

P-04-251

Oskarshamn site investigation

Sampling of freshwater fish

Description of the fish fauna in four lakes

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Medins Sjö- och Åbiologi AB

October 2004

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This report concerns a study which was conducted for SKB. The conclusions and viewpoints presented in the report are those of the authors and do not necessarily coincide with those of the client.

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Abstract

This document reports the data attained by standardised sampling of freshwater fish, which is one of the activities performed within the site investigation at Oskarshamn. Sampling was performed in August 2004 in four lakes: Lake Jämsen, Lake Söråmagasinet, Lake Frisksjön and Lake Plittorpsgöl.

The aim of the investigation was to achieve representative data about the fish populations in the four lakes respectively. The standardised method for sampling fish in lakes provides a whole-lake estimate for species occurrence, quantitative relative abundance and biomass.

The used multi-mesh gillnets, named NORDEN, are composed of 12 different mesh-sizes ranging between 5 to 55 mm knot to knot. Each gillnet is 30 m long and 1.5 m deep.

The results were basically evaluated according to the Swedish fish index (FIX), which is based on 9 different environment quality parameters.

Lake Jämsen, Lake Söråmagasinet and Lake Frisksjön were all placed in class 1, which means that the fish populations can be regarded as normal for this type of lakes. The catch in Lake Jämsen showed, however, an evident deviation due to somewhat low biomass per unit effort and in Lake Söråmagasinet there was a slight deviation for the proportions of piscivore percides and cyprinids. Lake Plittorpsgöl was placed in class 2, which indicates that the fish population slightly deviates from what is normal for this kind of lake. This was mainly due to low values of biomass and number of individuals.

Catch Per Unit Effort, expressed as numbers and weight per unit effort, varied between the lakes. Lake Söråmagasinet and Lake Frisksjön showed, however, similar results, with relatively high biomass and abundance. The poor catches in Lake Jämsen and Lake Plittorpsgöl is probably due to low levels of oxygen below the depth of two meters.

Six or seven different fish species were caught in Lake Jämsen, Lake Söråmagasinet and Lake Frisksjön. In Lake Plittorpsgöl three species were caught.

The fish condition factor was calculated for perch and roach. The result indicates that the perches and roaches in Lake Frisksjön have a better nutritional and health status than in the other sampled lakes.

A rough approximation was made to estimate the total biomass of the entire fish populations in the lakes, respectively. The values were in the range of 50 kg to 400 kg.

No deformities and signs of external injury were seen.

Some chosen individuals of different species were, for each lake, deep-frozen, to make further analysis possible.

Sammanfattning

Denna rapport redovisar data från standardiserat nätprovfiske i sötvatten. Aktiviteten är en del av de platsundersökningar som utförs i Oskarshamn. Undersökningen genomfördes i augusti 2004 och omfattade fyra sjöar: Jämsen, Söråmagasinet, Frisksjön och Plittorpsgöl.

Syftet med undersökningen var att inhämta representativa data om fiskpopulationerna i respektive sjö. Ett standardiserat nätprovfiske ger mått på antalet förekommande arter, deras relativa förekomst uttryckt som fångst per ansträngning i antal individer respektive biomassa, samt arternas storleksfördelning.

Översiktsnät av typen Norden användes i undersökningen. De består av 12 olika maskstorlekar från 5 till 55 mm. Näten är 30 m långa och 1,5 m höga.

Resultaten har i huvudsak utvärderats enligt den standard som definieras i svenskt fiskindex (FIX). Denna utvärdering grundar sig på nio olika parametrar, som kan betraktas var för sig, men som också ”slås samman” till ett samlat index, där sjöarna klassas i fem olika klasser.

Jämsen, Söråmagasinet och Frisksjön bedömdes alla tillhöra klass 1, vilket betyder att fisksamhället, för sjötypen, kan betraktas som ”normalt” och att resultatet är förväntat. En tydlig avvikelse i Jämsen visade dock på något låg biomassa. I Söråmagasinet avvek fångsten något när det gäller andelen piscivora abborrfiskar samt andelen cyprinider. Plittorpsgöl bedömdes tillhöra klass 2. Med detta menas att fisksamhället avvek något mot det förväntade resultatet, främst på grund av låg individtäthet och biomassa.

Fångst per ansträngning, uttryckt som antal individer och biomassa, varierade mellan sjöarna. I Söråmagasinet och Frisksjön var individtätheten och biomassan relativt hög, medan Jämsen och Plittorpsgöl uppvisade ganska låga värden. De lägre värdena berodde sannolikt på låga syrgashalter, vilket medförde att flera nät var fisktomma.

I Jämsen påträffades sju olika fiskarter, i Söråmagasinet och Frisksjön sex arter, och i Plittorpsgöl tre olika fiskarter.

Konditionsindex för fisk beräknades för abborre och mört. Resultatet indikerar att abborre och mört i Frisksjön har en ”hälsostatus” som är något bättre än abborre och mört i de andra tre sjöarna.

En grov uppskattning av den totala fiskbiomassan i var och en av de fyra sjöarna utfördes. Värdena varierade mellan 50–400 kg.

Inga ryggradskräkningar, yttre sår eller andra skador kunde noteras på fångsten.

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1 Introduction

This document reports the data attained by sampling of freshwater fish, which is one of the activities performed within the site investigation at Oskarshamn.

The activity, which is part of the surface ecosystem programme in Oskarshamn, was carried out in accordance with activity plan AP PS 400-04-083 (SKB internal controlling document) (Table 1-1). The activity is included in the detailed activity plan of the site; WBS 1.1.1.3.

Sampling of freshwater fish was performed in four lakes in August 2004. Data are stored in the database SICADA (Table 1-2). Some chosen individuals of different species were, for each lake, deep-frozen, to make further analysis possible (Table 1-2). The locations of the investigated lakes are shown in Figure 1-1.

Table 1-1. Controlling documents for the performance of the activity.

| Activity plan | Number | Version |
|-------------------------------------|------------------|---------|
| Provfiske av sötvattensfisk i sjöar | AP PS 400 04 083 | 1.0 |

Table 1-2. Data references.

| Subactivity | Database | Identity number |
|-----------------------------|------------|-----------------------------|
| Sampling of freshwater fish | SICADA | Field note no Simpevarp 521 |
| Stored fish samples | SKB-number | 9300 |

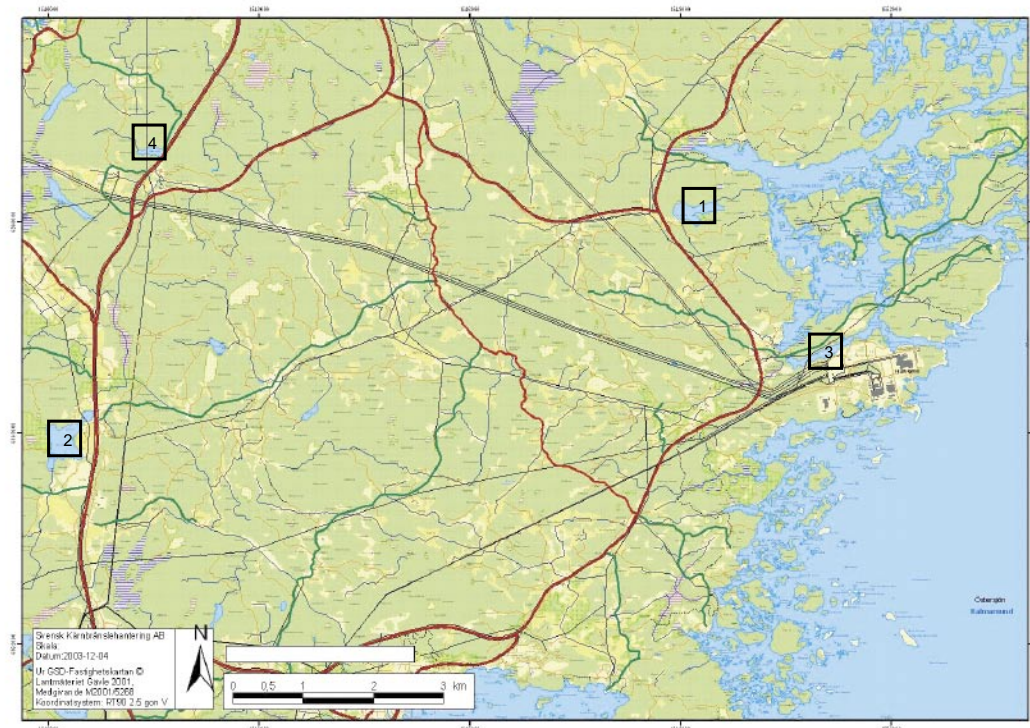


Figure 1-1. General overview over Oskarshamn site investigation area. The sampled lakes are: 1. Lake Frisksjön, 2. Lake Jämsen, 3. Lake Söråmagasinet, 4. Lake Plittorpögöl.

2 Objective and scope

In order to characterise the fish fauna in the lakes of the area, sampling of freshwater fish was performed in four lakes. The lakes are all located in the regional model area.

The aim of the investigation was to achieve representative data about the fish populations in the four lakes respectively. The standardised method for sampling fish in lakes provides a whole-lake estimate for species occurrence, quantitative relative abundance and biomass expressed as catch per unit effort (CPUE), and size structure of fish assemblages. It also provides estimates comparable over time within a lake, and estimates comparable between lakes.

Today there is no model for calculating the total biomass of the entire fish population in a lake in a reliable way using multi-mesh gillnets. Despite the uncertainty, a rough approximation has been made.



Figure 2-1. View from Lake Frisksjön.

3 Equipment

3.1 Description of equipment

The used multi-mesh gillnets, named NORDEN, are composed of 12 different mesh-sizes ranging between 5 to 55 mm knot to knot. The mesh-sizes follow a geometric series, with a ratio between mesh-sizes about 1.25. The mesh panels are stratified in three size groups, and within in each mesh-size group, the mesh panels have been randomly distributed over the gillnet. All gillnets have the same order of mesh panels. The gillnets are made of homogenous, uncoloured nylon. Each gillnet is 30 m long and 1.5 m deep. Each mesh panel is 2.5 m long and mounted on buoyancy line and lead line. The diameter of the threads varies between 0.10 mm for the 5 mm mesh, to 0.23 mm for the 55 mm mesh.

For measurements of weight, an electronical balance with an accuracy of ± 0.5 g was used. For measurements of length, a millimetre-graded plate was used.

Positions of all gillnets were given from GPS (± 10 m) and water depth was measured using an echo sounder.



Figure 3-1. Handling of caught fish.

4 Execution

4.1 General

The methods and measurements used in this investigation are described in “Standardiserad metodik för provfiske i sjöar” /1/ and in documents written by the Swedish Environmental Protection Agency (Naturvårdsverket) /2, 3/. The work was conducted according to Activity Plan AP PS 400-04-083 (SKB internal controlling document).

The amount of gillnets needed in a lake is determined by the precision demand, the lake area and maximum depth of the lake. The precision demand in this study was described as the number of gillnets required to achieve a precision which makes it possible to statistically determine 50% differences between sampling occasions in relative abundance of the most abundant fish species /1/.

Since the distribution of fish in a lake varies considerable and is not randomly distributed, stratified random sampling has been used. In short this means that by randomising the location of each gillnet within each depth stratum, and randomising the angle of the gillnet in relation to shoreline, an independent sample of the fish in each stratum will be achieved /1/.

In Lake Plittorpsgöl inventory sampling was performed, which is a simplified method for fish sampling. This was because of the small size of the lake. The minimum amount of gillnets was used in order to not affect the whole fish population. Two gillnets were set above the thermocline, and two gillnets below.

Sampling of freshwater fish was performed in the middle of August 2004. The four sampled lakes are small, and it was only in Lake Jämsen that two fishing nights were needed to fulfil the determined net effort (Table 4-1). All gillnets were set between 5 and 7 p.m. and lifted between 6 and 8 a.m. This ensured that activity peaks of each fish species were included.

The gillnets were rinsed and the catch within each gillnet was registered as number of individuals, length and weight for each specimen. Some chosen individuals of different species were, for each lake, deep-frozen to make further analysis possible.

Table 4-1. The sampled lakes, their areas and maximum depths, and number of efforts (gillnets) distributed in different depth zones.

| Lake | Lake area (ha) | Maximum depth (m) | Number of gillnets in depth zone: | | | Total number of gillnets |
|---------------|----------------|-------------------|-----------------------------------|-------|--------|--------------------------|
| | | | 0–3 m | 3–6 m | 6–12 m | |
| Jämsen | 24 | 11 | 5 | 6 | 5 | 16 |
| Frisksjön | 11 | 3.2 | 8 | 0 | 0 | 8 |
| Söråmagasinet | 8.9 | 4.5 | 4 | 4 | 0 | 8 |
| Plittorpsgöl | 3.3 | ca 8 | 2 | 1 | 1 | 4 |

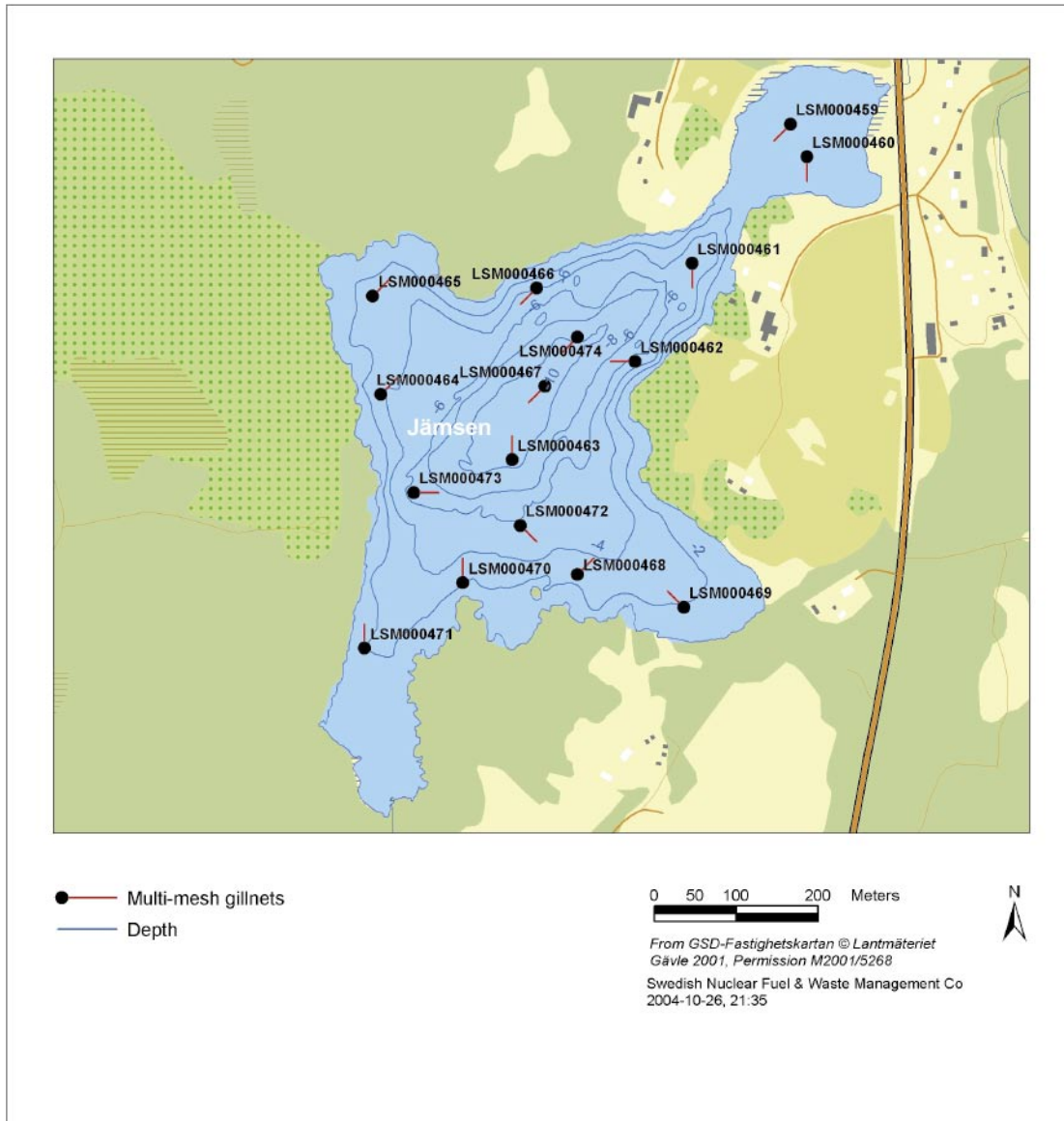


Figure 4-1. Sampling positions for the multi-mesh gillnets in Lake Jämsen.

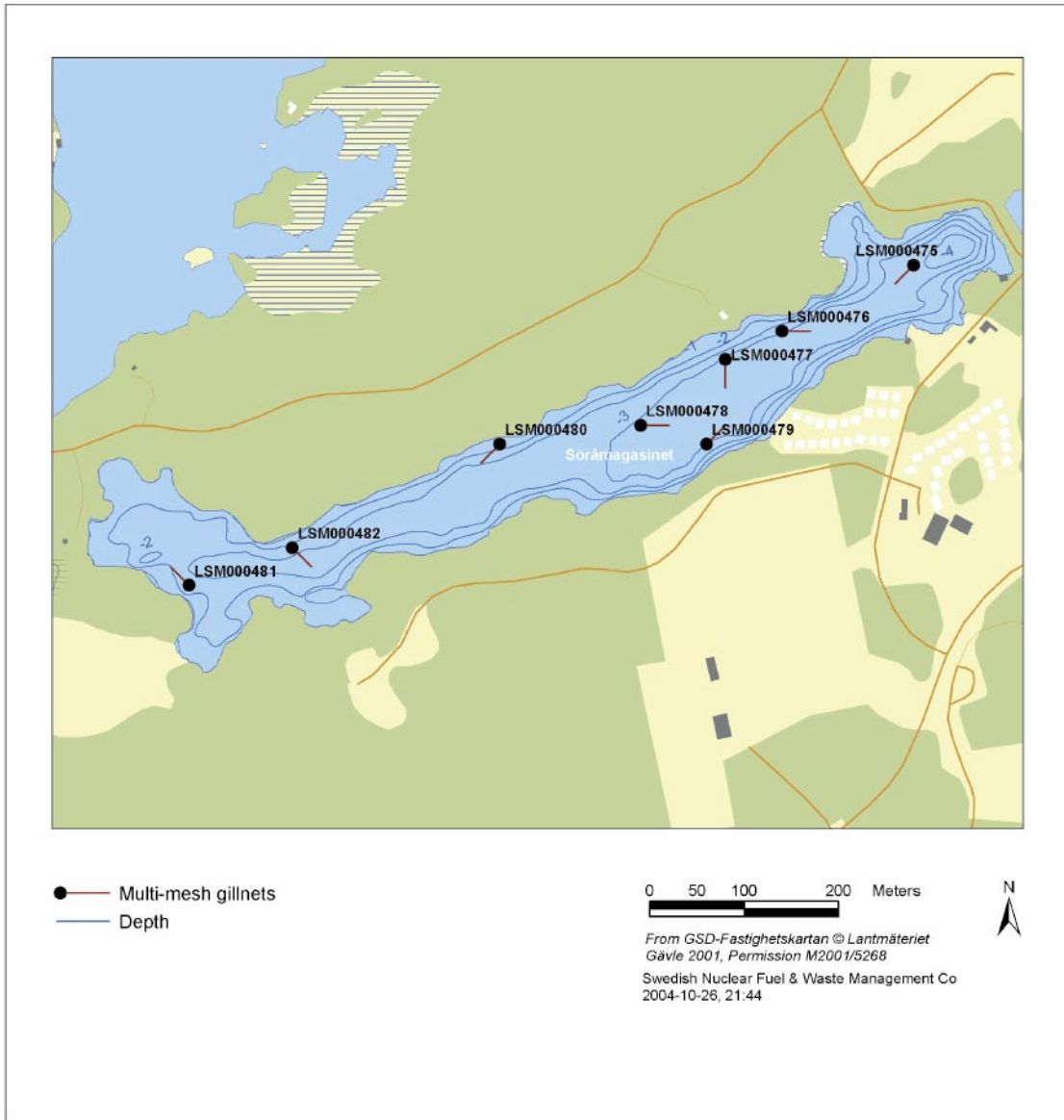


Figure 4-2. Sampling positions for the multi-mesh gillnets in Lake Söråmagasinet.

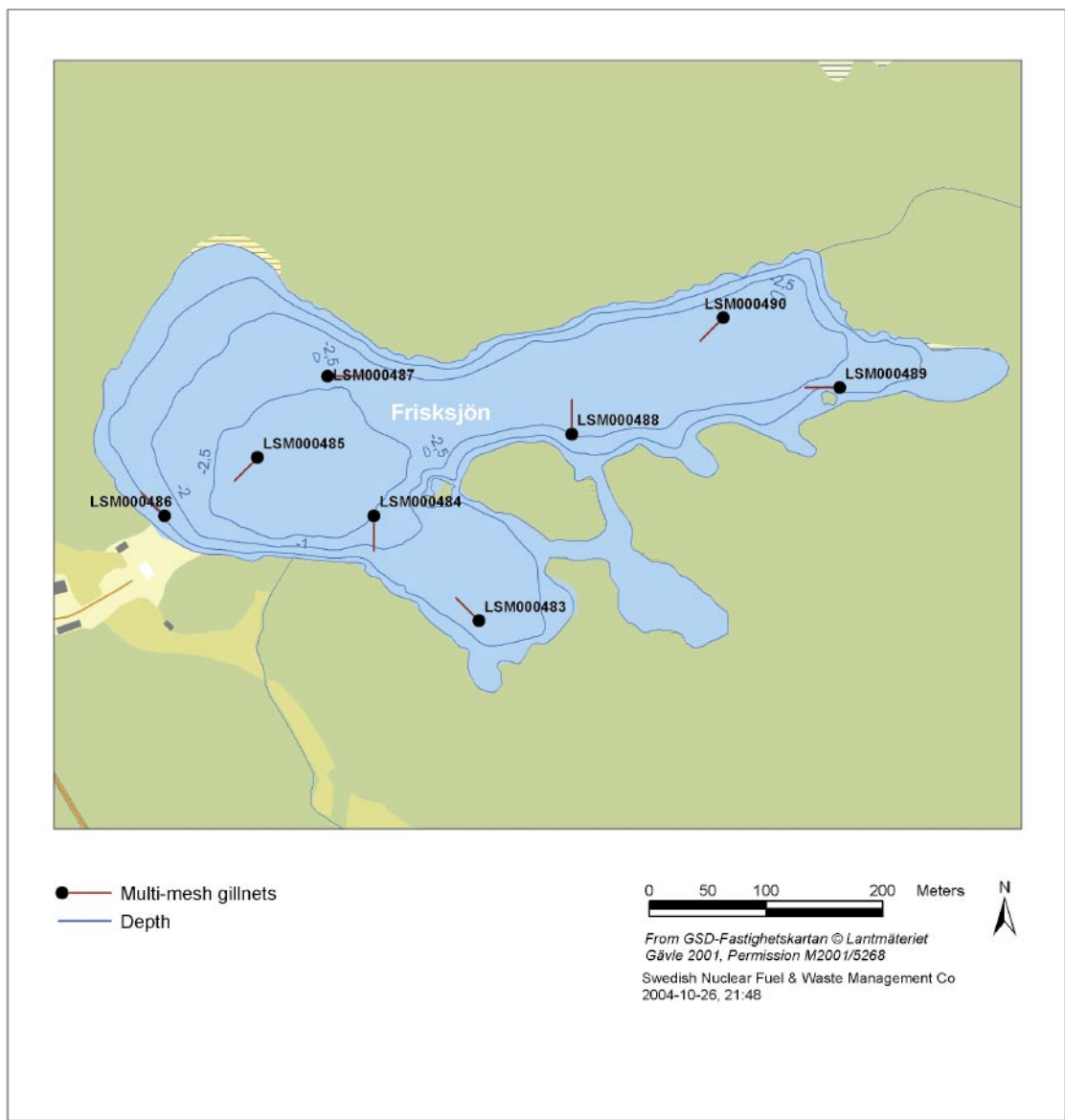


Figure 4-3. Sampling positions for the multi-mesh gillnets in Lake Frisksjön.

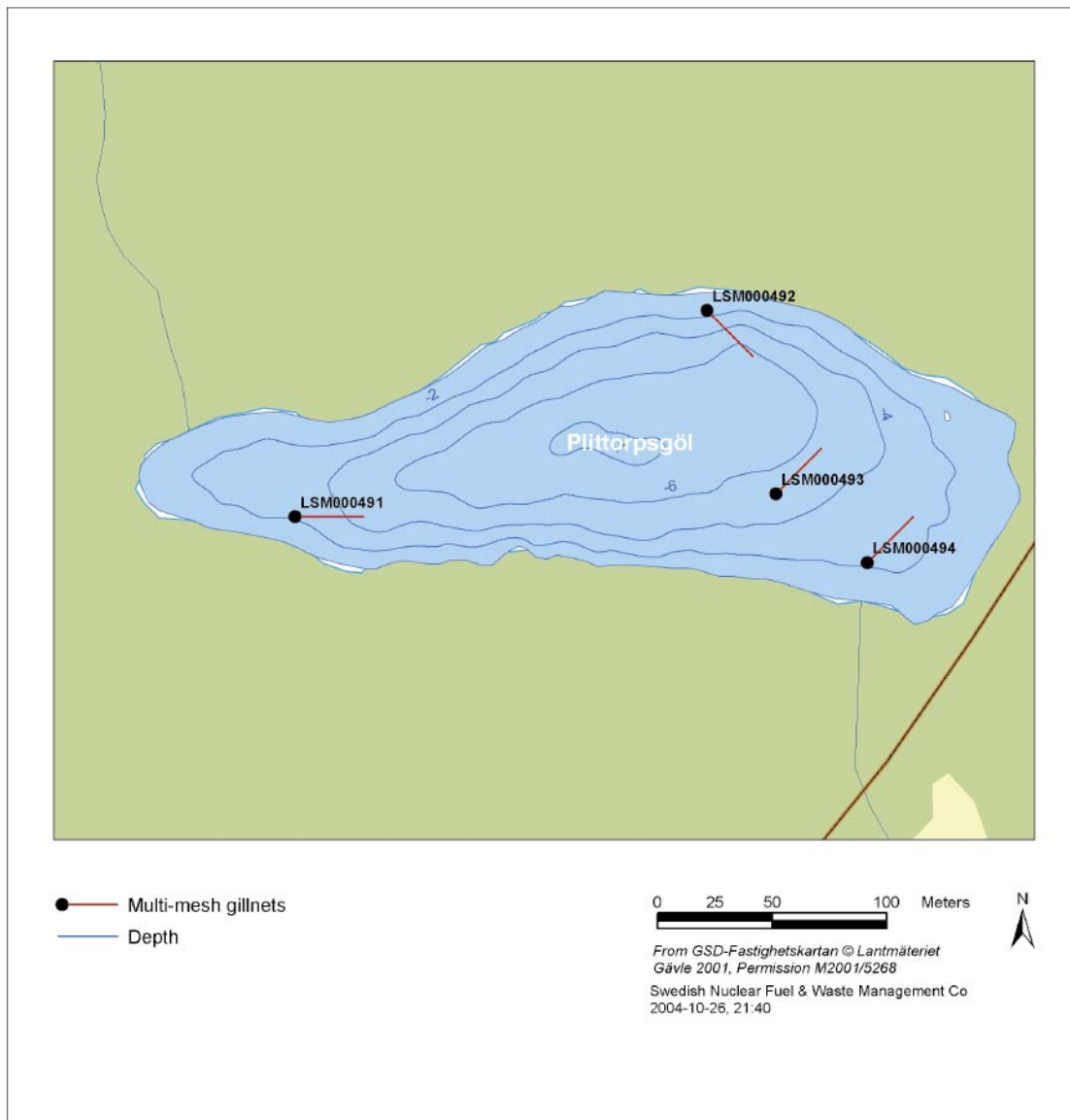


Figure 4-4. Sampling positions for the multi-mesh gillnets in Lake Plitterpsgöl.

4.2 Presampling preparations

Before sampling could take place some preparations regarding equipment and placement of the gillnets were necessary.

The condition of the gillnets was checked prior to sampling. Buoys were marked up with numbers corresponding to the gillnets, they were also marked with “sampling in progress”. Protocols for field observations were copied on water resistant paper and GPS receiver and echo sounder were also checked.

Maps with depth contours were used to randomly place the gillnets in the fixed depth zones and direction (Figure 4-1 to 4-4). A criterion was that the gillnets should be located at least 30 m apart from each other. Some minor adjustments of the positions of a few gillnets were made in the field, due to local depth conditions, and obstacles along the shore.

Water temperature and oxygen data from three of the lakes were available from the surface water programme. Measurements had been performed with a sonde a few days earlier. In Lake Plittorpsgöl a microprocessor oximeter was used to measure water temperature and oxygen in order to determine the depth of the thermocline.

4.3 Execution of field work

Sampling of freshwater fish was performed from August 15 to August 20. All gillnets were set between 5 and 7 p.m. The maximum effort for one fishing night was eight gillnets. For the largest lake, Lake Jämsen, two fishing nights were required. The gillnets were set at the predetermined locations and were marked with a buoy. Water depth and co-ordinates were recorded at both ends. Sampling information as water temperature, secchi depth, weather observations etc were also recorded.

The gillnets were lifted between 6 and 8 a.m. the next day. After landing the nets, they were rinsed and the fish was collected in marked buckets, separately for each gillnet.

The caught fish from each gillnet and species was registered as number of individuals and the total weight for each species. Also, length and wet weight for every single specimen was registered. Length was determined to the nearest millimetre and weight to the nearest gram.

Any deformities and signs of external injury was noted.

Some chosen individuals of perch, roach and pike were, for each lake, deep-frozen, to make further analysis possible (Appendix 3). For perch and roach, most of the stored individuals varied between 150 and 200 mm. All caught pikes were stored.

4.4 Data handling/post processing

The data obtained from the activity was reported digitally to SKB and stored in the database SICADA. The field note number was Simpevarp 521. These data will later be used for further interpretation and modelling.

4.5 Analyses and interpretations

The results in Chapter 5 are basically evaluated according to the Swedish fish index (FIX). A Detailed description how to calculate FIX is published by the Swedish Environmental Protection Agency, in “Bedömningsgrunder för miljökvalitet, sjöar och vattendrag” /2/. The assessment involves two aspects: (i) a classification of the state of the environment and (ii) a classification of the extent to which the recorded state deviates from a comparative value, which in most cases represent an estimate of a “natural state”. For both classifications an average index is calculated, based on the variables. The variables are presented in Table 4-2. The results of both classifications are graded on a scale of 1–5 (Table 4-3).

Table 4-2. Variables for determination of Swedish fish index (FIX). For classification of state parameters 1–5 are used, and for classification of deviation all nine parameters are used.

| | |
|---|--|
| 1 | Number of domestic species |
| 2 | Diversity of domestic species (Shannon-Wiener diversity index) |
| 3 | Relative biomass of domestic species WPUE* |
| 4 | Relative number individuals of domestic species NPUE** |
| 5 | Proportion of piscivore percides based on weight of the total catch |
| 6 | Proportion of cyprinids based on weight of the total catch |
| 7 | Presence of species sensitive to low pH-levels |
| 8 | Proportion of biomass from species resistant against low oxygen levels |
| 9 | Proportion of biomass from alien species |

* Weight per unit effort

** Number per unit effort

Table 4-3. Classification of state and deviation.

| Classification of state | | Classification of deviation | |
|-------------------------|-----------------------|-----------------------------|-------------------------------|
| Class | Legend | Class | Legend |
| 1 | Very high value | 1 | No or insignificant deviation |
| 2 | High value | 2 | Slight deviation |
| 3 | Moderately high value | 3 | Evident deviation |
| 4 | Low value | 4 | Large deviation |
| 5 | Very low value | 5 | Very large deviation |

The condition factor was calculated for perch and roach. The basic assumption underlying the use of condition factors is that fish in better “condition” (nutritional and health status) are more full-bodied and therefore heavier at a given length. Fish condition has therefore been traditionally estimated by the equation proposed by Fulton (1911):

$$K = (W/L^3) * 10^5$$

Where K = condition factor, W = body mass in gram, L = body length in millimetre

This equation assumes isometric growth, i.e. that the relative proportions of body length, height and thickness do not change in fish of similar condition as they increase in weight. It has, however, been shown that fish often grow allometrically, i.e. that these proportions are not constant /4/.

To reduce the effects of allometry and the scatter around the mean condition factor of the populations, a limited length frequency distribution data has been chosen for calculation of condition factors. For perch, lengths between 100–150 mm were used, and for roach 100–200 mm. The fish from the four lakes are sampled at the same time of the year, which also makes comparisons between the lakes more accurate. The effects of allometry are, however, hard to eliminate, and the condition factors should be viewed as a relatively blunt tool when comparing condition factors between the different lakes.

Today there is no model for calculating the total biomass of the entire fish population in a lake in a reliable way using multi-mesh gillnets. Despite the uncertainty, a rough approximation has been made, based on results and experiences, that the Institute of Freshwater Research, Drottningholm has conveyed /Persson, 2004, pers com/. The approximation used is:

$$20 * WPUE * A$$

where 20 = constant, WPUE = weight per unit effort, A = area of the lake in ha

4.6 Nonconformities

There were no significant nonconformities that affect the results or nonconformities with respect to activity plan or method descriptions.

5 Results

In this section the main results are presented, for each lake respectively. For more details see Appendix 1 where the results and field notes are presented lake by lake. The catch within each gillnet was registered as number of individuals and total weight for each species and can be viewed in Appendix 2. A register of fish placed in the freezer is presented in Appendix 3. A list of caught fish species and their names in Swedish, English and Latin is presented in Appendix 4.

Data is reported to SICADA, field note number Simpevarp 521.

5.1 Lake Jämsen

In Lake Jämsen, seven species were caught, which can be considered as a high value in a small lake as Lake Jämsen (Table 5-1). The species found are of frequent occurrence and the result is consequently expected.

The catch was dominated by perch in numbers, as well as in biomass, followed by roach and bream (Table 5-1 and Figure 5-1).

Catch per unit effort in numbers and in weight, for the caught species, can be seen in Table 5-1 and Figure 5-2. The values are relatively low, particularly for weight per unit effort. An explanation to this is probably the low oxygen levels below the depth of two meters.

Classification by the Swedish fish index (FIX) placed Lake Jämsen in class 1, which means that the fish population can be regarded normal, for this type of lake (Table 5-2). The catch showed, however, an evident deviation due to somewhat low biomass per unit effort.

Calculated Condition index for perch was 1.14 and for roach 0.93.

No deformities or signs of external injury were seen on the caught fish.

Table 5-1. Compiled results of fish data from Lake Jämsen.

| Species | Total number of caught fish | Number per unit effort | Total weight of caught fish (g) | Weight per unit effort (g) |
|-------------|-----------------------------|------------------------|---------------------------------|----------------------------|
| Perch | 145 | 9.1 | 4,739 | 296 |
| Roach | 64 | 4.0 | 1,089 | 68 |
| Bream | 49 | 3.1 | 2,206 | 138 |
| Bleak | 25 | 1.6 | 444 | 28 |
| Pike | 2 | 0.1 | 1,745 | 109 |
| Ruffe | 23 | 1.4 | 157 | 10 |
| Rudd | 1 | 0.1 | 108 | 7 |
| Sum: | 309 | 19.3 | 10,488 | 656 |

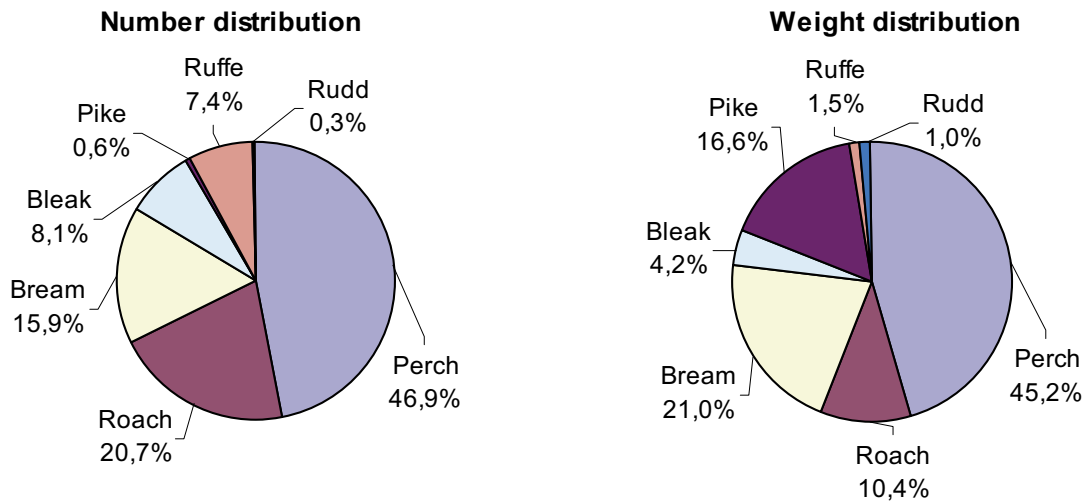


Figure 5-1. Number and weight distribution of caught fish in Lake Jämsen.

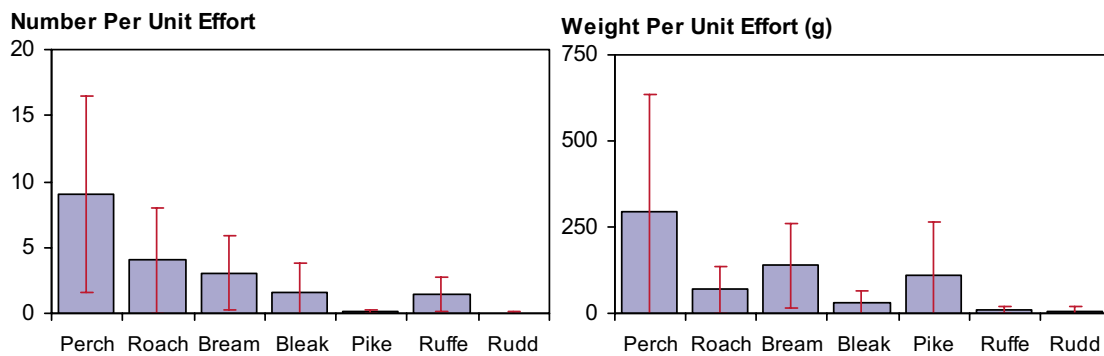


Figure 5-2. Catch per unit effort, with 95% confidence intervals in Lake Jämsen.

Table 5-2. Classification by the Swedish fish index (FIX) in Lake Jämsen.

| Classification of state | Value | Class | The value is |
|------------------------------------|------------|----------|------------------------|
| Number of domestic species | 7 | 2 | high |
| Diversity index (Shannon Wiener) | 0.64 | 2 | high |
| Biomass (g/unit effort) | 656 | 3 | moderately high |
| Number of individuals /unit effort | 19.3 | 3 | moderately high |
| Proportion of piscivores | 0.31 | 3 | moderately high |
| Average index | 2.6 | 3 | moderately high |

| Classificaton of deviation from comparative value | Class | The deviation is |
|--|--------------|----------------------------|
| Number of domestic species | 1 | no or insignificant |
| Diversity index (Shannon Wiener) | 1 | no or insignificant |
| Biomass (g/unit effort) | 3 | evident |
| Number of individuals /unit effort | 2 | slight |
| Proportion of piscivores | 2 | slight |
| Proportion of cyprinids | 2 | slight |
| Presence of species sensitive to low pH-levels | 1 | no or insignificant |
| Proportion of alien species | 1 | no or insignificant |
| Average index | 1 | no or insignificant |

5.2 Lake Söråmagasinet

In Lake Söråmagasinet, six species were caught, which can be considered as a high value in such a small lake (Table 5-3). The species found are of frequent occurrence and the result is consequently expected.

The catch was dominated by perch in numbers, as well as in biomass, followed by roach and bream (Table 5-3 and Figure 5-3).

The values were relatively high of catch per unit effort, both in numbers and in weight, for the caught species (Figure 5-4).

Classification by the Swedish fish index (FIX) placed Lake Söråmagasinet in class 1, which means that the fish population can be regarded as normal for this type of lake (Table 5-4). There was only slight deviation, with a slightly lower proportion of piscivores and a slightly higher proportion of cyprinids, in comparison with the comparative value..

Calculated Condition index for perch was 1.06 and for roach 0.96.

No deformities or signs of external injury were seen on the caught fish.

Table 5-3. Compiled results of fish data from Lake Söråmagasinet.

| Species | Total number of caught fish | Number per unit effort | Total weight of caught fish (g) | Weight per unit effort (g) |
|----------------|------------------------------------|-------------------------------|--|-----------------------------------|
| Perch | 192 | 24.0 | 7,145 | 893 |
| Roach | 92 | 11.5 | 3,837 | 480 |
| Bream | 52 | 6.5 | 4,815 | 602 |
| Rudd | 7 | 0.9 | 117 | 15 |
| Pike | 1 | 0.1 | 1,116 | 140 |
| Ruffe | 11 | 1.4 | 140 | 18 |
| Sum: | 355 | 44.4 | 17,170 | 2,146 |

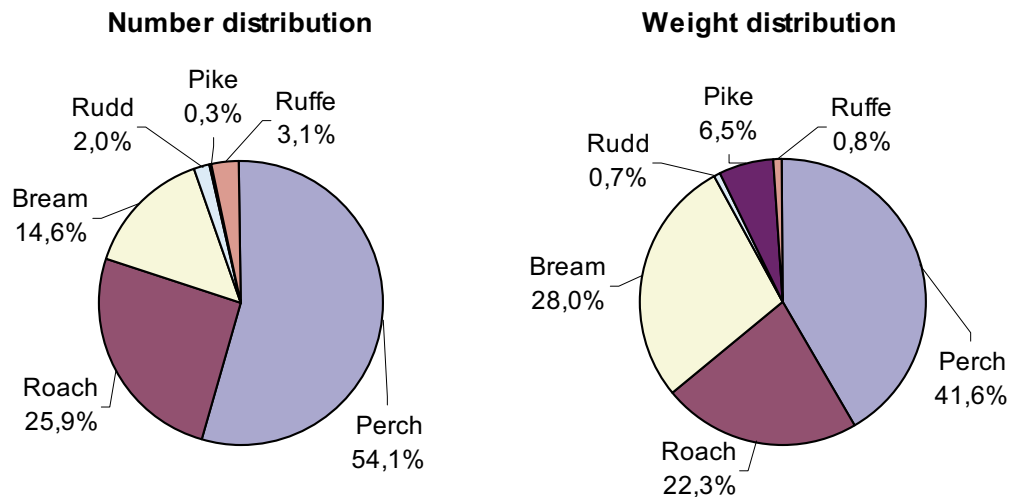


Figure 5-3. Number and weight distribution of caught fish in Lake Söråmagasinet.

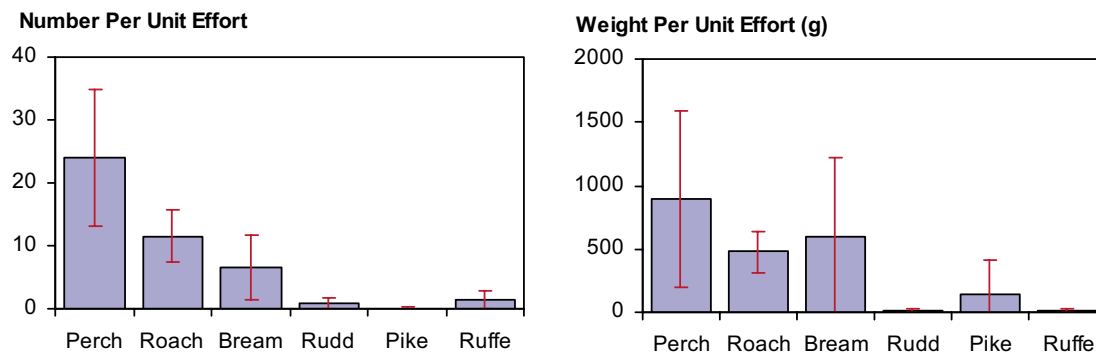


Figure 5-4. Catch per unit effort, with 95% confidence intervals, in Lake Söråmagasinet.

Table 5-4. Classification by the Swedish fish index (FIX) in Lake Söråmagasinet.

| Classification of state | Value | Class | The value is |
|------------------------------------|------------|----------|-----------------|
| Number of domestic species | 6 | 2 | high |
| Diversity index (Shannon Wiener) | 0.57 | 2 | high |
| Biomass (g/unit effort) | 2146 | 2 | high |
| Number of individuals /unit effort | 44.4 | 2 | high |
| Proportion of piscivores | 0.28 | 3 | moderately high |
| Average index | 2.2 | 2 | low |

| Classificaton of deviation from comparative value | Class | The deviation is |
|--|--------------|----------------------------|
| Number of domestic species | 1 | no or insignificant |
| Diversity index (Shannon Wiener) | 1 | no or insignificant |
| Biomass (g/unit effort) | 1 | no or insignificant |
| Number of individuals /unit effort | 1 | no or insignificant |
| Proportion of piscivores | 2 | slight |
| Proportion of cyprinids | 2 | slight |
| Presence of species sensitive to low pH-levels | 1 | no or insignificant |
| Proportion of alien species | 1 | no or insignificant |
| Average index | 1 | no or insignificant |

5.3 Lake Frisksjön

In Lake Frisksjön, six species were caught, which can be considered as a high value in such a small lake (Table 5-5). The species found are of frequent occurrence and the result is consequently expected.

The catch was dominated by perch in numbers, as well as in biomass, followed by roach and bream (Table 5-5 and Figure 5-5).

The catch per unit effort in numbers and in weight, for the caught species was relatively high (Table 5-5 and Figure 5-6).

Classification by the Swedish fish index (FIX) placed Lake Frisksjön in class 1, which means that the fish population can be regarded as normal for this type of lake (Table 5-6).

Calculated Condition index for perch was 1.25 and for roach 0.99.

No deformities or signs of external injury were seen on the caught fish.

Table 5-5. Compiled results of fish data from Lake Frisksjön.

| Species | Total number of caught fish | Number per unit effort | Total weight of caught fish (g) | Weight per unit effort (g) |
|----------------|------------------------------------|-------------------------------|--|-----------------------------------|
| Perch | 258 | 32.3 | 8,273 | 1,034 |
| Roach | 63 | 7.9 | 2,498 | 312 |
| Bream | 26 | 3.3 | 2,177 | 272 |
| Rudd | 8 | 1.0 | 252 | 32 |
| Pike | 2 | 0.3 | 892 | 112 |
| Ruffe | 7 | 0.9 | 65 | 8 |
| Sum: | 364 | 45.5 | 14,157 | 1,770 |

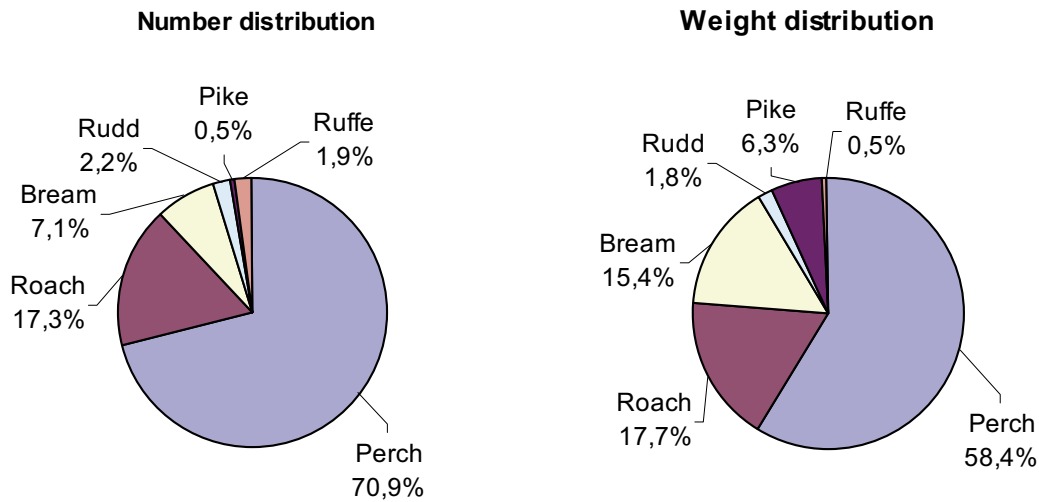


Figure 5-5. Number and weight distribution of caught fish in Lake Frisksjön.

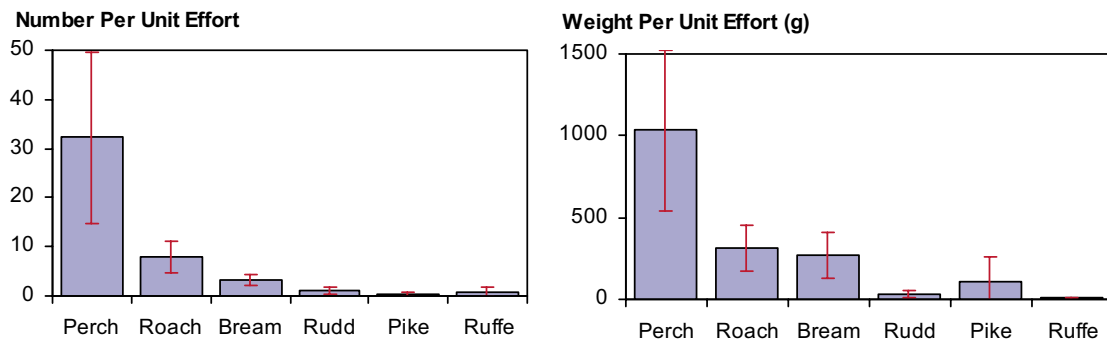


Figure 5-6. Catch per unit effort, with 95% confidence intervals, in Lake Frisksjön.

Table 5-6. Classification by the Swedish fish index (FIX) in Lake Frisksjön.

| Classification of state | Value | Class | The value is |
|------------------------------------|------------|----------|------------------------|
| Number of domestic species | 6 | 2 | high |
| Diversity index (Shannon Wiener) | 0.51 | 3 | moderately high |
| Biomass (g/unit effort) | 1,770 | 3 | moderately high |
| Number of individuals /unit effort | 45.5 | 2 | high |
| Proportion of piscivores | 0.42 | 3 | moderately high |
| Average index | 2.6 | 3 | moderately high |

| Classificaton of deviation from comparative value | Class | The deviation is |
|---|----------|----------------------------|
| Number of domestic species | 1 | no or insignificant |
| Diversity index (Shannon Wiener) | 2 | slight |
| Biomass (g/unit effort) | 1 | no or insignificant |
| Number of individuals /unit effort | 1 | no or insignificant |
| Proportion of piscivores | 1 | no or insignificant |
| Proportion of cyprinids | 1 | no or insignificant |
| Presence of species sensitive to low pH-levels | 1 | no or insignificant |
| Proportion of alien species | 1 | no or insignificant |
| Average index | 1 | no or insignificant |

Two different cyprinide species, caught in Lake Frisksjön can be viewed in Figure 5-7 and Figure 5-8. Roach was far more abundant than rudd was.



Figure 5-7. Roach caught in Lake Frisksjön.



Figure 5-8. Rudd caught in Lake Frisksjön.

5.4 Lake Plittorpsgöl

In lake Plittorpsgöl, three species were caught, which can be considered as a normal value in such a small lake (Table 5-7). The species found are of frequent occurrence and the result is consequently expected.

The catch was dominated by perch in numbers, as well as in biomass, followed by roach. (Table 5-7 and Figure 5-9).

The catch per unit effort in numbers and in weight, for the caught species, was relatively low (Table 5-7 and Figure 5-10). This was probably due to low oxygen levels below the depth of two meters in the lake.

Classification by the Swedish fish index (FIX) placed Lake Plittorpsgöl in class 2, which indicates that the fish population slightly deviates, compared to the expected, in this kind of lake (Table 5-8). This was due to low values of biomass and number of individuals.

Calculated Condition index was for perch 1.06 and for roach 0.89.

No deformities or signs of external injury were seen on the caught fish.

Table 5-7. Compiled results of fish data from Lake Plittorpsgöl.

| Species | Total number of caught fish | Number per unit effort | Total weight of caught fish (g) | Weight per unit effort (g) |
|-------------|-----------------------------|------------------------|---------------------------------|----------------------------|
| Perch | 24 | 6.0 | 1,623 | 406 |
| Roach | 21 | 5.3 | 1,057 | 264 |
| Pike | 1 | 0.3 | 534 | 134 |
| Sum: | 46 | 11.5 | 3,214 | 804 |

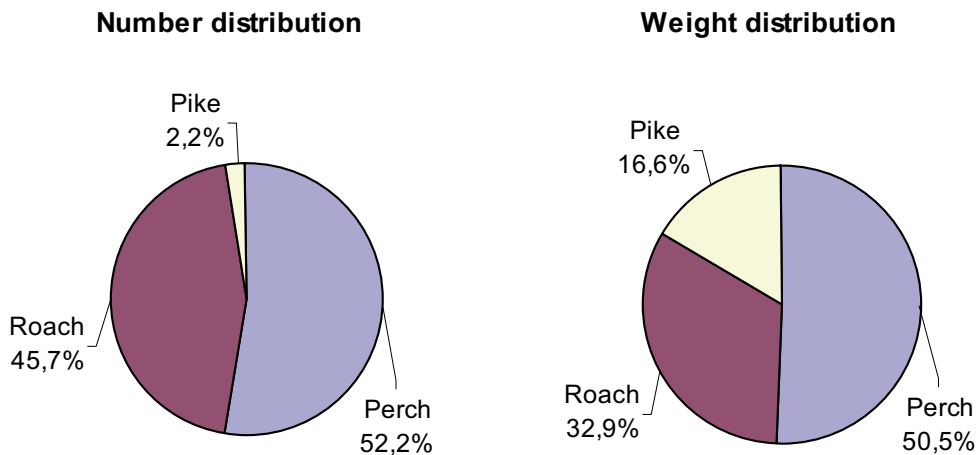


Figure 5-9. Number and weight distribution of caught fish in Lake Plittorpsgöl.

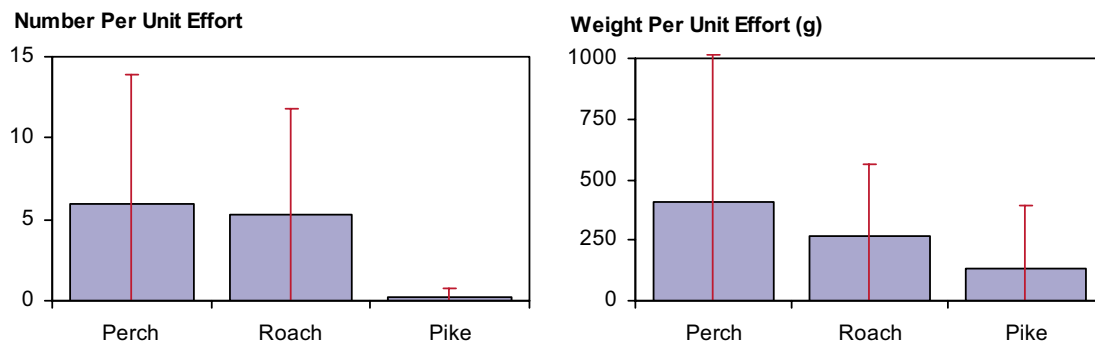


Figure 5-10. Catch per unit effort, with 95% confidence intervals, in Lake Plittorpsgöl.

Table 5-8. Classification by the Swedish fish index (FIX) in Lake Plittorpsgöl

| Classification of state | Value | Class | The value is |
|------------------------------------|------------|----------|------------------------|
| Number of domestic species | 3 | 3 | moderately high |
| Diversity index (Shannon Wiener) | 0.44 | 3 | moderately high |
| Biomass (g/unit effort) | 804 | 3 | moderately high |
| Number of individuals /unit effort | 11.5 | 4 | low |
| Proportion of piscivores | 0.44 | 3 | moderately high |
| Average index | 3.2 | 3 | moderately high |

| Classificaton of deviation from comparative value | Class | The deviation is |
|---|----------|---------------------|
| Number of domestic species | 1 | no or insignificant |
| Diversity index (Shannon Wiener) | 1 | no or insignificant |
| Biomass (g/unit effort) | 3 | evident |
| Number of individuals /unit effort | 3 | evident |
| Proportion of piscivores | 1 | no or insignificant |
| Proportion of cyprinids | 1 | no or insignificant |
| Presence of species sensitive to low pH-levels | 3 | evident |
| Proportion of alien species | 1 | no or insignificant |
| Average index | 2 | slight |



Figure 5-11. Handling the catch and gillnets.

6 Summary and discussions

The number of caught fish species varied somewhat between the lakes (Table 6-1). In Lake Söråmagasinet and Lake Frisksjön the same species were found. In Lake Plittorpsgöl, however, only three species were caught. This was not surprising considering the small size of the lake.

Table 6-1. Caught species in the sampled lakes.

| Lake | Species | | | | | | | Sum |
|---------------|---------|-------|------|-------|-------|------|-------|-----|
| | Perch | Roach | Pike | Bream | Ruffe | Rudd | Bleak | |
| Jämsen | x | x | x | x | x | x | x | 7 |
| Söråmagasinet | x | x | x | x | x | x | | 6 |
| Frisksjön | x | x | x | x | x | x | | 6 |
| Plittorpsgöl | x | x | x | | | | | 3 |

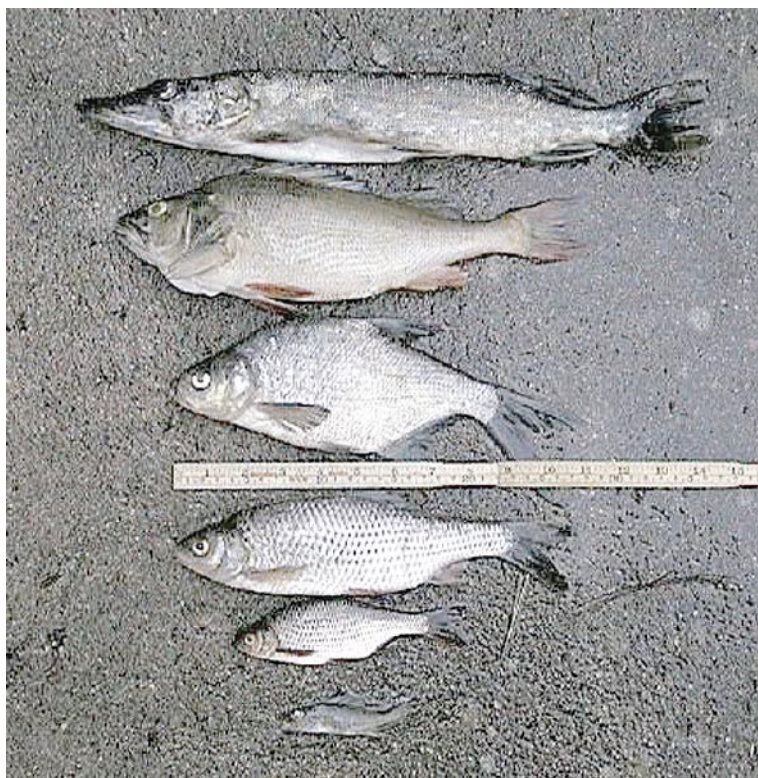


Figure 6-1. Caught species in Lake Frisksjön. From the top: pike, perch, bream, roach, rudd and ruffe.

Catch Per Unit Effort, expressed as numbers and weight per unit effort, varied quite a lot between the lakes (Table 6-2). Lake Söråmagasinet and Lake Frisksjön show, however, similar results. The relatively low catch in Lake Jämsen is probably due to low levels of oxygen below the depth of two meters. Since the lake has a maximum depth of eleven meters, several gillnets were set deeper than two meters, and consequently the catch in these gillnets were none or very poor. Similarly, in Lake Plittorpsgöl, only four gillnets were set and two were placed below the thermocline. There was no catch in these two gillnets.

Table 6-2. Catch Per Unit Effort in the sampled lakes.

| Lake | Number per unit effort | Weight per unit effort (g) |
|---------------|------------------------|----------------------------|
| Jämsen | 19.3 | 656 |
| Söråmagasinet | 44.4 | 2,146 |
| Frisksjön | 45.5 | 1,770 |
| Plittorpsgöl | 11.5 | 804 |

Perch was the dominating species in all the sampled lakes, a result that was expected (Figure 6-2). It can, however, be noticed that the proportion of cyprinids (roach and bream), is higher in Lake Söråmagasinet than in the other lakes (weight proportion). This indicates that Lake Söråmagasinet has a higher nutrient load. The lake is a former sea bay, which was enclosed during the 1970's.

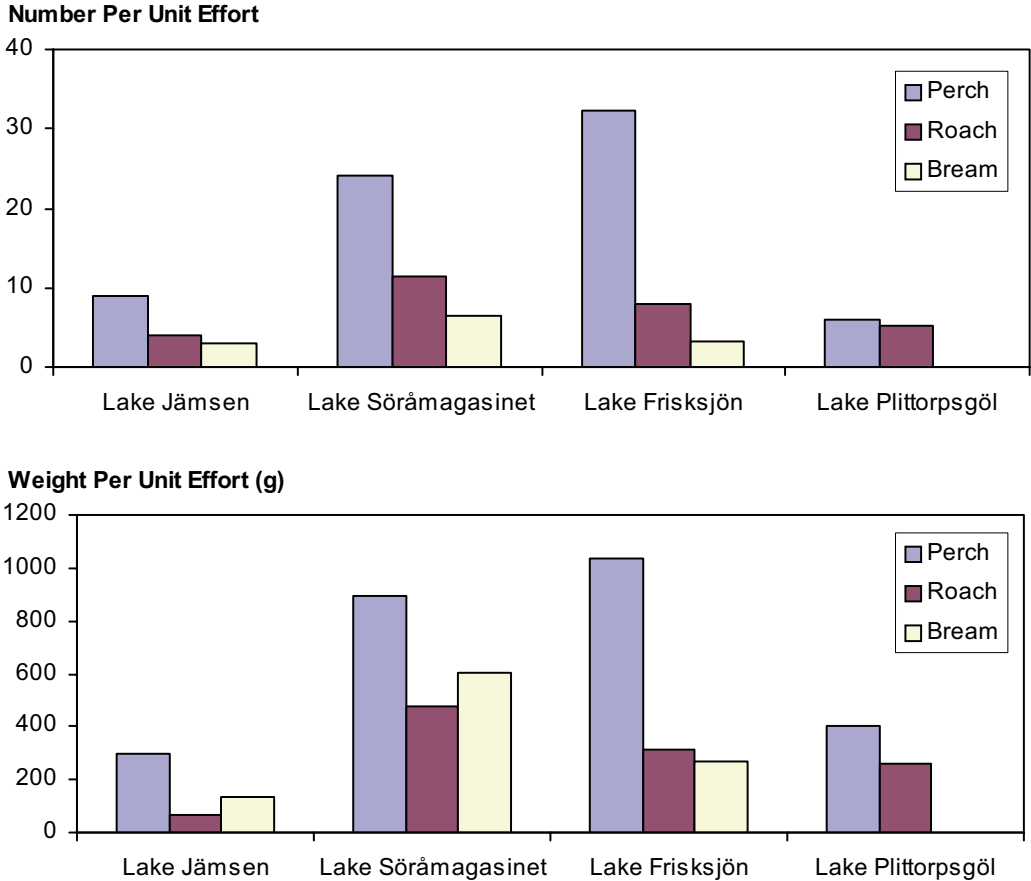


Figure 6-2. Catch Per Unit Effort, for the three most frequent occurring species.

The fish condition factor was calculated for perch and roach (Table 6-3). The basic assumption underlying the use of condition factor is that fish in better “condition” (nutritional and health status) are more full-bodied and therefore heavier at a given length. For perch, lengths between 100–150 mm were used, and for roach 100–200 mm.

The condition factor for perch was highest in Lake Frisksjön, (Figure 6-3). The differences are statistically significant, (students t-test, two-tailed, $p < 0.001$ in all cases). The result indicates that the perches in Lake Frisksjön have a better nutritional and health status than perches from the other sampled lakes, probably depending on the availability of food.

It is interesting to notice that the condition factor is highest in Lake Frisksjön for roach as well (students t-test, two-tailed, $p < 0.05$ in all cases) (Figure 6-4). The result indicates a “better environment” than for example in Lake Plittorpsgöl.

Table 6-3. Calculated condition factors for perch and roach.

| Perch Lake | Mean | Stdev | n |
|--------------------|------|-------|----|
| Lake Jämsen | 1.14 | 0.12 | 54 |
| Lake Söråmagasinet | 1.06 | 0.10 | 95 |
| Lake Frisksjön | 1.25 | 0.13 | 66 |
| Lake Plittorpsgöl | 1.06 | 0.08 | 11 |

| Roach Lake | Mean | Stdev | n |
|--------------------|------|-------|----|
| Lake Jämsen | 0.93 | 0.06 | 64 |
| Lake Söråmagasinet | 0.96 | 0.07 | 91 |
| Lake Frisksjön | 0.99 | 0.08 | 62 |
| Lake Plittorpsgöl | 0.89 | 0.06 | 17 |

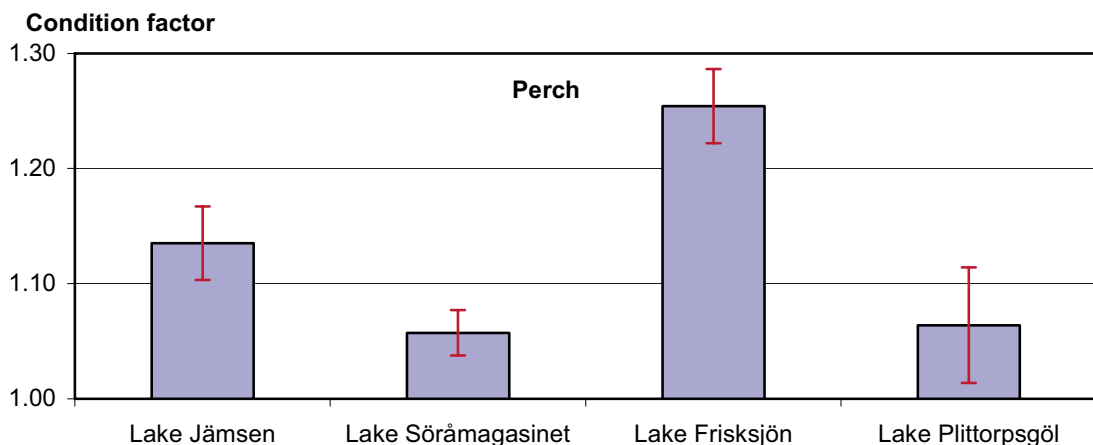


Figure 6-3. Calculated condition factors for perch with 95% confidence interval.

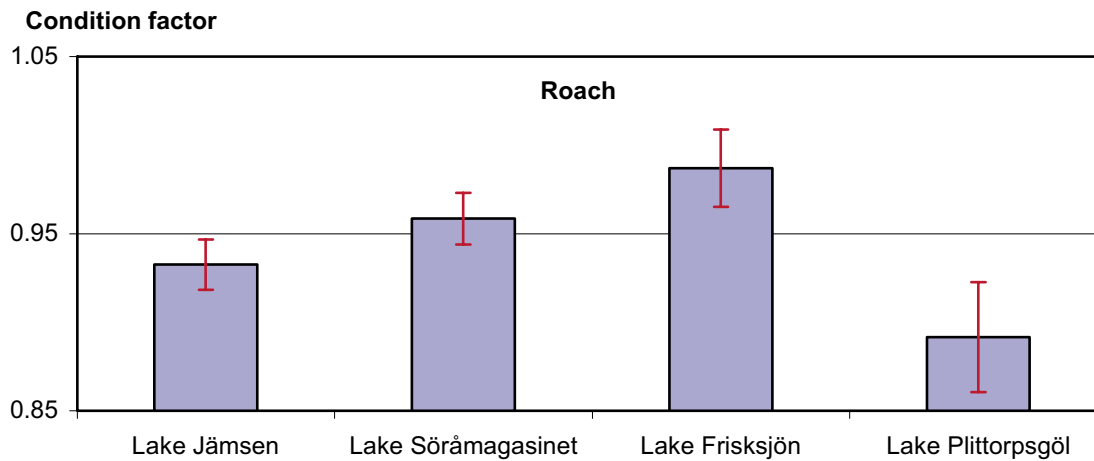


Figure 6-4. Calculated condition factors for roach with 95% confidence interval.

Today there is no model for calculating the total biomass of the entire fish population in a lake in a reliable way using multi-mesh gillnets. Despite the uncertainty, a rough approximation has been made (Table 6-4). As can be seen in the table, the approximations are very uncertain. This is due to the large variation of catch between the gillnets, which depends on several factors. The most important factor is the low levels of oxygen, which, especially in Lake Jämsen and Lake Plittorpsgöl, resulted in poor catches at lower depths.

The value of biomass for the entire lake is a very rough approximation, not only due to the large variations in the data series, but also due to the large uncertainty with the factor used for multiplying the weight per unit effort.


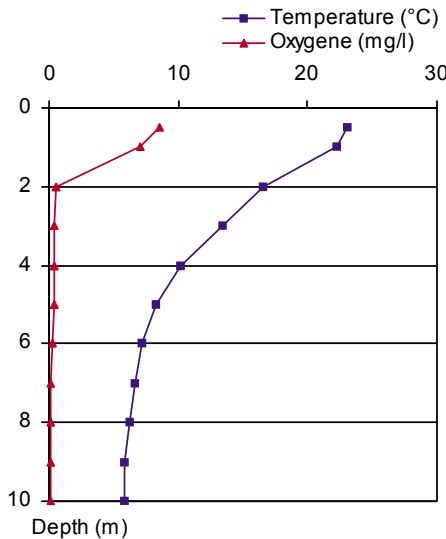
Table 6-4. Approximation of the total weight of the fish population per ha, and for the entire lake.

| Lake | Weight per unit effort (kg) | Confidence limit (95%) | Weight per ha (kg) | Total weight entire lake (kg) |
|---------------|-----------------------------|------------------------|--------------------|-------------------------------|
| Jämsen | 0.66 | 0.51 | 13 +/- 10 | 315 +/- 243 |
| Söråmagasinet | 2.15 | 1.37 | 43 +/- 27 | 382 +/- 243 |
| Frisksjön | 1.77 | 0.54 | 35 +/- 11 | 389 +/- 118 |
| Plittorpsgöl | 0.80 | 1.12 | 16 +/- 22 | 53 +/- 74 |

7 References

- /1/ **Kinnerbäck A, 2001.** Standardiserad metodik för provfiske i sjöar. Fiskeriverket informerar 2001:2.
- /2/ **Wiederholm T, 1999.** Bedömningsgrunder för miljö kvalitet. Sjöar och vattendrag. Naturvårdsverket rapport 4913.
- /3/ **Wiederholm T, 1999.** Bedömningsgrunder för miljö kvalitet. Sjöar och vattendrag. Bakgrundsrapport biologiska parametrar. Naturvårdsverket rapport 4921.
- /4/ **Richter H, Lückstädt C, Focken U L, Becker K, 2000.** An improved procedure to assess fish condition on basis of length-weight relationships. Arch. Fish. Mar. Res. 48(3), 2000, 226–235.

Results, lake by lake

| Lake Jämsen | |  REPORT utfärdad av ackrediterat laboratorium REPORT issued by an Accredited Laboratory | | | | | | | | | |
|--|----------------------------------|---|--|-----------|------------|------------|----------------|-----------|-----------------------|-------------------|------------------|
| Water area information | | | | | | | | | | | |
| Lake: | Jämsen | Main catch area: | 72/73 | | | | | | | | |
| Co-ordinates: | 636528/154063 | Topogr. map: | 6G SO | | | | | | | | |
| County: | Kalmar | Altitude (m): | 30 | | | | | | | | |
| Municipality: | Oskarshamn | Catchm. (km ²): | - | | | | | | | | |
| | | Lake area (ha): | 24 | | | | | | | | |
| | | Max.depth (m): | 11 | | | | | | | | |
| | | Aver. depth(m): | 4 | | | | | | | | |
| | | Liming: | no | | | | | | | | |
| Sampling information | | | | | | | | | | | |
| First setting: | 2004-08-15 | Method: | standard | | | | | | | | |
| Last uptake: | 2004-08-17 | Benthic gillnets: | 16 | | | | | | | | |
| Fishermen: | Engdahl/Andersson | Pelagic gillnets: | 0 | | | | | | | | |
| Responsibility: | Medins | Type of gillnets: | Nordic | | | | | | | | |
| Purpose: | site investigations | Earlier sampl: | - | | | | | | | | |
| | | Surf. temp. (°C): | 23,1 | | | | | | | | |
| | | Turbidity: | clear | | | | | | | | |
| | | Colour: | strongly col. | | | | | | | | |
| | | Secchi depth: | 1,4 m | | | | | | | | |
| | | Trophic level: | mesotrophic | | | | | | | | |
| Miscellaneous | | | | | | | | | | | |
| Weather conditions: | clear to cloudy | Air temp. (°C): | 18 | | | | | | | | |
| Wind conditions: | light to gentle breeze from west | Chem. sampl: | no | | | | | | | | |
| Other observations: | - | | | | | | | | | | |
| Water temperature- and oxygene profile | | | | | | | | | | | |
| Depth (m) | Temperature (°C) | Oxygene (mg/l) |  | | | | | | | | |
| 0,5 | 23,1 | 8,6 | | | | | | | | | |
| 1 | 22,2 | 7,1 | | | | | | | | | |
| 2 | 16,5 | 0,5 | | | | | | | | | |
| 3 | 13,4 | 0,4 | | | | | | | | | |
| 4 | 10,2 | 0,4 | | | | | | | | | |
| 5 | 8,3 | 0,4 | | | | | | | | | |
| 6 | 7,2 | 0,3 | | | | | | | | | |
| 7 | 6,6 | 0,2 | | | | | | | | | |
| 8 | 6,2 | 0,2 | | | | | | | | | |
| 9 | 5,9 | 0,2 | | | | | | | | | |
| 10 | 5,8 | 0,2 | | | | | | | | | |
| Results | | | | | | | | | | | |
| Species | Numb. (pcs) | Numb. (%) | Catch/ net (pcs) | Std. dev. | Weight (g) | Weight (%) | Catch/ net (g) | Std. dev. | Length in-terval (mm) | Length aver. (mm) | Weight aver. (g) |
| Perch | 145 | 46,9 | 9,1 | 15,2 | 4739 | 45,2 | 296 | 689 | 65-358 | 111 | 33 |
| Roach | 64 | 20,7 | 4,0 | 8,1 | 1089 | 10,4 | 68 | 135 | 106-171 | 121 | 17 |
| Bream | 49 | 15,9 | 3,1 | 5,8 | 2206 | 21,0 | 138 | 254 | 75-334 | 154 | 45 |
| Bleak | 25 | 8,1 | 1,6 | 4,6 | 444 | 4,2 | 28 | 81 | 105-155 | 136 | 18 |
| Pike | 2 | 0,6 | 0,1 | 0,3 | 1745 | 16,6 | 109 | 321 | 491-595 | 543 | 873 |
| Ruffe | 23 | 7,4 | 1,4 | 2,7 | 157 | 1,5 | 10 | 22 | 62-122 | 83 | 7 |
| Rudd | 1 | 0,3 | 0,1 | 0,3 | 108 | 1,0 | 7 | 27 | 213-213 | 213 | 108 |
| Sum: | 309 | 100,0 | 19,3 | | 10488 | 100,0 | 656 | | | | |
| <small>Laboratorium ackrediteras av Styrelsen för ackreditering och teknisk kontroll (SWEDAC) enligt svensk lag. Den ackrediterade verksamheten vid laboratorierna uppfyller kraven i SS-EN ISO/IEC 17025 (2000). Denna rapport får endast återges i sin helhet, om inte utfärdande laboratorium i förväg godkänt annat.</small> | | | | | | | | | | | |

Lake Jämsen

Classification according to the Swedish fish index (FIX)

| Classification of state | Value | Class | The value is |
|---------------------------------|-------|-------|-----------------|
| Number of species | 7 | 2 | high |
| Diversity index | 0,64 | 2 | high |
| Biomass (g/unit effort) | 656 | 3 | moderately high |
| No. of individuals /unit effort | 19,3 | 3 | moderately high |
| Proportion of piscivores | 0,31 | 3 | moderately high |
| Average index | 2,6 | 3 | moderately high |

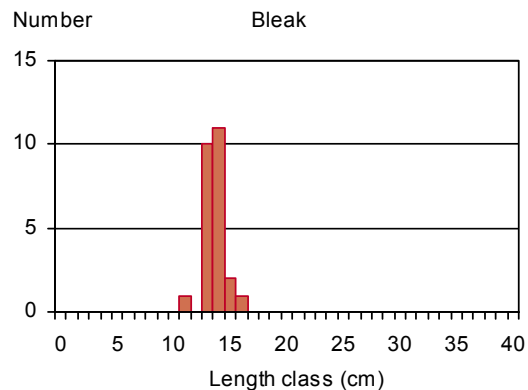
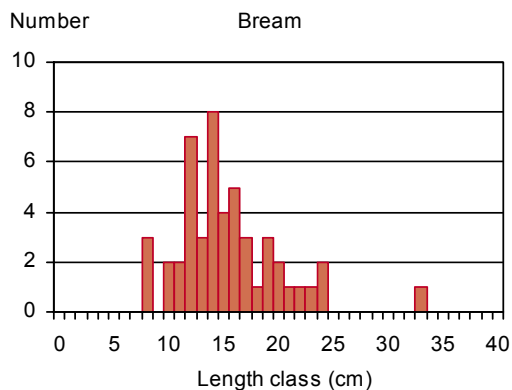
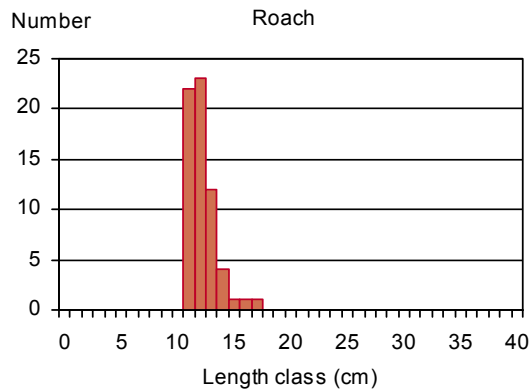
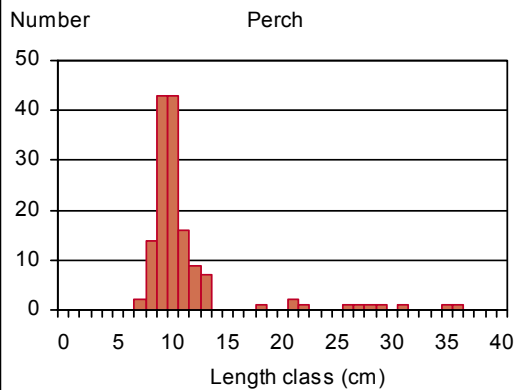
Explanation

| Class | Designation |
|-------|-----------------------|
| 1 | very high value |
| 2 | high value |
| 3 | moderately high value |
| 4 | low value |
| 5 | very low value |

| Classification of deviation from comparative value | Class | The deviation is |
|--|-------|-------------------|
| Number of species | 1 | no or insignific. |
| Diversity index | 1 | no or insignific. |
| Biomass (g/unit effort) | 3 | evident |
| No. of individuals /unit effort | 2 | slight |
| Proportion of piscivores | 2 | slight |
| Proportion of cyprinids | 2 | slight |
| Pres. of species sensit. to low pH-levels | 1 | no or insignific. |
| Proportion of alien species | 1 | no or insignific. |
| Average index | 1 | no or insignific. |

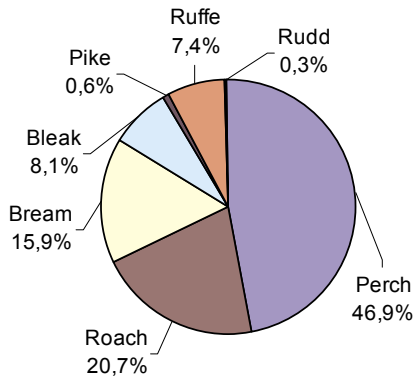
| Class | Designation |
|-------|-------------------------------|
| 1 | no or insignificant deviation |
| 2 | slight deviation |
| 3 | evident deviation |
| 4 | large deviation |
| 5 | very large deviation |

Length frequency distribution

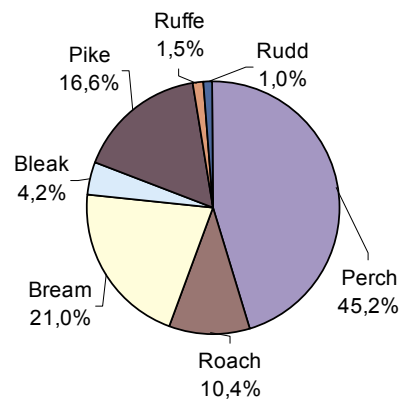


Lake Jämsen

Number distribution

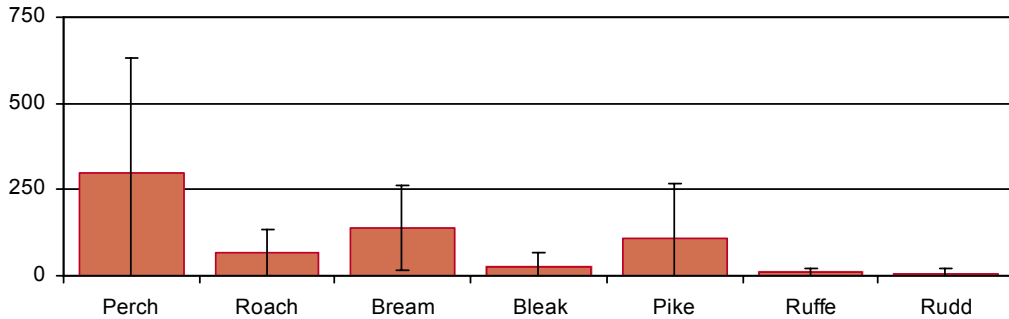


Weight distribution



Catch per unit effort (with 95% confidence intervals)

Weight Per Unit Effort (g)



Number Per Unit Effort



Comments

All together, seven species were caught which is a high value considering the small size of the lake. The catch was dominated by perch in numbers, as well as in biomass. Low oxygene levels below the depth of two meters resulted in poor catches in quite a number of gillnets. Despite this, classification by the Swedish fish index (FIX) places Lake Jämsen in class 1, which indicates that the result consequently is expected.

Lake Söråmagasinet



REPORT

utfärdad av ackrediterat laboratorium
REPORT issued by an Accredited Laboratory

Water area information

| | | | | | |
|---------------|----------------------|-----------------------------|--------------|-----------------|------------|
| Lake: | <u>Söråmagasinet</u> | Main catch area: | <u>72/73</u> | Lake area (ha): | <u>8,9</u> |
| Co-ordinates: | <u>-</u> | Topogr. map: | <u>6G SO</u> | Max.depth (m): | <u>4,5</u> |
| County: | <u>Kalmar</u> | Altitude (m): | <u>5</u> | Aver. depth(m): | <u>-</u> |
| Municipality | <u>Oskarshamn</u> | Catchm. (km ²): | <u>-</u> | Liming: | <u>no</u> |

Sampling information

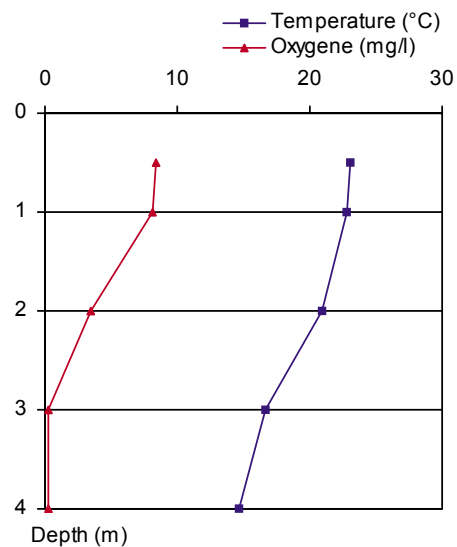
| | | | | | |
|-----------------|----------------------------|-------------------|-----------------|-------------------|--------------------|
| First setting: | <u>2004-08-17</u> | Method: | <u>standard</u> | Surf. temp. (°C): | <u>23</u> |
| Last uptake: | <u>2004-08-18</u> | Benthic gillnets: | <u>8</u> | Turbidity: | <u>turbid</u> |
| Fishermen: | <u>Engdahl/Andersson</u> | Pelagic gillnets: | <u>0</u> | Colour: | <u>coloured</u> |
| Responsibility: | <u>Medins</u> | Type of gillnets: | <u>Nordic</u> | Secchi depth: | <u>2,0 m</u> |
| Purpose: | <u>site investigations</u> | Earlier sampl: | <u>-</u> | Trophic level: | <u>mesotrophic</u> |

Miscellaneous

| | | | |
|---------------------|-------------------------------|-----------------|-----------|
| Weather conditions: | <u>partly cloudy</u> | Air temp. (°C): | <u>18</u> |
| Wind conditions: | <u>light breeze from west</u> | Chem. sampl: | <u>no</u> |
| Other observations: | <u>-</u> | | |

Water temperature- and oxygene profile

| Depth (m) | Temperature (°C) | Oxygene (mg/l) |
|-----------|------------------|----------------|
| 0,5 | 23,0 | 8,4 |
| 1 | 22,8 | 8,1 |
| 2 | 20,9 | 3,4 |
| 3 | 16,7 | 0,3 |
| 4 | 14,6 | 0,2 |



Results

| Species | Numb. (pcs) | Numb. (%) | Catch/ net (pcs) | Std. dev. | Weight (g) | Weight (%) | Catch/ net (g) | Std. dev. | Length interval (mm) | Length aver. (mm) | Weight aver. (g) |
|---------|-------------|-----------|------------------|-----------|------------|------------|----------------|-----------|----------------------|-------------------|------------------|
| Perch | 192 | 54,1 | 24,0 | 15,6 | 7145 | 41,6 | 893 | 1005,8 | 70-425 | 117 | 37 |
| Roach | 92 | 25,9 | 11,5 | 6,0 | 3837 | 22,3 | 480 | 235,8 | 135-277 | 161 | 42 |
| Bream | 52 | 14,6 | 6,5 | 7,3 | 4815 | 28,0 | 602 | 884,7 | 94-408 | 181 | 93 |
| Rudd | 7 | 2,0 | 0,9 | 1,1 | 117 | 0,7 | 15 | 17,9 | 97-152 | 116 | 17 |
| Pike | 1 | 0,3 | 0,1 | 0,4 | 1116 | 6,5 | 140 | 394,6 | 560-560 | 560 | 1116 |
| Ruffe | 11 | 3,1 | 1,4 | 2,0 | 140 | 0,8 | 18 | 24,3 | 79-137 | 102 | 13 |
| Sum: | 355 | 100,0 | 44,4 | | 17170 | 100,0 | 2146 | | | | |

Laboratorium ackrediteras av Styrelsen för ackreditering och teknisk kontroll (SWEDAC) enligt svensk lag. Den ackrediterade verksamheten vid laboratorierna uppfyller kraven i SS-EN ISO/IEC 17025 (2000). Denna rapport får endast återges i sin helhet, om inte utfärdande laboratorium i förväg godkänt annat.

Lake Söråmagasinet

Classification according to the Swedish fish index (FIX)

Explanation

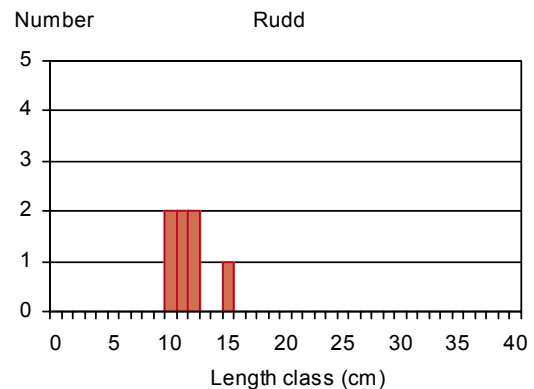
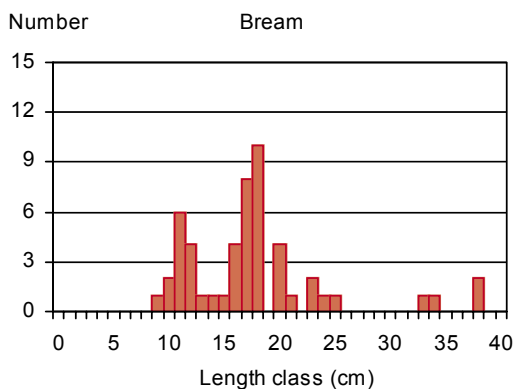
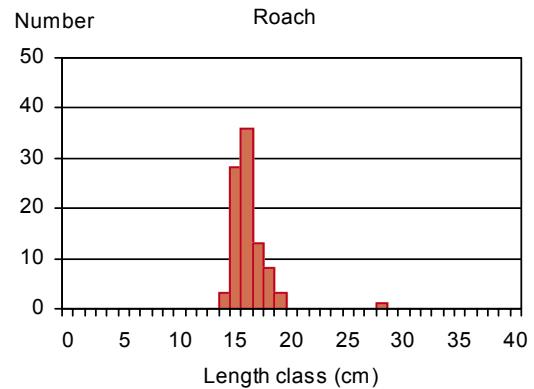
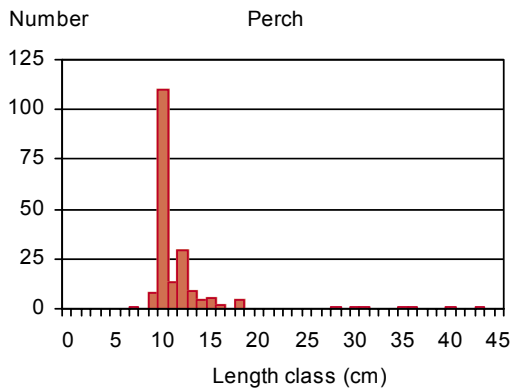
| Classification of state | Value | Class | The value is |
|---------------------------------|-------|-------|-----------------|
| Number of species | 6 | 2 | high |
| Diversity index | 0,57 | 2 | high |
| Biomass (g/unit effort) | 2146 | 2 | high |
| No. of individuals /unit effort | 44,4 | 2 | high |
| Proportion of piscivores | 0,28 | 3 | moderately high |
| Average index | 2,2 | 2 | low |

| Class | Designation |
|-------|-----------------------|
| 1 | very high value |
| 2 | high value |
| 3 | moderately high value |
| 4 | low value |
| 5 | very low value |

| Classification of deviation from comparative value | Class | The deviation is |
|--|-------|-------------------|
| Number of species | 1 | no or insignific. |
| Diversity index | 1 | no or insignific. |
| Biomass (g/unit effort) | 1 | no or insignific. |
| No. of individuals /unit effort | 1 | no or insignific. |
| Proportion of piscivores | 2 | slight |
| Proportion of cyprinids | 2 | slight |
| Pres. of species sensit. to low pH-levels | 1 | no or insignific. |
| Andel främmande arter | 1 | no or insignific. |
| Average index | 1 | no or insignific. |

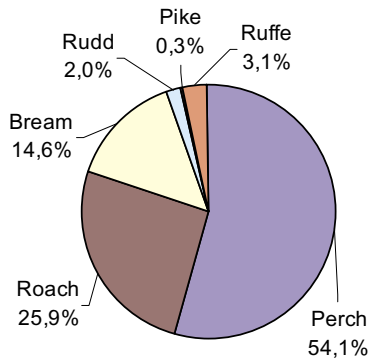
| Class | Designation |
|-------|-------------------------------|
| 1 | no or insignificant deviation |
| 2 | slight deviation |
| 3 | evident deviation |
| 4 | large deviation |
| 5 | very large deviation |

Length frequency distribution

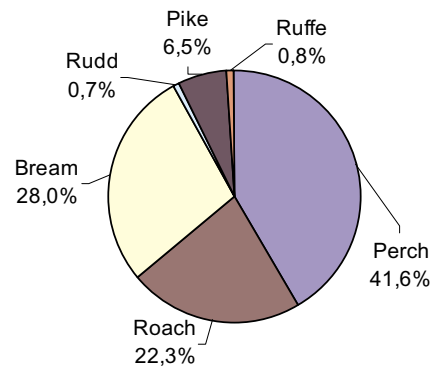


Lake Söråmagasinet

Number distribution

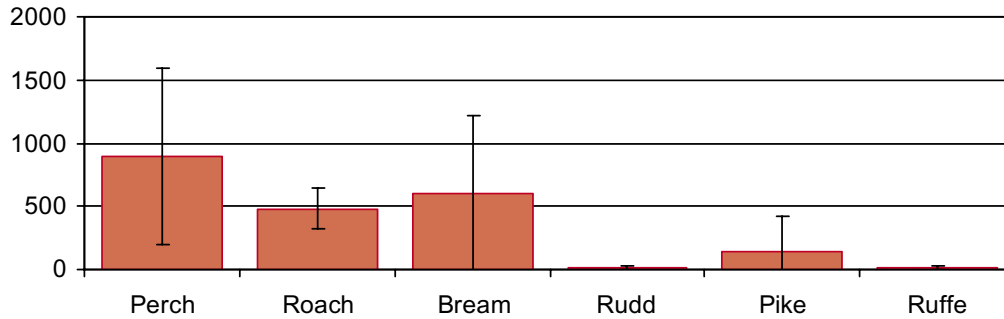


Weight distribution

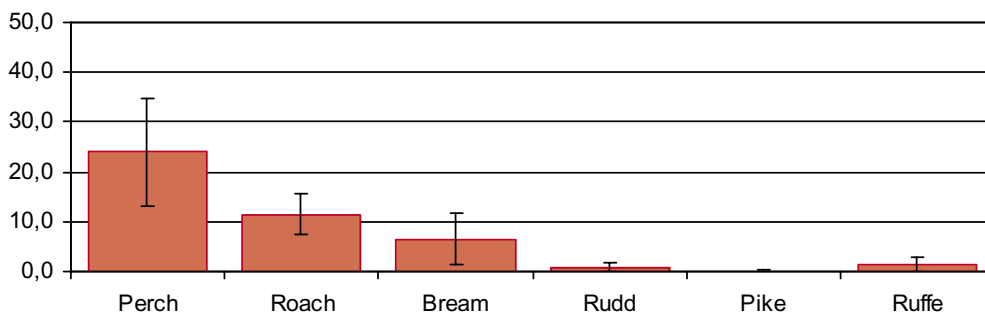


Catch per unit effort (with 95% confidence intervals)

Weight Per Unit Effort (g)



Number Per Unit Effort



Comments

Lake Söråmagasinet is a former sea bay, which was enclosed when the nuclear power station was built during the 1970's. There is no connection between the lake and the Baltic Sea. All together, six species were caught, which is a high value considering that the lake is so small. The catch was dominated by perch in numbers, as well as in biomass. Total number of individuals and biomass were relatively high. Classification by the Swedish fish index (FIX) places Lake Söråmagasinet in class 1, which indicates that the result consequently is expected.

Lake Frisksjön



REPORT

utfärdad av ackrediterat laboratorium
REPORT issued by an Accredited Laboratory

Water area information

Lake: Frisksjön Main catch area: 72/73 Lake area (ha): 11
 Co-ordinates: 636827/154947 Topogr. map: 6G SO Max.depth (m): 3,2
 County: Kalmar Altitude (m): 1 Aver. depth(m): 2
 Municipality: Oskarshamn Catchm. (km²): - Liming: no

Sampling information

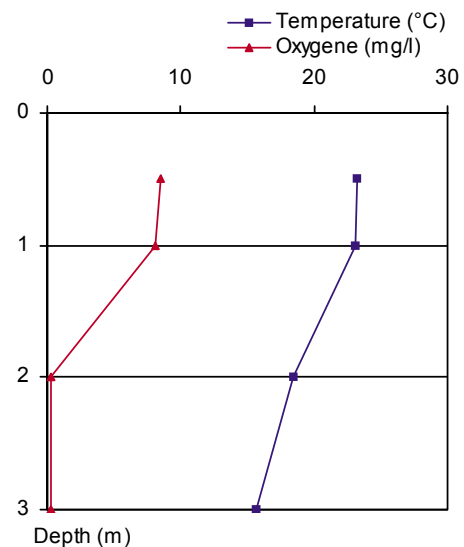
First setting: 2004-08-18 Method: standard Surf. temp. (°C): 23,2
 Last uptake: 2004-08-19 Benthic gillnets: 8 Turbidity: clear
 Fishermen: Engdahl/Andersson Pelagic gillnets: 0 Colour: strongly col.
 Responsibility: Medins Type of gillnets: Nordic Secci depth: 1,7 m
 Purpose: site investigations Earlier sampl.: - Trophic level: mesotrophic

Miscellaneous

Weather conditions: partly cloudy Air temp. (°C): 19
 Wind conditions: light breeze from west Chem. sampl.: no
 Other observations: -

Water temperature- and oxygene profile

| Depth (m) | Temperature (°C) | Oxygene (mg/l) |
|-----------|------------------|----------------|
| 0,5 | 23,2 | 8,47 |
| 1 | 23,1 | 8,09 |
| 2 | 18,5 | 0,33 |
| 3 | 15,7 | 0,25 |



Results

| Species | Numb. (pcs) | Numb. (%) | Catch/ net (pcs) | Std. dev. | Weight (g) | Weight (%) | Catch/ net (g) | Std. dev. | Length interval (mm) | Length aver. (mm) | Weight aver. (g) |
|---------|-------------|-----------|------------------|-----------|------------|------------|----------------|-----------|----------------------|-------------------|------------------|
| Perch | 258 | 70,9 | 32,3 | 25,0 | 8273 | 58,4 | 1034 | 708,8 | 59-365 | 106 | 32 |
| Roach | 63 | 17,3 | 7,9 | 4,6 | 2498 | 17,7 | 312 | 208,0 | 117-268 | 154 | 40 |
| Bream | 26 | 7,1 | 3,3 | 1,6 | 2177 | 15,4 | 272 | 205,6 | 90-299 | 190 | 84 |
| Rudd | 8 | 2,2 | 1,0 | 1,1 | 252 | 1,8 | 32 | 33,0 | 118-155 | 137 | 32 |
| Pike | 2 | 0,5 | 0,3 | 0,5 | 892 | 6,3 | 112 | 206,9 | 435-439 | 437 | 446 |
| Ruffe | 7 | 1,9 | 0,9 | 1,1 | 65 | 0,5 | 8 | 10,4 | 87-99 | 91 | 9 |
| Sum: | 364 | 100,0 | 45,5 | | 14157 | 100,0 | 1770 | | | | |

Laboratorium ackrediteras av Styrelsen för ackreditering och teknisk kontroll (SWEDAC) enligt svensk lag. Den ackrediterade verksamheten vid laboratorierna uppfyller kraven i SS-EN ISO/IEC 17025 (2000). Denna rapport får endast återges i sin helhet, om inte utfärdande laboratorium i förväg godkänt annat.

Lake Frisksjön

Classification according to the Swedish fish index (FIX)

| Classification | Value | Class | The value is |
|---------------------------------|-------|-------|-----------------|
| Number of species | 6 | 2 | high |
| Diversity index | 0,51 | 3 | moderately high |
| Biomass (g/unit effort) | 1770 | 3 | moderately high |
| No. of individuals /unit effort | 45,5 | 2 | high |
| Proportion of piscivores | 0,42 | 3 | moderately high |
| Average index | 2,6 | 3 | moderately high |

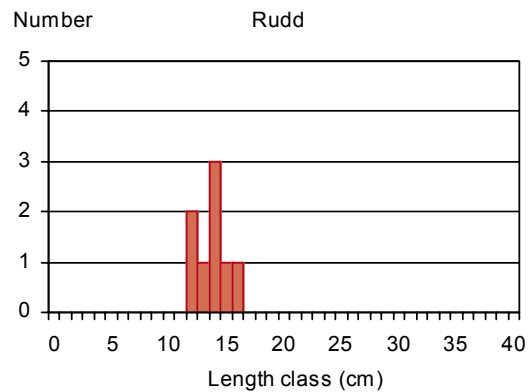
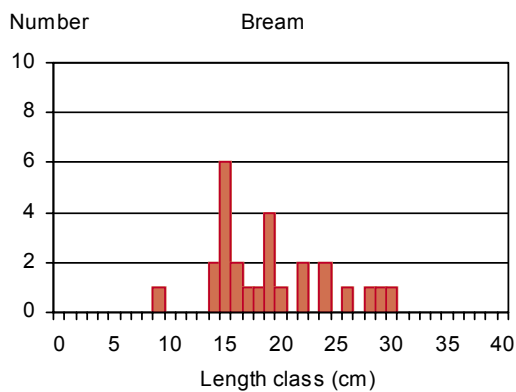
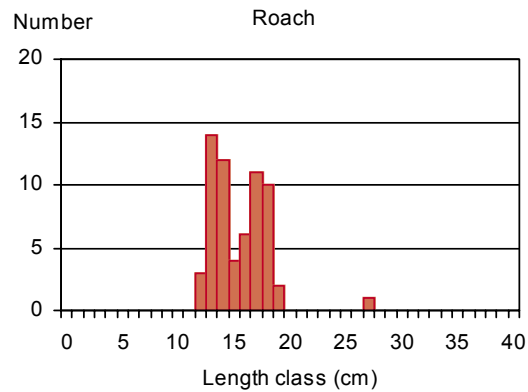
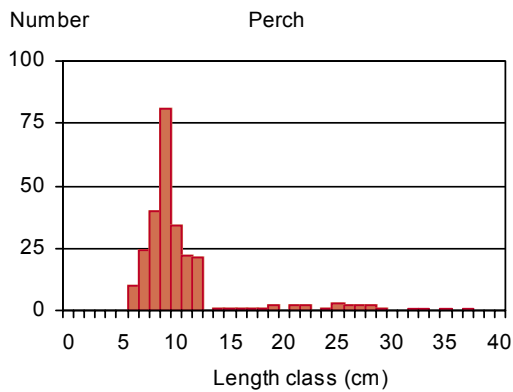
Explanation

| Class | Designation |
|-------|-----------------------|
| 1 | very high value |
| 2 | high value |
| 3 | moderately high value |
| 4 | low value |
| 5 | very low value |

| Classificaton of deviation from comparative value | Class | The deviation is |
|---|-------|-------------------|
| Number of species | 1 | no or insignific. |
| Diversity index | 2 | slight |
| Biomass (g/unit effort) | 1 | no or insignific. |
| No. of individuals /unit effort | 1 | no or insignific. |
| Proportion of piscivores | 1 | no or insignific. |
| Proportion of cyprinids | 1 | no or insignific. |
| Pres. of species sensit. to low pH-levels | 1 | no or insignific. |
| Andel främmande arter | 1 | no or insignific. |
| Average index | 1 | no or insignific. |

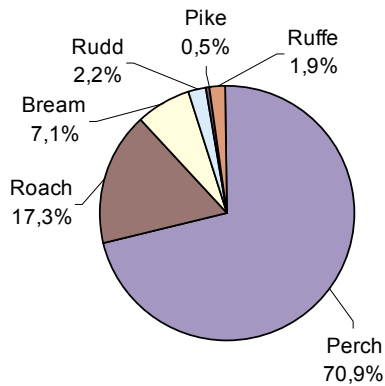
| Class | Designation |
|-------|-------------------------------|
| 1 | no or insignificant deviation |
| 2 | slight deviation |
| 3 | evident deviation |
| 4 | large deviation |
| 5 | very large deviation |

Length frequency distribution

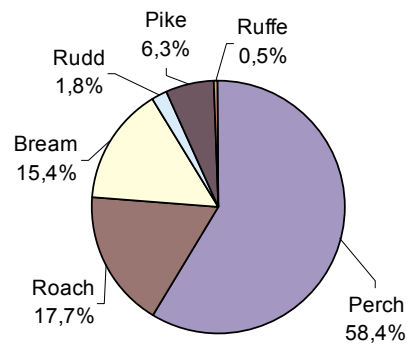


Lake Frisksjön

Number distribution

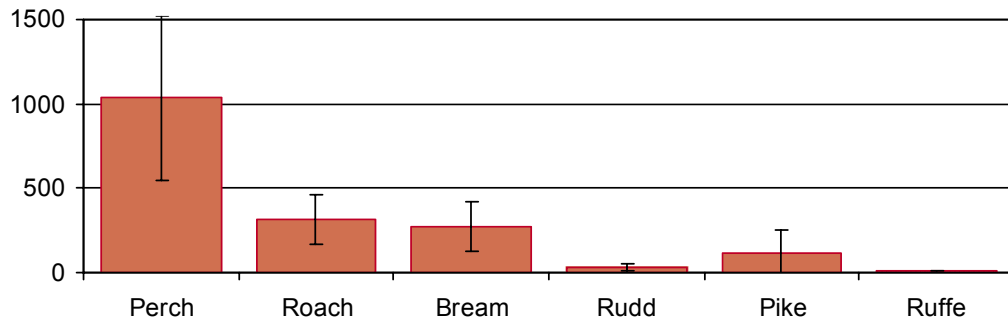


Weight distribution

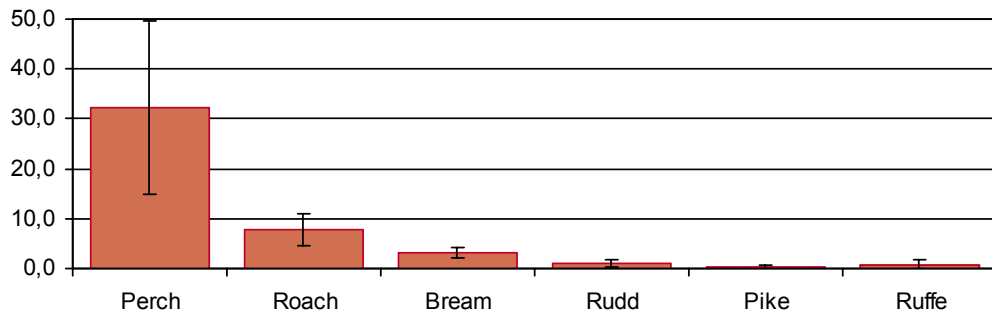


Catch per unit effort (with 95% confidence intervals)

Weight Per Unit Effort (g)



Number Per Unit Effort



Comments

All together, six species were caught, which is a high value considering that the lake is so small. The catch was dominated by perch in numbers, as well as in biomass. Total number of individuals was relatively high. Classification by the Swedish fish index (FIX) places Lake Frisksjön in class 1, which indicates that the result is expected.

Lake Plittorpsgöl



REPORT

utfärdad av ackrediterat laboratorium
REPORT issued by an Accredited Laboratory

Water area information

| | | | | | |
|---------------|----------------------|-----------------------------|--------------|-----------------|------------|
| Lake: | <u>Plittorpsgöl</u> | Main catch area: | <u>72/73</u> | Lake area (ha): | <u>3,3</u> |
| Co-ordinates: | <u>636893/154157</u> | Topogr. map: | <u>6G SO</u> | Max.depth (m): | <u>7,5</u> |
| County: | <u>Kalmar</u> | Altitude (m): | <u>15</u> | Aver. depth(m): | <u>-</u> |
| Municipality | <u>Oskarshamn</u> | Catchm. (km ²): | <u>-</u> | Liming: | <u>no</u> |

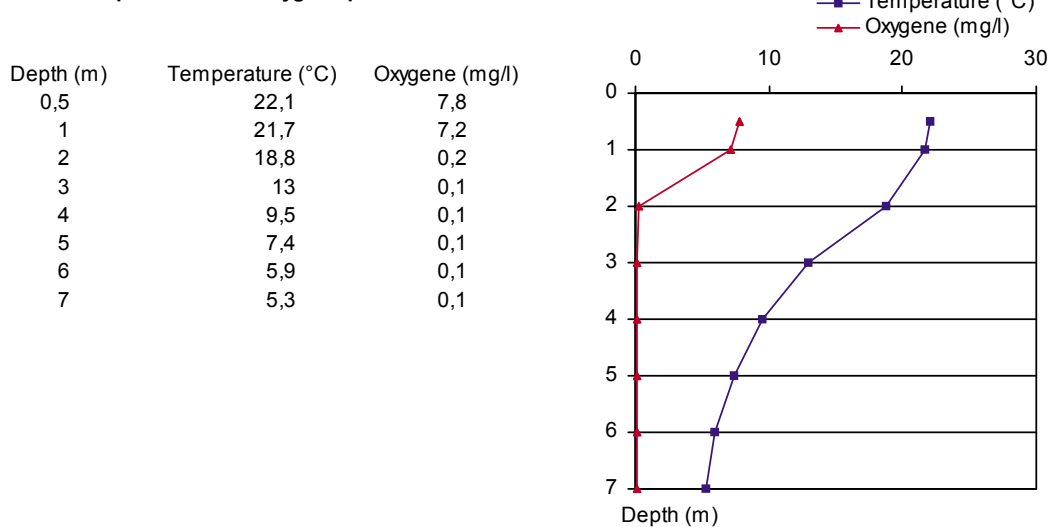
Sampling information

| | | | | | |
|-----------------|----------------------------|-------------------|------------------|-------------------|----------------------|
| First setting: | <u>2004-08-19</u> | Method: | <u>inventory</u> | Surf. temp. (°C): | <u>22,1</u> |
| Last uptake: | <u>2004-08-20</u> | Benthic gillnets: | <u>4</u> | Turbidity: | <u>clear</u> |
| Fishermen: | <u>Engdahl/Andersson</u> | Pelagic gillnets: | <u>0</u> | Colour: | <u>strongly col.</u> |
| Responsibility: | <u>Medins</u> | Type of gillnets: | <u>Nordic</u> | Secci depth: | <u>1,6 m</u> |
| Purpose: | <u>site investigations</u> | Earlier sampl: | <u>-</u> | Trophic level: | <u>mesotrophic</u> |

Miscellaneous

| | | | |
|---------------------|--------------------------------|-----------------|-----------|
| Weather conditions: | <u>clear</u> | Air temp. (°C): | <u>19</u> |
| Wind conditions: | <u>gentle breeze from west</u> | Chem. sampl: | <u>no</u> |
| Other observations: | <u>-</u> | | |

Water temperature- and oxygene profile



Results

| Species | Numb. (pcs) | Numb. (%) | Catch/ net (pcs) | Std. dev. | Weight (g) | Weight (%) | Catch/ net (g) | Std. dev. | Length interval (mm) | Length aver. (mm) | Weight aver. (g) |
|---------|-------------|-----------|------------------|-----------|------------|------------|----------------|-----------|----------------------|-------------------|------------------|
| Perch | 24 | 52,2 | 6,0 | 8,0 | 1623 | 50,5 | 406 | 621,2 | 83-337 | 145 | 68 |
| Roach | 21 | 45,7 | 5,3 | 6,7 | 1057 | 32,9 | 264 | 308,5 | 140-230 | 171 | 50 |
| Pike | 1 | 2,2 | 0,3 | 0,5 | 534 | 16,6 | 134 | 267,0 | 480-480 | 480 | 534 |
| Sum: | 46 | 100,0 | 11,5 | | 3214 | 100,0 | 804 | | | | |

Laboratorium ackrediteras av Styrelsen för ackreditering och teknisk kontroll (SWEDAC) enligt svensk lag. Den ackrediterade verksamheten vid laboratorierna uppfyller kraven i SS-EN ISO/IEC 17025 (2000). Denna rapport får endast återges i sin helhet, om inte utfärdande laboratorium i förväg godkänt annat.

Lake Plittorpsgöl

Classification according to the Swedish fish index (FX)

Explanation

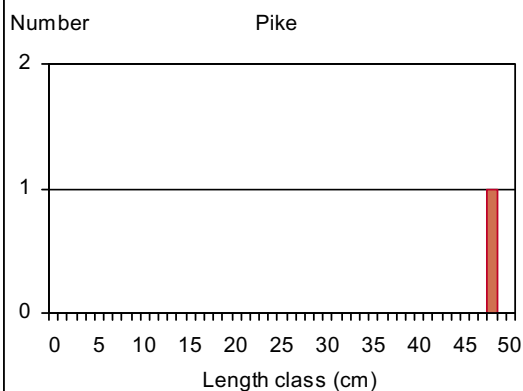
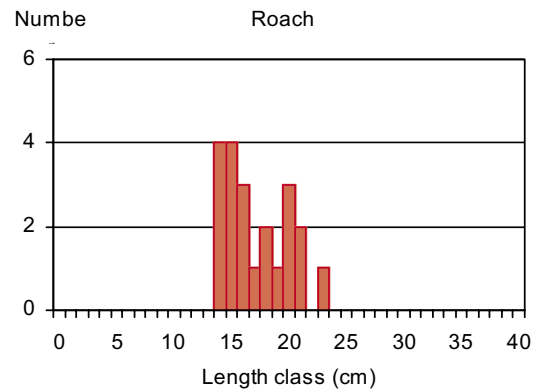
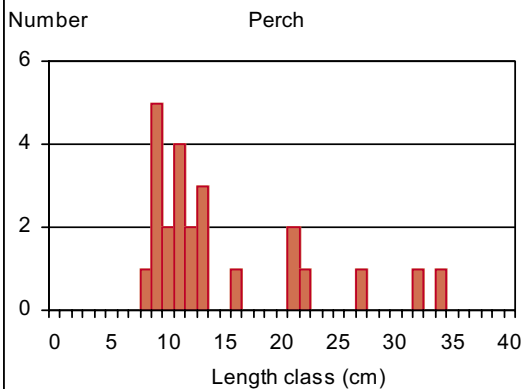
| Classification | Value | Class | The value is |
|---------------------------------|-------|-------|-----------------|
| Number of species | 3 | 3 | moderately high |
| Diversity index | 0,44 | 3 | moderately high |
| Biomass (g/unit effort) | 804 | 3 | moderately high |
| No. of individuals /unit effort | 11,5 | 4 | low |
| Proportion of piscivores | 0,44 | 3 | moderately high |
| Average index | 3,2 | 3 | moderately high |

| Class | Designation |
|-------|-----------------------|
| 1 | very high value |
| 2 | high value |
| 3 | moderately high value |
| 4 | low value |
| 5 | very low value |

| Classification of deviation from comparative value | Class | The deviation is |
|--|-------|-------------------|
| Number of species | 1 | no or insignific. |
| Diversity index | 1 | no or insignific. |
| Biomass (g/unit effort) | 3 | evident |
| No. of individuals /unit effort | 3 | evident |
| Proportion of piscivores | 1 | no or insignific. |
| Proportion of cyprinids | 1 | no or insignific. |
| Pres. of species sensit. to low pH-levels | 3 | evident |
| Andel främmande arter | 1 | no or insignific. |
| Average index | 2 | slight |

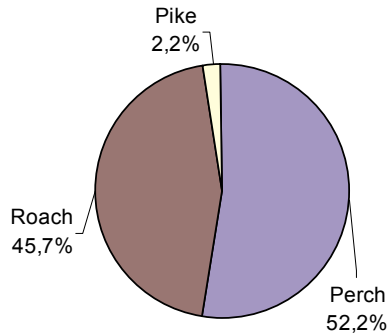
| Class | Designation |
|-------|-------------------------------|
| 1 | no or insignificant deviation |
| 2 | slight deviation |
| 3 | evident deviation |
| 4 | large deviation |
| 5 | very large deviation |

Length frequency distribution

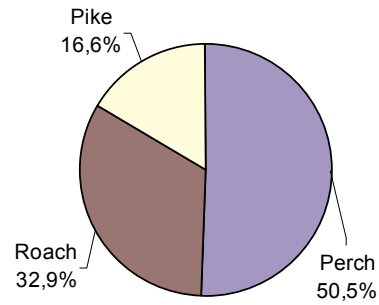


Lake Plittorpsgöl

Number distribution

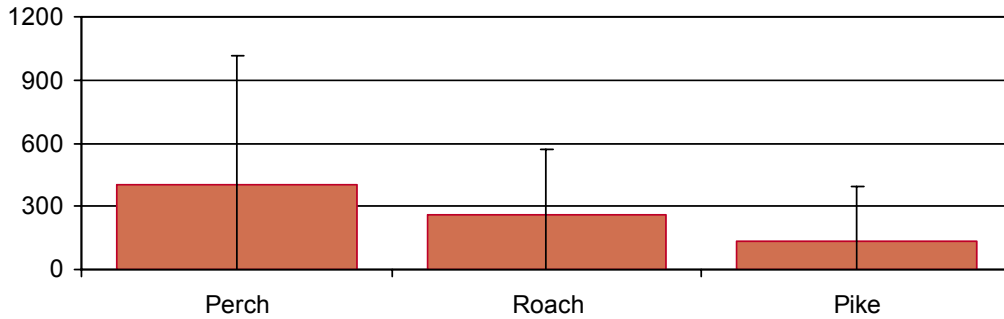


Weight distribution

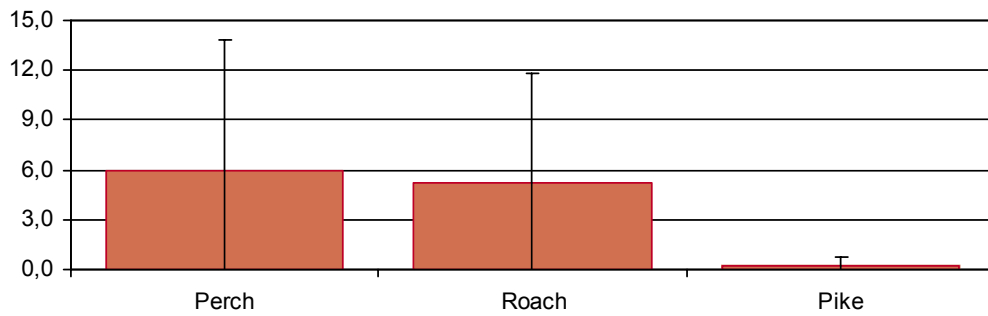


Catch per unit effort (with 95% confidence intervals)

Weight Per Unit Effort (g)



Number Per Unit Effort



Comments

Lake Plittorpsgöl is a mere and the standardized sampling method is not appropriate. Instead, inventory sampling was performed. Two gillnets respectively were set above and below the thermo cline. All together, three species were caught which can be considered as a normal value for this kind of lake. The catch was dominated by perch and roach. Low oxygen levels below the depth of two meters resulted in no catch in the gillnets below the thermo cline. Classification by the Swedish fish index (FIX) places Lake Plittorpsgöl in class 2, which indicates that the result slightly deviates from expected values.

Catches within each gillnet

Lake Jämsen

Catch and location for individual gillnets (all weights in gram)

| Gillnet number: | LSM000459 | LSM000460 | LSM000461 | LSM000462 |
|--------------------|---------------------|---------------------|---------------------|---------------------|
| Depth zone: | 0–3 m | 0–3 m | 3–6 m | 6–11 m |
| Start co-ordinate: | 636526/154054 | 636522/154056 | 636509/154042 | 636497/154035 |
| Stop co-ordinate: | 636524/154052 | 636519/154056 | 636506/154042 | 636497/154032 |
| Direction: | NE–SW | N–S | N–S | E–W |
| Fishing depth: | 1.8–1.5 m | 1.8–1.7 m | 4.2–5.0 m | 7.9–8.8 m |
| Species | numb. weight | numb. weight | numb. weight | numb. weight |
| Perch | 35 368 | 20 203 | 0 0 | 0 0 |
| Roach | 22 352 | 25 427 | 0 0 | 0 0 |
| Bream | 20 823 | 10 539 | 0 0 | 0 0 |
| Bleak | 8 146 | 17 298 | 0 0 | 0 0 |
| Pike | 0 0 | 0 0 | 0 0 | 0 0 |
| Ruffe | 5 25 | 6 38 | 0 0 | 0 0 |
| Rudd | 0 0 | 1 108 | 0 0 | 0 0 |
| Sum: | 90 1,714 | 79 1,613 | 0 0 | 0 0 |

| Gillnet number: | LSM000463 | LSM000464 | LSM000465 | LSM000466 |
|--------------------|---------------------|---------------------|---------------------|---------------------|
| Depth zone: | 6–11 m | 3–6 m | 0–3 m | 3–6 m |
| Start co-ordinate: | 636485/154020 | 636493/154004 | 636505/154003 | 636506/154023 |
| Stop co-ordinate: | 636488/154020 | 636495/154006 | 636507/154005 | 636504/154021 |
| Direction: | S–N | SW–NE | SW–NE | NE–SW |
| Fishing depth: | 11.0–11.0 m | 4.3–4.5 m | 2.7–2.4 m | 5.2–4.5 m |
| Species | numb. weight | numb. weight | numb. weight | numb. weight |
| Perch | 0 0 | 0 0 | 11 115 | 0 0 |
| Roach | 0 0 | 0 0 | 4 74 | 1 15 |
| Bream | 0 0 | 0 0 | 7 404 | 0 0 |
| Bleak | 0 0 | 0 0 | 0 0 | 0 0 |
| Pike | 0 0 | 0 0 | 1 545 | 0 0 |
| Ruffe | 0 0 | 0 0 | 0 0 | 0 0 |
| Rudd | 0 0 | 0 0 | 0 0 | 0 0 |
| Sum: | 0 0 | 0 0 | 23 1,138 | 1 15 |

Lake Söråmagasinet

Catch and location for individual gillnets (all weights in gram)

| Gillnet number: | LSM000475 | LSM000476 | LSM000477 | LSM000478 |
|--------------------|---------------------|---------------------|---------------------|---------------------|
| Depth zone: | 3–6 m | 3–6 m | 3–6 m | 3–6 m |
| Start co-ordinate: | 636632/155137 | 636625/155123 | 636622/155117 | 636615/155108 |
| Stop co-ordinate: | 636630/155135 | 636625/155126 | 636619/155117 | 636615/155111 |
| Direction: | NE–SW | W–E | N–S | W–E |
| Fishing depth: | 3.8–3.7 m | 3.4–3.8 m | 3.5–3.8 m | 3.5–3.6 m |
| Species | numb. weight | numb. weight | numb. weight | numb. weight |
| Perch | 5 70 | 7 95 | 11 150 | 34 429 |
| Roach | 7 279 | 9 382 | 22 910 | 18 690 |
| Bream | 0 0 | 3 626 | 0 0 | 5 156 |
| Rudd | 0 0 | 0 0 | 0 0 | 1 37 |
| Pike | 0 0 | 0 0 | 0 0 | 0 0 |
| Ruffe | 0 0 | 0 0 | 0 0 | 0 0 |
| Sum: | 12 349 | 19 1,103 | 33 1,060 | 58 1,312 |

| Gillnet number: | LSM000479 | LSM000480 | LSM000481 | LSM000482 |
|--------------------|---------------------|---------------------|---------------------|---------------------|
| Depth zone: | 0–3 m | 0–3 m | 0–3 m | 0–3 m |
| Start co-ordinate: | 636613/155115 | 636613/155093 | 636598/155060 | 636602/155071 |
| Stop co-ordinate: | 636615/155117 | 636611/155091 | 636600/155058 | 636600/155073 |
| Direction: | SW–NE | NE–SW | SE–NW | NW–SE |
| Fishing depth: | 2.5–2.5 m | 1.8–2.3 m | 1.5–2.2 m | 1.6–2.1 m |
| Species | numb. weight | numb. weight | numb. weight | numb. weight |
| Perch | 27 2,157 | 28 1,143 | 29 438 | 51 2,663 |
| Roach | 7 286 | 15 527 | 8 541 | 6 222 |
| Bream | 1 42 | 8 540 | 19 800 | 16 2,651 |
| Rudd | 0 0 | 2 28 | 3 41 | 1 11 |
| Pike | 0 0 | 0 0 | 0 0 | 1 1116 |
| Ruffe | 5 52 | 0 0 | 3 43 | 3 45 |
| Sum: | 40 2,537 | 53 2,238 | 62 1,863 | 78 6,708 |

Lake Jämsen

Catch and location for individual gillnets (all weights in gram)

| Gillnet number: | LSM000467 | LSM000468 | LSM000469 | LSM000470 |
|--------------------|---------------------|---------------------|---------------------|---------------------|
| Depth zone: | 6–11 m | 3–6 m | 0–3 m | 3–6 m |
| Start co-ordinate: | 636494/154024 | 636471/154028 | 636467/154041 | 636470/154014 |
| Stop co-ordinate: | 636492/154022 | 636473/154030 | 636469/154039 | 636473/154014 |
| Direction: | NE–SW | SW–NE | SE–NW | S–N |
| Fishing depth: | 7.0–9.8 m | 3.5–4.1 m | 1.5–2.1 m | 4.2–4.1 m |
| Species | numb. weight | numb. weight | numb. weight | numb. weight |
| Perch | 0 0 | 1 15 | 46 2,701 | 1 394 |
| Roach | 0 0 | 0 0 | 2 33 | 0 0 |
| Bream | 0 0 | 0 0 | 10 363 | 0 0 |
| Bleak | 0 0 | 0 0 | 0 0 | 0 0 |
| Pike | 0 0 | 0 0 | 0 0 | 0 0 |
| Ruffe | 0 0 | 0 0 | 4 12 | 0 0 |
| Rudd | 0 0 | 0 0 | 0 0 | 0 0 |
| Sum: | 0 0 | 1 15 | 62 3,109 | 1 394 |

| Gillnet number: | LSM000471 | LSM000472 | LSM000473 | LSM000474 |
|--------------------|---------------------|---------------------|---------------------|---------------------|
| Depth zone: | 0–3 m | 3–6 m | 6–11 m | 6–11 m |
| Start co-ordinate: | 636462/154002 | 636477/154021 | 636481/154008 | 636500/154028 |
| Stop co-ordinate: | 636465/154002 | 636475/154023 | 636481/154011 | 636498/154026 |
| Direction: | S–N | NW–SE | W–E | NE–SW |
| Fishing depth: | 2.1–2.3 m | 5.2–4.9 m | 7.2–9.1 m | 10.1–8.9 m |
| Species | numb. weight | numb. weight | numb. weight | numb. weight |
| Perch | 30 936 | 0 0 | 0 0 | 1 7 |
| Roach | 10 188 | 0 0 | 0 0 | 0 0 |
| Bream | 2 77 | 0 0 | 0 0 | 0 0 |
| Bleak | 0 0 | 0 0 | 0 0 | 0 0 |
| Pike | 1 1,200 | 0 0 | 0 0 | 0 0 |
| Ruffe | 8 82 | 0 0 | 0 0 | 0 0 |
| Rudd | 0 0 | 0 0 | 0 0 | 0 0 |
| Sum: | 51 2,483 | 0 0 | 0 0 | 1 7 |

Lake Frisksjön

Catch and location for individual gillnets (all weights in gram)

| Gillnet number: | LSM000483 | LSM000484 | LSM000485 | LSM000486 |
|--------------------|---------------------|---------------------|---------------------|---------------------|
| Depth zone: | 0–3 m | 0–3 m | 0–3 m | 0–3 m |
| Start co-ordinate: | 636798/154921 | 636807/154912 | 636812/154902 | 636807/154894 |
| Stop co-ordinate: | 636800/154919 | 636804/154912 | 636810/154900 | 636809/154892 |
| Direction: | SE–NW | N–S | NE–SW | SE–NW |
| Fishing depth: | 1.8–2.2 m | 2.7–2.3 m | 3.0–3.0 m | 2.6–2.1 m |
| Species | numb. weight | numb. weight | numb. weight | numb. weight |
| Perch | 44 1,917 | 29 587 | 3 53 | 32 1,197 |
| Roach | 6 237 | 11 661 | 6 146 | 5 206 |
| Bream | 4 525 | 2 143 | 1 38 | 4 180 |
| Rudd | 3 91 | 1 20 | 0 0 | 2 58 |
| Pike | 0 0 | 0 0 | 1 421 | 0 0 |
| Ruffe | 2 21 | 0 0 | 0 0 | 1 9 |
| Sum: | 59 2,791 | 43 1,411 | 11 658 | 44 1,650 |

| Gillnet number: | LSM000487 | LSM000488 | LSM000489 | LSM000490 |
|--------------------|---------------------|---------------------|---------------------|---------------------|
| Depth zone: | 0–3 m | 0–3 m | 0–3 m | 0–3 m |
| Start co-ordinate: | 636819/154908 | 636814/154929 | 636818/154952 | 636824/154942 |
| Stop co-ordinate: | 636819/154911 | 636817/154929 | 636818/154949 | 636822/154940 |
| Direction: | W–E | S–N | E–W | NE–SW |
| Fishing depth: | 2.2–2.4 m | 2.1–2.5 m | 1.9–2.4 m | 2.0–2.8 m |
| Species | numb. weight | numb. weight | numb. weight | numb. weight |
| Perch | 85 1,224 | 16 311 | 35 2,026 | 14 958 |
| Roach | 6 255 | 18 616 | 4 116 | 7 261 |
| Bream | 4 301 | 6 598 | 3 325 | 2 67 |
| Rudd | 0 0 | 0 0 | 1 48 | 1 35 |
| Pike | 0 0 | 0 0 | 1 471 | 0 0 |
| Ruffe | 1 9 | 0 0 | 3 26 | 0 0 |
| Sum: | 96 1,789 | 40 1,525 | 47 3,012 | 24 1,321 |

Lake Plittorpsgöl

Catch and location for individual gillnets (all weights in gram)

| Gillnet number: | LSM000491 | LSM000492 | LSM000493 | LSM000494 |
|------------------------|---------------------|---------------------|---------------------|---------------------|
| Depth zone: | 3–6 m | 0–3 m | 3–6 m | 0–3 m |
| Start co-ordinate: | 636897/154132 | 636906/154150 | 636898/154153 | 636895/154157 |
| Stop co-ordinate: | 636897/154135 | 636904/154152 | 636900/154155 | 636897/154159 |
| Direction: | W–E | NW–SE | SW–NE | SW–NE |
| Fishing depth: | 5.0–6.0 m | 2.1–2.5 m | 3.9–4.9 m | 2.3–1.9 m |
| Species | numb. weight | numb. weight | numb. weight | numb. weight |
| Perch | 0 0 | 7 312 | 0 0 | 17 1,311 |
| Roach | 0 0 | 7 473 | 0 0 | 14 584 |
| Pike | 0 0 | 0 0 | 0 0 | 1 534 |
| Sum: | 0 0 | 14 785 | 0 0 | 32 2,429 |

Deep-frozen fish

Lake Jämsen

| Species | Running no | Length (mm) | Wet weight (g) | From gillnet no |
|---------|------------|-------------|----------------|-----------------|
| Perch | 1 | 124 | 20 | LSM000459 |
| Perch | 2 | 123 | 20 | LSM000459 |
| Perch | 3 | 114 | 18 | LSM000459 |
| Perch | 4 | 112 | 14 | LSM000459 |
| Perch | 5 | 116 | 14 | LSM000459 |
| Perch | 6 | 133 | 27 | LSM000460 |
| Perch | 7 | 127 | 23 | LSM000465 |
| Perch | 8 | 284 | 294 | LSM000469 |
| Perch | 9 | 267 | 236 | LSM000469 |
| Perch | 10 | 210 | 113 | LSM000469 |
| Perch | 11 | 221 | 166 | LSM000471 |
| Perch | 12 | 214 | 115 | LSM000471 |
| Perch | 13 | 178 | 65 | LSM000471 |
| Roach | 1 | 129 | 22 | LSM000459 |
| Roach | 2 | 134 | 21 | LSM000459 |
| Roach | 3 | 135 | 23 | LSM000459 |
| Roach | 4 | 130 | 20 | LSM000459 |
| Roach | 5 | 126 | 18 | LSM000459 |
| Roach | 6 | 126 | 19 | LSM000460 |
| Roach | 7 | 171 | 41 | LSM000460 |
| Roach | 8 | 137 | 25 | LSM000460 |
| Roach | 9 | 137 | 24 | LSM000460 |
| Roach | 10 | 129 | 21 | LSM000460 |
| Pike | 1 | 491 | 545 | LSM000465 |
| Pike | 2 | 595 | 1,200 | LSM000471 |

Lake Söråmagasinet

| Species | Running no | Length (mm) | Wet weight (g) | From gillnet no |
|----------------|-------------------|--------------------|-----------------------|------------------------|
| Perch | 1 | 118 | 16 | LSM000475 |
| Perch | 2 | 117 | 16 | LSM000475 |
| Perch | 3 | 121 | 17 | LSM000475 |
| Perch | 4 | 140 | 28 | LSM000477 |
| Perch | 5 | 134 | 23 | LSM000478 |
| Perch | 6 | 141 | 27 | LSM000478 |
| Perch | 7 | 150 | 38 | LSM000479 |
| Perch | 8 | 182 | 63 | LSM000480 |
| Perch | 9 | 154 | 39 | LSM000480 |
| Perch | 10 | 184 | 71 | LSM000481 |
| Perch | 11 | 179 | 66 | LSM000482 |
| Perch | 12 | 181 | 58 | LSM000482 |
| Perch | 13 | 158 | 42 | LSM000482 |
| Roach | 1 | 175 | 46 | LSM000475 |
| Roach | 2 | 149 | 33 | LSM000475 |
| Roach | 3 | 158 | 37 | LSM000475 |
| Roach | 4 | 162 | 39 | LSM000475 |
| Roach | 5 | 166 | 42 | LSM000475 |
| Roach | 6 | 170 | 39 | LSM000475 |
| Roach | 7 | 173 | 43 | LSM000475 |
| Roach | 8 | 181 | 61 | LSM000476 |
| Roach | 9 | 172 | 46 | LSM000476 |
| Roach | 10 | 153 | 33 | LSM000476 |
| Pike | 1 | 560 | 1,116 | LSM000482 |

Lake Frisksjön

| Species | Running no | Length (mm) | Wet weight (g) | From gillnet no |
|----------------|-------------------|--------------------|-----------------------|------------------------|
| Perch | 1 | 188 | 68 | LSM000483 |
| Perch | 2 | 179 | 67 | LSM000483 |
| Perch | 3 | 172 | 54 | LSM000483 |
| Perch | 4 | 155 | 47 | LSM000486 |
| Perch | 5 | 189 | 73 | LSM000487 |
| Perch | 6 | 209 | 119 | LSM000488 |
| Perch | 7 | 263 | 249 | LSM000489 |
| Perch | 8 | 235 | 162 | LSM000489 |
| Perch | 9 | 150 | 38 | LSM000489 |
| Perch | 10 | 248 | 217 | LSM000490 |
| Roach | 1 | 194 | 75 | LSM000483 |
| Roach | 2 | 161 | 43 | LSM000483 |
| Roach | 3 | 173 | 46 | LSM000483 |
| Roach | 4 | 177 | 47 | LSM000484 |
| Roach | 5 | 168 | 49 | LSM000484 |
| Roach | 6 | 175 | 54 | LSM000484 |
| Roach | 7 | 178 | 48 | LSM000484 |
| Roach | 8 | 178 | 54 | LSM000484 |
| Roach | 9 | 167 | 44 | LSM000484 |
| Roach | 10 | 166 | 41 | LSM000484 |
| Pike | 1 | 439 | 421 | LSM000485 |
| Pike | 2 | 435 | 471 | LSM000489 |

Lake Plittorpsgöl

| Species | Running no | Length (mm) | Wet weight (g) | From gillnet no |
|----------------|-------------------|--------------------|-----------------------|------------------------|
| Perch | 1 | 221 | 117 | LSM000492 |
| Perch | 2 | 209 | 95 | LSM000492 |
| Perch | 3 | 158 | 40 | LSM000492 |
| Perch | 4 | 116 | 16 | LSM000492 |
| Perch | 5 | 120 | 19 | LSM000492 |
| Perch | 6 | 317 | 329 | LSM000494 |
| Perch | 7 | 268 | 201 | LSM000494 |
| Perch | 8 | 209 | 107 | LSM000494 |
| Perch | 9 | 130 | 24 | LSM000494 |
| Perch | 10 | 125 | 24 | LSM000494 |
| Roach | 1 | 198 | 69 | LSM000492 |
| Roach | 2 | 187 | 66 | LSM000492 |
| Roach | 3 | 180 | 50 | LSM000492 |
| Roach | 4 | 175 | 48 | LSM000492 |
| Roach | 5 | 155 | 32 | LSM000492 |
| Roach | 6 | 199 | 79 | LSM000494 |
| Roach | 7 | 202 | 85 | LSM000494 |
| Roach | 8 | 174 | 47 | LSM000494 |
| Roach | 9 | 164 | 37 | LSM000494 |
| Roach | 10 | 155 | 32 | LSM000494 |
| Pike | 1 | 480 | 534 | LSM000494 |

Appendix 4

Caught fish species name in swedish, english and latin

| Swedish | English | Latin |
|---------|---------|------------------------------------|
| Abborre | Perch | <i>Perca fluviatilis</i> |
| Braxen | Bream | <i>Abramis brama</i> |
| Gers | Ruffe | <i>Gymnocephalus cernuus</i> |
| Gädda | Pike | <i>Esox lucius</i> |
| Löja | Bleak | <i>Alburnus alburnus</i> |
| Mört | Roach | <i>Rutilus rutilus</i> |
| Sarv | Rudd | <i>Scardinius erythrophthalmus</i> |