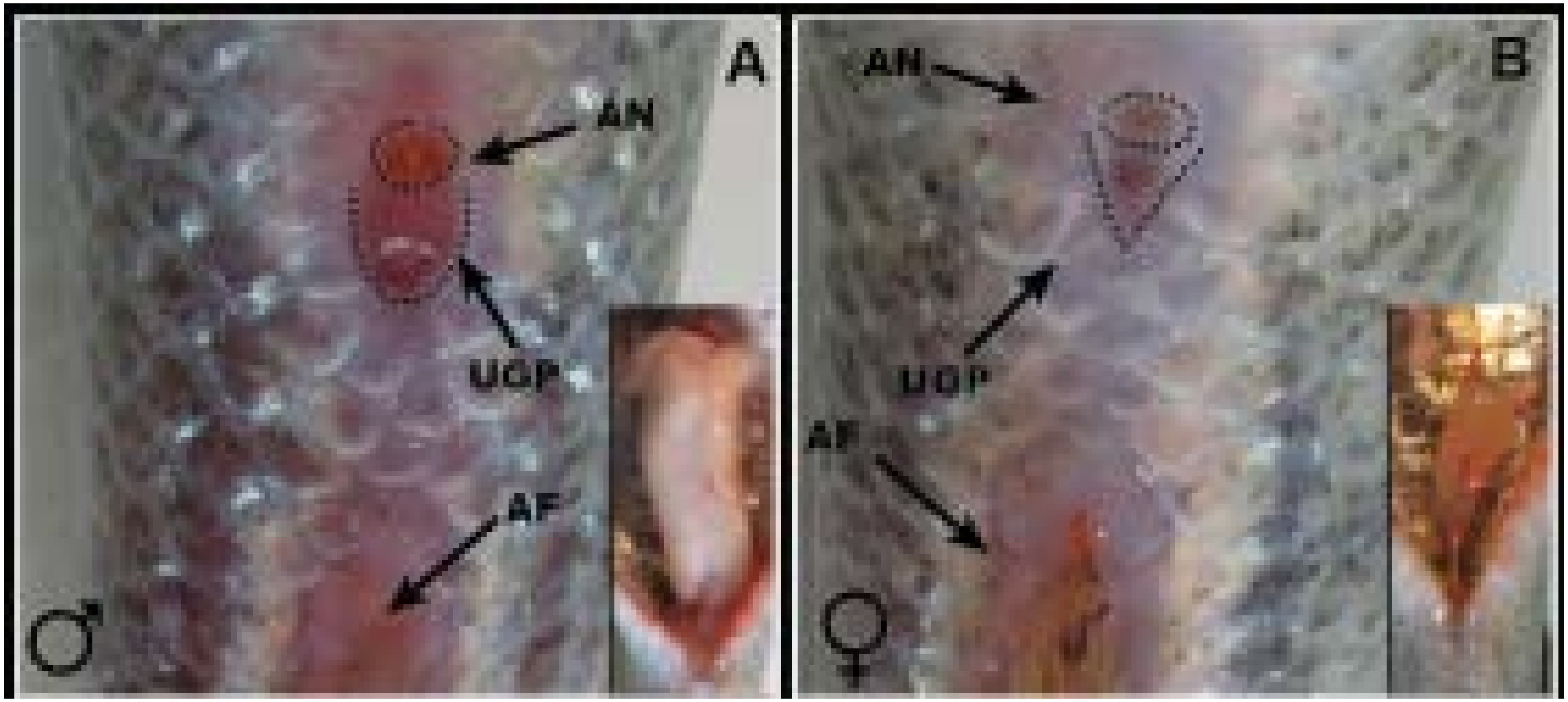

Figure 2- External morphology of the urogenital papilla of male and female Yellow Perch. Dashed lines indicate general shape of the UGP in males (panel A) and females (panel B) (Shepherd, et al., 2013). AN = anus, AF= Anal Fin, UGP = urogenital papilla.

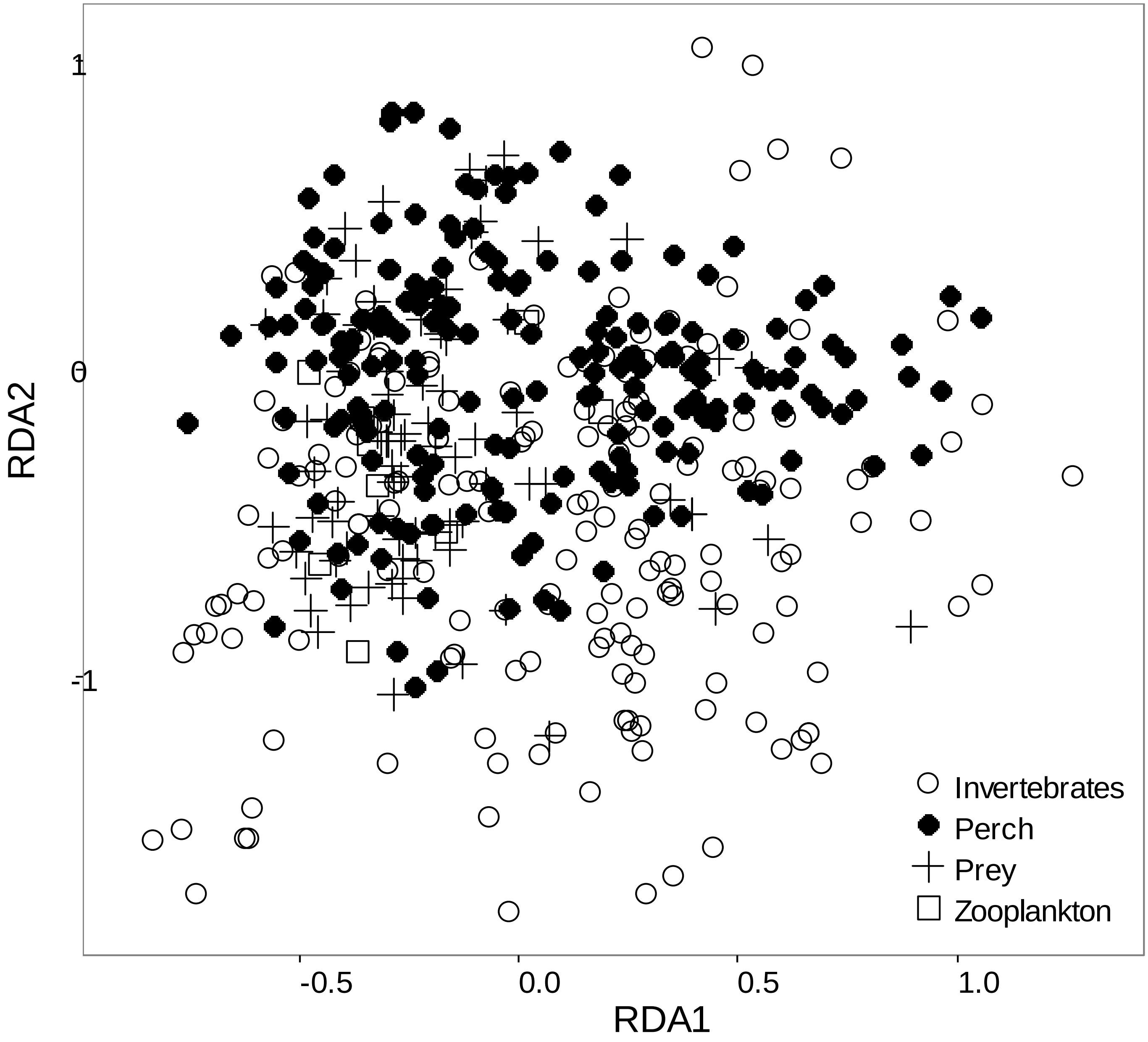

Figure 3 – Ordination scores for observations subjected to a Redundancy analysis (RDA) of fatty acid composition for fish, invertebrates, and zooplankton captured in four lakes with top piscivores and four lakes without top piscivores in the Outaouais region (Quebec, Canada). Analysis is based on the fatty acid signatures of 201 YP, 112 fish of 13 species (potential preys), 176 invertebrates, and nine zooplankton samples, using 23 fatty acids. The two eigenvectors (RDA1 and RDA2) account for 42.1% of the variation (RDA1=27.3% and 2=14.8%)

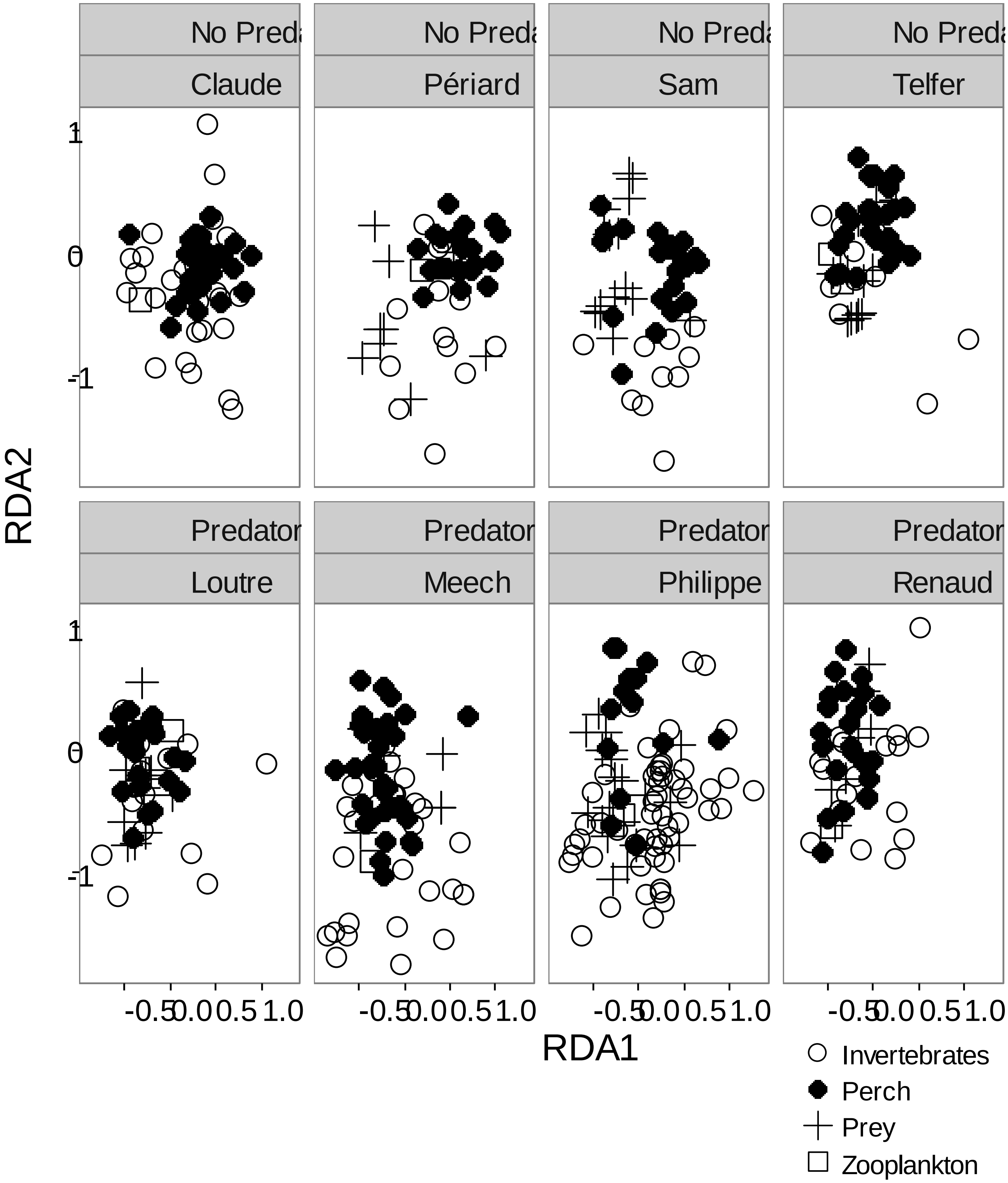

Figure 4 – Individual ordination scores for observations subjected to Redundancy analysis (RDA) of fatty acid composition for fish, invertebrates, and zooplankton separated by the lake of capture. Analysis is based on the fatty acid signatures of 201 YP, 112 fish of 13 species (potential preys), 176 invertebrates, and nine zooplankton samples, using 23 fatty acids. RDA1 and RDA2 = scores for the first two eigenvectors.

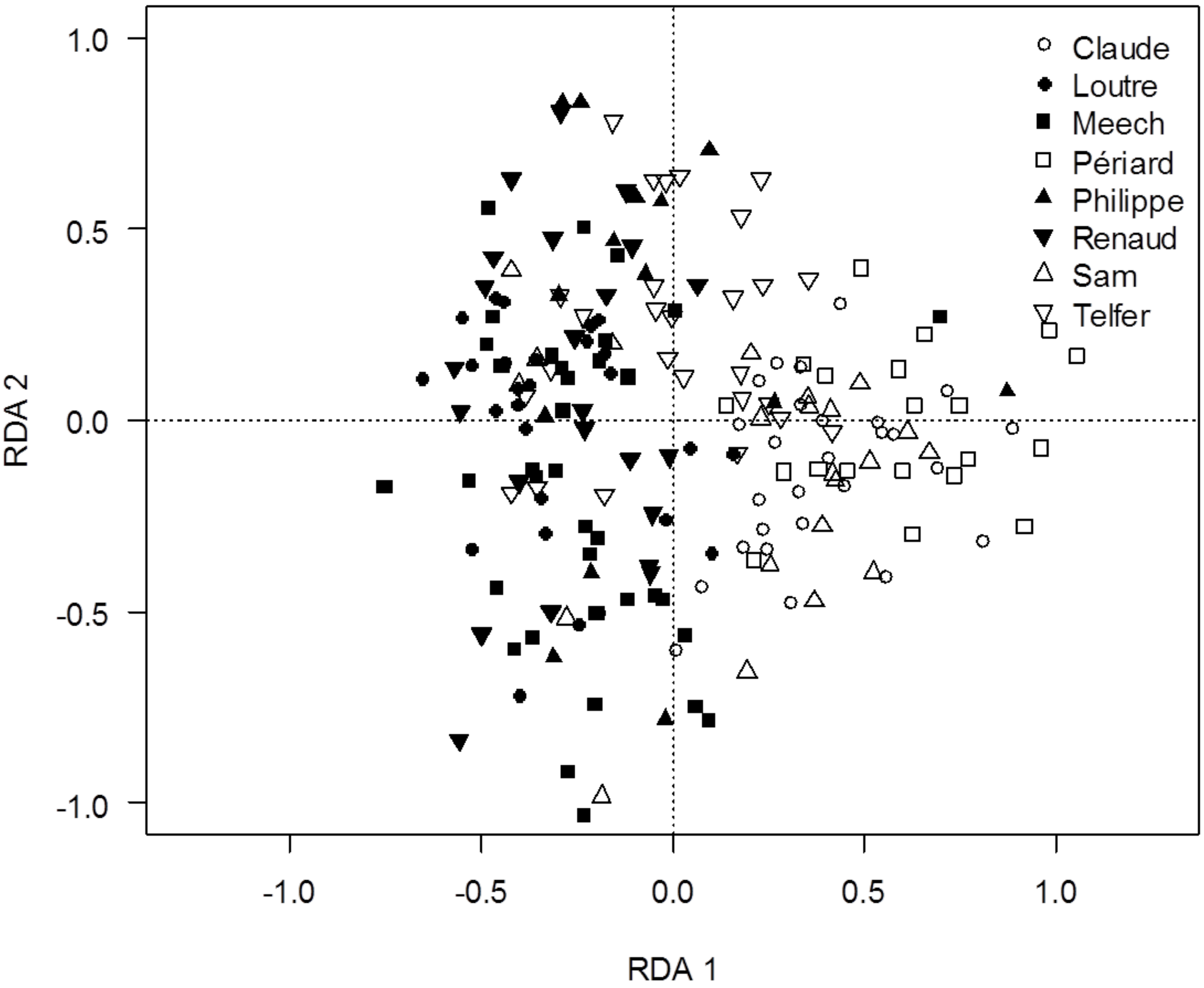

Figure 5 - Individual ordination scores for the first two eigenvectors of each data point obtained from a Redundan*t* Analysis (RDA) of fatty acid composition for YP captured in four lakes with top piscivores and four lakes without top piscivores in the Outaouais region (Quebec, Canada). Analysis is based on the fatty acid signatures of 201 YP using 23 fatty acids. Filled points represent lakes with top piscivores and empty points represent lakes without top piscivores. The first two eigenvectors (RDA1 and RDA2) account for 42.1% of the variation (1=27.6% and 2=14.6%) in FAs composition among the observations.

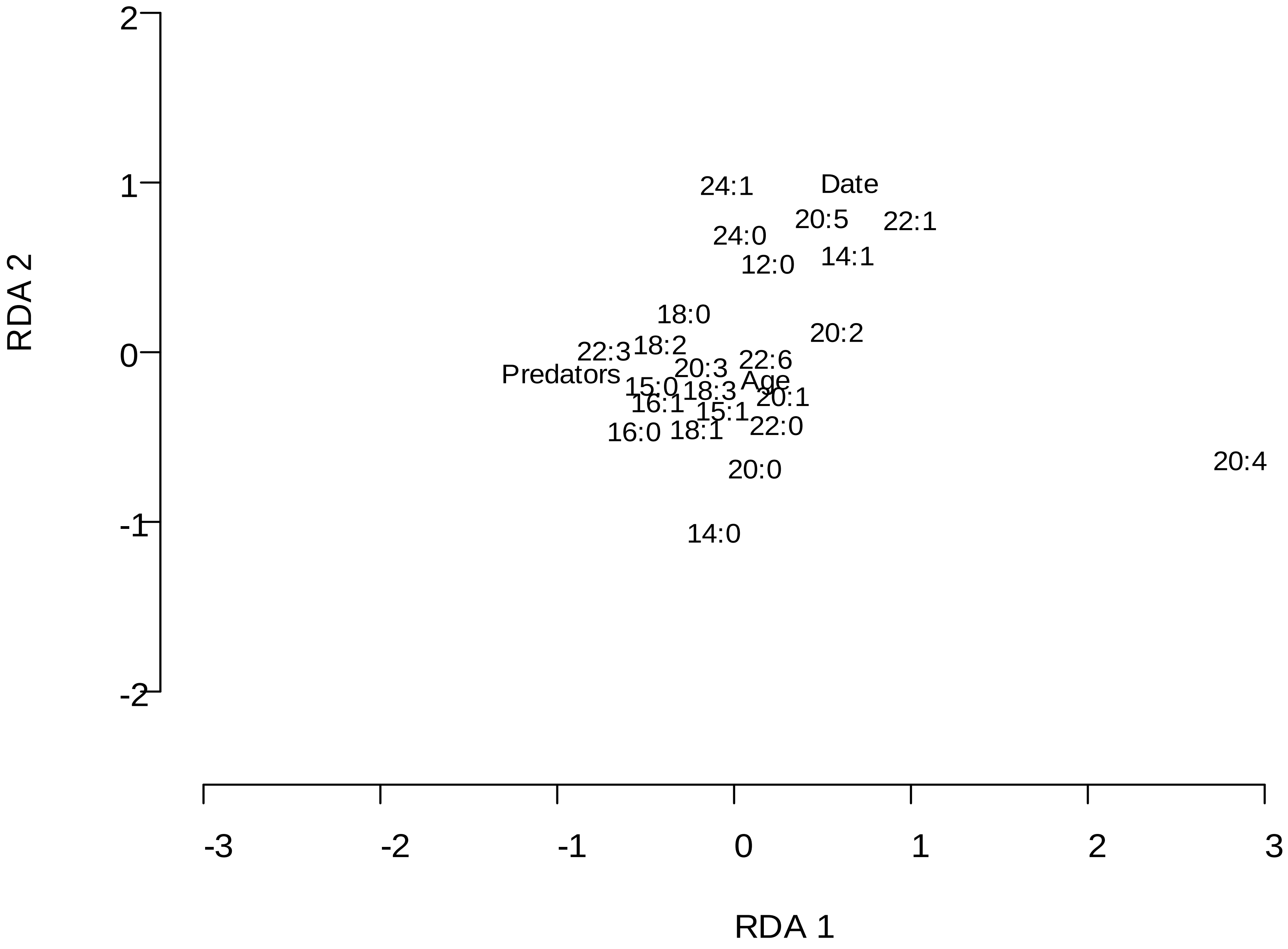

Figure 6 – FAs loadings and constraint vector of the redundancy analysis (RDA) of fatty acid composition for YP captured in four lakes with top piscivores and four lakes without top piscivores in the Outaouais region (Quebec, Canada). The analysis used the age of the YP, the date of capture, and the predation type of each lake as constraints. Analysis is based on the fatty acid signatures of 201 YP using 23 fatty acids. The first two eigenvectors (RDA1 and RDA2) account for 42.1% of the variation (1=27.6% and 2=14.6%) in FAs composition among the observations.

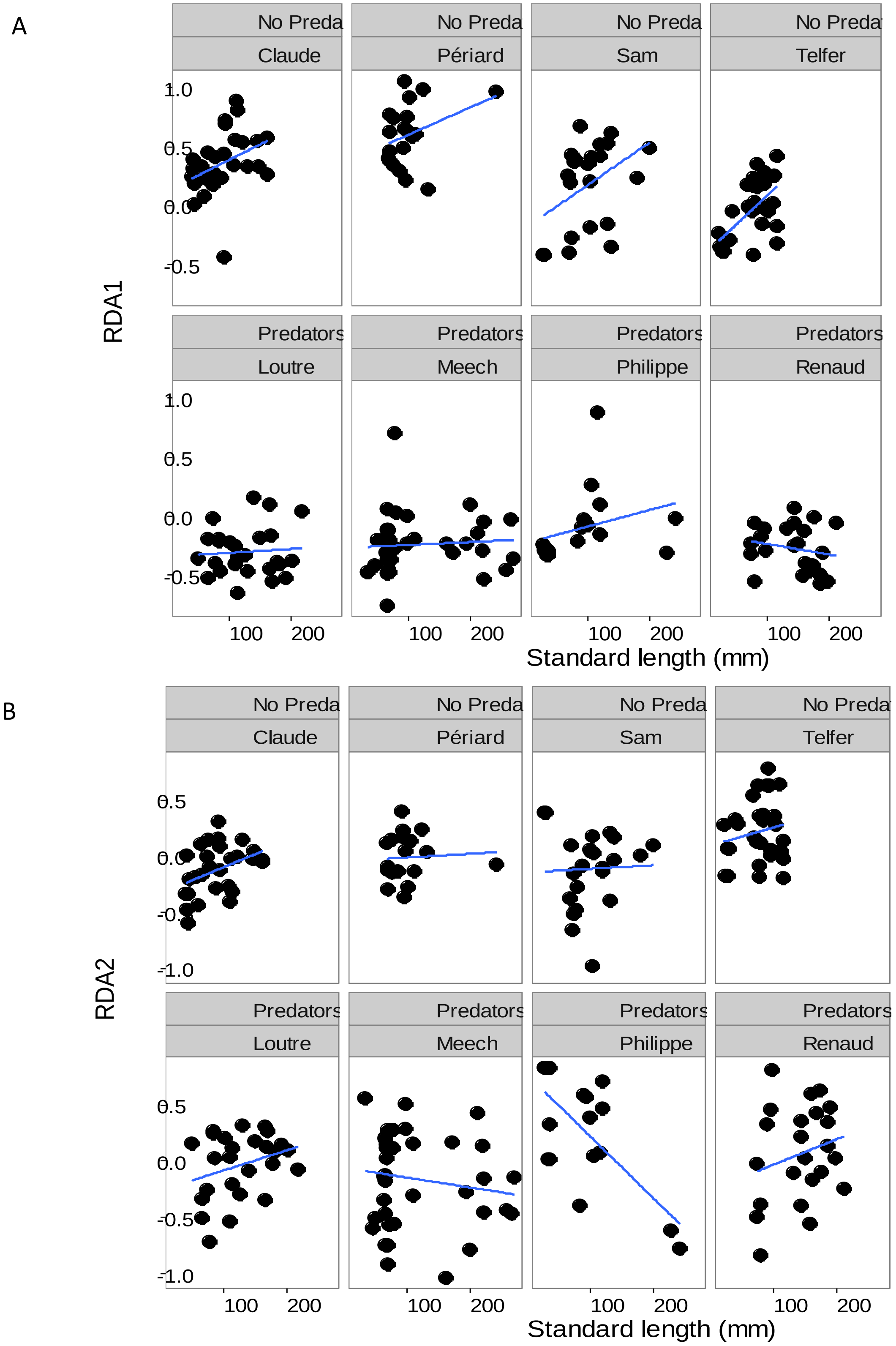

Figure 7 - Individual ordination scores for the first (Panel A) and second (Panel B) eigenvectors for observations subjected to a Redundancy analysis (RDA) of fatty acid composition for YP captured in four lakes with top piscivores and four lakes without top piscivores in the Outaouais region (Quebec, Canada). Data is represented for standard length of YP and is separated by lakes. Analysis is based on the fatty acid signatures of 201 YP using 23 fatty acids. RDA1 and RDA2 = first two eigenvectors.

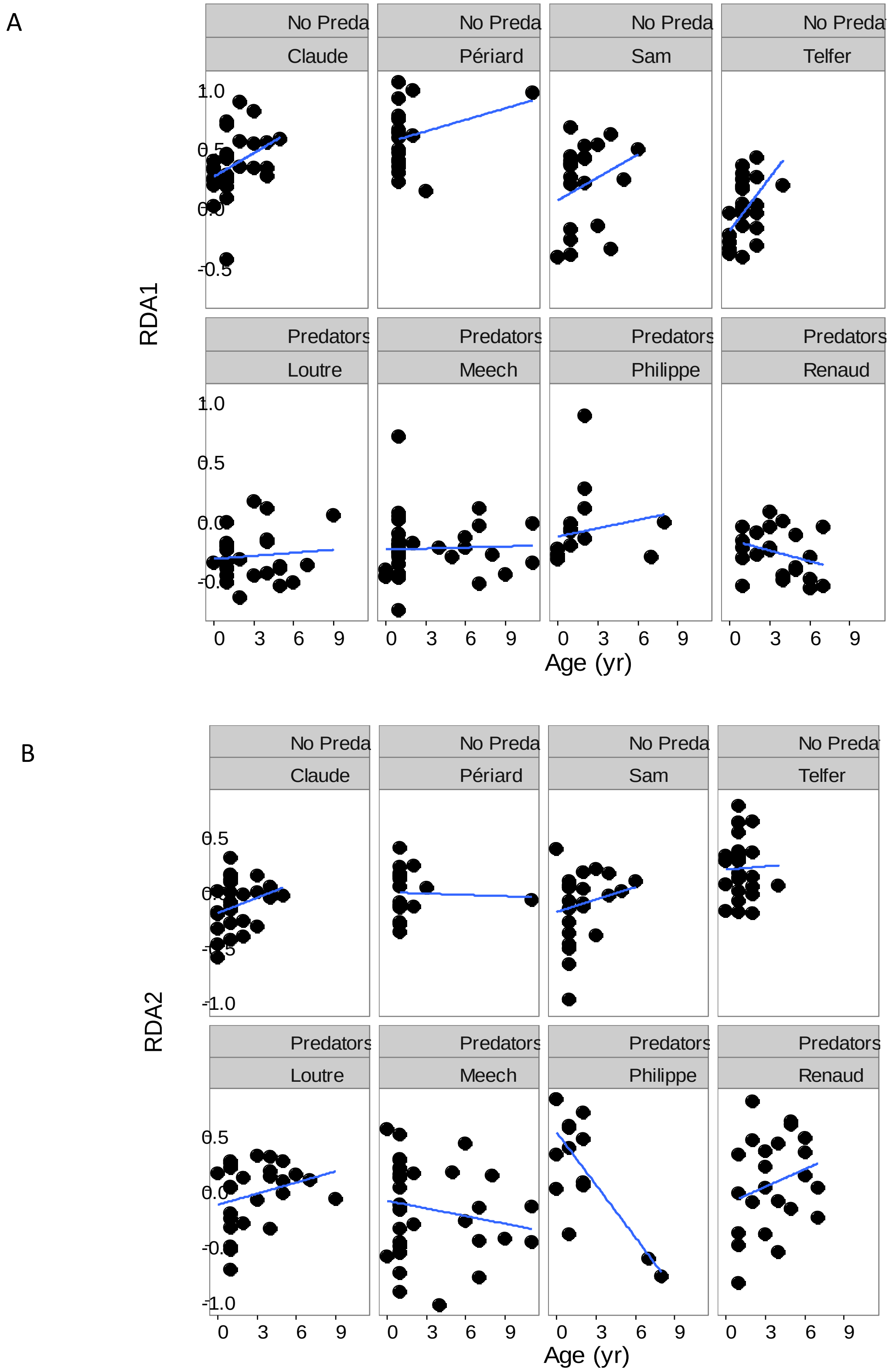

Figure 8 - Individual scores for the first (Panel A) and second (Panel B) component of each data point obtained from a Redundancy analysis (RDA) of fatty acid composition for YP captured in four lakes with top piscivores and four lakes without top piscivores in the Outaouais region (Quebec, Canada). Data is represented for the age of YP and is separated by lakes. Analysis is based on the fatty acid signatures of 200 YP using 23 fatty acids. RDA1 and RDA2 = first two eigenvectors.

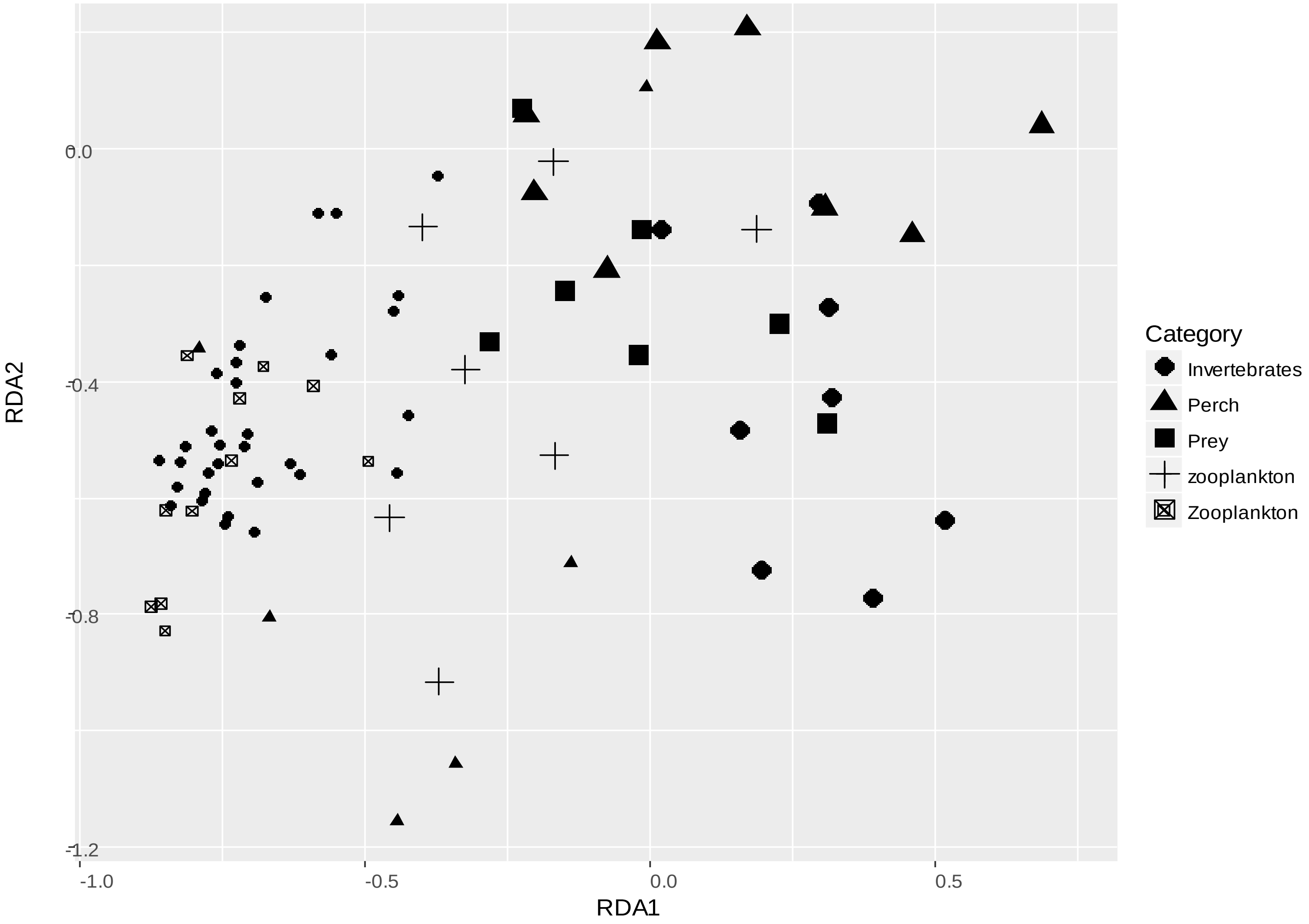

Figure 9 - Ordination scores for observations subjected to a Redundancy analysis (RDA) of fatty acid composition for yellow perch, fish prey, invertebrates, and zooplankton captured in four lakes with top piscivores and four lakes without top piscivores in the Outaouais region (Quebec, Canada). The two eigenvectors (RDA1 and RDA2) account for 42.1% of the variation (RDA1=27.3% and 2=14.8%). Larger symbols (as well as the cross symbol for *zooplankton*) represent data obtained in this study. Smaller symbols (as well as square symbol for *Zooplankton*) represent predicted RDA1 and RDA2 scores (RDA 1 and RDA2) from fatty acids profiles published in five studies (Czesny, et al., 2011; Lau, et al., 2012; Vasconi, et al., 2014; Cappelli, 2012; Gonzalez, et al., 2006).

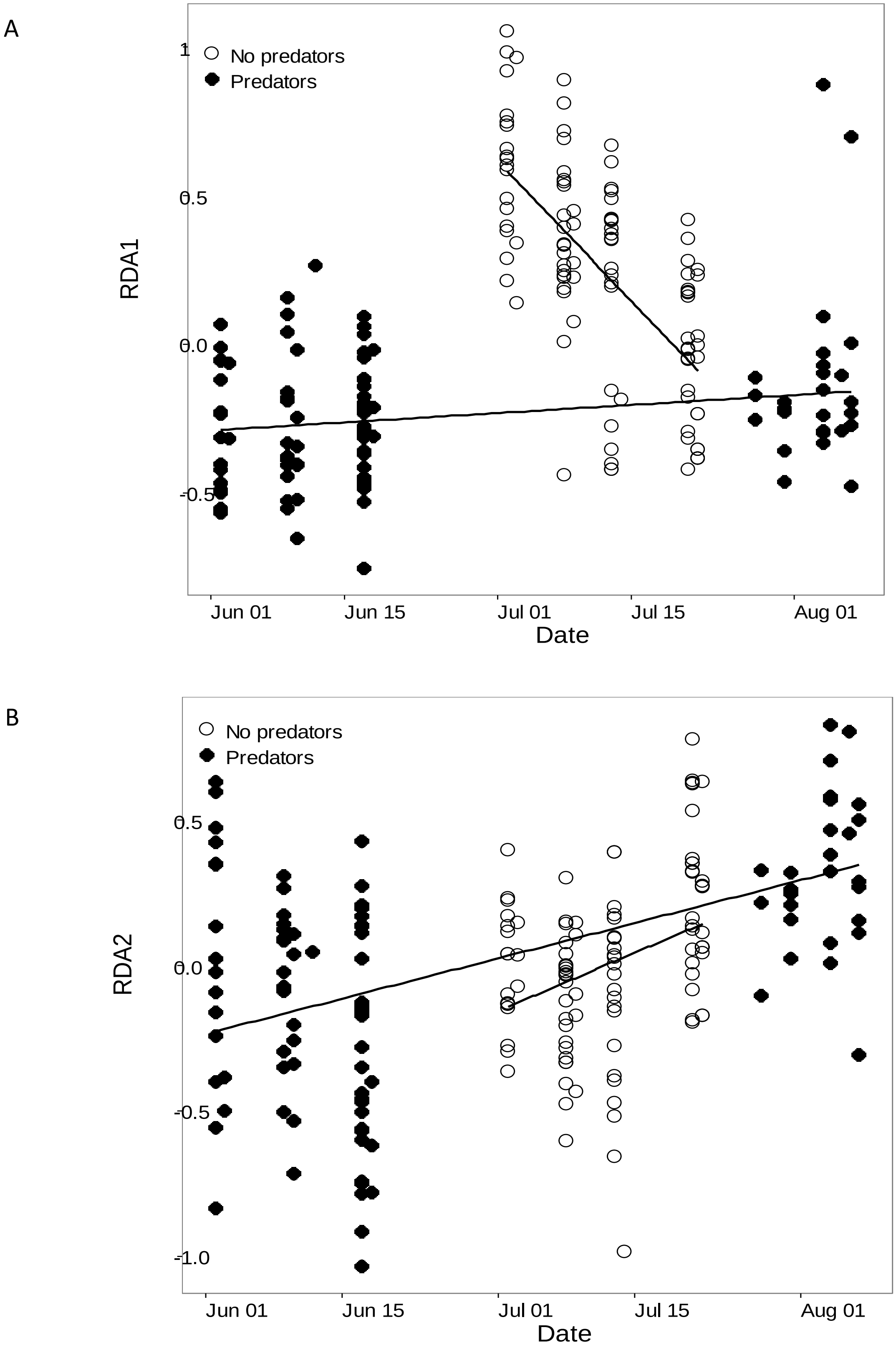

Figure 10 - Individual scores for the first (Panel A) and second (Panel B) component of each data point obtained from a Redundancy analysis (RDA) of fatty acid composition for YP captured in four lakes with top piscivores and four lakes without top piscivores in the Outaouais region (Quebec, Canada). Data is represented based on date of capture of specimens. RDA1 and RDA2 = first two eigenvectors.

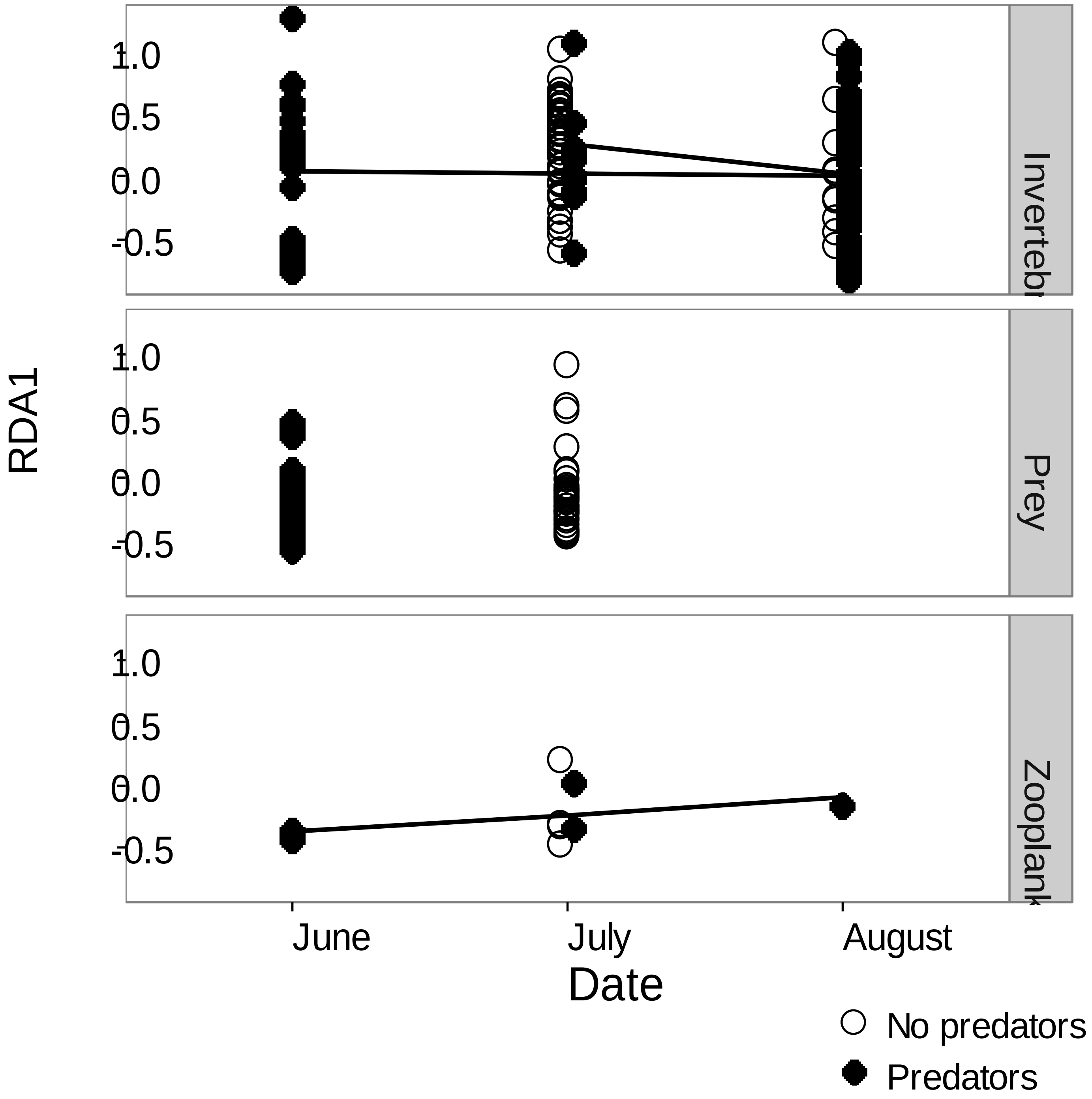

Figure 11 - Individual scores for the first component of each data point obtained from a Redundancy analysis (RDA) of fatty acid composition for invertebrates, fish prey, and zooplankton captured in four lakes with top piscivores and four lakes without top piscivores in the Outaouais region (Quebec, Canada). Data is represented based on date of capture of specimens. RDA1 = first eigenvector.

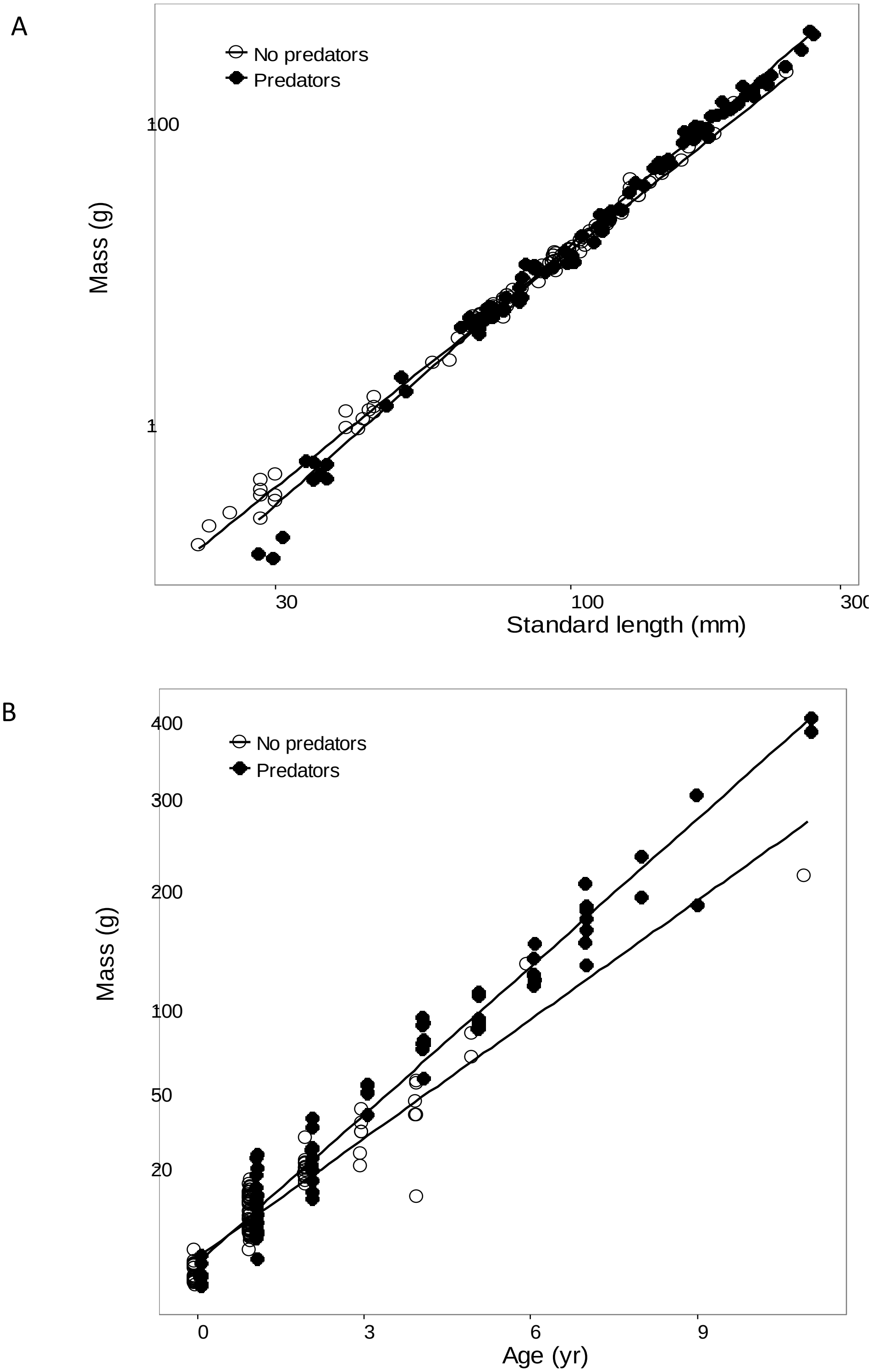

Figure 12 – Scatterplot of mass and standard length (Panel A) and mass and age (Panel B) for yellow perch captured in four lakes with top piscivores and four lakes without top piscivores in the Outaouais region (Quebec, Canada). In both panels, the mass axis and standard length is expressed as logarithm (10). Individual coefficients of determination (R2) for lakes with and without top piscivores are 0.88 and 0.90, respectively (Panel A) and 0.76 and 0.83 (in Panel B).

Table 2 - List of fatty acids identified with their structural name, common name, shorthands structural formula and type of omega unsaturation. SAFA = Saturated fatty acids, MUFA = Monounsaturated fatty acids, PUFA = polyunsaturated fatty acids.

IUPAC name	Common name (common abbreviation)	Carbon number: Double bond number	Omega (ω) type
	SAFA		
Dodecanoic acid	Lauric acid	12:0	
Tetradecanoic acid	Myristic acid	14:0	
Pentadecylic acid		15:0	
Hexadecanoic acid	Palmitic acid	16:0	
Heptadecanoic acid	Margaric acid	17:0	
Octadecanoic acid	Stearic acid	18:0	
Icosanoic acid	Arachidic acid	20:0	
Docosanoic acid	Behenic acid	22:0	
Tetracosanoic acid	Lignoceric acid	24:0	
	MUFA		
Tetradecenoic acid	Myristoleic acid	14:1	ω-5
Pentadecenoic acid		15:1	
Hexadecenoic acid	Palmitoleic acid	16:1	ω-7
Octadecenoic acid	Oleic acid	18:1	ω-9
Eicosenoic acid	Gadoleic acid	20:1	ω-11
Docosenoic acid	Erucic acid	22:1	ω-9
Tetracosenoic acid	Nervonic acid	24:1	
	PUFA		
octadecadienoic acid	Linoleic acid (LA)	18:2	ω-6
octadecatrienoic acid	α-Linolenic acid (ALA)	18:3	ω-3
octadecatrienoic acid	γ-Linolenic acid (GLA)	18:3	ω-6
octadecatetraenoic acid	Stearidonic acid	18:4	ω-3
Eicosadienoic acid		20:2	
Eicosatrienoic acid	Mead acid	20:3	ω-9
Eicosatrienoic acid	Dihomo-γ-linolenic acid (DGLA)	20:3	ω-6
Eicosatetraenoic acid	Arachidonic acid (ARA)	20:4	ω-6
Eicosapentaenoic acid	Eicosapentaenoic acid (EPA)	20:5	ω-3
Docosatrienoic acid		22:3	ω-3
Docosapentaenoic acid	Docosapentaenoic acid (DPA)	22:5	ω-3
Docosahexaenoic acid	Docosahexaenoic acid (DHA)	22:6	ω-3

Appendix 1 - Fish species and number of specimens captured

Fish species and number of specimens captured. The "total" column represents the total number of species in each lake. S.B=Smallmouth bass (*Micropterus dolomieu*); L.B=Largemouth bass (*Micropterus salmoides*); B.S=Bluegill (*Lepomis macrochirus*); Ps=Pumpkinseed (*Lepomis gibbosus*); B.B=Brown bullhead (*Ameiurus nebulosus*); F.D=Fantail darter (*Etheostoma flabellare*); J.D=Johnny darter (*Etheostoma nigrum*); C.D=Channel darter (*Percina copelandi*); G.S=Golden shiner (*Notemigonus crysoleucas*); N.P=Northern pike (*Esox lucius*); W.S=White sucker (*Catostomus commersonii*); B.T=Brook trout (*Salvelinus fontinalis*); C.M=Central mudminnow (*Umbra limi*).

Family	Centrarchidae				Ictaluridae	Percidae			Cyprinidae		Esocidae	Catostomidae	Salmonidae	Umbridae	Total
Species	S.B	L.B	B.S	Ps	B.B	F.D	J.D	C.D	G.S	Other[1]	N.P	W.S	B.T	C.M	
Périard	-	-	-	-	7	-	-	-	250	10[2]	-	1	-	-	4
Sam	-	-	-	35	-	-	-	4	10	12[3]	-	2	-	-	5
Claude	-	-	-	-	3	-	-	-	-	-	-	-	-	-	1
Telfer	-	-	-	-	5	-	2	-	-	90[4]	-	19	50	-	6
Loutre	14	-	30	31	1	2	-	-	7	21[5]	24	4	-	-	9
Meech	8	-	-	170	1	-	-	-	1	15[6]	-	3	7	-	7
Philippe	26	32	-	33	4	-	-	-	17	18[7]	-	9	1	-	7
Renaud	4	12	2	64	13	-	-	-	25	-	-	23	-	4	8

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[1] Cyprinids could not be identified (except golden shiner) in the field and a subset were brought back to the laboratory for identification.

[2] The fish were identified as northern redbelly dace (*Phoxinus eos*)

[3] The fish were identified as bluntnose minnow (*Pimephales notatus*)

[4] The fish were identified as bluntnose minnow (*Pimephales notatus*) and as northern redbelly dace (*Phoxinus eos*)

[5] The fish were identified as rosyface shiner (*Notropis rubellus*)

[6] The fish were identified as blackchin shiner (*Notropis heterodon*)

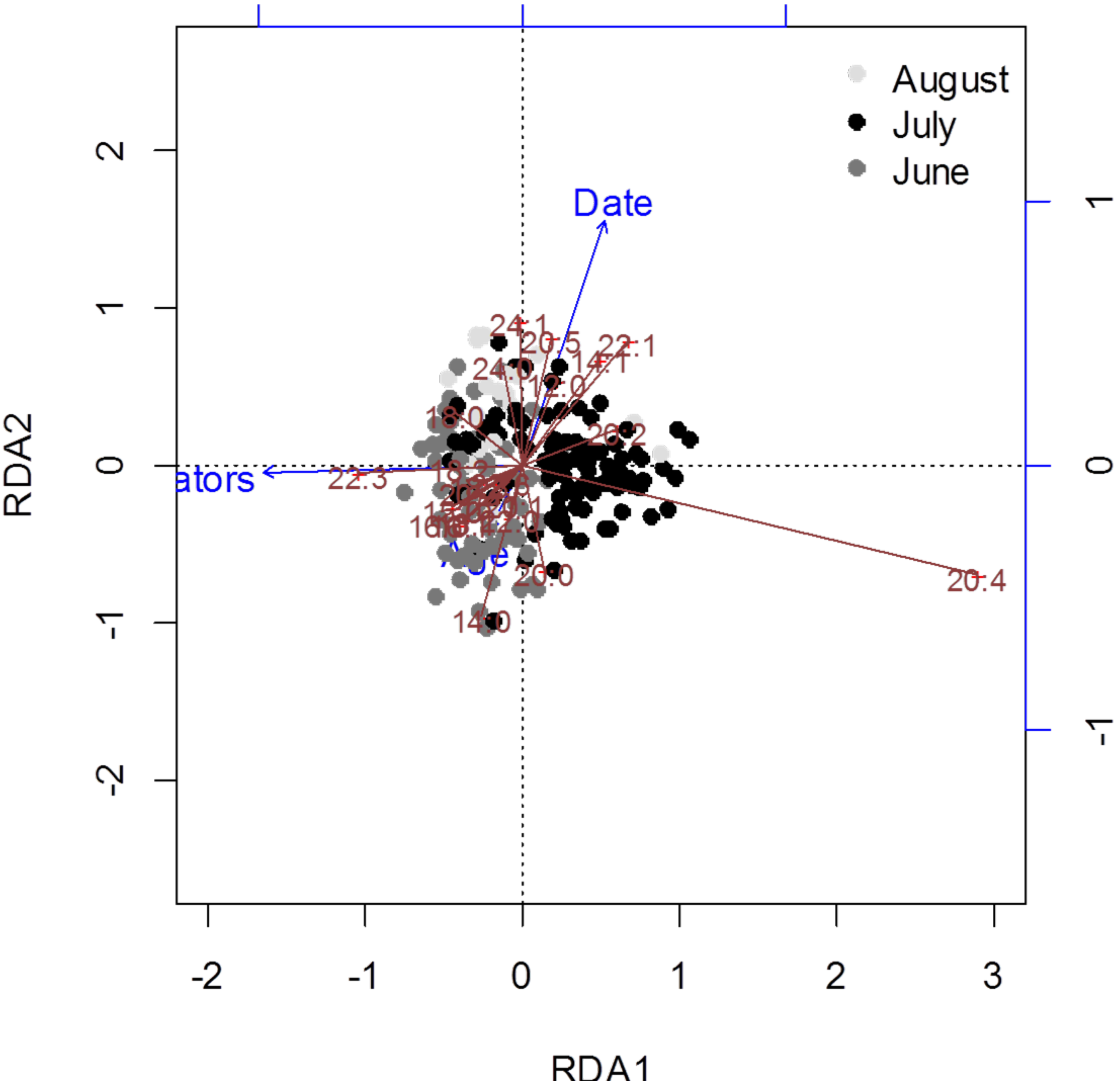
[7] The fish were identified as blackchin shiner (*Notropis heterodon*) and as bluntnose minnow (*Pimephales notatus*)

Appendix 2 – Measurements of yellow perch

Mean total length (TL), standard length (SL), mass (W), Fulton's body condition factor (F.C.F) and age for yellow perch captured in eight lakes. Means are represented per lake and per life stage of individuals. Standard deviations are in brackets when sample size for life stage was greater than one. The sample size for each life stage per lake is in brackets beside the life stage. Sample size for Lake Claude, Loutre, Meech, Périard, Philippe, Renaud, Sam, and Telfer are 26, 20, 20, 30, 23, 17, 26, and 37 respectively.

Lake	Life Stage	TL (mm)	SL (mm)	W (grams)	F.C.F	Age (years)
	Female	138.89 (31.22)	120.33 (26.32)	29.85 (20.75)	1.51 (0.18)	3 (1)
Claude	Male	150.50 (26.41)	127.75 (24.51)	34.34 (19.62)	1.48 (0.16)	3 (1)
	Juvenile	70.46 (17.17)	56.85 (14.29)	2.92 (2.10)	1.35 (0.10)	0 (1)
	Female	198.25 (40.45)	164.75 (31.59)	92.12 (51.70)	1.83 (0.16)	5 (2)
Loutre	Male	150.50 (36.07)	126.00 (27.08)	39.13 (30.08)	1.69 (0.17)	2 (2)
	Juvenile	89.25 (14.22)	74.00 (12.21)	7.50 (3.47)	1.70 (0.13)	1 (0)
	Female	237.57 (62.97)	199.29 (53.46)	175.78 (133.20)	1.80 (0.21)	6 (3)
Meech	Male	206.50 (77.43)	176.50 (66.52)	133.97 (128.67)	1.60 (0.27)	7 (5)
	Juvenile	79.95 (14.49)	64.64 (12.40)	4.64 (2.08)	1.54 (0.18)	1 (0)
	Female	142.33 (55.45)	119.89 (47.68)	39.99 (66.00)	1.49 (0.14)	2 (3)
Périard	Male	118.25 (9.74)	100.00 (8.29)	13.30 (3.96)	1.30 (0.06)	1 (1)
	Juvenile	86.71 (4.50)	71.57 (3.15)	5.40 (0.95)	1.46 (0.09)	1 (0)
	Female	169.00 (75.77)	145.50 (68.49)	84.28 (105.38)	1.59 (0.19)	4 (3)
Philippe	Male	130.00 (11.27)	113.00 (11.27)	21.64 (8.40)	1.44 (0.21)	2 (1)
	Juvenile	49.25 (21.72)	39.75 (18.63)	1.61 (3.63)	0.93 (0.38)	0 (0)
	Female	179.47 (44.97)	152.40 (38.98)	74.66 (49.77)	1.75 (0.23)	4 (2)
Renaud	Male	183.20 (40.57)	150.80 (34.02)	70.69 (33.57)	1.81 (0.32)	4 (2)
	Juvenile	91.33 (4.04)	76.00 (3.46)	6.12 (0.68)	1.39 (0.04)	1 (0)
	Female	144.80 (35.77)	122.70 (29.76)	32.32 (36.68)	1.37 (0.16)	2 (1)
Sam	Male	211.00 (NA)	180.00 (NA)	83.64 (NA)	1.43 (NA)	5 (NA)
	Juvenile	77.56 (25.01)	65.67 (21.35)	4.68 (2.81)	1.27 (0.14)	1 (0)
	Female	119.38 (9.30)	101.13 (8.32)	14.90 (3.10)	1.43 (0.11)	2 (1)
Telfer	Male	120.00 (16.09)	105.67 (13.05)	16.43 (5.86)	1.35 (0.04)	2 (1)
	Juvenile	63.32 (27.55)	52.68 (25.14)	3.50 (3.33)	1.53 (0.17)	0 (1)

Appendix 3 – RDA of fatty acid composition for yellow perch separated by the month of capture



Individual ordination scores for observations subjected to an RDA of fatty acid composition for yellow perch captured in four lakes with top piscivores and four lakes without top piscivores in the Outaouais region (Quebec, Canada) separated by the month of capture. The analysis used the age of the YP, the date of capture, and the predation type of each lake as constraints (represented as blue vectors pointing in the direction of maximum variance accounted for by the respective constraint). Analysis is based on the fatty acid signatures of 201 YP using 23 fatty acids (black vectors). The first two eigenvectors (RDA1 and RDA2) account for 42.1% of the variation (1=27.6% and 2=14.6%) in FAs composition among the observations.

Appendix 4 – Supplementary Information

Variables																										Fatty Acids (% relative concentration of total FAs)																										
Category	Taxa	Family	Organism	Predation Type	Lake	Date	Area (ha)	Altitude (m)	Perimeter (m)	Max Depth (m)	Mean Depth (m)	SD Ratio	pH	Temp. (Co)	Cond (uS)	Capture Method	Time in water	State at capture	Sex	Killing Method	Tlength (mm)	Slength (mm)	Weight (g)	Fulton Condition	Age (year)	Lauric	Myristic	Myristoleic	Pentadecylic	Pentadecenoic	Palmitic	Palmitoleic	Stearic	Oleic	Linoleic	Arachidic	a-Linolenic	Eicosenoic	Eicosadienoic	Arachidonic	Behenic	Eicosatrienoic	Docosenoic	Eicosapentaenoic	Lignoceric	Docosatrienoic	Nervonic	Docosanexaenoic	n-3/n-6	PLFAQuantity	unsaturation index	MUFA/PUFA
Invertebrates	Odonata	gomphidae	Anisoptera	No Predators	Claude	July	15	215	1410			1	7.2	22.1	12	Kicknet		Alive		Freezing			0.01			0.24	0.28	0.06	0.63	0.06	19.19	5.78	12.32	21.55	5.68	0.93	4.71	1.77	8.11	0.55	3.15	4.96	1.33	5.43	1.41	0.38	0.53	0.94	0.57		112.11	1.16
Invertebrates	Odonata	gomphidae	Anisoptera	No Predators	Claude	July	15	215	1410			1	7.2	22.1	12	Kicknet		Alive		Freezing			0.01			0.94	2.75	0.21	1.67	0.45	24.47	9.96	9.76	20.94	3.53	0.5	1.74	1.18	3.04	1.36	8.75	1.27	1.57	3.16	0.93	0.14	0.81	0.85	0.63		80.94	2.45
Invertebrates	Odonata	coenagrionidae	Zygoptera	No Predators	Claude	July	15	215	1410			1	7.2	22.1	12	Kicknet		Alive		Freezing			0.01			0.81	2.22	0.26	2.11	0.23	28.43	9.68	12.63	19.11	5.23	0.26	3.31	0.14	1.68	0.56	2.48	2.28	0.12	4.16	1.26	0.41	1.49	1.13	0.88		86.35	1.85
Invertebrates	Odonata	coenagrionidae	Zygoptera	No Predators	Claude	July	15	215	1410			1	7.2	22.1	12	Kicknet		Alive		Freezing			0.01			1.59	2.88	0.84	1.92	0.37	21.76	9.34	10.35	17.47	4.63	0.4	3.22	1	1.87	0.59	9.72	1.57	0.78	4.79	1.49	0.49	0.47	2.44	1.21		96.38	1.64
Invertebrates	Odonata	corduliidae	Anisoptera	No Predators	Claude	July	15	215	1410			1	7.2	22.1	12	Kicknet		Alive		Freezing			0.13			0.36	1.12	0.86	0.61	0.34	16.26	2.52	13.46	16.86	5.94	3.89	0.72	7.66	4.52	6.25	0.93	5.01	0.71	7.8	3.35	0	0	0.86	0.43		130.42	0.97
Invertebrates	Odonata	corduliidae	Anisoptera	No Predators	Claude	July	15	215	1410			1	7.2	22.1	12	Kicknet		Alive		Freezing			0.04			0.16	1.09	0.47	0.93	0.29	28.31	3.92	10.86	25.6	11.76	7.25	0.6	2.01	0.77	3.86	0.49	4.34	0.27	1.62	0.95	0	0	0.44	0.13		110.71	1.24

Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates
Odonata	Odonata	Odonata	Odonata	Odonata	Odonata	Odonata	Odonata	Odonata
coenagrionidae	coenagrionidae	coenagrionidae	coenagrionidae	coenagrionidae	corduliidae	corduliidae	corduliidae	corduliidae
Zygoptera	Zygoptera	Zygoptera	Zygoptera	Zygoptera	Anisoptera	Anisoptera	Anisoptera	Anisoptera
No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators
Claude	Claude	Claude	Claude	Claude	Claude	Claude	Claude	Claude
July	July	July	July	July	July	July	July	July
15	15	15	15	15	15	15	15	15
215	215	215	215	215	215	215	215	215
1410	1410	1410	1410	1410	1410	1410	1410	1410
1	1	1	1	1	1	1	1	1
7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2
22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1
12	12	12	12	12	12	12	12	12
Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet
Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing
0.02	0.03	0.02	0.03	0.02	0.03	0.63	0.03	0.03
0.97	1.4	1.36	0.68	1.42	0.4	2.39	0.59	0.28
3.46	1.79	1.07	1.2	2.04	1.46	1.35	1.18	2.17
0.98	0	2.46	1.59	3.61	1.17	3.16	1.47	0.61
0.76	3.12	0.8	0.99	1.31	0.48	0	0.58	0
0	0	0	0	0	0	0	0	0
13.92	15.94	8.78	19.29	20.99	13.04	14	20.49	15.73
7.81	7.32	6.05	5.78	11.13	3.8	4.55	4.5	6.89
9.75	7.76	5.51	9.8	9.49	7.46	8.29	12.78	25.47
17.87	16.9	11.03	21.77	17.08	17.29	15.08	23.21	6.89
5.18	5.68	3.43	10.24	7.84	2.91	5.16	4.45	3.85
3.74	0	0.37	0.73	0	4.49	3.87	3.29	0
0.63	4.42	4.13	8.78	6.22	0	1.42	0	0
7.98	2.41	5.78	1.52	2.61	3.82	2.71	6.96	8.86
8.2	1.59	2.56	2.72	2.57	3.8	3.01	1.23	2.23
9.91	2.62	8.05	5.71	1.27	7.59	2.66	2.16	3.23
1.65	1.57	3.67	0.49	2.52	0.75	0.58	1.67	2.63
3.2	23.12	1.86	5.49	4.05	1.61	4.17	2.8	3.9
0.7	1.48	17.27	0.61	1.53	9.4	7.39	1.44	1.7
0	0	0	0	0	10.19	8.31	6.83	9.48
1.5	0.76	1.1	0.59	1.47	7.34	7.41	3.49	4.72
0	0.9	0	0.9	1.22	1.84	1.66	0.24	0
0	0	0	0	0	0	2.84	0	0
1.79	1.23	14.73	1.1	1.64	1.15	0	0.66	1.38
0.09	0.17	1.19	0.41	0.5	0.71	0.65	0.7	0.82
119.43	73.84	180.94	112.91	92.77	153.01	126.26	107.38	102.48
1.2	1.71	1.28	1.04	1.73	1.11	1.37	1.99	1.24

Invertebrates	Odonata	coenagrionidae	Zygoptera	No Predators	Claude	July	15	215	1410			1	7.2	22.1	12	Kicknet		Alive		Freezing			0.02			0.83	5.32	1.23	0.69	0	11.35	8.05	8.75	7.05	10.05	4.91	4.78	6.22	9.71	11.44	2.56	3.32	1.1	0	0.95	0	0	1.68	0.19		141.54	0.56
Invertebrates	Odonata	coenagrionidae	Zygoptera	No Predators	Claude	July	15	215	1410			1	7.2	22.1	12	Kicknet		Alive		Freezing			0.01			0.58	1.54	0.21	0.88	0.16	23.07	6.62	8.53	30.75	2.64	0.49	1.78	4.4	1.29	1.99	5.68	1.79	2	2.69	0.76	0.07	1.52	0.56	0.74		83.79	3.97
Invertebrates	Odonata	coenagrionidae	Zygoptera	No Predators	Claude	July	15	215	1410			1	7.2	22.1	12	Kicknet		Alive		Freezing			0.01			2.49	2.21	5.45	1.36	0	16.12	10.03	8.8	18.37	5.68	0.54	4.62	6.89	2.05	1.28	2.24	2.3	2.44	5.28	0.41	0	0	1.44	1		113.56	2.06
Invertebrates	Odonata	coenagrionidae	Zygoptera	No Predators	Claude	July	15	215	1410			1	7.2	22.1	12	Kicknet		Alive		Freezing			0.02			1.6	1.37	4.31	1.11	1.19	15.79	8.74	9.26	19.44	5.35	4.48	0	6.03	3.6	3.65	0.86	3.66	0.99	5.74	0.9	0	0	1.92	0.47		127.66	1.65
Invertebrates	Odonata	coenagrionidae	Zygoptera	No Predators	Claude	July	15	215	1410			1	7.2	22.1	12	Kicknet		Alive		Freezing			0.03			1.6	1.61	3.18	0.98	0	13.83	5.84	7.34	19.22	6.99	4.38	0.85	4.88	5.46	11.61	1.57	4.55	0.77	3.15	0.4	0.86	0	0.9	0.17		137.48	0.99
Invertebrates	Odonata	coenagrionidae	Zygoptera	No Predators	Claude	July	15	215	1410			1	7.2	22.1	12	Kicknet		Alive		Freezing			0.02			1.53	4.23	1.02	1.09	0	17.78	7.9	9.77	21.44	7.08	5.57	0	5	1.73	2.77	1.41	3.97	0.36	4.89	1.23	0	0.52	0.72	0.36		113.22	1.59
Invertebrates	Odonata	coenagrionidae	Zygoptera	No Predators	Claude	July	15	215	1410			1	7.2	22.1	12	Kicknet		Alive		Freezing			0.02			1.16	1.24	2.61	0.9	0	15.77	7.22	8.55	22.15	8.74	5.93	0	3.47	3.32	4.13	1.5	5.73	0.74	5.17	0	1.13	0	0.56	0.26		128.99	1.25
Invertebrates	Odonata	coenagrionidae	Zygoptera	No Predators	Claude	July	15	215	1410			1	7.2	22.1	12	Kicknet		Alive		Freezing			0.02			0.37	1.33	1	1.15	0	19.11	5.58	8.82	21.43	9.52	8.03	0.93	2.09	2.76	5.86	0.79	6.46	0.42	2.01	0.76	0.59	0.32	0.69	0.15		123.8	1.01
Invertebrates	Odonata	gomphidae	Anisoptera	No Predators	Claude	July	15	215	1410			1	7.2	22.1	12	Kicknet		Alive		Freezing			0.12			0.25	0.96	0.15	0.74	0.2	24.4	4.29	13.25	22.58	8.78	0.97	6.55	0.71	5.14	0.2	0.9	5.59	0.5	2.41	0.43	0.32	0.09	0.62	0.49		97.21	1.14

Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates
Coleoptera	Ephemeroptera	Odonata	Odonata	Diptera	Diptera	Coleoptera	Odonata	Odonata
gyrinidae	Caenidae	gomphidae	coenagrionidae	chironomidae	chironomidae	haliplidae	corduliidae	gomphidae
Coleoptera	Ephemeroptera	Anisoptera	Zygoptera	Diptera	Diptera	Coleoptera	Anisoptera	Anisoptera
Predators	Predators	Predators	Predators	Predators	Predators	Predators	No Predators	No Predators
Loutre	Loutre	Loutre	Loutre	Loutre	Loutre	Loutre	Claude	Claude
August	August	August	July	August	August	August	July	July
14.16	14.16	14.16	14.16	14.16	14.16	14.16	15	15
198	198	198	198	198	198	198	215	215
2005	2005	2005	2005	2005	2005	2005	1410	1410
3.6	3.6	3.6	3.6	3.6	3.6	3.6		
1.5	1.5	1.5	1.5	1.5	1.5	1.5		
1.5	1.5	1.5	1.5	1.5	1.5	1.5	1	1
8.5	8.5	8.5	8.5	8.5	8.5	8.5	7.2	7.2
26.3	26.3	26.3	26.3	26.3	26.3	26.3	22.1	22.1
166	166	166	166	166	166	166	12	12
Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet
Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing
0	0	0.02	0.01	0	0	0	0.03	0.02
2.78	1.89	4.71	1.8	1.6	1.93	0.58	0.9	0.54
2.46	3.73	3.61	2.18	4.12	3.8	1.45	2.26	3.41
1.29	1.44	4.23	3.17	0.95	1.3	0.38	1.11	0.05
1.55	2.19	1.27	1.15	2.45	2.22	0.75	0.8	0.7
0.25	0.43	0.43	0	0.42	0.6	0.11	2.39	0.21
28.52	26.28	16.97	19.05	25.87	23.23	46.17	11.91	17.98
9.46	10.81	11.26	6.16	10.37	10.12	5.28	4.15	7.53
8.97	8.66	8.92	9.93	10.82	10.07	4.58	8.92	11.22
17.69	15.91	20.87	19.01	20.46	18.13	8.19	11.2	20.13
8.1	4.31	8.79	4.69	7.04	6.31	8.68	4.68	6.86
0.19	0.1	0.54	3.63	0.49	3.2	0.48	3.83	0.9
7.06	2.36	5.56	0.8	2.47	6.27	17.5	1.29	5.21
0.18	0.53	0.82	3.24	0.74	0.66	0.33	5.95	0.61
4.96	11.36	1.76	5.04	0.94	0.83	1.03	2.48	6.16
0.19	0.89	0.16	2.91	0.3	0.33	0.17	2.78	0.39
1.85	2.77	2.2	2.85	2.81	3.76	1.47	2.76	3.5
1.27	1.14	2.7	2.53	0.63	0.83	0.77	1.76	5.13
0.17	0.43	0.18	1.82	1.24	1.83	0.31	7.49	1.43
2.23	2.17	3.42	4.07	3.07	2.21	0.98	11.6	3.92
0.51	0.97	0.94	0.89	1.23	0.94	0.36	6.12	1.14
0	0.11	0.05	2.86	0.09	0.1	0.03	0	0.53
0	0.27	0.13	0.85	0.61	0.09	0.21	5.63	0.69
0.32	1.25	0.47	1.36	1.28	1.25	0.18	0	1.76
0.66	0.33	0.7	0.41	0.76	1.17	1.75	1.1	0.59
90.75	90.02	98.42	116.47	84.27	98.46	95.27	137.78	108.83
1.26	1.32	1.83	1.35	2.22	1.6	0.51	1.42	1.19

Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates
Odonata	Diptera	Trichoptera	Trichoptera	Odonata	Odonata	Odonata	Odonata	Diptera
coenagrionidae	chironomidae	psychomyiidae	philopotamidae	aeshnidae	corduliidae	corduliidae	corduliidae	chironomidae
Zygoptera	Diptera	Tricoptera	Tricoptera	Anisoptera	Anisoptera	Anisoptera	Anisoptera	Diptera
Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators
Meech	Loutre	Loutre	Loutre	Loutre	Loutre	Loutre	Loutre	Loutre
August	August	August	August	August	July	July	July	August
14.16	14.16	14.16	14.16	14.16	14.16	14.16	14.16	14.16
198	198	198	198	198	198	198	198	198
2005	2005	2005	2005	2005	2005	2005	2005	2005
3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
26.3	26.3	26.3	26.3	26.3	26.3	26.3	26.3	26.3
166	166	166	166	166	166	166	166	166
Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet
Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing
0.04	0	0	0	0.05	0.22	0.03	0.32	0
0.63	0.42	1.29	0.24	0.6	0.29	0.72	0.13	0.35
2.09	2.15	6.78	3.55	1.89	1.38	2.61	2.13	14.26
2.12	0.12	0.77	0.09	0.46	0.42	0.68	0	0.26
0.99	0.83	3.08	1.07	1.2	0.85	0.44	1.5	1.88
0.97	0.15	0.57	0.1	0.24	0	0	0	0.38
16.01	28.02	25.75	25.73	24.3	18.52	8.59	24.66	30.22
5.78	3.67	10.92	7.5	6.52	4.93	4.07	5.01	16.08
8.2	36.66	8.46	7.08	11.31	8.59	7.22	11.47	4.15
18.69	13.1	17.7	15.32	19.05	27.64	9.32	17.23	15.18
7.83	3.88	3.75	12.81	9.33	9.93	2.95	7.74	4.62
4.79	1.13	3.88	1.28	0.72	6.31	2.45	7.15	6.94
1.91	1.49	2.72	11.24	9.16	1.16	0	4.03	2.53
1.61	0.53	0.54	0.23	0.44	1.62	4.77	3.99	0.34
1.35	1.23	2.82	4.11	3.03	0.95	8.28	1.55	0.32
3.6	0.16	0.45	0.02	0.07	7.78	28.54	4.12	0.09
3.33	0.74	3.68	0.25	0.8	0.2	1.73	0.32	0.31
11.21	0.24	0.65	8.2	3.26	7.25	3.27	4.22	0.17
1.08	0.58	1.57	0.2	0.69	0.18	1.92	0.53	0.31
2.83	0.89	1.92	0.34	3.67	1.18	7.2	2.78	0.77
0.82	0.5	0.67	0.13	0.91	0.53	4.17	0.54	0.45
0.95	0.09	0.79	0.12	0.06	0	0.2	0	0.05
0.17	0.04	0.06	0.09	1.92	0	0.29	0.67	0.01
3.03	3.38	1.19	0.32	0.38	0.28	0.57	0.24	0.31
0.32	1.04	0.76	0.47	0.84	0.1	0.18	0.4	0.7
119.65	62.89	89.39	100.22	105.41	116.19	178.92	114.36	83.93
1.16	1.49	1.83	0.78	1.11	1.26	0.42	0.99	2.09

Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates
Hemiptera	Hemiptera	Odonata	Ephemeroptera	Odonata	Odonata	Odonata	Odonata	Odonata
nepidae	nepidae	coenagrionidae	ephemerellidae	coenagrionidae	coenagrionidae	coenagrionidae	coenagrionidae	coenagrionidae
Hemiptera	Hemiptera	Zygoptera	Ephemeroptera	Zygoptera	Zygoptera	Zygoptera	Zygoptera	Zygoptera
Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators
Meech	Meech	Meech	Meech	Meech	Meech	Meech	Meech	Meech
August	August	August	August	August	August	August	August	August
304	304	304	304	304	304	304	304	304
171	171	171	171	171	171	171	171	171
17900	17900	17900	17900	17900	17900	17900	17900	17900
22.2	22.2	22.2	22.2	22.2	22.2	22.2	22.2	22.2
9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9
2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1
88	88	88	88	88	88	88	88	88
Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet
Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing
0.06	0.09	0.04	0.01	0.04	0.04	0.04	0.03	0.02
0.43	1.66	0.67	0	0.84	0	0	0	0.71
2.49	3.3	2.02	3.92	2.84	2.4	2.49	2.1	1.16
0.89	4.92	1.2	0	1.51	0	0	0	1.26
0.47	0.87	0.81	2.29	1.51	1.06	0	0	0.49
0	0.64	0	0	0.32	0	0	0	0
20.91	16.87	17.23	23.79	20.56	22.62	21.98	20.02	11.81
8.65	9.37	7.15	15.31	8.52	10.89	9.2	9.96	5.15
8.12	6.99	6.81	9.87	10.03	7.82	10.32	8.69	5.51
29.38	20.47	19.72	23.6	20.17	23.5	22.46	25.74	13.38
9.56	5.07	8.06	5.95	5.85	5.98	8.37	8.18	4.12
1.12	3.02	1.34	2.12	0.74	3.89	4.83	3.73	0.86
6.32	0	6.62	0	3.27	0	0	0	2.92
0	2.46	0	2.5	3.82	2.23	1.21	0	8.67
4.09	0	3.76	1.62	1.6	3.93	4.59	3.74	30.89
6.77	14.35	9.97	0	3.04	0	0	1.26	1.86
0	5.19	1.83	3.42	5.78	1.18	1.41	1.63	0.93
0	1.58	11.38	2.91	6.16	13.24	13.14	12.99	6.54
0.22	1.71	0	0	0.24	0	0	0	0.56
0	0	0	0	0	0	0	0	0
0	0.89	0	1.35	1.49	0	0	0	0.39
0	0	0	0	0.28	0	0	0	0.51
0	0	0	0	0.37	0	0	0	0.65
0.59	0.64	1.42	1.38	1.06	1.26	0	1.95	1.61
0.34	0.03	0.24	0.13	0.26	0.05	0	0.07	0.1
113.7	108.68	115.4	73.26	78.96	79.55	78.13	89.96	128.66
1.38	1.71	0.9	3.74	2.21	2.43	1.85	1.89	0.69

Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates
Ephemeroptera	Odonata	Ephemeroptera	Ephemeroptera	Ephemeroptera	Odonata	Odonata	Odonata	Hemiptera
ephemerellidae	coenagrionidae	siphlonuridae	ephemerellidae	ephemerellidae	coenagrionidae	corduliidae	corduliidae	nepidae
Ephemeroptera	Zygoptera	Ephemeroptera	Ephemeroptera	Ephemeroptera	Zygoptera	Anisoptera	Anisoptera	Hemiptera
Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators
Meech	Meech	Meech	Meech	Meech	Meech	Meech	Meech	Meech
August	August	August	August	August	August	August	August	August
304	304	304	304	304	304	304	304	304
171	171	171	171	171	171	171	171	171
17900	17900	17900	17900	17900	17900	17900	17900	17900
22.2	22.2	22.2	22.2	22.2	22.2	22.2	22.2	22.2
9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9
2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1
88	88	88	88	88	88	88	88	88
Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet
Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing
0.08	0.02	0.02	0.01	0.01	0.03	0.06	0.12	0.09
0.79	1.55	0.27	0.34	1.27	0	1.66	1.14	0.13
3.08	1.82	1.84	0.46	2.77	2.3	3.3	2.9	1.39
0.73	3.57	0.72	0.21	0.5	0	4.92	2.54	0.29
1.21	0.83	0.79	0.68	1.56	1.15	0.87	0.78	0.43
0.22	0	0	0.17	0.32	0	0.64	0	0
39.98	16.35	29.07	24.21	38.2	18.79	16.87	18.96	21.33
14.42	9.7	21.27	12.11	14.91	12.1	9.37	9.84	10.64
5.43	6.83	3.87	11.41	6.12	7.52	6.99	6.76	8.1
14.26	18.04	19.47	18.6	14.36	23.15	20.47	27.61	26.65
5.67	5.48	9.99	5.33	4.26	6.89	5.07	7.34	11.07
0.61	0.31	1.01	1.45	0.87	4.34	3.02	4.39	0.87
3.56	3.54	4.01	3.79	3.02	1.33	0	2.68	8.13
0.25	0	0	1.34	0.63	0	2.46	3.23	0
1.27	7.19	0.81	1.92	0.7	4.27	0	1.39	3.85
0.34	13.97	1.5	0.52	0.08	0	14.35	2.64	0
1.44	1.29	0.56	5.08	3.54	0	5.19	2.55	0.04
2.57	7.37	4.81	3.78	2.48	17.03	1.58	3.46	6.3
0.44	0	0	1.07	0.58	0	1.71	1.04	0.18
1.6	0	0	4.07	2.04	0	0	0	0
0.51	0.98	0	1.59	1	0	0.89	0.3	0
0.11	0	0	0.09	0.09	0	0	0	0
1.19	0.21	0	0.79	0.23	0	0	0	0
0.33	0.98	0	1.01	0.45	1.11	0.64	0.43	0.61
0.56	0.13	0.23	0.77	0.73	0.09	0.03	0.21	0.41
69.8	116.54	83.65	94.16	67.42	85.62	108.68	97.88	99.08
2.34	1	2.39	1.89	2.74	1.96	1.71	2.34	1.54

Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates
Ephemeroptera	Coleoptera	Diptera	amphipoda	Coleoptera	Arachnida	Hemiptera	Ephemeroptera	Ephemeroptera
siphlonuridae	haliplidae	chironomidae	amphipode	gyrinidae	Hydracarien	mesoveliidae	siphlonuridae	siphlonuridae
Ephemeroptera	Coleoptera	Diptera	Amphipoda	Coleoptera	Hydracarien	Hemiptera	Ephemeroptera	Ephemeroptera
Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators
Meech	Meech	Meech	Meech	Meech	Meech	Meech	Meech	Meech
July	July	July	July	July	August	August	August	August
304	304	304	304	304	304	304	304	304
171	171	171	171	171	171	171	171	171
17900	17900	17900	17900	17900	17900	17900	17900	17900
22.2	22.2	22.2	22.2	22.2	22.2	22.2	22.2	22.2
9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9
2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1
88	88	88	88	88	88	88	88	88
Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet
Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing
0.01	0.01	0	0.01	0.08	0	0	0.01	0.02
1.34	1.53	4	2.51	0.3	0.68	2.47	0.31	0
3.43	2.82	5.87	2.77	1.8	1.59	3.71	2.23	2.28
0.67	0.53	3.31	1.6	0.09	0.13	1.69	0.2	0
1.56	1.3	2.15	0.88	0.65	0.6	1.06	0.7	1.04
0.29	0.14	0.39	0.22	0.03	0.15	0.31	0.11	0
26.87	23.71	26.71	19.24	33.78	20.22	28.35	33.71	26.64
13.51	6.38	12.97	9.35	7.93	11.8	8.94	20.51	29.57
9.25	10.69	6.73	4.81	9.49	8.5	5.91	5.94	3.44
11.79	13.07	15.86	16.45	19.97	25.23	23.22	16.43	13.67
5.34	8.01	4.36	8.17	9.98	10.21	4.41	4.26	5.82
0.73	2.97	1.63	8.39	0.77	1.13	11.86	1.51	3.88
4.74	10.72	2.66	11.11	3.97	3.44	0.35	4.53	0
0.49	0.18	0.72	0.43	0.28	0.63	0.34	0.09	0
2.85	8.86	0.59	1.81	2.21	2.64	0.7	1.6	7.69
0.62	0.85	0.54	1.29	0.09	0.46	0.38	0.07	0
6.74	1.22	2.56	1.32	0.51	1.48	1.29	0.47	0
3.6	2.42	2.26	4.06	5.07	4.39	0.7	5.26	5.97
2.08	0.89	1.1	2.16	0.49	1.64	1.01	0.55	0
2.18	1.65	3.38	2.29	1.23	1.57	2.17	0.8	0
0.51	0.26	1.51	0.72	0.29	0.4	0.8	0.16	0
0.07	0.07	0.11	0.09	0.26	0.3	0.07	0.04	0
0.09	0.84	0.27	0.04	0.09	0.1	0.13	0.18	0
1.26	0.89	0.33	0.3	0.71	2.7	0.14	0.36	0
0.66	0.66	0.82	0.89	0.34	0.44	0.43	0.51	0
82.97	116.16	79.83	134.49	79.72	106.56	107.35	75.86	85.78
1.63	0.65	2.55	0.9	1.5	1.77	1.78	2.89	2.49

Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates
Odonata	Odonata	Odonata	Coleoptera	Odonata	Odonata	Odonata	Odonata	amphipoda
gomphidae	gomphidae	gomphidae	elmidae	gomphidae	gomphidae	gomphidae	aeshnidae	amphipode
Anisoptera	Anisoptera	Anisoptera	Coleoptera	Anisoptera	Anisoptera	Anisoptera	Anisoptera	Amphipoda
No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators
Périard	Périard	Périard	Périard	Périard	Périard	Périard	Périard	Périard
July	July	July	July	July	July	July	July	July
4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	304
191	191	191	191	191	191	191	191	171
769	769	769	769	769	769	769	769	17900
								22.2
								9.9
1	1	1	1	1	1	1	1	2.9
7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	8.5
20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	21.1
52	52	52	52	52	52	52	52	88
Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet
Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing
0.029	0.011	0.012	0.011	0.067	0.001	0.011	0.09	0.025
1.371	4.011	2.13	2.981	1.328	2.223	3.619	0.689	2.381
1.699	5.101	2.306	3.643	1.801	3.172	2.391	2.383	2.216
2.958	0	3.556	3.901	1.873	2.887	6.578	1.005	4.233
1.242	0	1.046	1.832	0.952	1.742	1.337	1.31	0.992
0	0	0	0	0	1.014	0	0	0
19.734	0	16.113	22.63	22.443	19.489	15.285	32.505	14.525
7.771	0	7.075	10.134	7.022	12.942	10.539	8.448	7.953
10.988	3.544	8.325	10.141	11.342	6.309	7.966	7.42	9.507
25.91	2.492	16.316	20.584	26.032	25.076	20.975	19.912	18.576
6.322	1.597	4.121	4.607	7.235	3.763	4.564	5.342	6.366
3.657	5.296	2.602	0	4.588	1.048	0	2.632	0.728
0	0	0	2.973	0.862	2.897	2.776	0	5.828
1.984	1.558	4.436	2.281	0.745	1.601	3.598	0	6.581
3.45	25.623	3.787	1.03	4.676	7.877	11.236	9.408	3.795
2.165	0.428	21.122	3.606	0.833	0.443	1.01	4.45	6.978
2.777	48.131	3.037	2.561	1.072	1.175	2.922	0	3.505
3.45	0	1.537	1.538	6.379	4.01	1.635	2.688	4.076
0.888	0	0.963	1.597	0	0.601	0.574	0	0
1.277	0.662	0.648	1.788	0	0.598	1.425	0.621	1.033
0	0	0	0	0	0	0	0.282	0
0	0	0	0	0	0	0	0	0
1.164	1.558	0.232	1.442	0	0.515	1.17	0.305	0.455
1.19	0	0.648	0.729	0.817	0.615	0.4	0.599	0.273
0.935	1.19	0	0.648	0.817	0.615	0.4	0.729	0.779
102.227	94.868	85.826	129.299	87.831	88.811	95.915	84.266	99.497
1.279	2.252	0.167	0.989	1.876	2.589	2.029	2.711	1.454

Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates
amphipoda	Odonata	Odonata	Decapoda	Odonata	Odonata	Odonata	Odonata	Odonata
amphipode	gomphidae	gomphidae	cambaridae	gomphidae	coenagrionidae	gomphidae	gomphidae	gomphidae
Amphipoda	Anisoptera	Anisoptera	Cambaridae	Anisoptera	Zygoptera	Anisoptera	Anisoptera	Anisoptera
Predators	Predators	Predators	Predators	No Predators	No Predators	No Predators	No Predators	No Predators
Philippe	Philippe	Philippe	Philippe	Périard	Périard	Périard	Périard	Périard
August	August	August	July	July	July	July	July	July
176	176	176	4.5	4.5	4.5	4.5	4.5	4.5
172	172	172	191	191	191	191	191	191
9650	9650	9650	769	769	769	769	769	769
17.4	17.4	17.4						
8.7	8.7	8.7						
2.1	2.1	2.1	1	1	1	1	1	1
8.6	8.6	8.6	7.8	7.8	7.8	7.8	7.8	7.8
24.4	24.4	24.4	20.9	20.9	20.9	20.9	20.9	20.9
75	75	75	52	52	52	52	52	52
Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet
Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing
0.0101	0.01	0.03	0.0278	0.25	0.011	0.034	0.076	0.053
1.9	3.36	0	0.35	0.106	2.541	0.497	0.103	1.813
4	3.56	2.09	1.94	1.547	2.983	1.685	1.885	1.813
2.44	5.14	0	0.81	0.36	3.336	0.826	0.336	2.691
0	1.48	0	1.06	0.528	1.337	0.794	0.051	0.946
0	0	0	0.48	0.25	0	0.394	0	0
21.78	18.93	22.72	21.14	18.748	16.897	16.824	20.723	19.691
12.5	11.76	9.88	9.19	6.128	7.606	5.551	10.376	6.147
6.31	8.35	8.51	7.92	6.656	7.479	5.852	8.58	11.193
31.66	28.37	30.46	28.35	30.243	17.786	18.68	28.526	21.492
4.29	4.41	7.37	6.86	6.893	4.016	5.56	8.967	5.717
0	0.94	2.6	2.42	0.942	0	4.047	0.903	3.689
0	0	0	0.4	3.185	2.707	1.295	8.861	0
3.57	2.77	2.35	2.19	0.794	5.629	1.778	0.596	1.033
6.78	1.33	5.25	4.89	1.441	14.881	12.911	2.819	10.816
0	1.73	0	1.59	10.348	2.116	10.168	0.494	3.957
2.14	1.88	1.8	1.67	0.135	4.314	0.989	0	1.594
2.62	1.38	5.95	5.54	10.885	1.696	10.001	5.576	3.972
0	0.28	0	0.19	0	1.757	0.752	0.644	1.251
0	2.1	0	0.68	0	1.077	0.469	0	0.765
0	0.68	0	0.71	0.156	0	0.153	0	0
0	0	0	0.27	0	0	0	0	0
0	0.58	0	0.38	0	1.066	0.172	0.068	0.486
0	0.96	1.03	0.96	0.655	0.779	0.603	0.492	0.935
0	0.35	0.06	0.11	0	15.339	0.655	0.603	0.492
72.31	85.61	84.51	90.7	96.229	183.01	102.739	121.636	98.744
4.53	4.26	2.63	2.3	1.452	1.229	1.61	0.803	1.799

Invertebrates	Odonata	gomphidae	Anisoptera	Predators	Philippe	August	176	172	9650	17.4	8.7	2.1	8.6	24.4	75	Kicknet		Alive		Freezing			0.05			1.67	3.51	2.14	1.02	2.03	19.11	10.97	5.54	27.78	3.76	3.24	0.78	3.13	5.95	2.45	1.88	2.3	0.57	0.86	0.62	0	0.44	0.25	0.13		94.93	2.72
Invertebrates	Odonata	gomphidae	Anisoptera	Predators	Philippe	August	176	172	9650	17.4	8.7	2.1	8.6	24.4	75	Kicknet		Alive		Freezing			0.03			1.88	3.21	2.37	0.92	2.5	18.82	10.66	8.52	27.89	6.09	2.31	0	0	3.22	3.22	1.79	4.45	0	0.78	0.38	0	0.33	0.66	0.09		89.15	2.69
Invertebrates	amphipoda	amphipode	Amphipoda	Predators	Philippe	August	176	172	9650	17.4	8.7	2.1	8.6	24.4	75	Kicknet		Alive		Freezing			0.0021			0.23	4.68	0.57	2.91	0.1	44.62	12.26	9.25	13.02	0.99	0.93	0.42	0.36	1.05	0.34	3.52	0.09	0.08	3.22	1.37	0	0	0	1.47		52.57	3.8
Invertebrates	Decapoda	cambaridae	Cambaridae	Predators	Philippe	August	176	172	9650	17.4	8.7	2.1	8.6	24.4	75	Kicknet		Alive		Freezing			0.0049			2.98	5.49	1.04	3.31	0.68	27.85	15.1	10.36	16.08	2.72	0.77	0.63	0.72	1.42	0.29	2.72	0.72	1.34	3.12	1.13	0.64	0.07	0.83	0.89		71.64	3.36
Invertebrates	Odonata	gomphidae	Anisoptera	Predators	Philippe	August	176	172	9650	17.4	8.7	2.1	8.6	24.4	75	Kicknet		Alive		Freezing			0.23			0.03	6.33	0.35	0.39	0	24.65	10.63	35.9	4.34	3.39	5.86	0.61	0.68	0.4	0.49	0.28	4.78	0.1	0.47	0.05	0.08	0	0.18	0.14		54.11	1.4
Invertebrates	Odonata	gomphidae	Anisoptera	Predators	Philippe	August	176	172	9650	17.4	8.7	2.1	8.6	24.4	75	Kicknet		Alive		Freezing			0.01			1.11	3.11	1.88	1.01	0	19.89	10.42	7.23	33.1	4.19	1.68	0	5.35	2.97	1.27	2.45	0.75	0.82	1.71	0.43	0	0	0.65	0.26		88.84	4.14
Invertebrates	Odonata	gomphidae	Anisoptera	Predators	Philippe	August	176	172	9650	17.4	8.7	2.1	8.6	24.4	75	Kicknet		Alive		Freezing			0.08			0.15	0.81	0.48	0.36	0.59	8.43	3.96	5.02	15.36	4.54	2.34	0.56	1.87	8.6	34.62	1.85	3.75	0.65	2.36	2.32	0.3	0.5	0.58	0.07		180.76	0.43
Invertebrates	Odonata	gomphidae	Anisoptera	Predators	Philippe	August	176	172	9650	17.4	8.7	2.1	8.6	24.4	75	Kicknet		Alive		Freezing			0.02			0.42	0.87	1.3	0.54	0.57	8.32	3.77	4.86	12.44	4.14	1.86	0	27.47	5.36	16.29	1.5	3.81	0.76	2.82	1.19	0.3	0.55	0.85	0.12		142.29	1.48
Invertebrates	Odonata	gomphidae	Anisoptera	Predators	Philippe	August	176	172	9650	17.4	8.7	2.1	8.6	24.4	75	Kicknet		Alive		Freezing			0.02			0.37	0.53	1.31	0.41	0	10.28	5.67	9.3	22.79	6.18	2.78	0	7.66	1.88	3.01	5.55	2.66	5.59	7	1.74	1.17	0.22	3.91	0.79		141.44	1.67

Invertebrates	Odonata	corduliidae	Anisoptera	Predators	Philippe	August	176	172	9650	17.4	8.7	2.1	8.6	24.4	75	Kicknet		Alive		Freezing			0.14			0.17	1.09	0.78	0.72	0.48	19.2	5.69	11.61	24.12	5.1	2.11	0.78	3.03	0.75	6.21	0.42	6.59	1.44	3.76	0.9	1.34	1.8	1.91	0.35		112.77	1.7
Invertebrates	Odonata	corduliidae	Anisoptera	Predators	Philippe	August	176	172	9650	17.4	8.7	2.1	8.6	24.4	75	Kicknet		Alive		Freezing			0.15			0.76	1.54	1.21	0.85	0.49	19.9	7.89	11.73	22.56	5.03	3.01	0.87	2.48	0.59	6.44	0.6	7.02	0.68	2.7	0.33	1.04	1.71	0.56	0.22		102.22	1.83
Invertebrates	Odonata	cordulegastridae	Anisoptera	Predators	Philippe	August	176	172	9650	17.4	8.7	2.1	8.6	24.4	75	Kicknet		Alive		Freezing			0.17			0.08	1.17	0.49	0.6	0	17.6	5.66	9.97	25.64	6.1	3.18	0.57	1.43	9.96	4.21	1.46	7.69	0.97	1.46	0.07	0.88	0	0.79	0.1		108.1	1.26
Invertebrates	Odonata	gomphidae	Anisoptera	Predators	Philippe	August	176	172	9650	17.4	8.7	2.1	8.6	24.4	75	Kicknet		Alive		Freezing			0.06			0.24	0.8	0.82	0.6	0.59	17.55	6.04	11.16	27.99	6.49	4.09	0	1.84	2.74	5.01	0.89	7.63	0.89	2.4	0.88	0	0.62	0.73	0.14		105	1.81
Invertebrates	Odonata	gomphidae	Anisoptera	Predators	Philippe	August	176	172	9650	17.4	8.7	2.1	8.6	24.4	75	Kicknet		Alive		Freezing			0.03			0.61	1.66	1.95	0.78	0.49	11.1	4.47	6.16	13.47	4.79	2.29	0	1.61	9.99	29.45	1.28	3.19	1.12	2.89	1.31	0.3	0.6	0.48	0.07		169.02	0.47
Invertebrates	Odonata	gomphidae	Anisoptera	Predators	Philippe	August	176	172	9650	17.4	8.7	2.1	8.6	24.4	75	Kicknet		Alive		Freezing			0.04			0.45	1.07	1.89	0.56	0	13.6	7.55	10.84	27.89	5.79	3.23	4.47	2.09	1.9	3.64	3.09	3.96	1.34	3.17	1.1	0.58	0.71	1.06	0.57		118.06	1.74
Invertebrates	Odonata	gomphidae	Anisoptera	Predators	Philippe	August	176	172	9650	17.4	8.7	2.1	8.6	24.4	75	Kicknet		Alive		Freezing			0.06			0.24	4.77	0.96	0.38	0	19.32	9.84	9.59	25.31	4.75	4	4.96	1.79	1.96	3.58	1.69	2.14	0.6	2.09	0.7	0.28	0.37	0.68	0.62		109.3	1.74
Invertebrates	Odonata	gomphidae	Anisoptera	Predators	Philippe	August	176	172	9650	17.4	8.7	2.1	8.6	24.4	75	Kicknet		Alive		Freezing			0.19			0.14	4.63	0.34	0.43	0.41	20.93	8.38	9.18	28.5	4.35	2.51	5.76	1.45	0.83	3.38	0.41	4.28	0.55	1.49	0.45	0.48	0.36	0.75	0.62		101.2	2.05
Invertebrates	Odonata	gomphidae	Anisoptera	Predators	Philippe	August	176	172	9650	17.4	8.7	2.1	8.6	24.4	75	Kicknet		Alive		Freezing			0.03			0.49	1.16	1.68	0.77	0.64	16.64	6.96	9.93	24.77	7.13	4	0	2.25	1.93	6.08	1.12	6.75	1.58	3.19	0.76	0.65	0.63	0.9	0.19		114.11	1.61

Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates
amphipoda	Odonata	Odonata	Odonata	Odonata	Odonata	Odonata	Odonata	Odonata
amphipode	corduliidae	corduliidae	corduliidae	corduliidae	corduliidae	corduliidae	gomphidae	gomphidae
Amphipoda	Anisoptera	Anisoptera	Anisoptera	Anisoptera	Anisoptera	Anisoptera	Anisoptera	Anisoptera
Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators
Philippe	Philippe	Philippe	Philippe	Philippe	Philippe	Philippe	Philippe	Philippe
August	August	August	August	August	August	August	August	August
176	176	176	176	176	176	176	176	176
172	172	172	172	172	172	172	172	172
9650	9650	9650	9650	9650	9650	9650	9650	9650
17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4
8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7
2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4
75	75	75	75	75	75	75	75	75
Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet
Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing
0.0182	0.01	0.44	0.28	0.13	0.15	0.18	0.02	0.03
0.41	1.24	0.01	1.03	0.09	2.03	0.08	0.42	0.52
4.4	1.39	1.89	2.06	1.47	1.35	1.23	1.22	1.2
0.5	3.7	0.25	1.56	0.55	3.53	0.47	1.35	1.59
1.18	0.59	0.66	0.94	0.76	0	0.65	0.57	0.76
0	0	0	0	0.34	0	0.41	0.57	0.77
38.58	19.88	23.15	24	22.66	13.14	19.93	12.81	16.3
10.98	8.68	10.92	7.54	5.3	5.01	7.2	5.06	5.86
6.91	11.52	32.7	13.17	13.77	10.09	10.33	6.37	9.48
20.08	24.21	6.81	19.82	22.83	12.71	26.27	23.2	20.89
3.13	3.91	0.89	5.17	5.27	3.77	6.23	6.47	6.78
1.97	3.92	4.63	2.55	3.94	2.46	3.27	2.54	3.52
0.52	2.06	0.74	0.57	0.71	1.27	0.85	0	0
0.66	2.58	0.47	2.35	1.98	4.12	1.3	1.96	2.67
1.37	0.92	0.39	1.1	0.61	3.62	1.1	2.84	4.66
4.67	1.67	5.23	5.77	4.59	18.45	8.21	22.55	6.68
0.7	2.26	0.05	0.46	0.23	1.57	0.25	3.73	3.83
1.81	1.95	8.64	5.77	5.31	5.74	8.45	2.45	5.48
0.75	1.06	0.25	0.5	1.94	0.86	0.91	0.73	1.65
0	3.99	0.31	2.46	3.23	5.29	0.36	2.65	4.23
0.57	2.57	0.41	0.85	1.21	2.39	0.6	0.76	0.94
0.22	0	0	0.7	1.04	0	0.95	0.37	0.36
0.23	0	0	1.26	1.62	0.72	0	0.61	0.87
0.36	1.91	1.59	0.36	0.56	1.88	0.93	0.77	0.96
0.08	0.94	0.17	0.19	0.29	0.27	0.09	0.1	0.22
68.5	108.12	68.81	91.39	100.64	148.42	101.75	148.89	119.3
2.71	2.19	1.36	1.77	1.73	0.73	1.67	0.88	1.26

Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates
Odonata	Odonata	Odonata	Odonata	Odonata	Odonata	Odonata	Odonata	Odonata
coenagrionidae	coenagrionidae	coenagrionidae	coenagrionidae	coenagrionidae	coenagrionidae	coenagrionidae	coenagrionidae	coenagrionidae
Zygoptera	Zygoptera	Zygoptera	Zygoptera	Zygoptera	Zygoptera	Zygoptera	Zygoptera	Zygoptera
Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators
Philippe	Philippe	Philippe	Philippe	Philippe	Philippe	Philippe	Philippe	Philippe
June	June	June	June	June	June	June	June	June
176	176	176	176	176	176	176	176	176
172	172	172	172	172	172	172	172	172
9650	9650	9650	9650	9650	9650	9650	9650	9650
17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4
8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7
2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3
73	73	73	73	73	73	73	73	73
Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet
Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing
0.03	0.02	0.01	0	0.0051	0.0036	0.0046	0.011	0.045
0.67	0.2	0.34	0.61	0.66	0.27	0.41	0.74	0.23
3.01	0.37	0.73	0.75	1.52	4.08	1.66	2.62	0.58
0.81	1.18	1.08	1.27	1.54	0	1.47	2.02	0.67
0.16	0.32	0.38	0.31	0.58	0.82	0.86	0	0.29
0	0	0.45	0.33	0	0	0	3.11	6.89
16.49	14.79	6.65	5.59	17.34	30.36	18.46	15.42	2.36
6.73	4.54	2.26	2.23	7.04	12.04	6.6	4.13	53.45
10.4	9.48	5.52	3.57	8.35	9.86	9.58	12.82	5.15
23.04	15.69	3.89	7.55	21.89	1.48	22.97	3.93	9.12
8.9	9.14	3.68	1.28	7.38	16.03	7.37	0.95	2.48
1.32	7.79	2.27	4.08	7.7	2.05	4.85	3.62	2.1
0.93	1.21	0	0	1.13	0	1.28	0.62	0
5.16	4.43	4.25	7.66	0.85	0.59	2.03	7.55	3.24
1.61	0.93	11.42	1.41	1.94	1.22	1.36	3.39	1.03
3.06	3.6	42.95	8.9	4.18	4.08	3.45	4.94	1.06
2.08	3.1	1.04	0.94	0.88	0.48	2.07	2.02	1.29
10.12	11.51	2.16	1.2	11.97	14.21	9.67	1.82	2.12
0	1.12	0.53	16.29	1.03	0.35	0.61	5.87	0.74
3.74	5.09	4.94	14.93	1.92	0.95	2.52	11.82	3.76
0.72	3.08	3.29	14.02	1.12	0.27	0.58	4.36	0.55
0	0.55	0	3.48	0	0	0.36	0.83	0.17
0	0.08	0	0.53	0	0	0	7.02	2.23
1.07	1.8	2.16	3.07	0.98	0.86	1.84	0.38	0.49
0.24	0.32	0.12	1.41	0.16	0.05	0.26	1.15	0.63
99.07	130.64	218.23	187.75	113.19	79.31	109.46	137.39	117.18
1.73	0.9	0.18	0.97	1.28	0.57	1.46	1.27	6.88

Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates
Ephemeroptera	Odonata	Odonata	Odonata	Odonata	Odonata	Odonata	Ephemeroptera	Coleoptera
ephemerellidae	coenagrionidae	coenagrionidae	coenagrionidae	coenagrionidae	coenagrionidae	coenagrionidae	ephemeridae	hydrophilidae
Ephemeroptera	Zygoptera	Zygoptera	Zygoptera	Zygoptera	Zygoptera	Zygoptera	Ephemeroptera	Coleoptera
Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators
Philippe	Philippe	Philippe	Philippe	Philippe	Philippe	Philippe	Philippe	Philippe
June	June	June	June	June	June	June	June	June
176	176	176	176	176	176	176	176	176
172	172	172	172	172	172	172	172	172
9650	9650	9650	9650	9650	9650	9650	9650	9650
17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4
8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7
2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3
73	73	73	73	73	73	73	73	73
Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet
Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing
0.02	0.03	0.03	0.02	0.03	0.02	0.01	0.12	0.08
0.32	0.47	1.4	0.21	0.64	0.09	0.15	0.04	0.15
0.94	2.04	0.75	0.8	1.68	0.96	0.98	2.32	0.56
0.11	0.47	0	0.49	1.35	0.35	0.73	2.24	0.12
0.43	0.69	0.61	0.52	1.11	0.44	0.58	2.29	0.54
0.1	0.36	0	0.68	0.67	0.46	0.74	0	0.36
29.91	20.43	19.06	16.81	20.8	17.06	14.45	31.03	13.04
15.27	11.56	8.42	6.17	10.23	4.61	3.5	27.21	3.9
4.01	6.21	7.74	8.67	8.33	10.18	10.42	2.87	16.62
21.74	23.35	25.43	18.64	20.67	22.06	13.13	16.24	14.38
8.64	7.74	7.71	6.45	6.37	10.04	5.72	2.9	9.96
1.81	5.85	1.07	5.23	3.63	7.01	4.2	0.81	0.9
8.2	1.79	4.95	1.32	1.31	1.33	0.71	2.2	8.3
0.19	0.69	1.63	3.73	1.89	2.15	5.84	0.12	0.89
1.6	0.98	1.19	1.32	0.88	0.41	2.42	0.14	3.33
0.02	3.74	3.89	4.44	5.2	4.33	11.51	4.11	2.06
0.55	0.55	2.14	1.74	1.24	0.72	3.16	0.05	2.28
5.25	10.51	9.87	13.31	9.35	11.5	5.73	5.05	2.61
0.13	0.24	0.45	0.85	0.62	1.14	1.48	0.03	4.52
0.4	0.78	1.68	4.01	1.95	2.3	6.23	0.21	4.91
0.15	0.16	0.32	0.44	0.37	0.84	3.89	0.06	2.8
0.12	0.3	0.35	0.77	0	0.38	0.29	0	4.53
0.01	0.15	0.24	1.8	0.34	1.06	0.23	0	1.79
0.1	0.91	1.11	1.63	1.36	0.56	3.89	0.07	1.45
0.56	0.15	0.34	0.27	0.21	0.16	0.43	0.2	0.82
92.93	104.55	100.85	118.19	102.22	113.77	150.74	75.55	134.1
1.8	1.67	1.65	1.29	1.73	1.21	0.73	4.39	0.73

Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates
Odonata	Coleoptera	Arachnida	Ephemeroptera	Ephemeroptera	Ephemeroptera	Coleoptera	Ephemeroptera	Ephemeroptera
corduliidae	gyrinidae	Hydracarien	ephemerellidae	ephemerellidae	ephemerellidae	haliplidae	ephemerellidae	ephemerellidae
Anisoptera	Coleoptera	Hydracarien	Ephemeroptera	Ephemeroptera	Ephemeroptera	Coleoptera	Ephemeroptera	Ephemeroptera
Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators
Renaud	Renaud	Renaud	Philippe	Philippe	Philippe	Philippe	Philippe	Philippe
August	August	June	June	June	June	June	June	June
10.23	10.23	176	176	176	176	176	176	176
203	203	172	172	172	172	172	172	172
2057	2057	9650	9650	9650	9650	9650	9650	9650
4.3	4.3	17.4	17.4	17.4	17.4	17.4	17.4	17.4
1	1	8.7	8.7	8.7	8.7	8.7	8.7	8.7
1.8	1.8	2.1	2.1	2.1	2.1	2.1	2.1	2.1
7.8	7.8	8.6	8.6	8.6	8.6	8.6	8.6	8.6
25.6	25.6	19.3	19.3	19.3	19.3	19.3	19.3	19.3
77	77	73	73	73	73	73	73	73
Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet
Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing
0.03	0.01	0.02	0.04	0.03	0.03	0.01	0.02	0.02
1.55	0.48	0.12	0.17	0.17	0.29	0	0.42	0.79
1.48	1.58	0.86	0.81	2.96	1.36	0.49	1.16	2.11
0.92	1.8	0.01	0.02	0.06	0.09	0.34	0.19	0.21
0.47	1.05	0.33	0.46	0.72	0.59	0.62	0.58	0.68
0	0	0.02	0.1	0.15	0.11	0.02	0.13	0.14
24.99	22.66	24.3	30.37	30.68	36.53	23.51	33.33	31.84
7.07	5	1.27	16.12	17.16	20.92	13.3	14.98	22.39
10.91	11.31	52.96	4	2.82	3.95	13.5	4.47	2.37
25.27	19.5	11.23	23.34	19.42	18.69	24.82	19.39	19
6.46	7.2	3.35	7.48	7.87	5.18	6.77	7.86	6.69
2.28	2.29	0.46	1.56	1.62	0.93	0.67	1.33	1.29
0.32	8.9	0.25	7.34	9.03	4.38	6.9	7.83	5.09
1.42	2.29	0.62	0.23	0.1	0.25	0.68	0.24	0.12
3.09	3.63	0.49	2.16	1.44	0.87	0.75	1.55	1.56
1.32	2.48	0.16	0.11	0.01	0.08	0.13	0.02	0.02
0.99	2.46	0.25	0.23	0.17	0.35	1.99	0.6	0.21
2.48	2.06	0.22	4.49	4.55	3.2	2.21	4.83	4.72
1.92	0.58	0.33	0.23	0.24	0.8	0.57	0.19	0.08
4.52	2.66	0.87	0.56	0.27	0.84	1.65	0.53	0.33
2.54	0.99	0.26	0.13	0.22	0.32	0.96	0.15	0.11
0	0	1.48	0.02	0.12	0.15	0.06	0.1	0.02
0	0	0.12	0	0.13	0.01	0	0	0.23
0	1.1	0.05	0.05	0.11	0.1	0.05	0.11	0.01
0.36	0.82	0.28	0.56	0.68	0.57	0.87	0.59	0.42
92.36	113.98	33.47	91.06	91.82	75.34	87.27	86.43	80.92
2.03	1.03	1.91	2.08	1.82	3.26	2.34	1.82	2.81

Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates
Trichoptera	Odonata	Odonata	Odonata	Odonata	Odonata	Odonata	Odonata	Odonata
psychomyiidae	corduliidae	corduliidae	gomphidae	corduliidae	corduliidae	corduliidae	corduliidae	corduliidae
Tricoptera	Anisoptera	Anisoptera	Anisoptera	Anisoptera	Anisoptera	Anisoptera	Anisoptera	Anisoptera
Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators
Renaud	Renaud	Renaud	Renaud	Renaud	Renaud	Renaud	Renaud	Renaud
August	August	August	August	August	August	August	August	August
10.23	10.23	10.23	10.23	10.23	10.23	10.23	10.23	10.23
203	203	203	203	203	203	203	203	203
2057	2057	2057	2057	2057	2057	2057	2057	2057
4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
1	1	1	1	1	1	1	1	1
1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8
25.6	25.6	25.6	25.6	25.6	25.6	25.6	25.6	25.6
77	77	77	77	77	77	77	77	77
Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet
Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing
0	0.03	0.36	0.15	0.14	0.08	0.05	0.02	0.01
0.47	0.11	0.12	0.08	0.17	0.2	1.22	1.72	1.1
0.97	0.23	1.49	0.93	1.25	1.51	2.2	2.86	3.8
0.12	0.49	0.44	0.07	1.11	0.38	0.39	3.9	0.88
1.16	0.12	1.35	1.47	1.12	0.85	0.36	1.17	0.63
0.19	0.13	0.24	0.08	0.56	0.32	0.28	1.35	0
18.71	2.56	22.52	23.54	21.68	10.2	6.06	16.34	11.67
10.36	0.94	4.84	6.91	6.37	11.47	2.89	6.29	5.94
11.88	2.18	10.5	8.86	10.69	5.59	3.54	10.52	10.39
24.37	3	24.39	28.57	22.54	20.8	8.57	17.24	14.17
4.39	1.36	13.11	18.36	10.41	9.01	3.04	4.13	4.19
0.43	0.67	5.29	0.41	5.07	9.01	0	2.02	1.75
1.75	0	0	3.28	0.61	1.11	2.69	0	1.03
1.01	2.02	1.05	0.18	3.91	0.94	5.15	5.75	11.4
0.78	0.36	0.42	3.21	0.73	6.78	0.93	2.33	2.13
0.26	0.59	5.4	0.02	4.97	1.27	7.45	1.7	2.65
15.17	0.57	0.18	0.83	0.77	0.47	0.47	2.44	2.57
0.78	81.06	5.39	2.55	4.5	6.13	1.01	1.23	1.54
0.5	0.37	0.68	0.1	0.79	1.47	18.13	2.94	5.65
4.04	1.89	1.16	0.4	1.11	1.26	13.83	9.46	11.91
1.59	1.19	0.59	0.06	1.27	0.82	17.81	5.87	6.6
0	0.04	0	0.01	0.18	2.6	1.81	0.28	0
1.09	0	0.39	0.02	0	0	1.01	0	0
0	0.13	0.45	0.06	0.19	7.81	1.17	0.46	0
0.93	0.02	0.07	0.16	0.09	0.44	1.42	1.06	1.23
75.88	25.16	104.97	93.04	101.79	171.09	156.4	114.48	128.25
3.24	1.38	1.24	1.39	1.52	0.91	1.18	1.84	1.61

Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates
Odonata	Ephemeroptera	Arachnida	Odonata	Diptera	Diptera	Arachnida	Ephemeroptera	Diptera
gomphidae	Caenidae	Hydracarien	coenagrionidae	chironomidae	chironomidae	Hydracarien	Neophemeridae	chironomidae
Anisoptera	Ephemeroptera	Hydracarien	Zygoptera	Diptera	Diptera	Hydracarien	Ephemeroptera	Diptera
No Predators	No Predators	No Predators	Predators	Predators	Predators	Predators	Predators	Predators
Sam	Sam	Sam	Renaud	Renaud	Renaud	Renaud	Renaud	Renaud
July	July	August	August	August	August	August	August	August
186	186	10.23	10.23	10.23	10.23	10.23	10.23	10.23
251	251	203	203	203	203	203	203	203
10251	10251	2057	2057	2057	2057	2057	2057	2057
64	64	4.3	4.3	4.3	4.3	4.3	4.3	4.3
36.5	36.5	1	1	1	1	1	1	1
2.2	2.2	1.8	1.8	1.8	1.8	1.8	1.8	1.8
8.4	8.4	7.8	7.8	7.8	7.8	7.8	7.8	7.8
24.2	24.2	25.6	25.6	25.6	25.6	25.6	25.6	25.6
59	59	77	77	77	77	77	77	77
Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet
Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing
0.011	0.01	0.004	0	0.05	0	0	0	0.01
3.221	0.867	1.047	0.47	0.48	1.11	0.51	0.59	2.85
2.525	4.125	1.477	0.97	1.03	0.63	0.92	4.71	3.63
5.346	8.167	1.486	0.12	0.11	0.15	0.05	0.42	0.7
1.563	0	2.397	1.16	0.94	0.97	0.72	2.91	2.82
0	0	0	0.19	0.28	0.15	0.15	0.21	0.62
20.526	7.907	26.599	18.71	23.52	15.32	18.32	34.11	23
10.511	9.575	21.553	10.36	9.75	13.68	8.88	10.66	8.05
10.396	6.281	5.121	11.88	11.29	11.07	8.21	12.08	9.45
20.192	11.631	20.102	24.37	26.96	21.37	20.37	14.12	15.82
4.793	5.658	4.26	4.39	6.57	2.99	10.83	5.14	7.22
4.079	4.954	0.958	0.43	1.17	0.7	1.22	0.53	0.99
0.686	4.293	3.154	1.75	2.87	1.08	7.31	3.83	4.75
3.373	1.227	0.221	1.01	0.69	1.71	1.22	0.98	0.34
1.21	1.651	0.937	0.78	1.47	3.24	3.12	1.38	8.64
4.507	1.054	3.702	0.26	0.11	0.19	0.73	0.62	0.18
3.135	2.175	1.227	15.17	4.55	17.2	5.13	1.79	4.06
1.677	5.192	4.898	0.78	2.41	1.15	3.04	1.83	4.15
0.334	9.902	0.357	0.5	0.7	0.87	2.34	0.71	0.29
0.6	0	0.299	4.04	2.77	4.39	1.74	1.67	1.74
0	0	0	1.59	1.21	1.25	0.58	0.98	0.5
0	0	0	0	0.29	0.45	0.26	0.19	0.05
0	0	0.041	1.09	0.61	0.34	0.93	0.48	0
1.325	15.339	0.165	0	0.23	0	3.43	0.05	0.13
0	0.327	2.466	0.93	0.56	0.72	0.7	0.62	0.33
99.887	93.301	107.249	75.88	84.89	80.6	120.88	65.35	85.94
1.655	2.14	1.6	3.24	2.53	2.94	1.19	2.06	1.09

Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates
Odonata	Diptera	Ephemeroptera	Ephemeroptera	Ephemeroptera	Odonata	Odonata	Hemiptera	Odonata
gomphidae	chironomidae	Caenidae	Caenidae	Caenidae	coenagrionidae	corduliidae	hydrometridae	gomphidae
Anisoptera	Diptera	Ephemeroptera	Ephemeroptera	Ephemeroptera	Zygoptera	Anisoptera	Hemiptera	Anisoptera
No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators
Telfer	Telfer	Sam	Sam	Sam	Sam	Sam	Sam	Sam
August	July	July	July	July	July	July	July	July
343.005	186	186	186	186	186	186	186	186
261	251	251	251	251	251	251	251	251
34338	10251	10251	10251	10251	10251	10251	10251	10251
	64	64	64	64	64	64	64	64
	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5
5.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
7.9	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
24.3	24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2
38	59	59	59	59	59	59	59	59
Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet
Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing
0.01	0.01	0.028	0.018	0.002	0.005	0.045	0.005	0.005
3.62	2.85	2.28	1.115	0.378	0.776	1.698	0.522	0.459
4.19	3.63	1.531	1.363	0.9	1.244	1.168	1.47	1.025
4.16	0.7	4.524	3.185	0.844	1.875	5.049	0.651	1.062
1.7	2.82	1.298	1.388	1.454	0.908	1.087	2.713	2.029
0.58	0.62	0	0	0	0	0	0	0
17.77	23	16.378	16.815	23.479	19.601	15.981	26.789	25.288
10.2	8.05	9.89	8.637	13.521	9.107	10.69	21.996	18.403
9.23	9.45	11.083	11.19	4.989	9.866	11.409	4.752	4.597
16.84	15.82	19.815	17.831	20.277	26.177	21.317	21.179	23.203
6.33	7.22	5.658	4.164	4.413	11.227	6.728	4.539	5.004
1.08	0.99	3.671	3.656	2.716	6.544	4.123	0.732	3.265
3.99	4.75	0	0	0	0	0	2.773	0.525
0.53	0.34	3.238	5.39	3.265	1.932	3.306	0.638	0.743
6.09	8.64	2.923	5.291	18.272	5.396	6.18	3.82	0.935
0.61	0.18	4.209	6.679	0.697	0.457	0.683	0	5.647
1.51	4.06	7.108	7.46	0.525	1.117	3.728	0.773	1.548
4.11	4.15	2.794	1.512	4.272	3.772	4.959	5.781	6.069
2.22	0.29	1.742	0	0	0	0	0.242	0
3.85	1.74	1.531	0.496	0	0	1.213	0.381	0
0.68	0.5	0	0	0	0	0	0	0
0.06	0.05	0	0	0	0	0	0	0
0.29	0	0	1.363	0	0	0	0	0
0.35	0.13	0.327	2.466	0	0	0.683	0.249	0.199
0.48	0.33	5.781	4.898	0.249	0.165	0.199	1.325	0.683
99.3	85.94	168.463	170.79	76.072	81.038	88.056	94.606	94.88
1.56	1.09	4.343	4.881	3.578	3.247	2.787	2.311	2.058

Perch	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates	Invertebrates
	Hemiptera	Odonata	Odonata	Odonata	Odonata	Odonata	Odonata	Arachnida
Percidae	notonectidae	gomphidae	corduliidae	coenagrionidae	coenagrionidae	corduliidae	corduliidae	Hydracarien
Perca flavescens	Hemiptera	Anisoptera	Anisoptera	Zygoptera	Zygoptera	Anisoptera	Anisoptera	Hydracarien
No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators
Claude	Telfer	Telfer	Telfer	Telfer	Telfer	Telfer	Telfer	Telfer
09/07/2015	August	August	August	August	August	August	August	August
15	343.005	343.005	343.005	343.005	343.005	343.005	343.005	343.005
215	261	261	261	261	261	261	261	261
1410	34338	34338	34338	34338	34338	34338	34338	34338
1	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
7.2	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9
22.1	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3
12	38	38	38	38	38	38	38	38
Trap	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet	Kicknet
27								
Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Juvenile								
Clove	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing	Freezing
74								
61								
2.65	0.01	0.05	0.09	0.03	0.01	0.08	0.04	0
1.17								
1								
0.1	1.89	0.45	1.09	1.36	0.5	0.19	3.83	0.51
2.16	4.21	1.01	1.96	2.3	1.7	0.79	2.51	0.92
0.32	1.01	0.08	0.3	2.23	0.77	0.21	1.5	0.05
0.39	3.16	1.12	1.59	0.93	0.8	0.9	1.8	0.72
0.05	0.48	0.1	0.37	0	0	0.08	0.45	0.15
10.74	27.3	17.54	17.56	15.17	16.94	16.81	18.24	18.32
7.18	9.31	7.8	9.11	5.03	5.46	4.79	8.15	8.88
2.78	13.78	14	9.54	7.28	5.89	15.08	15.84	8.21
19.02	16.1	22.19	18.32	12.7	18.72	19.19	17	20.37
4.53	6.82	7.17	6.38	2.9	5.6	7.56	5.83	10.83
6.95	0.8	1.71	0.94	2.17	4.07	0.55	0.57	1.22
3.74	4.79	4.73	4.62	0.53	1.3	5.02	2.22	7.31
0.28	0.69	0.75	0.52	5.46	1.79	0.61	0.89	1.22
16.96	1.17	4.56	11.86	3.98	13.17	6.71	2.3	3.12
1.05	0.06	0.12	0.9	30.4	10.24	0.4	0.13	0.73
0.28	3.59	2.89	2.54	1.6	1	8.73	5.44	5.13
4.62	0.61	4.08	4.7	1.6	10.07	5.59	2.28	3.04
3.6	1.41	1.42	1.65	2.25	0.76	0.69	2.17	2.34
0.33	2.21	5.73	4.25	0	0	4.37	4.18	1.74
0.31	0.42	0.61	1.17	0.78	0.47	0.49	1.1	0.58
0.74	0	0	0.05	0	0.15	0.06	2.55	0.26
1.47	0	1.73	0.06	0.51	0	0.72	0.26	0.93
12.38	0.19	0.19	0.52	0.83	0.61	0.46	0.76	3.43
0.61	0.83	0.67	0.39	0.03	0.05	0.49	0.68	0.7
622.2								
197.13	74.95	108.72	111.68	148.37	120.05	98.05	89.07	120.88
0.72	1.81	1.41	1.03	0.69	0.78	1.05	1.64	1.19

Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch
Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae
Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens
No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators
Claude	Claude	Claude	Claude	Claude	Claude	Claude	Claude	Claude
08/07/2015	08/07/2015	08/07/2015	08/07/2015	08/07/2015	08/07/2015	09/07/2015	09/07/2015	09/07/2015
15	15	15	15	15	15	15	15	15
215	215	215	215	215	215	215	215	215
1410	1410	1410	1410	1410	1410	1410	1410	1410
1	1	1	1	1	1	1	1	1
7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2
22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1
12	12	12	12	12	12	12	12	12
Net	Net	Net	Net	Net	Net	Trap	Trap	Trap
4.5	4.5	4.5	4.5	4.5	4.5	27	27	27
Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Female	Female	Male	Female	Female	Juvenile	Juvenile	Juvenile	Juvenile
Natural	Natural	Natural	Natural	Natural	Clove	Clove	Clove	Clove
132	131	168	192	140	89	94	85	80
111	113	145	162	114	75	76	67	65
18.98	20.03	45.88	68.83	20.67	6.02	5.12	4.23	3.69
1.39	1.39	1.5	1.62	1.4	1.43	1.17	1.41	1.34
2	2	4	5	3	1	1	1	1
0	1.87	0.65	1.81	0.64	0.35	0.46	0.4	0.3
1.96	1.97	1.79	2.34	1.97	1.44	2.23	3.35	2.05
1.08	2.24	0.92	2.55	0.79	0.86	0.78	0.87	0.86
0.87	0.72	0.78	0.76	0.58	0.71	0.84	0.79	0.89
0.17	0.17	0.2	0.17	0.14	0.07	0.14	0.12	0.16
15.97	15.31	17.11	16.43	12.8	19.16	18.11	14.79	18.58
6.07	4.78	5.47	7.67	6.24	4.79	4.61	2.11	4.88
6.7	5.78	6.32	5.68	3.65	7.15	6.58	4.7	7.26
15.73	9.7	13.75	15.09	13.58	15.27	12.62	20.1	14.13
4.07	3.53	4.57	5.54	2.94	4.72	3.34	5.52	3.45
1.13	0.5	0.44	0.66	0.64	1.82	1.49	1.4	1
2.4	2.16	2.3	3.17	1.57	3.11	2.81	3.64	2.54
0.56	0.44	0.38	0.38	0.35	0.53	0.33	0.48	0.37
5.79	7.02	7.85	3.89	10.83	5.47	12.16	5.18	5.28
14.15	27.29	12.34	12.26	21.49	2.92	2.93	8	3.44
1.31	1.36	1.41	1.07	0.64	1.93	0.88	0.53	0.74
5.35	2.74	5.07	5.04	4.1	5.35	5.41	4.99	5.2
3.7	3.44	3.76	3.97	5.06	3.63	5.03	4.6	3.18
0.95	0.8	1.15	0.9	0.42	1.14	1.06	0.95	0.99
0.63	0.43	0.61	0.41	0.33	0.79	0.92	0.53	0.68
0.92	0.59	1.22	0.88	0.76	1.33	0.89	1.21	0.92
1.51	1.7	2.08	1.76	1.07	2.47	3.81	2.4	6.31
8.33	5.47	9.85	7.56	9.44	14.97	12.58	13.34	16.78
0.4	0.21	0.45	0.44	0.29	1.04	0.69	0.76	1.17
265.7	340	335.3	196.1	474.1	386.5	323.1	606.1	215.6
184.28	187.93	190.95	178.94	206	196.33	189.06	206.33	202.09
0.69	0.45	0.6	0.81	0.53	0.71	0.66	0.72	0.77

Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch
Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae
Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens
No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators
Claude	Claude	Claude	Claude	Claude	Claude	Claude	Claude	Claude
08/07/2015	08/07/2015	08/07/2015	08/07/2015	08/07/2015	08/07/2015	08/07/2015	08/07/2015	08/07/2015
15	15	15	15	15	15	15	15	15
215	215	215	215	215	215	215	215	215
1410	1410	1410	1410	1410	1410	1410	1410	1410
1	1	1	1	1	1	1	1	1
7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2
22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1
12	12	12	12	12	12	12	12	12
Net	Net	Net	Net	Net	Net	Net	Net	Net
4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Female	Male	Female	Juvenile	Juvenile	Juvenile	Juvenile	Juvenile	Juvenile
Clove	Clove	Clove	Clove	Natural	Natural	Natural	Natural	Natural
116	173	190	58	50	55	56	55	53
131	148	161	46	42	43	45	44	40
42.18	54.91	56.18	1.31	0.94	1.09	1.2	1.24	0.95
1.88	1.69	1.35	1.35	1.27	1.37	1.31	1.46	1.48
3	4	4	0	0	0	0	0	0
0.45	0.41	1.03	0.44	0.97	0.09	0	0.17	0.84
0.75	1.21	1.95	3.6	2.76	1.41	3.09	5.29	1.47
1.4	0.89	1.88	0.98	1.96	0.33	1.1	0.98	1.39
0.62	0.67	0.74	0.86	0.93	0.27	0.67	0.83	0.32
0.62	0.12	0.14	0.1	0.17	0.03	0.09	0.08	0.05
15.85	19.76	17.61	19.97	19.42	7.5	16.26	19.25	7.32
6.84	5.08	6.6	7.02	5.27	2.91	6.73	12.35	3.65
6.2	8.07	8.07	5.53	7.87	2.05	4.52	3.79	2.05
13.25	17.81	18.79	12.13	14.92	10.74	20.2	28.74	61.55
3.82	5.12	3.98	7.48	4.69	4.81	6.43	9.89	4.11
0.48	0.67	1.82	2.1	1.48	5.45	2.91	2.24	1.7
3.46	3.33	1.82	3.5	2.98	3.07	4.37	0.49	2.37
0.64	0.53	0.87	0.41	0.37	0.17	0.38	0	0.16
14.72	4.67	8.42	13.03	3.51	47.26	8.86	1.85	2.12
4.13	6.44	3.23	2.99	7.21	1.43	3.04	1.71	2.23
1.53	2.04	1.96	0.94	1.4	2.05	0.46	0.29	0.26
4.5	5.5	3.74	4.98	6.32	3.06	4.86	3.45	2.62
4.08	2.48	2.13	2.03	3.21	1.51	2.4	1.36	0.99
1.13	1.7	0.88	1	1.63	0.36	0.93	0.47	0.3
0.28	0.72	0.57	0.82	0.81	0.35	0.95	0.36	0.38
1.37	1.13	0.9	0.66	1.08	0.37	0.94	0.57	0.45
2.21	2.83	2.21	1.94	2.56	0.65	1.95	0.83	0.55
11.66	8.8	10.67	7.5	8.47	4.13	8.86	5	3.1
0.6	0.64	0.69	0.42	0.6	0.13	0.61	0.35	0.52
204.7	220.6	205.3	335	323.9	1751.2	602.2	1777.6	1382.4
196.98	175.34	164.16	167.45	171.89	183.08	178.88	123.77	133.73
0.65	0.81	0.97	0.6	0.79	0.25	0.86	1.89	3.95

Perch		Percidae	Perca flavescens	No Predators	Claude	08/07/2015	15	215	1410			1	7.2	22.1	12	Net	4.5	Alive	Male	Clove	146	123	24.75	1.33	3	0.31	1.09	0.7	0.55	0.13	16.67	4.32	5.96	10.34	3.34	2.85	2.38	0.27	12.19	7.47	1.79	5.75	6.45	1.13	0.76	1.07	2.34	12.13	0.54	282.8	196.99	0.54
Perch		Percidae	Perca flavescens	No Predators	Claude	08/07/2015	15	215	1410			1	7.2	22.1	12	Rod	1	Alive	Female	Clove	127	109	17.44	1.35	2	0.49	2.43	1.07	1.06	1.07	19.35	7.19	5.65	13.7	4.01	0.82	2.37	0.46	5.46	7.73	2.06	5.75	2.43	0.97	0.82	1.26	2.28	11.57	0.65	351.4	185.6	0.72
Perch		Percidae	Perca flavescens	No Predators	Claude	09/07/2015	15	215	1410			1	7.2	22.1	12	Trap	27	Alive	Juvenile	Clove	98	78	6.96	1.47	1	0.33	2.48	0.78	0.79	0.12	17.99	5.23	5.94	14.13	0.61	1.9	3.41	0.36	7.44	5.36	0.74	6.85	4.15	1.03	0.74	1.01	3.12	15.47	0.98	285.6	208.98	0.68
Perch		Percidae	Perca flavescens	No Predators	Claude	08/07/2015	15	215	1410			1	7.2	22.1	12	Net	4.5	Alive	Juvenile	Natural	69	57	2.55	1.37	0	0.22	1.86	0.64	0.5	0.07	12.76	6.05	4.25	14.04	3.76	1.39	3.3	0.4	22.89	3.23	0.34	4.15	2.91	0.4	0.42	0.81	1.85	13.76	0.51	653.9	212.32	0.5
Perch		Percidae	Perca flavescens	No Predators	Claude	08/07/2015	15	215	1410			1	7.2	22.1	12	Net	4.5	Alive	Female	Clove	107	89	11.24	1.59	1	0.36	2.15	0.81	0.88	0.15	20.47	5.3	6.08	14.28	4.69	1.86	3.77	0.43	4.64	4.54	1.33	6.93	2.34	0.7	0.49	1.04	2.99	13.78	0.88	348.7	198.17	0.66
Perch		Percidae	Perca flavescens	No Predators	Claude	08/07/2015	15	215	1410			1	7.2	22.1	12	Net	4.5	Alive	Male	Natural	115	95	11.83	1.38	1	0.81	1.69	0.84	0.71	0.25	15.67	3.23	6.85	11.49	2.33	0.79	0.86	0.4	30.62	9.72	0.34	1.98	3.98	1.05	0.61	0.75	1.03	4.05	0.15	557.82	161.09	0.66
Perch		Percidae	Perca flavescens	No Predators	Claude	08/07/2015	15	215	1410			1	7.2	22.1	12	Net	4.5	Alive	Male	Natural	115	95	11.83	1.38	1	1.43	2.74	1.32	1.1	0.46	23.27	4.72	10.43	16.79	2.85	1.32	0.36	0.67	1.08	17.12	0.44	1.32	6.58	1.43	0.67	0.71	0.9	2.3	0.18	339	121.2	1.16
Perch		Percidae	Perca flavescens	No Predators	Claude	08/07/2015	15	215	1410			1	7.2	22.1	12	Net	4.5	Alive	Female	Clove	115	93	13.13	1.63	1	0.18	0.63	0.35	0.32	0.04	8.07	1.74	3.26	6.19	1.81	0.25	1.36	0.13	60.16	2.32	0.24	2.64	1.37	0.67	0.54	0.78	1.16	5.79	0.12	776.64	200.98	0.15
Perch		Percidae	Perca flavescens	No Predators	Claude	08/07/2015	15	215	1410			1	7.2	22.1	12	Net	4.5	Alive	Female	Clove	115	93	13.13	1.63	1	1.05	2.95	0.76	1.36	0.39	19.96	4.88	10.85	12.76	5.79	1.13	3.2	0.79	4.93	0.3	3.67	5.24	2.17	1.16	1.34	1.8	2.74	10.78	0.93	120.76	162.86	0.74

Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch
Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae
Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens
Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators
Loutre	Loutre	Loutre	Loutre	Loutre	Loutre	Loutre	Loutre	Loutre
09/06/2015	09/06/2015	09/06/2015	09/06/2015	09/06/2015	09/06/2015	09/06/2015	09/06/2015	09/06/2015
14.16	14.16	14.16	14.16	14.16	14.16	14.16	14.16	14.16
198	198	198	198	198	198	198	198	198
2005	2005	2005	2005	2005	2005	2005	2005	2005
3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9
162	162	162	162	162	162	162	162	162
Net	Net	Net	Net	Rod	Net	Net	Net	Rod
6	0.4	0.4	0.4	2	6	0.4	6	0.4
Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Female	Female	Male	Female	Female	Female	Female	Male	Female
Clove	Clove	Clove	Clove	Clove	Clove	Clove	Clove	Clove
170	212	210	250	268	204	226	180	212
140	181	170	201	217	166	191	149	177
50.02	111.34	92.86	172.14	185.24	94.1	120.6	57.13	109.17
1.82	1.88	1.89	2.12	1.81	2.06	1.73	1.73	1.97
3	5	5	7	9	4	6	4	5
0.37	0.62	0.54	0.7	0.51	0.29	0.2	1.37	1.75
1.39	2.43	2.93	3	0.41	2.54	2.03	3.37	3.46
0.71	0.46	1.51	0.61	0.15	0.62	0.66	1.23	1.25
0.71	1.23	1.34	1.83	1.12	1.24	0.74	1.49	1.66
0.26	0.25	0.32	0.54	0.35	0.35	0.17	0.51	0.62
18.14	19.33	21.08	24.81	20.73	21.15	20.24	20.92	23.8
6.97	8.44	6.92	8.48	8.76	9.06	6.98	9.43	13.96
6.47	6.26	6.87	7.6	7.65	7.26	6.38	9.1	6.95
16.51	13.48	12.73	12.75	15.98	15.98	11.29	13.58	19.97
5.42	4.29	3.67	3.73	5.72	4.86	3.4	4	4.67
0.53	0.94	1.13	0.37	0.22	0.51	0.82	0.64	0.69
1.88	2.85	2.81	2.58	1.1	2.29	2.39	1.71	4.97
1.09	1.01	0.46	0.31	2.12	0.67	0.28	0.68	0.3
7.08	8.66	6.47	8.44	5.38	5.16	8.76	3.76	3.49
3.9	0.36	0.1	0.4	2.69	4.31	0.12	0.77	0.37
1.15	0.79	0.33	0.75	1.41	1	0.21	4.32	0.5
6.51	6.07	6.49	4.64	3.58	5.5	7.25	4.03	2.9
2.87	2.52	2.34	2.06	1.83	1.81	2.2	2.46	0.63
0.7	0.88	0.77	0.86	0.49	0.65	0.51	1.39	1.13
0.6	0.79	0.93	0.65	0.58	0.81	0.47	0.76	0.51
2.33	2.89	2.01	1.75	1.19	1.83	2.25	0.96	0.67
2.49	3.13	2.67	2.39	2.33	1.62	2.39	4.61	2.15
11.94	12.3	15.57	10.76	11.62	10.5	20.27	8.91	3.59
0.63	0.83	1.15	0.83	0.76	0.68	1.19	0.96	0.85
191.1	242.6	241.6	240.6	193.7	221.7	237.6	156.1	235.6
187	184.56	193.68	160.84	162.58	170.54	222.91	140	126.89
0.78	0.76	0.71	0.82	1.12	0.86	0.53	1.27	1.78

Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch
Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae
Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens
Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators
Loutre	Loutre	Loutre	Loutre	Loutre	Loutre	Loutre	Loutre	Loutre
31/07/2015	10/06/2015	10/06/2015	10/06/2015	09/06/2015	10/06/2015	09/06/2015	09/06/2015	09/06/2015
14.16	14.16	14.16	14.16	14.16	14.16	14.16	14.16	14.16
198	198	198	198	198	198	198	198	198
2005	2005	2005	2005	2005	2005	2005	2005	2005
3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
26.3	19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9
166	162	162	162	162	162	162	162	162
Net	Net	Net	Net	Net	Net	Net	Net	Net
4.5	4.5	4.5	4.5	0.4	4.5	0.4	0.4	6
Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Juvenile	Juvenile	Juvenile	Juvenile	Juvenile	Female	Female	Female	Female
Natural	Clove	Clove	Clove	Clove	Clove	Clove	Clove	Clove
101	95	92	82	82	135	200	200	149
86	79	75	67	67	114	165	168	127
10.78	8.08	6.94	4.89	4.68	22.99	77.25	88.39	34.57
1.7	1.64	1.64	1.63	1.56	1.55	1.72	1.86	1.69
1	1	1	1	1	2	4	4	2
0.18	0.3	0.22	0.53	0.22	0.09	1.1	0.92	0.64
1.47	3.15	1.64	2.53	2.73	0.71	4.16	3.04	2.79
0.51	0.36	0.6	0.42	0.59	0.41	1.07	2.41	0.59
0.97	0.86	0.93	0.97	1.21	0.57	1.39	1.48	0.84
0.18	0.16	0.41	0.24	0.14	0.09	0.38	0.52	0.21
21.34	18.47	23.57	19.05	24.32	20.02	21.93	21.53	20.32
10.77	11.83	9.1	13.28	5.88	7.09	7.08	8.99	8.89
7.03	4.42	7.65	5.35	6.59	7.7	7.38	6.38	5.86
22.08	18.07	18.45	20.55	12.8	15.42	10.66	14.57	15.13
7.38	6.6	5.15	5.82	4.52	4.86	3.8	4.44	5.33
0.9	3.83	0.57	1.77	1.35	1.08	1.3	0.98	1.5
3.06	5.34	1.87	3.78	4.12	4.39	3.34	1.28	5.98
0.44	0.35	1.12	0.49	0.64	0.5	0.17	0.87	0.73
4.71	4.08	3.72	4.85	9.21	5.56	5.55	7	5.41
0.21	0.45	2.48	0.22	1	0.08	0.17	0.72	0.58
0.71	0.89	1.15	0.92	0.37	1.38	0.39	0.68	1.89
3.95	7.68	4.55	5.8	8.4	6.7	5.1	5.17	6.49
2.45	1.66	1.38	1.24	2.35	1.55	5.86	2.52	1.86
0.97	0.38	1.04	0.62	0.46	0.65	0.96	0.97	0.59
0.57	0.27	0.7	0.46	0.16	0.67	0.35	0.59	0.49
1.05	1.71	1.4	1.52	2.68	2.38	2.27	1.54	2.14
1.54	0.54	1.8	1.1	0.56	2.32	3.56	2.66	1.48
7.51	8.61	10.52	8.49	9.7	15.78	12.03	10.74	10.26
0.71	0.76	0.84	0.77	0.62	1.21	1.12	0.75	0.94
451.1	1815.3	261.3	453.2	247.6	1043.9	246.6	245.6	269.2
150.07	177.11	159.93	163.77	180.33	206.66	172.23	159.84	184.86
1.32	0.95	1.07	1.2	0.57	0.68	0.87	1.02	0.79

Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch
Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae
Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens
Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators
Meech	Loutre	Loutre	Loutre	Loutre	Loutre	Loutre	Loutre	Loutre
17/06/2015	10/06/2015	10/06/2015	10/06/2015	31/07/2015	31/07/2015	31/07/2015	31/07/2015	31/07/2015
304	14.16	14.16	14.16	14.16	14.16	14.16	14.16	14.16
171	198	198	198	198	198	198	198	198
17900	2005	2005	2005	2005	2005	2005	2005	2005
22.2	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
9.9	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
2.9	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
21.1	19.9	19.9	19.9	26.3	26.3	26.3	26.3	26.3
88	162	162	162	166	166	166	166	166
Net	Net	Net	Net	Net	Net	Net	Net	Net
0.4	0.4	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Dead	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Juvenile	Male	Male	Male	Male	Juvenile	Female	Juvenile	Juvenile
Natural	Clove	Clove	Clove	Natural	Natural	Natural	Natural	Natural
65	129	135	129	120	60	153	101	101
51	110	114	111	102	50	130	84	84
1.66	24.31	22.99	19.81	17.68	2.05	39.65	11.27	11.27
1.25	1.83	1.55	1.45	1.67	1.64	1.8	1.9	1.9
1	1	1	1	1	0	3	1	1
0.43	0.31	0.33	0.54	0.15	0.16	0.22	0.07	0.35
5.87	2.88	2.14	2.4	0.66	0.91	0.66	0.41	1.01
0.31	0.29	0.64	0.78	0.43	0.64	0.96	0.44	1.39
0.88	1.27	1.02	0.9	0.72	0.64	0.66	0.51	0.72
0.11	0.19	0.26	0.26	0.13	0.11	0.14	0.08	0.17
26.29	27.02	21.56	17.6	18.78	22.34	17.47	19.69	20.15
4.47	8.55	15.8	12.55	7.89	8.1	10.35	7.22	6.27
8.79	7.48	7.01	4.49	7.4	9	5.87	8.58	8.36
19.22	15.05	15.59	20.33	20.33	20.68	24.36	22.2	16.08
5.32	4.63	4.41	5.63	6.85	8.49	8.16	7.02	5.47
2.54	0.67	0.49	1.42	0.88	0.88	0.99	0.93	0.64
3.42	1.83	1.54	4.48	2.87	3.36	3.61	3.45	3.36
0.23	0.23	0.95	0.65	0.67	0.81	0.61	0.73	0.6
5.13	4.68	4.99	4.9	7.8	6.62	4.33	7.99	9.7
0.75	0.41	0.58	0.94	0.61	0.35	0.19	0.63	0.49
0.31	0.59	1.86	1.61	1.28	0.55	0.79	0.63	0.96
4.02	5.54	5.08	6.12	4.52	3.68	5.2	4.6	5.97
1.59	2.53	1.37	1.34	3.4	1.9	2.51	3.1	2.84
0.44	1.24	0.71	0.44	1.1	1.25	0.93	1.37	1
0.37	0.96	0.64	0.38	0.83	0.88	1.07	0.9	0.62
0.69	1.9	1.78	2.19	1.59	1.35	1.56	1.35	1.38
1.04	2.12	1.44	0.71	2.6	1.4	2.37	1.79	1.31
7.78	9.63	9.83	9.34	8.51	5.88	6.99	6.32	11.16
0.76	0.83	0.8	0.81	0.63	0.55	0.64	0.55	0.72
695.6	3385.6	245	485.8	328.1	532.7	496.2	476.2	509.9
137.67	151.62	153.92	176.69	163.24	145.44	160.55	155.4	180.6
0.98	0.97	1.25	1.08	1.05	1.09	1.33	1.09	0.74

1.03	0.64	0.64	0.58	0.77	0.69	0.52	0.7	0.68
127.34	214.45	168.59	175.9	181.26	201.33	202.8	170.11	191.93
845.9	566.4	848.9	847.9	767	565	439.8	156.6	438.8
0.58	1.06	0.76	0.94	0.62	1.05	0.96	0.95	1.36
5.57	15.11	8.63	11.98	5.42	15.5	14.03	10.19	16
1.19	2.45	1.63	2.84	0.43	2.14	1.16	2.42	2.85
0.87	1.52	1.28	1.66	1.25	2.39	2.46	1.67	1.83
0.49	0.83	0.5	0.98	0.13	0.78	0.77	0.87	1.3
0.37	0.95	0.72	0.93	0.13	1.32	1.22	0.77	0.94
1.65	3.31	2.56	3.18	1.36	3.67	4.7	2.23	4.02
4.04	7.56	6.75	6.54	8.03	7.06	9.09	5.69	6
1.22	1.12	0.83	1.65	0.14	1.37	0.68	0.88	0.59
2.88	0.1	0.63	0.47	0.67	0.53	0.31	0.01	0.2
4.52	5.43	4.98	5.5	6.98	6.87	6.95	4.83	4.5
0.27	0.54	0.63	0.17	0.44	1.34	0.91	0.2	0.6
3.27	5.25	5.56	3.95	8.69	2.57	4.12	5.11	3.17
2.35	5.75	6.65	4.11	9.42	3.21	4.09	5.72	2.97
4.56	7.07	7.21	5.47	7.24	3.93	3.75	6.32	4.12
18.43	16.19	10.67	9.38	16.35	15.61	9.6	12.98	9.78
8.53	6.14	4.94	5.71	2.25	6.43	5.01	5.27	5.34
4.73	4.35	5.81	4.94	10.62	4.34	4.83	6.19	6.26
26.63	14.83	19.15	21.14	14.61	15.49	18.56	21.01	18.52
0.19	0.04	0.32	0.24	0.08	0.05	0.23	0.13	0.63
1	0.36	1.34	1.36	0.63	0.34	1.11	0.98	2.01
0.4	0.54	1.13	0.5	0.35	0.55	0.23	0.22	0.79
6.63	0.51	6.83	6.45	4.58	0.54	4.54	5.89	5.27
0.2	0.04	1.25	0.87	0.21	3.97	1.64	0.43	2.33
1	1	1	1	4	6	1	1	1
1.33	1.44	1.69	1.69	1.83	1.59	1.55	1.63	1.53
4	4.32	4.43	4.63	76.54	149.77	4.68	4.7	4.81
67	67	64	65	161	211	67	66	68
80	84	79	83	200	238	82	82	84
Natural	Natural	Natural	Natural	Natural	Natural	Natural	Natural	Natural
Juvenile	Juvenile	Juvenile	Juvenile	Female	Female	Juvenile	Juvenile	Juvenile
Alive	Alive	Alive	Alive	Dead	Dead	Alive	Alive	Alive
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Net	Net	Net	Net	Net	Net	Net	Net	Net
88	88	88	88	88	88	88	88	88
21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1
8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9
22.2	22.2	22.2	22.2	22.2	22.2	22.2	22.2	22.2
17900	17900	17900	17900	17900	17900	17900	17900	17900
171	171	171	171	171	171	171	171	171
304	304	304	304	304	304	304	304	304
17/06/2015	17/06/2015	17/06/2015	17/06/2015	17/06/2015	17/06/2015	17/06/2015	17/06/2015	17/06/2015
Meech	Meech	Meech	Meech	Meech	Meech	Meech	Meech	Meech
Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators
Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens
Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae
Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch

Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch
Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae
Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens
Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators
Meech	Meech	Meech	Meech	Meech	Meech	Meech	Meech	Meech
17/06/2015	17/06/2015	17/06/2015	17/06/2015	17/06/2015	17/06/2015	17/06/2015	17/06/2015	17/06/2015
304	304	304	304	304	304	304	304	304
171	171	171	171	171	171	171	171	171
17900	17900	17900	17900	17900	17900	17900	17900	17900
22.2	22.2	22.2	22.2	22.2	22.2	22.2	22.2	22.2
9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9
2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1
88	88	88	88	88	88	88	88	88
Net	Net	Net	Net	Net	Net	Net	Net	Net
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Alive	Alive	Dead	Dead	Dead	Alive	Alive	Dead	Alive
Male	Male	Female	Female	Juvenile	Juvenile	Juvenile	Juvenile	Juvenile
Clove	Clove	Natural	Natural	Natural	Natural	Natural	Natural	Natural
255	313	300	319	88	83	83	82	59
221	269	256	265	71	66	68	67	46
183.33	384.83	303.05	404.83	5.15	5.11	5.05	5.05	1.32
1.7	1.98	1.81	2.18	1.44	1.78	1.6	1.68	1.36
7	11	9	11	1	1	1	1	0
0.35	0.12	0.27	0.54	0.15	0.03	1.76	0.23	0.27
5.91	1.16	3.29	4.26	4.78	0.33	5.44	3.68	6.29
0.56	0.94	0.17	1	0.24	0.5	1.05	0.45	0.3
1.06	0.47	0.87	0.92	0.73	0.31	1.07	0.67	0.77
0.17	0.05	0.15	0.12	0.08	0.04	0.3	0.18	0.05
27.68	17.02	17.82	26.84	20.65	15.64	18.45	13.77	22.53
5.69	8.14	7.04	5.89	5.62	3.11	5.85	5.89	5.06
8.94	4.75	4.46	10.16	5.98	7.3	5.33	3.68	6.57
18.34	18.39	10.34	19.88	17.52	13.25	10.83	13.74	17.42
3.52	6.19	5.07	3.88	6.08	4.05	3.21	6.66	6.29
1.2	3.96	2.94	0.83	5.88	2.29	3.7	5.83	3.91
2.2	5.23	3.25	2.48	5.33	3.21	3.7	5.56	5.23
0.23	0.49	0.73	0.43	0.26	1	1.34	0.39	0.33
4.39	4.55	9.56	2.7	7.25	6.98	5.57	15.87	2.64
1.76	0.38	0.26	2.09	0.86	0.57	0.38	0.74	0.35
0.47	0.45	1.6	1.25	0.69	3.74	1.45	0.37	0.24
3.62	7.69	9.87	3.85	5.55	9.74	5.03	6.45	6.66
2.88	2.28	2.12	1.57	1.89	3.32	4.77	2.59	1.97
0.35	0.41	0.67	0.4	0.32	0.91	1.63	0.4	0.27
0.56	0.78	0.27	0.47	0.3	0.85	1.23	0.47	0.33
1.54	2.23	2.3	1.24	1.34	1.68	2.38	1.23	0.99
0.92	1.46	1.57	0.8	1.03	3.34	1.34	1.11	1.04
7.65	12.87	15.4	8.39	7.49	17.81	14.2	10.06	10.48
0.77	0.98	0.78	0.9	0.67	1.03	1.38	0.54	1
487.6	835.9	101.1	371.6	786.7	598.1	437.8	1586	1684
129.85	202.43	213.74	135.5	160.59	223.02	186.97	196.88	170.33
1.15	0.8	0.48	1.19	0.78	0.55	0.71	0.52	0.8

Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch
Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae
Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens
Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators
Meech	Meech	Meech	Meech	Meech	Meech	Meech	Meech	Meech
17/06/2015	17/06/2015	17/06/2015	17/06/2015	17/06/2015	17/06/2015	17/06/2015	17/06/2015	17/06/2015
304	304	304	304	304	304	304	304	304
171	171	171	171	171	171	171	171	171
17900	17900	17900	17900	17900	17900	17900	17900	17900
22.2	22.2	22.2	22.2	22.2	22.2	22.2	22.2	22.2
9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9
2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1
88	88	88	88	88	88	88	88	88
Net	Net	Net	Net	Net	Net	Net	Net	Net
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Dead	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Juvenile	Juvenile	Juvenile	Juvenile	Male	Female	Female	Male	Male
Natural	Natural	Natural	Natural	Natural	Natural	Natural	Clove	Clove
89	88	85	87	205	233	244	263	256
70	71	69	72	172	193	199	220	222
6.03	5.94	5.82	5.54	88.35	124.57	150.88	192.4	179.7
1.76	1.66	1.77	1.48	1.74	1.73	1.91	1.81	1.64
1	1	1	1	5	6	7	8	7
0.21	0.68	2.36	0.07	0.63	0.59	0.28	0.28	0.7
6.13	1.97	3.76	3.4	2.94	3.61	6.4	1.33	3.19
0.33	0.25	0.87	0.46	1.52	0.48	0.46	1.38	0.39
0.69	1.2	0.87	0.61	0.88	1.26	1.02	0.71	0.89
0.07	0.32	0.14	0.11	0.2	0.07	0.18	0.16	0.22
21.29	22.04	18.75	15.14	15.63	19.17	27.68	15.8	21.96
5.09	6.15	4.74	6.22	5.75	5.53	4.57	6.5	7.34
5.84	8.44	5.51	4.07	4.64	5.18	9.8	5.08	4.97
19.03	11.86	9.53	16.44	10.11	9.47	20.53	11.63	11.32
6.71	5.25	3.29	8.19	2.97	4.04	3.71	3.27	3.02
5.86	2.15	2.41	8.21	2.16	2.21	1.39	2.27	1.43
5.79	2.52	2.35	7.2	2.17	2.59	2.4	2.55	1.95
0.26	0.53	0.39	0.66	0.48	0.29	0.34	0.54	0.47
2.92	3.97	6.57	4.77	5.98	8.91	4.03	6.59	4.62
0.74	0.23	0.75	0.42	0.32	0.6	3.05	0.39	0.16
0.26	1.75	0.75	0.69	2.76	3.91	1.13	1.82	3.63
6.83	5.64	7.79	7.3	6.44	7.06	3.29	7.9	6.17
1.62	4	3.29	1.88	3.3	2.42	2.34	2.92	2.21
0.22	1.58	0.8	0.47	0.84	0.69	0.34	0.86	0.68
0.18	1.96	0.77	0.52	1.16	0.34	0.28	0.79	0.56
1.2	1.79	1.78	1.69	2.44	1.85	0.99	2.63	2.26
0.46	4.08	2.7	1.47	3.27	1.86	0.49	2.67	1.81
8.27	11.65	19.83	10.01	23.42	17.88	5.3	21.95	20.05
0.83	1.04	1.25	0.86	1.68	1.03	0.57	1.4	1.62
1779.6	846.9	102.2	883.8	417.2	67.3	435.8	767	71.2
164.7	167.13	217.22	194.27	234.29	207.85	117.6	237.48	206.41
0.82	0.83	0.5	0.68	0.55	0.46	1.25	0.56	0.61

Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch
Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae
Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens
Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators
Meech	Meech	Meech	Meech	Meech	Meech	Meech	Meech	Meech
07/08/2015	07/08/2015	07/08/2015	07/08/2015	07/08/2015	07/08/2015	17/06/2015	07/08/2015	07/08/2015
304	304	304	304	304	304	304	304	304
171	171	171	171	171	171	171	171	171
17900	17900	17900	17900	17900	17900	17900	17900	17900
22.2	22.2	22.2	22.2	22.2	22.2	22.2	22.2	22.2
9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9
2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1
88	88	88	88	88	88	88	88	88
Seine	Seine	Seine	Seine	Seine	Seine	Net	Seine	Seine
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Male	Female	Juvenile	Juvenile	Male	Male	Juvenile	Juvenile	Juvenile
Clove	Clove	Clove	Natural	Natural	Clove	Natural	Clove	Clove
131	129	45	43	115	114	100	94	94
111	110	35	34	98	99	80	79	79
19	20.79	0.56	0.57	12.34	11.8	9.33	6.86	6.47
1.39	1.56	1.3	1.44	1.31	1.22	1.82	1.39	1.31
2	2	0	0	1	1	1	1	1
0.09	0.43	0.7	0.7	0.78	1.58	0.16	0.22	1.28
1.11	2.82	2.31	2.31	1.2	1.97	5.85	1.15	1.54
0.55	0.9	0.55	0.55	2.22	2.78	0.43	0.86	2.61
0.68	0.57	1.08	1.08	0.82	0.88	1.45	0.86	0.66
0.13	0.09	0.18	0.18	0.25	0.19	0.53	0.19	0.19
17.54	15.66	18.38	18.38	14.2	19.99	27.56	16.62	14.17
4.65	6.04	5.03	5.03	6.82	7.37	7.27	6.38	5.68
8.08	4.56	10.73	10.73	6.02	7.77	8.9	8.56	6.09
16.02	19.98	11.41	11.41	21.06	16.98	19.08	16.77	12.45
4.36	7.55	4.18	4.18	8.14	3.97	4.21	5.02	3.24
1.22	3.48	0.78	0.78	1.35	1.17	1.23	1.08	0.89
2.15	6.17	1.39	1.39	3.21	2.52	2.05	2.88	2.04
1.06	0.35	0.49	0.49	0.55	0.48	0.23	0.98	0.41
7.2	4.79	9.56	9.56	5.86	4.55	7.42	6.65	3.24
0.63	0.69	0.12	0.12	1.17	0.29	2.42	0.67	20.59
1.5	0.39	0.83	0.83	2.67	1.11	0.8	2.08	0.75
4.18	7.74	7.18	7.18	3.63	4.76	1.96	6.5	3.33
3.85	3.22	3.83	3.83	3.99	4.88	1.09	2.67	3.88
1.01	0.43	1.05	1.05	0.98	1.16	0.6	1.15	1.32
0.52	0.32	1.47	1.47	0.99	0.69	0.98	0.93	1.67
1.85	1.67	1.73	1.73	1.2	0.87	0.68	3.18	1.72
4.21	1.06	5.12	5.12	3.05	2.96	1.33	2.28	3.97
17.39	11.08	11.89	11.89	9.83	11.07	3.76	12.32	8.27
1.25	0.85	0.68	0.68	0.75	1.09	0.4	0.87	0.38
275.7	587.5	687.5	687.5	687.5	248.3	862.4	405.3	566.2
200.05	200.03	173.28	173.28	170.73	162.56	108.25	188.01	190.9
0.79	0.79	0.72	0.72	1.12	1.22	1.3	0.79	0.67

Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch
Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae
Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens
No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators
Périard	Périard	Périard	Périard	Périard	Périard	Périard	Périard	Périard
03/07/2015	03/07/2015	02/07/2015	02/07/2015	02/07/2015	02/07/2015	02/07/2015	02/07/2015	02/07/2015
4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
191	191	191	191	191	191	191	191	191
769	769	769	769	769	769	769	769	769
1	1	1	1	1	1	1	1	1
7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8
20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9
52	52	52	52	52	52	52	52	52
Net	Rod	Net	Net	Net	Net	Net	Net	Net
5	2	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Female	Female	Female	Male	Juvenile	Juvenile	Juvenile	Juvenile	Juvenile
Clove	Clove	Clove	Natural	Clove	Clove	Clove	Clove	Natural
145	285	150	132	87	83	82	85	85
131	241	125	112	71	70	70	68	70
36.43	214.37	30.24	18.94	5.36	5	4.84	4.74	4.42
1.62	1.53	1.55	1.35	1.5	1.46	1.41	1.51	1.29
3	11	2	2	1	1	1	1	1
4.97	1.22	2.14	0.48	0.69	0.33	0.75	1.86	0.33
2.13	1.77	1.92	2.84	3	3.15	2.51	3.21	2.92
18.25	2.2	3.73	0.9	1.27	0.68	1.7	3.25	0.38
0.39	0.73	1.21	0.85	0.78	0.97	0.61	0.87	0.74
0.65	0.18	0.14	0.2	0.15	0.19	0.13	0.18	0.14
10.4	13.87	11.36	5.48	14.56	18.5	12.79	16.29	14.81
17.76	5.75	5.32	5.47	9	5.07	5.52	8.95	4.85
4.57	5.38	4.78	10.99	4.06	6.43	3.97	4.76	5.36
20.2	9.39	8.13	13.48	13.55	10.41	9.33	13.15	10.13
2.39	1.9	1.53	3.53	3.91	2.58	2.72	3.48	3.05
3.42	1.35	0.32	1.37	1.82	0.95	2.04	1.35	1.21
3.1	1.18	1.18	2.19	2.59	1.81	2.21	2.39	1.78
0.81	0.28	0.18	0.89	0.32	0.44	0.35	0.25	0.47
0.13	5.82	7.68	10.07	6.87	3.44	5.79	3.3	3.33
1.17	29.69	26.12	10.51	4.78	7.92	16.34	4.02	14.61
2.87	1.32	1.12	1.54	1.1	1.92	1.06	0.56	0.88
1.07	1.79	2.66	4.87	5.45	4.24	4.48	5.06	4.58
0.44	3.98	5.3	5.81	5.98	5.98	7.43	6.93	7.93
3.34	0.85	0.81	0.88	0.65	0.87	0.59	0.7	0.51
1.03	0.55	0.49	0.47	0.82	0.78	0.75	0.44	0.48
0.09	0.51	0.46	0.83	0.89	0.72	0.73	0.57	0.73
0.46	1.9	2.17	2.32	1.95	3.59	2.5	2.51	3.17
0.38	8.4	11.26	14.02	15.81	19.02	15.7	15.93	17.6
1.43	0.27	0.35	0.59	0.91	1.19	0.63	1.2	0.78
66.1	268.1	38.8	263.9	498.8	321.9	39.8	324.3	494.8
109.2	198.61	212.46	211.47	206.22	210.64	223.54	196.22	222.98
5.02	0.47	0.48	0.62	0.79	0.65	0.56	0.99	0.59

Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch
Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae
Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens
No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators
Périard	Périard	Périard	Périard	Périard	Périard	Périard	Périard	Périard
02/07/2015	02/07/2015	02/07/2015	02/07/2015	02/07/2015	02/07/2015	02/07/2015	03/07/2015	02/07/2015
4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
191	191	191	191	191	191	191	191	191
769	769	769	769	769	769	769	769	769
1	1	1	1	1	1	1	1	1
7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8
20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9
52	52	52	52	52	52	52	52	52
Net	Net	Net	Net	Net	Net	Net	Net	Net
2.5	2.5	2.5	2.5	2.5	2.5	2.5	5	2.5
Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Female	Male	Female	Female	Female	Male	Male	Juvenile	Juvenile
Clove	Clove	Clove	Clove	Natural	Clove	Clove	Clove	Clove
115	118	115	116	105	110	113	90	95
96	99	93	98	87	95	94	76	76
13.77	13.16	12.44	12.3	10.91	10.76	10.34	6.86	6.59
1.56	1.36	1.55	1.31	1.66	1.25	1.24	1.56	1.5
1	1	1	1	1	1	1	1	1
0.53	0.43	1.73	0.35	0.55	1.17	0.64	1.42	0.19
2.89	1.3	2.32	1.53	2.46	2.53	1.22	2.55	1.82
0.49	1.43	3.75	0.39	0.79	1.97	1.34	1.87	0.45
1.27	0.68	0.71	0.57	1.08	0.66	0.48	1.04	0.66
0.23	0.26	0.33	0.1	0.24	0.17	0.1	0.21	0.2
21.7	16.42	14.16	13.27	17.51	14.22	10.19	15.8	14.33
7.54	5.38	6.41	3.21	6.82	5.08	3.41	8.16	4.21
8.18	7.86	5.84	6.3	6.72	5.81	4.17	6.42	6.49
15.53	13.15	12.28	8.88	13.29	11.46	5.85	14.83	9.64
3.34	2.9	2.88	2.24	3.4	2.53	1.64	4.29	2.96
1	0.22	0.53	0.34	0.63	0.61	1.26	0.63	0.93
1.58	1.56	1.68	0.56	1.82	1.21	0.39	1.86	1.69
0.79	0.7	0.68	0.41	0.81	0.56	0.35	0.32	0.41
10.62	13.14	3.63	17.91	8.13	8.65	14.91	5.96	2.77
4.2	14.71	4.41	12.66	4.84	8.78	20.89	5.71	21.69
2.25	1.4	1.16	1.23	2.31	1.3	1.26	0.89	0.68
3.86	3.41	4.51	3.24	4.93	4.39	4.08	5.19	3.94
1.93	2.03	10.48	6.21	3.68	9.16	9.64	4.1	7.53
0.86	1.2	0.91	0.67	0.87	0.8	0.81	1.13	0.71
0.5	0.63	0.47	0.34	0.46	0.73	0.45	0.83	0.8
1.26	1.08	0.42	0.66	1.33	0.62	0.33	1.77	0.61
1.8	2.13	3.95	2.73	2.74	2.82	2.46	2.45	3.17
7.65	7.97	16.78	16.22	14.59	14.76	14.14	12.56	14.14
0.46	0.31	1.25	0.48	0.81	0.69	0.37	0.73	0.53
249.7	262	245.7	406.3	266.8	414.6	324.2	649.2	475.1
147.7	181.33	198.72	219.16	192.46	199.19	227.5	187.81	218.2
0.85	0.55	1.08	0.4	0.71	0.75	0.4	0.83	0.53

Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch
Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae
Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens
Predators	Predators	Predators	Predators	Predators	Predators	Predators	No Predators	No Predators
Philippe	Philippe	Philippe	Philippe	Philippe	Philippe	Philippe	Périard	Périard
04/08/2015	04/08/2015	18/06/2015	04/08/2015	18/06/2015	18/06/2015	12/06/2015	02/07/2015	02/07/2015
176	176	304	176	176	176	176	4.5	4.5
172	172	172	172	172	172	172	191	191
9650	9650	9650	9650	9650	9650	9650	769	769
17.4	17.4	17.4	17.4	17.4	17.4	17.4		
8.7	8.7	8.7	8.7	8.7	8.7	8.7		
2.1	2.1	2.1	2.1	2.1	2.1	2.1	1	1
8.6	8.6	8.6	8.6	8.6	8.6	8.6	7.8	7.8
24.4	24.4	19.3	24.4	19.3	19.3	19.3	20.9	20.9
75	75	73	75	73	73	73	52	52
Net	Net	Net	Net	Rod	Rod	Rod	Net	Net
5	5	5.8	5	1.8	1.2	0.1	2.5	2.5
Alive	Alive	Dead	Alive	Alive	Alive	Alive	Alive	Alive
Female	Male	Juvenile	Female	Female	Female	Female	Female	Female
Clove	Clove	Natural	Natural	Clove	Clove	Clove	Natural	Clove
113	117	102	106	276	255	129	125	125
95	100	85	90	240	226	107	106	102
14.16	11.95	10.58	10.13	233.38	206.01	16.1	15.18	14.27
1.65	1.2	1.72	1.39	1.69	1.78	1.31	1.27	1.34
1	1	1	1	8	7	2	1	1
0.85	0.69	0.22	1.14	0.3	0.19	2.29	0.66	0.81
1.33	1.45	4.13	1.28	6.45	3.93	2.59	2.67	3.29
1.86	1.22	0.2	2.77	0.34	0.31	2.93	5.41	1.24
0.8	0.72	0.66	0.98	1.11	0.75	0.78	0.9	0.64
0.16	0.17	0.07	0.26	0.46	0.12	0.27	0.26	0.15
15.71	16.4	24.34	18.39	29.01	24.6	15.47	16.54	12.8
5.46	5.63	2.87	6.86	5.45	7.65	7.9	5.06	4.62
9.1	8.27	6.97	8.53	9.55	7.44	6.2	6.53	4.62
12.09	14.98	13.45	16.26	20.18	19.85	15.26	11.84	7.53
3.75	4.61	3.5	4.24	3.44	5	3.62	3.27	2.46
0.77	1	2.49	0.54	0.69	2.09	0.93	0.33	1.19
2.54	3.31	2.63	2.7	1.92	3.2	1.94	1.49	1.56
1.36	0.27	0.21	0.49	0.49	0.34	4.5	0.73	0.41
8.46	9.1	6.16	4.86	5.24	5.34	11.88	3.19	9.27
0.84	0.81	0.76	0.69	2.13	0.63	2.72	7.8	27.16
1.01	0.71	0.27	1.34	1	0.43	1.63	2.72	0.54
4.99	4.71	9.58	3.63	2.07	4.69	4.19	3.48	3.7
6.58	3.89	2.47	4.72	1.16	1.57	2.67	7.58	5.01
1.23	1.05	0.59	1.31	0.37	0.3	1.05	0.58	0.52
0.84	0.43	0.29	0.72	0.31	0.37	0.53	0.42	0.33
1.72	1.48	1.84	1.21	0.83	1.44	1.06	0.39	0.6
4.22	4.33	1.24	3.84	0.56	0.72	1.75	2.86	1.65
14.35	14.78	15.07	13.23	6.96	9.05	7.84	15.29	9.9
1	1	0.91	1.28	0.72	0.8	0.48	0.98	0.28
436.3	248.1	682.9	386.4	431.8	876.7	283.6	297.1	685.2
191.25	197.39	195.05	175.79	118.29	151.15	158.31	188.72	213.53
0.84	0.76	0.51	1.1	1.25	1.03	1.03	0.95	0.37

Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch
Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae
Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens
Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators
Philippe	Philippe	Philippe	Philippe	Philippe	Philippe	Philippe	Philippe	Philippe
04/08/2015	04/08/2015	04/08/2015	04/08/2015	04/08/2015	04/08/2015	04/08/2015	04/08/2015	04/08/2015
176	176	176	176	176	176	176	176	176
172	172	172	172	172	172	172	172	172
9650	9650	9650	9650	9650	9650	9650	9650	9650
17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4
8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7
2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4
75	75	75	75	75	75	75	75	75
Seine	Seine	Seine	Seine	Seine	Seine	Net	Net	Net
0.4	0.4	0.4	0.4	0.4	0.4	5	5	5
Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Juvenile	Juvenile	Juvenile	Juvenile	Juvenile	Juvenile	Male	Male	Female
Clove	Clove	Clove	Clove	Clove	Clove	Clove	Clove	Natural
36	38	45	47	44	45	137	136	135
28	31	37	37	35	36	120	119	115
0.14	0.18	0.44	0.54	0.43	0.47	26.36	26.62	25.87
0.63	0.59	0.87	1.07	0.99	1	1.53	1.58	1.7
0	0	0	0	0	0	2	2	2
1.92	1.08	1.08	1.14	1.05	1.05	1.02	1.61	0.84
2.99	2.53	2.53	5.75	4.34	4.34	1.62	1.15	1.19
0.6	1.67	1.67	0.41	0.47	0.47	1.89	3.19	1.3
0.78	0.87	0.87	2.35	2.62	2.62	0.76	0.83	0.57
0.16	0.18	0.18	0.56	0.52	0.52	0.19	0.26	0.14
16.83	17.29	17.29	23.98	22.94	22.94	16.69	14.03	12.99
3.9	4.13	4.13	8.55	7.65	7.65	5.77	7.05	4.43
11.53	8.65	8.65	8.66	7.78	7.78	9.46	8.34	5.52
9.33	10.03	10.03	10.22	10.89	10.89	13.02	13.08	8.94
2.75	3.53	3.53	3.48	3.96	3.96	3.84	3.29	2.4
0.57	0.72	0.72	0.75	1.25	1.25	0.79	0.71	0.28
1.28	1.57	1.57	1.56	2.88	2.88	2.22	2.32	1.18
0.51	1.12	1.12	0.22	0.64	0.64	0.8	0.62	0.35
6.16	5.85	5.85	4.65	5.1	5.1	5.12	6.37	6.56
0.29	0.26	0.26	0.41	0.52	0.52	0.7	1.35	35.39
1.2	1.59	1.59	1.01	0.99	0.99	1.93	1.26	0.75
4.75	5.37	5.37	3.22	6.1	6.1	5.33	4.57	2.75
6.7	5.7	5.7	2.96	3.22	3.22	4.22	5.01	2.31
1.75	1.86	1.86	1.71	1.3	1.3	1.42	1.81	0.88
1.58	1.96	1.96	1.74	0.9	0.9	0.72	0.98	1.2
1.24	1.83	1.83	0.65	1.63	1.63	2.43	1.45	1.38
9.14	9.58	9.58	7.08	2.85	2.85	4.08	5.51	1.78
14.04	12.64	12.64	8.95	10.4	10.4	15.98	15.22	6.88
1.22	1.07	1.07	1.04	0.93	0.93	1.31	1.24	0.19
254.1	253.1	252.1	251.1	249.1	249.1	415.4	414	122.7
172.39	173.46	173.46	133.88	161.39	161.39	194.84	194.99	211.21
0.94	0.98	0.98	1.22	0.82	0.82	0.81	0.95	0.34

Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch
Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae
Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens
Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators
Renaud	Renaud	Renaud	Renaud	Renaud	Renaud	Renaud	Renaud	Philippe
02/06/2015	02/06/2015	02/06/2015	02/06/2015	02/06/2015	02/06/2015	02/06/2015	02/06/2015	04/08/2015
10.23	10.23	10.23	10.23	10.23	10.23	10.23	10.23	176
203	203	203	203	203	203	203	203	172
2057	2057	2057	2057	2057	2057	2057	2057	9650
4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	17.4
1	1	1	1	1	1	1	1	8.7
1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	2.1
7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	8.6
19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9	24.4
70	70	70	70	70	70	70	70	75
Net	Net	Net	Net	Net	Net	Net	Net	Seine
3.8	3.8	3.8	3.8	3.8	3.8	3.8	0.5	0.4
Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Male	Male	Male	Female	Female	Female	Male	Female	Juvenile
Clove	Clove	Clove	Clove	Clove	Clove	Clove	Clove	Clove
200	205	205	220	190	160	195	225	37
168	159	161	189	158	144	175	185	29
90.16	86.6	86.44	124.93	73.51	50.38	79.19	137.66	0.13
1.9	2.15	2.07	1.85	1.86	1.69	1.48	2.17	0.53
4	5	5	6	4	3	4	6	0
0.32	0.12	0.38	0.11	0.05	0.25	0.23	0.49	1.92
1.16	0.36	4.22	0.41	2.04	2.24	1.6	2.72	2.99
1.22	0.84	0.72	0.54	0.28	0.19	0.26	0.15	0.6
0.66	0.5	2.26	0.36	0.94	0.87	0.83	1.41	0.78
0.07	0.07	0.66	0.03	0.05	0.21	0.16	0.23	0.16
16.82	13.18	23.49	14.45	19.44	22.54	21.48	20.53	16.83
7.61	4.68	11.45	4.59	11.1	7.59	1.89	7.38	3.9
6.7	6.49	8.38	7.09	4.85	8.22	8.67	7.97	11.53
16.1	13.27	17.63	16.47	21.71	33.12	24.46	10.52	9.33
4.57	4.14	3.35	5.23	6.59	4.06	3.24	2.87	2.75
1.33	0.93	1.12	0.97	2.69	0.27	0.33	0.74	0.57
2.3	2.25	2.15	2.64	4.35	0.74	0.73	1.44	1.28
0.82	0.27	1.33	0.75	0.47	2.32	0.97	0.36	0.51
5.72	15.64	4.04	10.14	4.58	3.63	7.28	8.04	6.16
0.09	0.57	0.34	0.32	0.23	1.36	1.43	0.09	0.29
4.12	1.52	3.2	0.97	0.25	1.43	0.7	1.7	1.2
4.11	5.43	1.59	7.37	4.98	1.65	4.47	3.71	4.75
3.35	4.49	1.41	3.11	2.1	1.87	3.05	3.67	6.7
1.59	1.51	1.09	1.14	0.23	0.52	0.45	0.77	1.75
0.8	0.93	1.45	1.11	0.23	0.44	0.51	0.77	1.58
1.3	2.65	0.75	2.59	1.49	0.53	1.33	1.78	1.24
3.53	3.51	2.5	3.1	0.84	1.03	1.39	2.73	9.14
15.7	16.65	6.51	16.5	10.5	4.91	14.56	19.95	14.04
1.35	0.79	1.05	0.88	0.92	0.58	0.96	1.51	1.22
119	112	85	172.8	840.3	388.7	643.5	82.3	255.1
189.83	219.04	117.45	218.09	174.24	110.5	173.33	199.47	172.39
0.92	0.56	1.8	0.62	1.11	2.66	0.96	0.65	0.94

Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch
Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae
Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens
Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators
Renaud	Renaud	Renaud	Renaud	Renaud	Renaud	Renaud	Renaud	Renaud
03/06/2015	02/06/2015	03/06/2015	02/06/2015	02/06/2015	02/06/2015	02/06/2015	02/06/2015	02/06/2015
10.23	10.23	10.23	10.23	10.23	10.23	10.23	10.23	10.23
203	203	203	203	203	203	203	203	203
2057	2057	2057	2057	2057	2057	2057	2057	2057
4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
1	1	1	1	1	1	1	1	1
1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2
19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9
70	70	70	70	70	70	70	70	70
Net	Net	Net	Net	Net	Net	Net	Net	Net
5.8	3.8	5.8	3.8	3.8	0.5	3.8	3.8	3.8
Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Juvenile	Juvenile	Juvenile	Female	Female	Female	Female	Female	Female
Clove	Clove	Clove	Clove	Clove	Clove	Clove	Clove	Clove
96	89	89	240	180	220	230	210	160
80	74	74	210	150	186	197	174	144
6.9	5.81	5.66	162.11	53.5	116.37	132.69	90.53	49.75
1.35	1.43	1.4	1.75	1.59	1.81	1.74	1.72	1.67
1	1	1	7	3	6	7	5	3
0.39	0.52	0.09	0.43	0.75	1.92	0.07	0.15	0.19
3.46	4.01	2.91	3.71	2.57	2.48	0.77	0.48	0.81
0.26	0.7	0.18	1.44	0.73	0.9	0.3	0.8	1.15
1.59	2.37	0.94	1.44	1.23	1.15	0.59	0.51	0.74
0.41	0.53	0.12	0.38	0.36	0.2	0.04	0.07	0.09
20.44	21.12	19.19	21.69	21.15	19.4	14.31	15.22	14.74
9.41	9.8	5.74	7.43	8.31	7.29	10.72	4.62	5.78
6.78	8.61	5.79	6.31	7.48	5.64	4.64	8.41	7.17
21.5	9.37	42.66	22.7	18.16	9.66	21.46	14.77	13.55
4.4	3.41	1.06	5.45	4.93	2.87	6.67	5.13	3.78
1.15	1.99	0.97	0.85	0.92	0.67	1.85	1.06	2.45
1.33	1.98	0.97	1.61	1.64	1.22	3.4	2.22	4.09
2.12	0.67	2.51	2.04	1.72	0.31	0.63	0.66	0.52
4.75	4.43	2.26	3.98	13.65	7.8	6.53	8.06	15.33
1.38	0.81	0.32	1.35	0.52	0.05	0.09	0.12	1.26
1.5	4.16	2.63	2.1	2.2	0.76	0.48	1.17	2.02
3.07	3.53	1.52	2.38	4.44	4.37	4.32	5.95	4.07
3.4	2.96	2.11	2.27	2.78	3.93	3.79	3.47	4.29
0.68	1.35	0.43	0.63	0.82	0.43	0.4	1.17	1.82
0.91	1.87	0.54	0.6	0.71	0.35	0.48	0.99	0.97
0.67	1.59	0.51	0.85	1.8	1.29	2	1.43	1.69
1.55	4.06	1.09	2.27	2.11	2.35	1.86	4.74	4.2
8.83	10.15	5.47	8.09	1.02	24.96	14.6	18.8	9.3
0.8	1.11	1.33	0.78	0.15	1.76	1.05	1.15	0.62
326.9	74.7	234.6	225.8	205.1	91.4	0	122.6	84.8
139.76	144.68	110.39	134.82	116.09	226.73	198.75	215.94	182.36
1.54	1.03	4.34	1.58	1.19	0.57	1.02	0.68	0.72

Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch
Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae
Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens
No Predators	No Predators	No Predators	Predators	Predators	Predators	Predators	Predators	Predators
Sam	Sam	Sam	Renaud	Renaud	Renaud	Renaud	Renaud	Renaud
13/07/2015	13/07/2015	13/07/2015	06/08/2015	06/08/2015	28/07/2015	28/07/2015	02/06/2015	28/07/2015
186	186	186	10.23	10.23	10.23	10.23	10.23	10.23
251	251	251	203	203	203	203	203	203
10251	10251	10251	2057	2057	2057	2057	2057	2057
64	64	64	4.3	4.3	4.3	4.3	4.3	4.3
36.5	36.5	36.5	1	1	1	1	1	1
2.2	2.2	2.2	1.8	1.8	1.8	1.8	1.8	1.8
8.4	8.4	8.4	7.8	7.8	7.8	7.8	7.2	7.8
24.2	24.2	24.2	25.6	25.6	25.6	25.6	19.9	25.6
59	59	59	77	77	77	77	70	77
Net	Net	Net	Net	Net	Net	Net	Net	Net
1	1	1	4	4	3.8	3.8	3.8	3.8
Alive	Alive	Alive	Alive	Dead	Alive	Alive	Alive	Alive
Juvenile	Juvenile	Juvenile	Female	Female	Female	Female	Female	Male
Natural	Natural	Clove	Clove	Natural	Natural	Natural	Clove	Natural
87	83	83	113	115	152	172	105	111
74	68	70	96	98	131	143	81	91
5.4	4.48	4.45	11.58	13.11	38.06	54.31	11.42	11.06
1.33	1.43	1.3	1.31	1.39	1.69	1.86	2.15	1.47
1	1	1	2	2	2	3	1	1
22.56	0.24	0.16	2.38	0.9	0.16	0.2	0.11	0.25
3.01	1.81	1.69	2.03	0.77	1.75	1.3	4.61	1.16
1.3	0.5	0.62	3.56	2.68	0.51	0.55	0.28	0.84
1.11	0.53	0.69	1.38	0.66	1.26	0.94	1.7	1.35
0.38	0.1	0.14	0.28	0.09	0.2	0.2	0.2	0.14
11.39	11.42	15.5	16.31	10.23	23.6	21.45	24.21	15.17
3.09	5.34	6.3	7.62	5.15	9.47	8.8	3.64	6.38
8.99	3.36	5.46	7.65	31.84	6.26	7.59	4.26	6.9
8.62	15.24	14.39	17.97	14.55	17.5	17.04	26.6	13.56
3.29	4.9	6.56	5.69	3.4	5.31	5.3	7.84	5.62
13.43	2.78	3.76	0.91	0.86	0.96	0.72	2.92	2.34
2.36	4.11	4.72	2.88	2.02	2.75	2.66	4.46	4.08
0.14	4.91	0.34	0.71	0.47	0.28	0.26	1.27	0.33
0.6	15.08	4.71	6.93	3.95	8.92	6.68	2.93	10.39
3.75	2.9	0.2	0.7	0.16	1.18	0.5	0.18	0.51
2.78	0.49	0.47	1.04	0.95	0.37	0.59	0.49	0.73
6.95	5.48	7.17	3.74	3.07	4.24	4.81	4.05	5.69
0.28	3.82	4.98	4.5	4.51	2.56	5.2	1.77	6.45
3.8	0.57	0.87	1.31	0.86	0.88	1.13	0.28	1.17
1.57	0.21	0.57	0.81	0.63	0.58	0.54	0.2	1.02
0	1.26	1.45	1.72	0.79	1.52	1.57	1.06	1.4
0.6	1.96	2.63	2.08	2.81	1.8	2.14	0.39	2.9
0	12.99	16.6	7.81	8.64	7.95	9.84	6.56	11.64
0.42	0.62	1.19	0.7	1.09	0.59	0.79	0.75	0.76
8.6	284.3	520.2	445	362.1	881.8	659	1011.1	722.8
94.4	211.7	217.91	154.82	128.39	154.42	164.26	143.09	191.31
0.69	0.67	0.7	1.19	1.32	0.99	1.05	1.25	0.76

Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch
Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae
Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens
No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators
Sam	Sam	Sam	Sam	Sam	Sam	Sam	Sam	Sam
13/07/2015	13/07/2015	13/07/2015	13/07/2015	13/07/2015	13/07/2015	13/07/2015	13/07/2015	13/07/2015
186	186	186	186	186	186	186	186	186
251	251	251	251	251	251	251	251	251
10251	10251	10251	10251	10251	10251	10251	10251	10251
64	64	64	64	64	64	64	64	64
36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5
2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2
59	59	59	59	59	59	59	59	59
Net	Net	Net	Net	Net	Net	Net	Net	Net
1	1	1	1	1	1	1	1	1
Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Female	Female	Female	Female	Juvenile	Juvenile	Juvenile	Juvenile	Juvenile
Natural	Natural	Natural	Natural	Natural	Natural	Natural	Natural	Natural
140	139	129	125	100	95	92	89	87
120	119	105	107	88	80	79	73	74
22.2	21.2	17.15	16.05	8.75	6.48	6.48	5.49	5.4
1.28	1.26	1.48	1.31	1.28	1.27	1.31	1.41	1.33
2	2	2	2	1	1	1	1	1
0.32	0.34	0.62	0.73	0.23	0.42	0.52	0.45	0.44
1.53	1.51	2.13	2.76	0.71	2.59	3.26	4.02	5.36
0.94	0.69	1.15	1.14	0.42	0.8	0.91	0.76	0.2
0.6	0.73	1.12	0.81	0.42	0.79	0.48	0.76	0.66
0.14	0.15	0.25	0.19	0.07	0.12	0.04	0.09	0.05
12.19	14.73	16.83	14.68	10.28	14.7	9.12	14.56	13.23
5.29	5.25	6.63	5.57	2.96	6.74	5.94	7.95	10.16
5.04	4.99	7	5.45	4.17	4.58	2.2	3.44	2.9
10.29	11.29	13.31	11.81	12.48	12.42	9.1	12.5	11.28
3.68	3.49	3.84	2.71	2.53	6.03	4.6	6.18	7.48
2.32	2.2	1.43	1.58	1.78	3.45	3.91	4.72	5.25
3.09	2.5	2.63	1.7	1.39	4.73	4.46	5.62	6.17
2.82	5.92	0.21	2.23	5.51	0.24	5.75	0.17	0.41
15.42	13.02	4.26	14.25	28.1	4.27	27.3	6.07	4.27
7.37	5.45	3.23	3.72	7.97	7.6	3.15	3.67	0.26
1.29	1.15	2.08	1.44	1.1	0.6	0.18	0.29	0.31
4.93	4.86	3.93	4.32	3.1	6.26	5.98	7.41	11.99
3.34	3.83	3.78	6.96	3.96	4.95	2.62	2.97	2.85
1.08	0.84	1.49	0.79	0.71	0.78	0.28	0.25	0.43
0.96	1.02	1.01	0.52	0.89	0.8	0.73	0.21	0.31
0.92	0.9	1.1	0.71	0.63	1.44	0.87	1.57	0.16
2.75	2.93	5.63	3.69	1.79	2.01	0.7	1.1	1.08
13.69	12.2	16.34	12.21	8.8	13.68	7.91	15.22	14.76
0.57	0.58	1.34	0.59	0.26	0.79	0.31	0.9	0.89
181	153	99.8	149.8	294.3	236.8	653.4	332	451.99
214.41	193.97	197.15	183.54	191.32	214.42	200.4	221.76	226.47
0.51	0.69	0.84	0.78	0.51	0.61	0.46	0.56	0.57

Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch
Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae
Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens
No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators
Sam	Sam	Sam	Sam	Sam	Sam	Sam	Sam	Sam
14/07/2015	13/07/2015	13/07/2015	13/07/2015	13/07/2015	13/07/2015	13/07/2015	13/07/2015	13/07/2015
186	186	186	186	186	186	186	186	186
251	251	251	251	251	251	251	251	251
10251	10251	10251	10251	10251	10251	10251	10251	10251
64	64	64	64	64	64	64	64	64
36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5
2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2
59	59	59	59	59	59	59	59	59
Net	Net	Net	Net	Net	Net	Net	Net	Net
3.8	1	1	1	1	1	1	1	1
Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Female	Female	Female	Female	Male	Female	Female	Juvenile	Juvenile
Natural	Natural	Clove	Clove	Clove	Clove	Clove	Natural	Natural
120	116	156	156	211	165	165	34	35
104	101	132	132	180	138	138	29	30
13.77	12.14	32.69	32.69	83.64	39.7	39.7	0.24	0.31
1.22	1.18	1.42	1.42	1.43	1.51	1.51	0.98	1.16
1	1	3	3	5	4	4	0	0
0.17	0.33	1.34	2.17	2.88	0.6	0.31	0.47	0.47
4.95	1.33	2.08	2.33	5.63	1.75	0.65	3.87	3.87
0.57	0.74	0.36	0.51	0.87	0.13	0.71	1.26	1.26
0.71	0.65	0.72	1.38	0.7	1.07	0.31	1.18	1.18
0.08	0.12	0.21	1.07	0.11	0.22	0.05	0.22	0.22
14.24	14.48	16.62	12.15	15.52	21.59	6.16	19.93	19.93
10.92	6.23	8.32	3.46	7.99	8.67	2.03	6.2	6.2
2.52	5.67	5.93	3.46	6.2	8.01	2.38	10.47	10.47
15.67	13.42	14.36	9.99	20.76	15.22	4.53	11.51	11.51
7.56	4.98	3.73	3.91	7.58	3.31	0.91	3.97	3.97
5.89	2.9	1.2	1.3	0.37	1.22	9.78	1.64	1.64
7.18	3.69	2.04	3.89	2.58	1.88	0.8	2.25	2.25
0.23	0.21	0.69	7.64	0.13	0.63	6.46	0.59	0.59
4.95	4.96	8.58	12.03	3.38	7.42	50.88	4.66	4.66
1.41	5.41	0.68	11.73	4.22	0.3	2.43	0.14	0.14
0.24	0.7	2.67	0.59	1.12	1.88	0.58	1.17	1.17
8.34	6.17	3.4	3.1	2.26	2.95	0.98	4.15	4.15
0.75	5.8	3.13	2.82	1.85	2.72	1.18	3.55	3.55
0.2	1.03	1.4	1.36	0.95	1.45	0.88	1.74	1.74
0.19	0.78	0.94	0.17	0.69	0.84	0.65	1.23	1.23
2.67	1.32	1.54	2.21	0.88	1	0.42	0.8	0.8
0.86	4.6	3.95	1.48	3.01	4.47	1.59	4.45	4.45
9.72	14.46	16.13	11.28	10.31	12.67	5.35	14.56	14.56
0.77	0.89	1.19	0.54	0.79	1.14	0.13	1.44	1.44
729.2	162.5	257.9	257.92	174.5	276	276	1068.5	1068.5
202.08	209.92	191.9	210.84	163.05	163.7	173.9	173.98	173.98
0.69	0.74	0.83	0.54	1.08	1.04	0.26	0.86	0.86

Perch		Percidae	Perca flavescens	No Predators	Sam	13/07/2015	186	251	10251	64	36.5	2.2	8.4	24.2	59	Net	1	Alive	Female	Natural	122	102	14.65	1.38	1	0.54	2	1.03	0.98	0.21	18.11	5.23	6.63	10.95	3.23	0.91	1.63	1.8	12.15	4.34	0.8	3.39	3.43	0.9	0.71	0.93	3.18	16.91	0.84	151.9	201.73	0.59
Perch		Percidae	Perca flavescens	No Predators	Sam	13/07/2015	186	251	10251	64	36.5	2.2	8.4	24.2	59	Net	1	Alive	Female	Natural	236	199	133.65	1.7	6	0.53	1.95	0.93	0.7	0.14	12.88	5.04	4.35	10.63	3.04	0.87	1.98	2.87	16.78	4.72	0.66	4.2	9.58	0.67	0.49	0.89	2.87	13.25	0.55	256.6	200.04	0.7
Perch		Percidae	Perca flavescens	No Predators	Telfer	21/07/2015	343.005	261	34338			5.2	7.9	24.3	38	Net	3.8	Alive	Juvenile	Natural	84	69	5.24	1.6	1	0.07	0.21	0.76	0.28	0.04	11.44	3.49	7.25	14.22	4.1	1.33	2.74	0.55	23.35	1.22	0.89	5.26	5.42	1.07	0.78	1.1	2.81	11.62	0.45	288.1	201.7	0.54
Perch		Percidae	Perca flavescens	No Predators	Telfer	21/07/2015	343.005	261	34338			5.2	7.9	24.3	38	Net	3.8	Alive	Juvenile	Natural	82	71	5.25	1.47	1	1.37	3.58	2.08	0.92	0.18	18.29	5.6	6	15.3	4.87	2.35	3.47	0.53	6.09	0.83	0.78	5.25	6.47	0.82	0.53	0.95	2.42	11.33	0.92	204.6	173.72	0.97
Perch		Percidae	Perca flavescens	No Predators	Telfer	21/07/2015	343.005	261	34338			5.2	7.9	24.3	38	Net	3.8	Alive	Juvenile	Natural	90	77	6.03	1.32	1	0.06	0.23	0.75	0.34	0.06	12.21	4.13	6.24	15.3	4.98	2.47	3.32	0.48	7.9	0.53	0.73	7.76	9.13	1.3	0.96	1.03	4.27	15.81	0.97	501	216.9	0.8
Perch		Percidae	Perca flavescens	No Predators	Telfer	21/07/2015	343.005	261	34338			5.2	7.9	24.3	38	Net	3.8	Alive	Juvenile	Natural	89	75	6.25	1.48	1	0.97	3.12	1.79	0.75	0.11	14.69	5.66	4.54	17.43	4.65	2.21	3.16	0.86	13.88	1.14	0.74	5.03	7.99	0.77	0.49	0.54	1.81	7.67	0.47	238	166.71	0.97
Perch		Percidae	Perca flavescens	No Predators	Telfer	21/07/2015	343.005	261	34338			5.2	7.9	24.3	38	Net	3.8	Alive	Juvenile	Natural	89	78	6.48	1.36	1	0.59	2.29	1.44	0.67	0.21	13.09	4.48	5.17	11.33	3.92	1.29	2.18	0.63	20.18	1.56	1.19	4.67	9.16	0.87	1.13	0.93	2.94	10.08	0.43	156	182.46	0.68
Perch		Percidae	Perca flavescens	No Predators	Telfer	21/07/2015	343.005	261	34338			5.2	7.9	24.3	38	Net	0.4	Alive	Juvenile	Natural	92	79	7.2	1.46	1	0.71	2.82	0.86	0.77	0.17	14.78	6.15	5.29	13.14	4.94	2.86	3.42	1.65	13.45	2.04	0.89	5.13	4.6	0.88	0.66	1.14	2.36	11.3	0.73	379.11	188.48	0.72
Perch		Percidae	Perca flavescens	No Predators	Telfer	21/07/2015	343.005	261	34338			5.2	7.9	24.3	38	Net	0.4	Alive	Juvenile	Natural	92	79	7.2	1.46	1	0.58	5.83	0.22	1.19	0.14	18.13	7.12	5.04	12.48	6.92	3.55	3.96	0.39	6.44	0.21	1.13	6.03	4.27	0.84	0.66	1.02	2.22	11.63	0.84	78.5	179.11	0.72

Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch
Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae
Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens
No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators
Telfer	Telfer	Telfer	Telfer	Telfer	Telfer	Telfer	Telfer	Telfer
21/07/2015	21/07/2015	21/07/2015	21/07/2015	21/07/2015	22/07/2015	21/07/2015	21/07/2015	22/07/2015
343.005	343.005	343.005	343.005	343.005	343.005	343.005	343.005	343.005
261	261	261	261	261	261	261	261	261
34338	34338	34338	34338	34338	34338	34338	34338	34338
5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9
24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3
38	38	38	38	38	38	38	38	38
Net	Net	Net	Net	Net	Net	Net	Net	Net
3.8	3.8	3.8	3.8	3.8	3.3	3.8	3.8	3.3
Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Female	Juvenile	Female	Male	Female	Male	Juvenile	Juvenile	Juvenile
Natural	Natural	Clove	Natural	Natural	Clove	Natural	Natural	Clove
112	50	109	133	112	102	100	95	95
96	40	92	116	96	91	85	84	81
12	1.22	11.74	21.74	12	10.14	8.86	7.98	7.81
1.36	1.9	1.51	1.39	1.36	1.35	1.44	1.35	1.47
1	0	1	2	4	1	1	1	1
0.82	0.13	0.07	0.84	0.63	0.33	0.86	0.25	0.08
2.74	0.77	0.17	3.93	1.76	0.92	1.78	0.6	0.6
1.38	0.47	0.58	1.01	0.85	1.68	0.68	1.36	0.45
0.79	0.65	0.42	0.82	0.63	0.5	1.08	0.3	0.43
0.15	0.11	0.04	0.09	0.18	0.09	0.24	0.05	0.31
13.85	21.89	15.39	16.99	12.58	14.07	14.66	9.31	12.29
5.2	6.99	5.9	7.4	4.25	5.01	3.98	3.39	9.97
4.62	9.3	8.33	4.83	4.2	6.32	5.83	4.01	5.36
11.43	18.03	17.26	16.83	11.19	14.84	10.68	11.07	16.54
4.27	5.49	4.41	7.03	3.62	4.2	3.31	4.71	6.26
3.49	1.52	0.65	3.26	0.5	2.09	1.6	3.37	3.15
2.85	3.8	2.54	4.69	1.88	2.73	1.91	2.21	4.18
0.64	0.3	0.33	0.27	6.58	0.57	0.62	1.18	0.46
17.94	6.11	6.28	5.65	30.43	6.4	16.75	31.14	9.9
1.59	0.39	0.39	0.5	2	2.16	1.32	1.36	0.96
1.23	0.56	1.29	0.71	0.62	1.03	1.48	1.07	0.59
5.46	4.61	4.95	7.84	2.19	1.36	3.9	4.34	6.14
10.54	3.65	7.67	5.37	2.6	11.18	9.79	8.11	8.74
0.63	1.64	1.73	0.53	0.38	1.81	0.87	0.8	0.96
0.29	1.29	1.02	0.22	0.62	1.81	0.97	0.67	0.61
0.6	1.27	0.91	0.96	2.35	2.49	1.05	0.56	0.76
1.85	2.11	3.99	1.23	2.55	5.51	3.24	2.19	2.1
7.65	8.92	15.71	9.01	7.42	12.9	13.4	7.96	9.16
0.38	0.87	1.25	0.68	0.25	1.23	0.64	0.26	0.61
180.4	965.1	279.4	250.7	110.9	365.5	123.2	295	644.6
170.14	162.79	198.96	178.15	175.79	182.31	188.24	187.22	185.39
0.76	0.98	0.97	0.89	0.56	1.14	0.69	0.52	1.01

Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch	Perch
Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae
Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens
No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators
Telfer	Telfer	Telfer	Telfer	Telfer	Telfer	Telfer	Telfer	Telfer
22/07/2015	22/07/2015	22/07/2015	22/07/2015	22/07/2015	22/07/2015	22/07/2015	21/07/2015	21/07/2015
343.005	343.005	343.005	343.005	343.005	343.005	343.005	343.005	343.005
261	261	261	261	261	261	261	261	261
34338	34338	34338	34338	34338	34338	34338	34338	34338
5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9
24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3
38	38	38	38	38	38	38	38	38
Seine	Seine	Seine	Seine	Seine	Seine	Seine	Net	Net
0.5	0.5	0.5	0.5	0.5	0.5	0.5	3.8	3.8
Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Juvenile	Juvenile	Juvenile	Juvenile	Juvenile	Juvenile	Juvenile	Female	Male
Clove	Clove	Clove	Clove	Clove	Clove	Clove	Clove	Natural
35	31	29	37	36	38	40	119	125
25	22	23	30	29	29	30	101	110
0.26	0.16	0.21	0.34	0.37	0.43	0.47	15.11	17.41
1.67	1.48	1.69	1.26	1.52	1.74	1.74	1.47	1.31
0	0	0	0	0	0	0	2	2
0.88	0.49	0.49	0.44	0.44	0.44	0.44	0.13	0.39
3.3	4.27	4.27	3.86	3.86	3.86	3.86	0.79	0.94
0.27	0.16	0.16	0.46	0.46	0.46	0.46	0.46	1.04
1.15	1.09	1.09	1.84	1.84	1.84	1.84	0.73	0.65
0.28	0.16	0.16	0.37	0.37	0.37	0.37	0.09	0.13
18.83	23.28	23.28	21.81	21.81	21.81	21.81	16.98	14.59
5.16	4.27	4.27	6.05	6.05	6.05	6.05	5.72	3.6
5.85	15.46	15.46	11.05	11.05	11.05	11.05	5.24	6.44
15.57	8.74	8.74	11.96	11.96	11.96	11.96	15	11.34
8.4	3.34	3.34	3.59	3.59	3.59	3.59	3.86	1.81
3.92	1.09	1.09	1	1	1	1	1.66	1.43
6.53	1.96	1.96	1.71	1.71	1.71	1.71	2.8	2.48
0.86	0.38	0.38	0.51	0.51	0.51	0.51	0.49	0.35
6.75	6.37	6.37	5.64	5.64	5.64	5.64	16.9	17.15
0.39	0.53	0.53	0.24	0.24	0.24	0.24	0.51	0.44
1.01	0.79	0.79	0.94	0.94	0.94	0.94	0.54	1.03
10	4.87	4.87	3.52	3.52	3.52	3.52	5.04	3.21
1.94	4.22	4.22	5.59	5.59	5.59	5.59	7.37	8.3
1.11	1.83	1.83	1.45	1.45	1.45	1.45	1.11	1.12
0.96	1.68	1.68	1.68	1.68	1.68	1.68	0.77	0.75
0.99	0.92	0.92	1.09	1.09	1.09	1.09	0.65	0.66
2.2	3.96	3.96	0.57	0.57	0.57	0.57	2.74	4.49
3.66	10.12	10.12	14.63	14.63	14.63	14.63	10.42	17.66
0.44	0.92	0.92	1.37	1.37	1.37	1.37	0.54	0.94
444.8	443.8	442.8	441.8	440.8	439.8	438.8	437.8	382.3
167.41	146.82	146.82	167.32	167.32	167.32	167.32	181.87	209.72
0.69	0.73	0.73	0.8	0.8	0.8	0.8	0.77	0.66

Prey	Prey	Perch	Perch	Perch	Perch	Perch	Perch	Perch
Cyprinidae	Centrarchidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae	Percidae
Notemigonus crysoleucas	Lepomis gibbosus	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens	Perca flavescens
Predators	Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators
Loutre	Loutre	Telfer	Telfer	Telfer	Telfer	Telfer	Telfer	Telfer
June	June	21/07/2015	21/07/2015	22/07/2015	22/07/2015	21/07/2015	22/07/2015	22/07/2015
14.16	14.16	343.005	343.005	343.005	343.005	343.005	343.005	343.005
198	198	261	261	261	261	261	261	261
2005	2005	34338	34338	34338	34338	34338	34338	34338
3.6	3.6							
1.5	1.5							
1.5	1.5	5.2	5.2	5.2	5.2	5.2	5.2	5.2
8.5	8.5	7.9	7.9	7.9	7.9	7.9	7.9	7.9
19.9	19.9	24.3	24.3	24.3	24.3	24.3	24.3	24.3
162	162	38	38	38	38	38	38	38
Trap	Trap	Net	Net	Net	Net	Net	Net	Seine
		0.4	0.4	3.3	3.3	3.8	3.3	0.5
		Alive	Alive	Alive	Alive	Alive	Alive	Alive
		Female	Female	Female	Female	Female	Juvenile	Juvenile
		Clove	Clove	Clove	Clove	Natural	Clove	Clove
		135	135	123	130	115	56	35
		115	115	104	111	94	45	29
0.139	0.132	19.91	19.91	16.59	18.17	13.64	1.52	0.34
		1.31	1.31	1.47	1.33	1.64	1.67	1.41
		2	2	1	2	1	0	0
0.22	0.29	0.81	0.81	0.27	0.99	0.69	0.27	0.88
1.59	1.41	2.47	2.08	1.8	3.38	1.06	1.16	3.3
0.85	0.91	0.74	0.79	0.8	0.85	2.1	0.8	0.27
0.77	0.61	1.18	0.95	0.86	1.23	0.55	0.92	1.15
0.13	0.11	0.45	0.35	0.14	0.2	0.11	0.17	0.28
17.41	17.65	16.8	16.24	17.4	16.94	12.3	17.55	18.83
7.61	6.98	5.17	4.2	5.75	5.43	5.88	5.26	5.16
6.84	7.26	7.1	6.97	6.36	5.72	4.51	7.34	5.85
22.04	23.83	10.22	10.86	14.48	12.32	12.46	16.42	15.57
6.58	6.95	7.42	4.88	4.65	3.93	3.65	4.57	8.4
2.12	1.82	3.36	2.07	2.04	2.49	1.81	2.14	3.92
4.56	4.52	2.84	1.85	3.57	3.95	2.66	2.95	6.53
0.55	0.68	0.63	0.52	0.4	0.59	0.47	0.33	0.86
5.96	4.69	8.72	19.67	14.4	14.75	18.26	13.99	6.75
0.59	0.22	0.29	5.01	0.7	2.74	0.38	0.85	0.39
1.16	1.69	1.97	1.16	0.63	1.34	1.27	0.94	1.01
6.89	6.21	7.13	4.56	5.09	4.46	5.43	4.37	10
1.98	1.5	3.35	3.67	7.44	6.51	9.31	3.9	1.94
0.79	1.07	1.5	1.28	1.22	2.2	1.11	1.38	1.11
0.35	0.46	0.56	0.58	0.75	0.7	0.99	1.41	0.96
1.97	2.01	1.17	0.96	0.67	1.44	0.92	1.18	0.99
0.45	0.63	3.43	2.23	2.76	1.89	2.66	2.78	2.2
8.58	8.5	12.69	8.37	7.82	5.94	11.43	9.33	3.66
543.94	129.81	0.72	0.44	0.51	0.47	0.55	0.57	0.44
157.15	153.38	58.9	308.36	279.5	303.7	407.4	461.2	445.8
0.94	1.01	189.79	175.44	168.8	165.9	192.5	170.92	167.41
0.7	0.78	0.57	0.6125	0.83	0.71	0.75	0.77	0.69

Prey	Prey	Prey	Prey	Prey	Prey	Prey	Prey	Prey
Percidae	Catostomidae	Cyprinidae	Cyprinidae	Cyprinidae	Cyprinidae	Cyprinidae	Cyprinidae	Cyprinidae
Etheostoma flabellare	Catostomus commersonii	Notemigonus crysoleucas	Notemigonus crysoleucas	Notemigonus crysoleucas	Notemigonus crysoleucas	Notemigonus crysoleucas	Notropis rubellus	Notemigonus crysoleucas
Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators
Loutre	Loutre	Loutre	Loutre	Loutre	Loutre	Loutre	Loutre	Loutre
June	June	June	June	June	June	June	June	June
14.16	14.16	14.16	14.16	14.16	14.16	14.16	14.16	14.16
198	198	198	198	198	198	198	198	198
2005	2005	2005	2005	2005	2005	2005	2005	2005
3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9
162	162	162	162	162	162	162	162	162
Net	Net	Net	Net	Trap	Trap	Trap	Trap	Trap
0.149	0.132	0.173	0.16	0.173	0.143	0.158	0.168	0.138
0.14	0.91	1.02	1.01	0.14	0.11	0.38	0.49	0.25
1.04	0.1	1.29	1.87	1.29	1.65	2.23	1.9	1.26
0.42	1.98	1.53	1.37	0.24	0.28	0.92	1.14	0.95
0.78	1.95	0.79	0.78	0.66	0.74	1.4	0.89	0.66
0.08	1.21	0.06	0.42	0.05	0.06	0.2	0.15	0.06
21.92	22.3	23.95	22.52	20.25	19.3	20.88	19.23	15.73
7.29	6.7	7.81	8.35	11.63	12.18	5.83	6.94	7.33
8.14	9.85	5.7	9.5	4.97	5.22	8.67	7.82	6
20.21	14.64	22.01	27.5	29.94	30.41	17	19.12	24
6.27	4.48	5	5.15	8.96	8.42	4.56	4.48	7.03
0.83	0.39	1.34	0.7	1.07	1.28	0.95	1.17	2.82
3.84	2.83	5.41	3.14	5.44	5.51	2.64	2.98	4.87
0.51	0.71	0.53	0.63	0.39	0.23	0.53	0.43	0.5
6.6	7	3.5	4.04	3.62	3.24	5.63	6.65	5.52
0.82	0.45	0.67	0.61	0.58	0.38	0.93	2.4	0.37
1.21	2.32	1.06	0.6	0.62	0.15	3.26	3.07	1.64
3.98	3	4.31	4.48	4.33	5.65	6.11	5.79	2.04
2.28	2.24	1.27	1.01	0.39	0.48	1.81	1.22	2.74
1.04	1.35	0.84	0.59	0.53	0.37	1.62	1.04	0.85
0.59	0.96	0.4	0.35	0.21	0.18	1.03	0.44	0.37
3.01	2.76	3.75	1.37	1.01	1.12	1.91	1.94	2.37
0.44	0.97	0.31	0.24	0.2	0.14	0.61	0.69	0.53
8.55	10.9	7.45	3.76	3.47	2.89	10.89	10.01	12.09
506.88	625.29	835.17	828.16	913.5	2511.44	325.34	191.96	396.08
143.39	145.37	134.85	112.59	126.85	126.57	155.9	156.52	161.92
0.92	0.87	1.08	1.71	1.53	1.59	0.78	0.84	1.03
0.76	1.01	1.02	0.52	0.54	0.5	0.88	0.73	1.19

Prey	Prey	Prey	Prey	Prey	Prey	Prey	Prey	Prey
Centrarchidae	Centrarchidae	Cyprinidae	Cyprinidae	Cyprinidae	Catostomidae	Catostomidae	Centrarchidae	Percidae
Lepomis gibbosus	Lepomis gibbosus	Notropis heterodon	Notropis heterodon	Notropis heterodon	Micropterus salmoides	Moxostoma carinatum	Lepomis gibbosus	Etheostoma flabellare
Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators
Meech	Meech	Meech	Meech	Meech	Meech	Meech	Loutre	Loutre
June	June	June	June	June	June	June	June	June
304	304	304	304	304	304	304	14.16	14.16
171	171	171	171	171	171	171	198	198
17900	17900	17900	17900	17900	17900	17900	2005	2005
22.2	22.2	22.2	22.2	22.2	22.2	22.2	3.6	3.6
9.9	9.9	9.9	9.9	9.9	9.9	9.9	1.5	1.5
2.9	2.9	2.9	2.9	2.9	2.9	2.9	1.5	1.5
8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
21.1	21.1	21.1	21.1	21.1	21.1	21.1	19.9	19.9
88	88	88	88	88	88	88	162	162
Net	Net	Seine	Seine	Seine	Net	Net	Net	Net
0.176	0.152	0.0893	0.157	0.16	0.129	0.147	0.161	0.152
1.13	1.08	0.18	0.18	0.18	1.28	0.21	0.15	0.07
3.24	1.66	2.28	2.28	2.28	2.54	2.77	2.33	1.45
1.41	2.64	0.58	0.58	0.58	2.41	0.05	0.35	0.44
1.07	0.79	1.6	1.6	1.6	1.27	0.75	0.67	0.93
0.16	0.85	0.36	0.36	0.36	0.27	0.42	0.09	0.37
20.04	15.64	19.03	19.03	19.03	20.3	17.55	15.65	21.93
8.79	8.93	6.7	6.7	6.7	6.8	10.21	8.27	10.01
9.18	6.63	8.49	8.49	8.49	7.76	5.13	5.01	5.35
15.2	16.08	15.43	15.43	15.43	12.52	25.7	25.35	21.92
4.67	4.61	4.39	4.39	4.39	4.12	5.94	7.63	8.95
0.53	0.44	0.92	0.92	0.92	0.51	1.72	2.58	0.89
3.6	2.85	4	4	4	2.54	3.8	4.35	6.44
0.46	0.72	1.55	1.55	1.55	0.58	1.19	0.51	0.53
7.06	4.63	4.34	4.34	4.34	7.55	4.31	5.42	4.04
0.85	10.3	14.35	14.35	14.35	0.89	0.45	0.26	1.19
1.3	0.74	0	0	0	3.75	0	1.19	0.5
4.07	4.45	4.71	4.71	4.71	4.02	6.55	6.51	2.64
2.29	2.83	1.41	1.41	1.41	2.02	1.38	1.49	1.74
0.94	0.72	1.15	1.15	1.15	1.41	0.58	0.51	0.37
0.64	0.84	0.94	0.94	0.94	0.71	0.42	0.36	0.3
3.23	2.26	1.73	1.73	1.73	3.48	2.55	2.33	3.13
0.61	1.61	0.86	0.86	0.86	1.13	0.36	0.39	0.24
9.53	8.73	4.17	4.17	4.17	12.17	7.48	8.6	6.59
858.6	344.61	588.35	588.35	588.35	571.76	592.72	477.48	1183.52
143.9	165.4	149	149	149	155.5	146.5	156.58	136.02
1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.02	1.06
0.84	0.51	0.34	0.34	0.34	0.97	0.69	0.68	0.8

Prey	Prey	Prey	Prey	Prey	Prey	Prey	Prey	Prey
Cyprinidae	Cyprinidae	Cyprinidae	Cyprinidae	Cyprinidae	Cyprinidae	Cyprinidae	Centrarchidae	Centrarchidae
Phoxinus eos	Phoxinus eos	Phoxinus eos	Phoxinus eos	Notemigonus crysoleucas	Notemigonus crysoleucas	Notemigonus crysoleucas	Lepomis gibbosus	Lepomis gibbosus
No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	Predators	Predators
Périard	Périard	Périard	Périard	Périard	Périard	Périard	Meech	Meech
July	July	July	July	July	July	July	June	June
4.5	4.5	4.5	4.5	4.5	4.5	4.5	304	304
191	191	191	191	191	191	191	171	171
769	769	769	769	769	769	769	17900	17900
							22.2	22.2
							9.9	9.9
1	1	1	1	1	1	1	2.9	2.9
7.8	7.8	7.8	7.8	7.8	7.8	7.8	8.5	8.5
20.9	20.9	20.9	20.9	20.9	20.9	20.9	21.1	21.1
52	52	52	52	52	52	52	88	88
Net	Net	Net	Net	Net	Net	Net	Seine	Seine
0.15	0.159	0.134	0.149	0.142	0.157	0.16	0.112	0.16
0.02	0.06	0.13	0.73	1.73	0.51	1.18	1.02	1.02
2.2	2.13	1.97	1.76	2.85	3.25	4.18	3.01	3.01
0.32	0.4	0.32	1.51	3.85	7.56	0.33	1.72	1.72
0.84	0.95	0.76	0.81	1.22	0.91	0.47	1.17	1.17
0.06	0.15	0.07	0.11	0.24	0.16	0.69	0.22	0.22
18.08	15.7	17.72	15.31	17.71	12.61	7.88	20.35	20.35
10.89	14.69	9.51	8.63	10.07	6.55	4.24	7.66	7.66
3.36	3.19	4.01	5.51	6.27	3.1	2.78	9.31	9.31
23.06	26.1	25.32	20.45	17.74	12.8	12.07	13.92	13.92
5.31	7.65	9.34	5.58	4.66	3.51	3	4.23	4.23
0.84	1.02	0.98	1.07	1.9	1.54	0.7	0.46	0.46
2.27	3.47	3.35	3.01	3.38	3.48	2.91	2.48	2.48
0.53	0.6	0.64	0.42	0.47	1.03	0.61	0.57	0.57
5.89	5.46	5.29	7.71	5.8	6.52	3.56	6.72	6.72
0.86	0.42	1.03	0.86	0.24	9	44.21	0.22	0.22
0.43	0.29	0.45	0.97	1.93	0.17	0.69	2.47	2.47
5.37	5.7	5.07	6.31	6.4	5.93	2.8	4.15	4.15
1.37	0.87	1.14	1.53	2.68	5.07	2.43	2.32	2.32
0.24	0.15	0.33	0.61	1.3	0.55	0.63	2.32	2.32
0.21	0.17	0.39	0.58	0.69	0.08	0.04	0.68	0.68
1.99	2.03	1.66	2.27	1.24	2.85	0.91	2.69	2.69
0.48	0.27	0.57	1.23	1.46	7.2	0.64	0.52	0.52
15.37	8.52	9.98	13.03	6.17	5.62	3.03	11.79	11.79
1068.41	1434.98	808.36	344.27	103.24	474.47	337.52	659.35	659.35
183.4	155.7	161.8	178.6	137.4	158	208	155.9	155.9
1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49
1.03	0.63	0.66	0.81	0.63	0.39	0.12	1.08	1.08

Prey	Prey	Prey	Prey	Prey	Prey	Prey	Prey	Prey
Centrarchidae	Centrarchidae	Centrarchidae	Centrarchidae	Centrarchidae	Cyprinidae	Cyprinidae	Cyprinidae	Cyprinidae
Micropterus salmoides	Micropterus salmoides	Micropterus salmoides	Micropterus salmoides	Micropterus salmoides	Notropis heterodon	Notropis heterodon	Phoxinus eos	Phoxinus eos
Predators	Predators	Predators	Predators	Predators	Predators	Predators	No Predators	No Predators
Philippe	Philippe	Philippe	Philippe	Philippe	Philippe	Philippe	Périard	Périard
June	June	June	June	June	June	June	July	July
176	176	176	176	176	176	176	4.5	4.5
172	172	172	172	172	172	172	191	191
9650	9650	9650	9650	9650	9650	9650	769	769
17.4	17.4	17.4	17.4	17.4	17.4	17.4		
8.7	8.7	8.7	8.7	8.7	8.7	8.7		
2.1	2.1	2.1	2.1	2.1	2.1	2.1	1	1
8.6	8.6	8.6	8.6	8.6	8.6	8.6	7.8	7.8
19.3	19.3	19.3	19.3	19.3	19.3	19.3	20.9	20.9
73	73	73	73	73	73	73	52	52
Seine	Seine	Seine	Seine	Seine	Seine	Seine	Net	Net
0.1356	0.1215	0.1189	0.106	0.0986	0.143	0.133	0.129	0.135
0.66	0.49	0.89	0.59	1.36	1.78	0.5	0.12	0.09
1.56	2.18	1.35	1.24	2.75	3.49	2.33	3.17	1.83
1.14	0.91	1.63	1.93	1.87	2.05	0.92	0.48	0.34
0.74	0.74	0.69	0.57	1.02	1.36	0.62	1.14	0.95
0.15	0.1	0.11	0.07	0.23	0.28	0.09	0.07	0.08
17.08	16.42	15.21	17.92	17.22	19.13	18.46	22.12	18
5.94	5.54	6.29	5.45	7.75	8.28	5.67	10.9	10.09
7.67	4.52	16.79	7.91	6.43	7.42	10.74	2.67	4.42
14.07	12.91	6.17	21.99	17.61	22.05	19.86	20.09	24.1
3.9	5.51	12.27	6.11	5.88	5.24	4.87	5.52	6.78
0.66	1.18	2.44	0.88	0.77	0.72	0.86	3.1	0.98
2.33	3.99	4.4	2.83	2.64	2.86	2.84	7.08	3.07
0.55	0.49	0.61	0.7	0.63	0.83	0.65	0.89	0.67
7.47	9.06	6.64	5.04	6.59	4.88	5.28	0.55	5.83
0.21	2.27	0.47	0.34	0.32	0.56	0.11	5.19	0.95
1.57	0.45	1.25	1.94	1.32	1.19	1.83	0.48	0.41
5.23	6.89	5.16	3.96	4.71	4.24	6.08	0.73	5.96
3.85	3.36	2.29	1.99	1.73	1.46	1.35	1.08	1.12
0.93	0.7	0.53	0.99	0.68	1.08	2.11	0.27	0.31
0.99	0.25	0.35	0.51	0.81	1.14	1.54	0.27	0.36
4.08	3.53	2.85	3.21	2.87	1.97	1.92	1.96	1.93
0.98	0.3	0.36	0.92	0.64	0.71	0.57	0.33	0.64
18.22	18.19	11.26	12.88	14.19	7.28	10.8	11.76	11.07
512.59	1751.72	751.43	907.34	1139.44	1377.52	2125	3091.82	874.94
192	211.8	160.7	163	171.6	132.2	157.9	157.7	166.1
0.63	0.47	1.49	1.49	1.49	1.49	1.49	1.49	1.49
1.28	0.96	0.66	1.08	1	0.75	0.96	1.59	0.74

Prey	Prey	Prey	Prey	Prey	Prey	Prey	Prey	Prey
Cyprinidae	Cyprinidae	Cyprinidae	Cyprinidae	Centrarchidae	Centrarchidae	Centrarchidae	Centrarchidae	Centrarchidae
Pimephales notatus	Pimephales notatus	Pimephales notatus	Pimephales notatus	Lepomis gibbosus	Lepomis gibbosus	Lepomis gibbosus	Lepomis gibbosus	Lepomis gibbosus
Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators
Philippe	Philippe	Philippe	Philippe	Philippe	Philippe	Philippe	Philippe	Philippe
June	June	June	June	June	June	June	June	June
176	176	176	176	176	176	176	176	176
172	172	172	172	172	172	172	172	172
9650	9650	9650	9650	9650	9650	9650	9650	9650
17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4
8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7
2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3
73	73	73	73	73	73	73	73	73
Seine	Seine	Seine	Seine	Seine	Seine	Seine	Seine	Seine
0.1355	0.112	0.136	0.113	0.165	0.163	0.1299	0.1452	0.1266
0.33	0.54	0.15	1.14	1.25	4.28	1.19	0.31	0.46
2.77	2.6	2.88	2.96	2.96	1.84	2.37	4	2.43
0.39	0.48	0.58	1.56	1.3	7.85	1.65	2.09	0.66
0.52	0.57	0.58	0.47	0.56	0.64	1.28	0.55	0.61
0.05	0.07	0.05	0.04	0.08	0.06	0.09	0.13	0.16
19.23	17.96	15.58	16.09	19.06	12.46	23.43	16.28	19.01
7.69	8.23	9.82	8.89	10.18	4.5	15.84	10.09	5.74
6.5	6.02	4.69	4.39	5.39	4.52	5.53	3.99	8.83
26.63	24.46	23.34	21.13	29.47	8	16.3	32.05	21.49
6.54	8.37	8.79	6.14	6.7	2.81	3.64	8.87	5.83
1.56	1.49	1.61	1.49	0.83	0.4	0.65	1.2	0.9
3.99	4.65	5.61	3.8	3.48	3.32	2.19	4.89	3.13
0.61	0.85	1.35	0.52	0.52	0.16	0.34	0.55	0.8
3.85	4.42	4.91	3.81	3.31	9.24	3.97	3.26	7.82
2.72	1.51	0.72	11.83	0.96	4.9	8.14	0.13	0.6
0.42	0.48	0.28	0.49	0.47	0.45	0.76	0.17	1.24
7.37	7.88	8.77	6.79	2.98	7.55	4.07	3.04	4.54
0.85	1.03	0.95	1.34	1.46	4.8	1.27	1.05	2.38
0.46	0.63	0.41	0.47	0.75	0.7	1.24	0.33	0.82
0.45	0.53	0.36	0.22	0.68	0	0.72	0.21	0.46
1.85	2.15	2.53	1.72	2.29	3.42	1.49	1.88	2.33
0.28	0.31	0.29	0.16	0.3	0.15	0.22	0.13	0.45
4.94	4.76	5.76	4.55	5.05	17.97	3.6	4.8	9.32
3158.48	3116.7	3414.57	3589.46	1857.38	1609.6	1759.25	1922.93	821.95
138.8	142.7	154.4	157.2	122.6	215.8	126.1	128	148.3
1.15	1.03	0.97	0.86	1.7	0.51	1.26	1.69	0.92
0.46	0.45	0.51	0.31	0.66	0.9	0.35	0.66	0.71

Prey	Prey	Prey	Prey	Prey	Prey	Prey	Prey	Prey
Centrarchidae	Centrarchidae	Centrarchidae	Centrarchidae	Cyprinidae	Cyprinidae	Cyprinidae	Cyprinidae	Cyprinidae
Lepomis gibbosus	Lepomis gibbosus	Lepomis gibbosus	Lepomis gibbosus	Notemigonus crysoleucas	Pimephales notatus	Pimephales notatus	Pimephales notatus	Pimephales notatus
Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators	Predators
Renaud	Renaud	Renaud	Renaud	Renaud	Philippe	Philippe	Philippe	Philippe
June	June	June	June	June	June	June	June	June
10.23	10.23	10.23	10.23	10.23	176	176	176	176
203	203	203	203	203	172	172	172	172
2057	2057	2057	2057	2057	9650	9650	9650	9650
4.3	4.3	4.3	4.3	4.3	17.4	17.4	17.4	17.4
1	1	1	1	1	8.7	8.7	8.7	8.7
1.8	1.8	1.8	1.8	1.8	2.1	2.1	2.1	2.1
7.2	7.2	7.2	7.2	7.2	8.6	8.6	8.6	8.6
19.9	19.9	19.9	19.9	19.9	19.3	19.3	19.3	19.3
70	70	70	70	70	73	73	73	73
Trap	Trap	Trap	Trap	Net	Seine	Seine	Seine	Seine
0.128	0.1089	0.1178	0.1205	0.1125	0.104	0.1259	0.1454	0.1466
0.4	0.36	0.1	0.49	0.09	0.17	0.03	0.04	0.33
0.5	5.25	0.34	2.39	0.29	1.53	4.31	2.93	3.06
1.72	0.62	0.85	1.02	0.97	0.66	0.49	0.53	0.55
0.55	2.84	0.45	1.2	0.73	0.55	0.45	0.57	0.63
0.05	0.29	0.04	0.09	0.04	0.11	0.03	0.05	0.06
19.46	27.69	14.25	20.4	12.46	16.33	14.87	18.61	18.23
5.74	8.73	4.63	7.26	9.29	10.22	7.27	9.35	8.73
10.57	10.87	12.39	11.68	6.45	5.79	4.13	5.18	5.76
13.21	14.72	14	15.43	27.33	22.96	28.64	22.69	22.8
7.47	4.76	4.88	5.86	4.84	6.51	8.58	6.61	7.03
0.76	0.79	0.64	0.88	0.99	1.68	2.42	1.92	1.68
7.06	2.68	2.88	3.8	3.29	4.49	5.8	4.95	4.82
0.45	0.3	0.38	0.46	0.55	0.78	1	0.98	1.01
6.95	4.42	8.18	7.07	5.79	5.12	5.7	4.54	4.5
1.03	0.77	1.15	1.03	0.29	0.73	0.92	2.1	0.57
1.39	0.79	2.9	1.15	1.42	0.53	0.14	0.34	0.48
3	1.61	2.29	2.91	4.08	10.36	8.68	9.2	9.01
2.58	1.26	3.83	2.26	1.22	1.13	0.53	0.72	0.99
3.24	2.53	7.57	3.1	5.07	0.68	0.34	0.38	0.49
2.77	2.21	6.72	2.24	4.64	0.53	0.24	0.39	0.5
2.44	1.48	3.32	2.62	2.37	2.81	2.21	2.41	2.61
0.48	0.31	0.55	0.4	0.57	0.36	0.11	0.24	0.38
8.18	4.7	7.65	6.25	7.24	5.96	3.14	5.26	5.78
899.5	1120.34	917.5	887.45	1061.73	659.05	6008.77	2381.21	2333.72
154.6	102.3	155.4	131.9	157.1	155.7	142	148.2	146.9
0.62	1.14	0.64	0.82	1.21	0.99	1.08	0.98	0.99
1	0.86	1.1	0.78	1.04	0.49	0.39	0.47	0.53

Prey	Prey	Prey	Prey	Prey	Prey	Prey	Prey	Prey
Cyprinidae	Cyprinidae	Cyprinidae	Centrarchidae	Centrarchidae	Centrarchidae	Umbridae	Umbridae	Centrarchidae
Notemigonus crysoleucas	Notemigonus crysoleucas	Notemigonus crysoleucas	Lepomis gibbosus	Lepomis gibbosus	Lepomis gibbosus	Umbra limi	Umbra limi	Lepomis gibbosus
No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	Predators	Predators	Predators
Sam	Sam	Sam	Sam	Sam	Sam	Renaud	Renaud	Renaud
July	July	July	July	July	July	June	June	June
186	186	186	186	186	186	10.23	10.23	10.23
251	251	251	251	251	251	203	203	203
10251	10251	10251	10251	10251	10251	2057	2057	2057
64	64	64	64	64	64	4.3	4.3	4.3
36.5	36.5	36.5	36.5	36.5	36.5	1	1	1
2.2	2.2	2.2	2.2	2.2	2.2	1.8	1.8	1.8
8.4	8.4	8.4	8.4	8.4	8.4	7.2	7.2	7.2
24.2	24.2	24.2	24.2	24.2	24.2	19.9	19.9	19.9
59	59	59	59	59	59	70	70	70
Seine	Seine	Seine	Seine	Seine	Seine	Trap	Trap	Trap
0.122	0.127	0.1291	0.1203	0.119	0.164	0.1397	0.1196	0.1148
0.12	0.1	0.08	0.42	0.31	0.12	0.04	0.2	0.57
0.35	2.48	1.12	0.68	0.62	0.06	1.52	1.51	1.96
0.78	0.54	0.31	2.05	2.17	0.23	0.5	0.51	1.44
0.33	0.56	0.38	0.38	0.45	0.17	0.73	0.84	1.32
0.11	0.04	0.06	0.09	0.09	0.1	0.04	0.06	0.13
12.65	17.7	13.42	11.32	12.81	10.47	16.82	10.15	21.36
5.67	12.18	9.34	6.92	6.61	3.25	11.95	16.3	6.08
7.85	4.99	5.18	8.25	13.56	15.18	7.88	5.56	11.43
25.11	30.62	28.48	18.17	18.14	16.14	20.4	20.97	14.62
7.82	11.37	11.52	6.85	6.3	5.44	7.86	8.97	6.16
0.77	0.63	1.93	1.19	0.75	0.73	2.65	2.19	0.62
3.33	4.8	5.94	3.23	2.67	2.95	6.79	4.88	3.32
1.12	0.9	0.88	1	1.01	0.97	0.73	0.41	0.66
4.3	3.07	4.19	7.2	5.08	8.2	7.06	6.75	7.6
0.7	0.82	0.7	0.68	0.28	1.01	0.43	0.29	1.59
1.92	0.32	1.63	1.93	4	6.2	0.21	0.47	2.01
3.54	3.45	5.37	2.87	4.32	3.67	7.34	6.1	2.57
8.69	0.46	1.77	7.78	3.61	3.7	0.91	1.47	2.33
4.23	0.54	1.01	1.05	0.38	2.71	0.52	0.96	3.19
3.07	0.45	0.69	0.89	1.08	1.45	0.44	0.82	2.41
1.92	0.91	1.51	3.42	2.75	3.12	1.96	2.59	1.93
1.04	0.19	0.71	1.38	1.56	2.21	0.17	0.21	0.46
4.59	2.88	3.78	12.25	11.45	11.92	3.05	7.77	6.26
820.21	4018.4	655.97	188.3	131.24	280.7	3900.5	2420.82	1003.46
141.7	124.4	142.1	167.5	152.6	165.5	136.4	162.7	131.7
1.4	1.61	1.22	1	1	0.68	0.99	1.04	0.79
0.74	0.44	0.49	0.94	0.91	0.96	0.46	0.62	0.71

Prey	Prey	Prey	Prey	Prey	Prey	Prey	Prey	Prey
Cyprinidae	Percidae	Percidae	Percidae	Cyprinidae	Cyprinidae	Cyprinidae	Cyprinidae	Cyprinidae
Phoxinus eos	Percina caprodes	Percina caprodes	Percina caprodes	Pimephales notatus	Pimephales notatus	Pimephales notatus	Pimephales notatus	Pimephales notatus
No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators	No Predators
Telfer	Sam	Sam	Sam	Sam	Sam	Sam	Sam	Sam
July	July	July	July	July	July	July	July	July
343.005	186	186	186	186	186	186	186	186
261	251	251	251	251	251	251	251	251
34338	10251	10251	10251	10251	10251	10251	10251	10251
	64	64	64	64	64	64	64	64
	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5
5.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
7.9	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
24.3	24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2
38	59	59	59	59	59	59	59	59
Net	Net	Net	Net	Seine	Seine	Seine	Seine	Seine
0.1004	0.0945	0.1005	0.0995	0.094	0.109	0.1046	0.1358	0.158
0.2	2.72	0.38	0.35	0.04	0.16	0.03	0.26	0.08
6.5	3.68	6.46	4.66	1.02	2.93	0.32	0.6	1.45
0.87	0.55	0.97	0.74	0.22	0.36	0.12	0.85	0.45
0.89	0.67	0.7	0.91	0.45	1.35	0.44	0.35	0.41
0.07	0.11	0.06	0.1	0.07	0.11	0.05	0.07	0.06
18.12	11.93	12.59	14.19	13.81	23.79	15.78	14.4	13.05
10.47	7.68	11.11	8.26	4.7	7.51	3.99	4.54	3.77
4.14	3.68	2.11	5.25	5.77	11.57	10.1	7.03	4.16
20.58	15.73	14.18	13.95	26.99	20.29	20.65	25.78	19.78
7.08	8.72	8.06	7.75	9.63	9.69	7.8	19.37	35.92
4.17	2.69	5.78	3.26	1.98	2.23	0.75	0.93	1.15
5.1	4.34	7.33	5.86	3.91	5.62	3.16	5.12	7.94
0.4	0.61	0.4	0.39	1.29	0.45	0.83	0.62	0.36
7.52	3.26	4.75	4.86	5.49	3.14	5.72	3.62	2.27
0.69	16.3	0.22	0.96	1.58	0.31	0.81	0.43	0.33
0.55	0.67	0.45	0.96	0.89	0.8	1.5	0.83	0.2
2.09	3.15	6.32	4.76	6.45	3.25	4.29	3.19	2.58
2.1	3.34	3.72	5.29	2.2	0.51	2.64	0.9	0.72
1.36	0.98	0.49	1.23	1.39	1.39	1.49	1.72	0.55
1.12	0.64	0.34	0.68	0.83	0.89	1.26	1.34	0.38
1.44	1.51	2.48	2.22	1.73	0.47	1.98	1.29	0.89
0.21	0.44	0.55	0.73	0.55	0.42	1.48	0.58	0.2
4.31	6.6	10.57	12.62	9.01	2.74	14.83	6.18	3.3
787.28	881.79	1245.86	647.65	649.57	705.2	549.83	1958.6	3244.72
122.3	171.4	170.4	176	169.5	109.5	182.3	154.4	159.4
1.17	0.63	0.77	0.73	0.92	1.12	0.74	0.81	0.47
0.62	0.38	0.95	1.07	0.62	0.59	1.05	0.49	0.29

Prey		Cyprinidae	Phoxinus eos	No Predators	Telfer	July	343.005	261	34338			5.2	7.9	24.3	38	Net							0.102			0.43	3.62	0.57	0.86	0.12	17.36	9.36	6.76	24.7	9.64	1.39	3.41	0.88	4.9	0.23	1.35	3.4	1.94	2.12	0.38	1.15	0.86	4.58	283.23	130.1	1.31	0.56
Prey		Cyprinidae	Phoxinus eos	No Predators	Telfer	July	343.005	261	34338			5.2	7.9	24.3	38	Net							0.1134			0.77	2.31	0.58	1.02	0.28	16.73	8.04	8.87	22.98	6.91	1.7	3.13	1.07	6.17	1.78	1.06	4.79	2.94	1.36	0.85	1.3	1.28	4.09	662.07	128.6	1.26	0.44
Prey		Cyprinidae	Phoxinus eos	No Predators	Telfer	July	343.005	261	34338			5.2	7.9	24.3	38	Net							0.1074			0.04	0.16	0.44	0.11	0.12	8.02	6	8.8	23.94	6.27	0.81	2.98	1.1	8.56	1.29	3.79	5.86	4.25	1.84	1	1.46	2.49	10.68	539.86	177.5	0.98	0.7
Prey		Cyprinidae	Pimephales notatus	No Predators	Telfer	July	343.005	261	34338			5.2	7.9	24.3	38	Net							0.1199			0.04	0.34	1.46	0.39	0.28	0.1	17.53	9.03	17.56	4.24	1.01	2.28	0.53	10.72	1.47	2.66	7.35	5.86	1.97	1.45	1.49	0.43	11.82	573.43	194.9	1.06	0.68
Prey		Cyprinidae	Pimephales notatus	No Predators	Telfer	July	343.005	261	34338			5.2	7.9	24.3	38	Net							0.11			0.02	0.18	0.18	0.25	0.12	12.43	3.66	7.86	16.56	4.38	1.64	2.97	0.5	10.84	0.54	2.84	8.59	6.33	2.38	1.71	2.13	0.43	13.46	581.48	195.8	0.61	0.77
Prey		Cyprinidae	Pimephales notatus	No Predators	Telfer	July	343.005	261	34338			5.2	7.9	24.3	38	Net							0.0975			0.46	4.65	0.77	0.75	0.1	14.73	8.92	3.54	18.44	8.96	3.87	5.12	0.34	7.87	0.53	0.7	8.4	3.53	0.49	0.43	1.57	0.29	5.53	1334.03	152.2	0.84	0.43
Prey		Cyprinidae	Pimephales notatus	No Predators	Telfer	July	343.005	261	34338			5.2	7.9	24.3	38	Net							0.1124			0.6	4	0.76	0.98	0.13	17.55	7.47	5.9	17.46	5.15	1.59	2.84	0.56	8.27	0.85	1.36	7.09	6.07	1.05	0.67	1.45	0.4	7.81	702.63	151.2	0.95	0.55
Prey		Cyprinidae	Pimephales notatus	No Predators	Telfer	July	343.005	261	34338			5.2	7.9	24.3	38	Net							0.1025			0.13	0.7	0.25	0.41	0.06	15.14	5.31	6.67	19.68	6.28	2.65	4.16	0.67	10.02	0.32	1	9.23	5.92	0.9	0.44	1.55	0.28	8.23	664.79	169	0.79	0.51
Prey		Cyprinidae	Pimephales notatus	No Predators	Telfer	July	343.005	261	34338			5.2	7.9	24.3	38	Trap							0.1223			0.08	2.25	0.58	0.65	0.09	18.18	5.53	4.29	17.97	5.11	2.31	3.4	0.44	10.56	0.71	1.59	8.56	3.96	0.68	0.3	1.72	0.29	10.75	695.5	174.6	0.7	0.59

zooplankton	zooplankton	zooplankton	zooplankton	zooplankton	zooplankton	Prey	Prey	Prey
						Percidae	Percidae	Cyprinidae
						Etheostoma nigrum	Etheostoma nigrum	Pimephales notatus
Predators	No Predators	Predators	Predators	Predators	No Predators	No Predators	No Predators	No Predators
Philippe	Périard	Meech	Loutre	Loutre	Claude	Telfer	Telfer	Telfer
August	July	June	July	July	July	July	July	July
176	4.5	304	14.16	14.16	15	343.005	343.005	343.005
172	191	171	198	198	215	261	261	261
9650	769	17900	2005	2005	1410	34338	34338	34338
17.4		22.2	3.6	3.6				
8.7		9.9	1.5	1.5				
2.1	1	2.9	1.5	1.5	1	5.2	5.2	5.2
8.6	7.8	8.5	8.5	8.5	7.2	7.9	7.9	7.9
19.3	20.9	21.1	26.3	26.3	22.1	24.3	24.3	24.3
73	52	88	166	166	12	38	38	38
Net	Net	Net	Net	Net	Net	Seine	Seine	Trap
Alive	Alive	Alive	Alive	Alive	Alive			
Freezing	Freezing	Freezing	Freezing	Freezing	Freezing			
						0.095	0.095	0.1178
0.18	0.13	0.19	0.34	0.48	0.05	0.08	0.08	0.04
3.94	1.3	7.84	5.06	1.7	5.38	1.55	1.55	3.46
1.15	0.75	1.03	2.91	2.87	0.67	0.64	0.64	0.65
1.74	0.6	0.99	3.16	0.81	1.24	1.96	1.96	0.76
0.54	0.05	0.13	0.24	0.18	0.07	0.24	0.24	0.08
24.08	14.56	19.59	28.26	20.05	22.2	18.81	18.81	18.77
9.48	4.32	8.06	9.23	9.39	3.11	12.63	12.63	6.65
9.57	6.02	4.23	9.62	11.65	6.48	6.19	6.19	4.56
14.82	10.48	10.71	11.88	17.35	9.24	21.6	21.6	19.26
5.84	6.4	7.06	4.99	4.82	5.29	8.26	8.26	6.15
4.2	10.68	12.9	2.2	3.1	12.36	1.94	1.94	2.96
6.6	7.81	10.74	5.02	4.15	8.22	4.81	4.81	4.1
0.87	1.39	0.56	0.74	0.98	0.57	0.81	0.81	0.56
1.99	7.66	2.17	1.78	3.75	1.94	4.74	4.74	8.77
1.36	2.1	0.21	0.48	1.12	0.33	0.99	0.99	0.94
0.69	2.01	5.01	2.37	3.88	0.6	0.64	0.64	0.57
5.82	6.73	5.28	2.38	2.68	5.87	4.47	4.47	8.89
1.47	4.6	0.61	1.24	1.74	3.88	1.32	1.32	3.55
0.96	1.23	1.01	1.93	1.9	1.32	1.04	1.04	0.77
1.49	0.67	0.67	1.85	1.44	0.94	0.67	0.67	0.72
0.82	0.78	0.11	0.94	0.37	0.66	2	2	1.46
0.75	3.32	0.21	1	2.97	0.95	0.32	0.32	0.42
1.66	6.4	0.69	2.4	2.6	8.64	4.28	4.28	5.91
0.61	0.67	0.84	0.97	0.7	1.35	853.57	853.57	907.05
						129.7	129.7	151
102.63	172.4	133.74	92.92	107.1	168.46	1.23	1.23	0.84
1.24	0.58	0.61	1.38	1.63	0.48	0.55	0.55	0.44

zooplankton	zooplankton	zooplankton
No Predators	No Predators	Predators
Telfer	Telfer	Renaud
July	July	June
343.005	343.005	10.23
261	261	203
34338	34338	2057
		4.3
		1
5.2	5.2	1.8
7.9	7.9	7.8
24.3	24.3	25.6
38	38	77
Net	Net	Net
Alive	Alive	Alive
Freezing	Freezing	Freezing
0.25	0.05	0.07
4.34	3.23	2.47
0.71	0.71	0.38
1.05	0.63	13.52
0.12	0.03	0.14
21.96	18.91	24.52
6.23	3.67	3.78
5.98	5.11	5.01
10.3	7.64	8.59
6.09	6.59	6.1
9.7	13.16	5.69
6.5	8.23	11.27
0.56	0.49	0.36
4.06	3.66	4.02
0.2	0.04	0.39
1.52	0.56	0.61
5.31	7.6	5.12
5.32	6.71	1.63
1.43	1.68	0.61
0.76	0.52	0.84
0.56	0.67	1.24
0.84	1.39	0.46
6.22	8.72	3.2
0.9	1.04	0.96
149.42	181.32	119.25
0.69	0.48	0.47