National Research Survey Programme

Lakes 2016

Parteen Basin (Lower Lough Derg)

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Iascach Intíre Éireann
Inland Fisheries Ireland

Inland Fisheries Ireland

National Research Survey Programme

Fish Stock Survey of Parteen Basin (Lower Lough Derg),

June/July 2016

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TABLE OF CONTENTS

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1. Introduction

Parteen Basin (or Lower Lough Derg) is an artificial reservoir, located at the southern end of Lough Derg between Ballina/Killaloe and O' Brien's Bridge straddling the border of Counties Tipperary and Clare (Fig. 1.1). The reservoir is approximately 4.5km in length, with a surface area of 360Ha and maximum depth of 22m. The lake is categorised as typology class 12 (as designated by the EPA for the purposes of the Water Framework Directive (WFD)), i.e. deep (>4m), greater than 50ha and high alkalinity (>100mg/l $CaCO_3$).

The outflow from Lough Derg feeds into the River Shannon for approximately 3.5km and then into Parteen basin. A large weir (known as Parteen weir) spans the width of the River Shannon at the lower end of the reservoir (Plate 1.1) and diverts the normal flow of the River Shannon into the 12km long headrace canal to the 30m high dam at Ardnacrusha Power Station (Fig. 1.1). The weir and reservoir were constructed in the 1920s as part of the Shannon hydroelectric scheme. The valley downstream of Killaloe was flooded by the construction of Parteen weir which controls the headrace canal to the generating station at Ardnacrusha (Moriarty, 1974). The weir has a ships pass built into it which allows ships/boats to enter or exit the headrace canal. The reservoir upstream of Parteen Weir is contained partly by two embankments – Ardclooney at the West and Fort Henry to the East. The water levels of the reservoir are controlled by the sluice barrage at Parteen Weir and at the power station at Ardnacrushna. Once through the turbines at Ardnacrusha the water from the tailrace canal flows re-joins the original River Shannon flow.

The reservoir lies within the upper section of the Lower River Shannon SAC (NPWS, 2013). The SAC is large, encompassing the Lower River Shannon and Shannon estuary, from Killaloe to Loop and Kerry Heads and has been selected for a large number of habitats and species listed on Annexes I and II of the EU Habitats Directive, such as Sea lamprey, Brook lamprey, River Lamprey and Atlantic salmon (NPWS, 2013).

Parteen Basin is one of sixteen lake water bodies that were designated as a heavily modified waterbody (i.e. *a body of water which as a result of significant physical alterations by human activity, is substantially changed in character and cannot therefore meet good ecological status, e.g. dammed river*) for Water Framework Directive purposes (South Western River Basin District Project, 2008).

Parteen Basin has been assigned an ecological status of Good in the 2010 to 2015 ecological classification of Irish lakes for the WFD (EPA, 2017).

The objectives of the 2016 fish stock survey on Parteen Basin were:

1. Determine the current status of the fish stocks in the reservoir
2. Carry out a hydroacoustic survey of the reservoir
3. Undertake an inter-calibration exercise between the WFD multi method approach (BM CEN, FM CEN, Fyke and 2-PBB) and the “modified” method established by IFI in the late 1970s to assess the status of brown trout in lakes (8-PBB).

This report summarises the results of the 2016 fish stock and hydroacoustic survey on Parteen Basin, while the inter-calibration results are presented in a separate report.

Plate 1.1: Parteen weir (photo taken from Parteen basin)

Plate 1.2. Parteen Basin (looking upstream towards Ballina/Killaloe)

2. Methods

A multi-method fish stock survey (various survey net types and hydroacoustics) was undertaken on Parteen Basin over two nights between the 29th of June and the 1st of July 2016. Three netting protocols (WFD+, eight panel braided and pelagic survey gillnetting) described below were used alongside the hydroacoustic survey of the pelagic zone.

2.1 Netting

2.1.1 WFD+

The WFD+ survey comprised a total of three Dutch fyke nets (Fyke), 21 benthic monofilament multi-mesh (12 panel, 5-55mm mesh knot to knot) European standard survey gill nets (BM CEN) and four surface floating monofilament multi-mesh (FM CEN) (12 panel, 5-55mm mesh knot to knot, 1.5mdepth) European standard survey gill nets were deployed in the lake (CEN, 2015). The netting effort was supplemented using three two-panel benthic braided (63.5mm and 88.9mm mesh knot to knot) survey gill nets (2-PBB). These latter survey nets were modified to include the 88.9mm mesh panel (WFD+). Site locations were chosen randomly and a handheld GPS was used to mark the precise location of each net. The angle of each gill net in relation to the shoreline was also randomised.

2.1.2 Eight panel braided survey gillnets (8-PBB)

A total of five eight-panel benthic braided survey gill nets (8-PBB) were also deployed on the lake. These are composed of eight 27.5m long panels each a different mesh size, tied together in a random order that was standard for each net. The panels ranged from 2" (25.4mm mesh knot to knot) to 5" (63.5mm mesh knot to knot) in 0.5" (12.5mm) increments (O'Grady, 1981) with the addition of a 7" (88.9mm mesh knot to knot) panel. Site locations were chosen randomly and a handheld GPS was used to mark the precise location of each net. The angle of each gill net in relation to the shoreline was also randomised.

2.1.3 Pelagic survey gillnetting

A further six pelagic multi-mesh (12 panel, 5-55mm mesh knot to knot, 6m depth) CEN standard survey gillnets were set in the deepest area of Parteen Basin at 6m intervals from surface to lake floor (CEN, 2015) to examine the vertical distribution of fish. Additional pelagic nets were set at non-random locations along the basins longitudinal axis to examine the horizontal distribution of fish.

2.2.4 Fish handling

All fish apart from perch were measured and weighed on site and scales were removed from a subset of trout, roach, bream, hybrids and pike (five fish from each length range was sampled). The pelagic catch was sorted by net, mesh size and vertical distribution (per 1.5m panel from float-line to lead-line). Each fish was numbered, identified, measured, weighed and scales were then taken from each fish, where possible, for ageing. Live fish were returned to the water whenever possible (i.e. when the likelihood of their survival was considered to be good). Samples of fish were returned to the laboratory for further analysis.

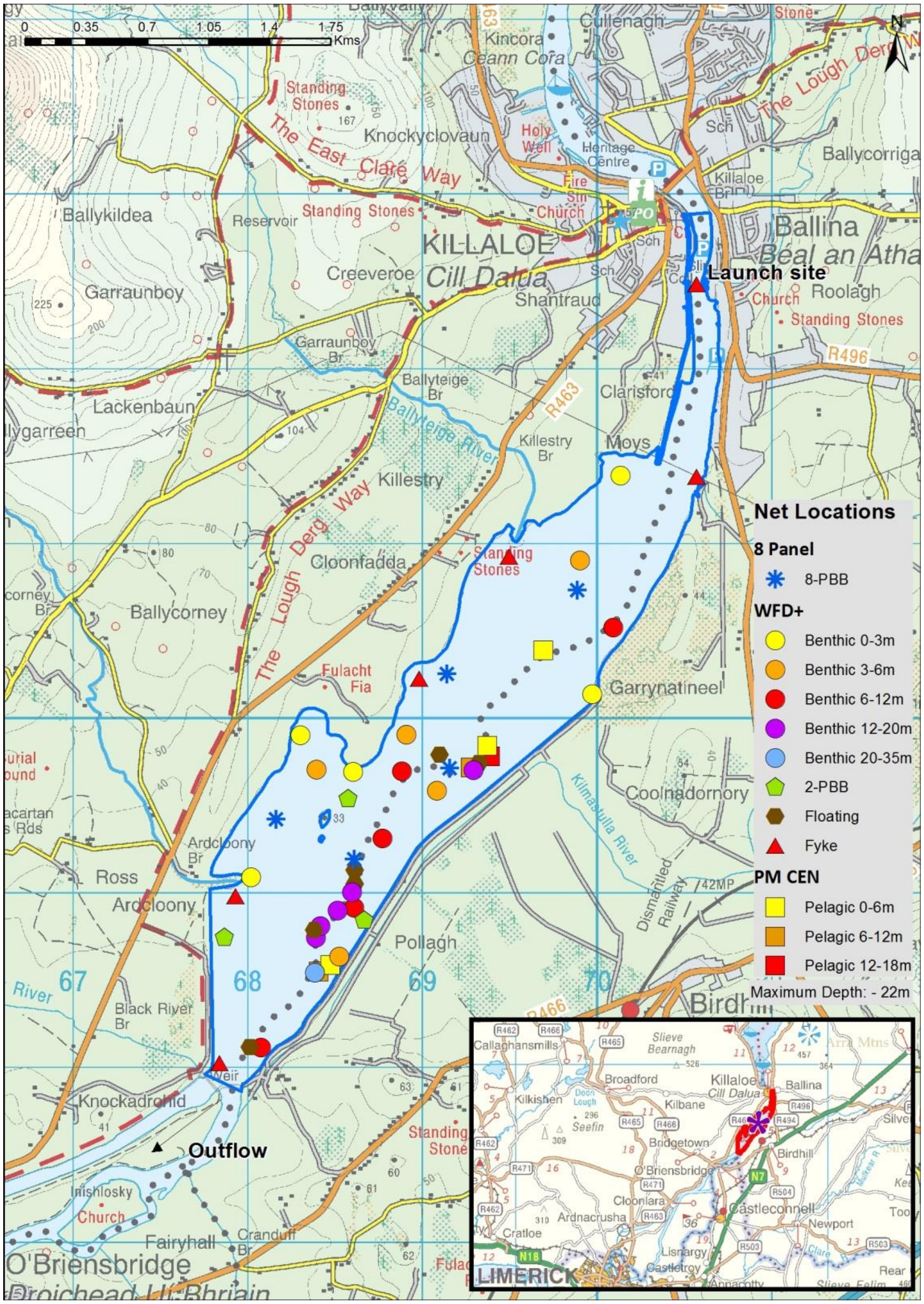

Fig. 1.1. Location map of Parteen Basin showing locations and depths of each net (outflow is indicated on map)

2.2 Hydroacoustic survey

Hydroacoustics (echo-sounding) technology sends a beam of sound into the water column and fish in the beam send back an echo. The location of the fish is determined by the time it takes for the echo to return and the size of the fish is estimated by how loud the returning echo is. Hydroacoustic technology provides minimum impact monitoring of fish populations. Pelagic survey gillnets were used to ground truth the hydroacoustic data.

A hydroacoustic survey was conducted on Parteen Basin between the hours of 04:31 and 05:36 on the night of the 14th June 2016. The survey in accordance with the European standard (CEN, 2015) followed a systematic parallel transect design, had a total track length of 3.69km and the degree of coverage had a co-efficient of variation (CV) of 0.12 (Fig. 2.2). Transects ranged in length from 144m to 512m with a mean length of 329m. Each transect was considered an elementary sampling units (ESU).

A SIMRAD EY60 scientific echosounder was used; two vertical split-beam circular transducers (120kHz and 200kHz) were deployed off the side of the boat at a depth of 0.5m. Both transducers were calibrated using the appropriate standard copper sphere and the nominal 3dB beam angle of the transducers was 7°. Ping rate was set at 5 pings s^{-1}, pulse duration was 0.256ms. A differential GPS connected to the echosounder recorded the location and reported an average sailing speed of 7km h^{-1} or 1.9 m s^{-1}. Range sampled was 30m; transmitted power was 100 W for 120kHz and 90 W for 200kHz. Water temperature was constant from the surface to the bottom with a mean temperature of 16.5°C. Mean water conductivity was 407µS/cm.

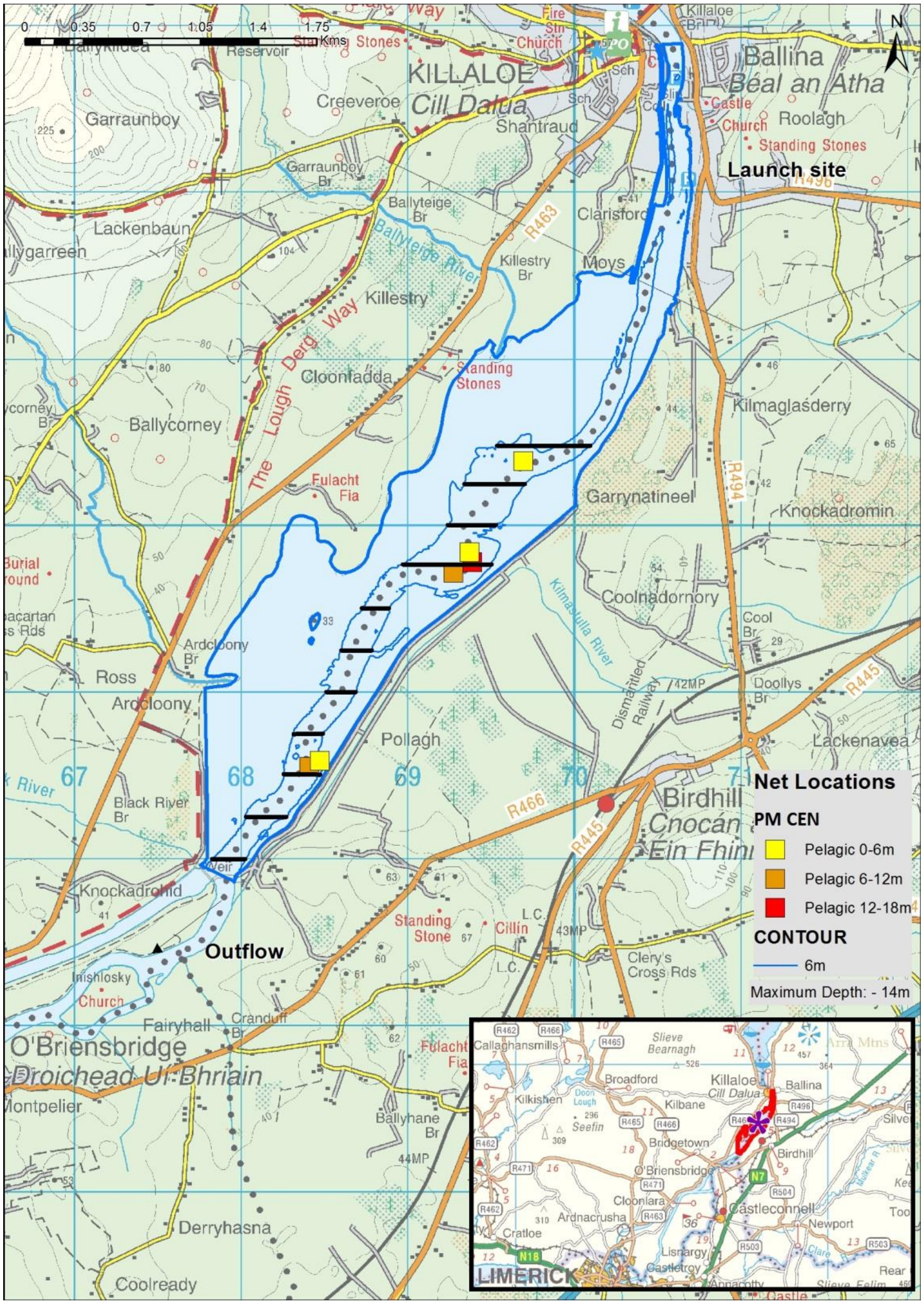

Fig. 2.2. Location map of Parteen Basin showing the 6m contour line, all hydroacoustic tracks and pelagic survey gillnet locations.

2.3 Fish length frequency, age and growth

In addition to determining fish stock abundance and the collection of basic biometric data, stock assessments provide insight into the age profile and growth rates of the species captured. Determining age is an important tool in fisheries biology and stock management (Gursoy *et al*., 2005) and is analogous with the aging of trees through growth rings (Campana, 2001). In fish, growth patterns (fine ridges, known as circuli) visible on the scales, are used to infer age and growth rate. In temperate climates, rapid growth during the summer is evidenced by widely spaced circuli. In the winter, growth slows and circuli are more tightly banded. The outer edge of the tightly banded circuli, termed the annulus, marks the end of that season's growth (Ericksen, 1999). By counting these annuli the age of the fish can be estimated, while the growth rate of each fish can be inferred by back calculating length at age (Bagenal and Tesch, 1978). Generation of growth rate models also provides an insight into population life history such as life span and the average maximum attainable size of long lived individuals.

Three commonly utilised growth models (Von-Bertalanffy, Gompertz and Logistic) were fitted to the data in the FSA package (Ogle, 2016) in R (R Core Team, 2015). In this instance, Observed Length at Age (OLA) was used. The most appropriate model was chosen based on the Aikake Information Criterion (AIC) (the AIC is a measure of how each model fits a specific data set) and with regard to the observed length and age data derived from each survey, so that the most convincing model was chosen if AIC values were similar. Asymptotic length ($L\infty$) (defined as the average length of the very oldest fish in any population) can be viewed as the maximum predicted length for each species. It thus provides insights into the fishery potential of that particular species.

Length frequency, age and growth analysis was carried out on four species and on roach x bream hybrids

2.4 Water chemistry:

Dissolved oxygen (mg L^{-1}), temperature (C°), pH and conductivity (mS cm^{-1}) were recorded at 1m intervals from the surface to 31m using a calibrated Hydrolab MS5 multi-parameter water quality sonde.

2.5 Fish diet

Fish were frozen before being dissected for stomach content analysis in the IFI laboratory. Total stomach contents were inspected and identified to the lowest taxonomic level possible. The percentage frequency occurrence (%O) of prey items were then calculated to identify key prey items (Amundsen *et al.*, 1996).

$$\%O_{ij} = (N_{ij}/ N_j)\times 100$$

Where:

$\%O_{ij}$ is the percentage frequency occurrence of prey item i, in fish species j stomach,

N_i is the number of species j with prey i in their stomach,

N_j is total number of species j with stomach contents.

2.6 Biosecurity - disinfection and decontamination procedures

Procedures are required for disinfection of equipment in order to prevent dispersal of alien species and other organisms to uninfected waters. A standard operating procedure was compiled by Inland Fisheries Ireland for this purpose (Caffrey, 2010) and is followed by staff on IFI's National Research Survey Programme (NRSP) team when moving between water bodies.

3. Results

3.1 Species Richness

A total of six fish species and one type of hybrid were recorded during the fish stock survey (benthic and pelagic zones) on Parteen Basin in June/July 2016 (Table 3.1). Roach followed by perch were the most common fish species recorded (all survey nets). Roach and brown trout were the most common fish species captured in the pelagic zone (PM CEN) (Table 3.1). In total, 467 fish were captured during the survey (Table 3.1).

Table 3.1. Number of each fish species captured by each gear type during the main fish stock survey (WFD+ and 8-PBB) and the pelagic survey (PM CEN) on Parteen Basin, June/July 2016

Scientific name	Common name	WFD+	8-PBB	PM CEN	Total
Rutilus rutilus	Roach	62	134	42	**238**
Perca fluviatilis	Perch	135	15	10	**160**
Salmo trutta	Brown trout	1	1	20	**22**
Esox lucius	Pike	15	2	0	**17**
Rutilus rutilus x Abramis brama	Roach x bream hybrid	2	4	6	**12**
Salmo salar	Salmon	0	0	1	**1**
Anguilla anguilla	European eel	17	0	0	**17**
Total		**232**	**156**	**79**	**467**

3.2 Fish abundance

Fish abundance (mean CPUE) and biomass (mean BPUE) were calculated as the mean number/weight of fish caught per metre of net. For all fish species except eel, CPUE/BPUE is based on all nets, whereas eel CPUE/BPUE is based on fyke nets only. Mean CPUE and BPUE for all fish species captured in the 2016 survey are summarised in Table 3.2 (Figs. 3.1 and 3.1).

Overall perch followed by roach were the dominant fish species in terms of abundance (CPUE), while roach was the dominant fish species in terms of biomass (BPUE) (Table 3.2, Figs. 3.1 and 3.2). Roach followed by brown trout were the most abundant species (CPUE) in the pelagic zone, while roach and roach bream hybrids were dominant in terms of biomass (BPUE) (Table 3.2, Figs. 3.1 and 3.2).

Table 3.2. Mean (S.E.) CPUE and BPUE (per metre of net) for all fish species captured on Parteen Basin, WFD+, 8-PBB and PM CEN

Scientific name	Common name	WFD+	8-PBB	PM CEN
			Mean CPUE (±S.E.)	
Perca fluviatilis	Perch	1.666 (0.034)	0.014 (0.005)	0.014 (0.008)
Rutilus rutilus	Roach	0.077 (0.019)	0.122 (0.029)	0.058 (0.022)
Esox lucius	Pike	0.014 (0.006)	0.002 (0.001)	-
Rutilus rutilus x Abramis brama	Roach x bream hybrid	0.002 (0.002)	0.004 (0.004)	0.008 (0.003)
Salmo trutta	Brown trout	0.001 (0.001)	0.001 (0.001)	0.028 (0.009)
Salmo salar	Atlantic salmon	-	-	0.001 (0.001)
*Anguilla Anguilla**	European eel*	0.142 (0.075)*	-	-
			Mean BPUE (±S.E.)	
Perca fluviatilis	Perch	5.871 (1.332)	2.095 (0.854)	0.655 (0.394)
Rutilus rutilus	Roach	20.006 (3.846)	37.648 (10.652)	11.159 (4.334)
Esox lucius	Pike	0.528 (0.320)	4.559 (3.898)	-
Rutilus rutilus x Abramis brama	Roach x bream hybrid	2.436 (1.691)	2.213 (2.213)	7.143 (3.204)
Salmo trutta	Brown trout	0.569 (0.569)	0.095 (0.095)	5.891 (2.185)
Salmo salar	Atlantic salmon	-	-	5.949 (5.949)
*Anguilla Anguilla**	European eel*	25.397 (13.514) *	-	-

Note: On the rare occasion where biomass data was unavailable for an individual fish, this was determined from a length/weight regression for that species. *Eel CPUE and BPUE based on fyke nets only

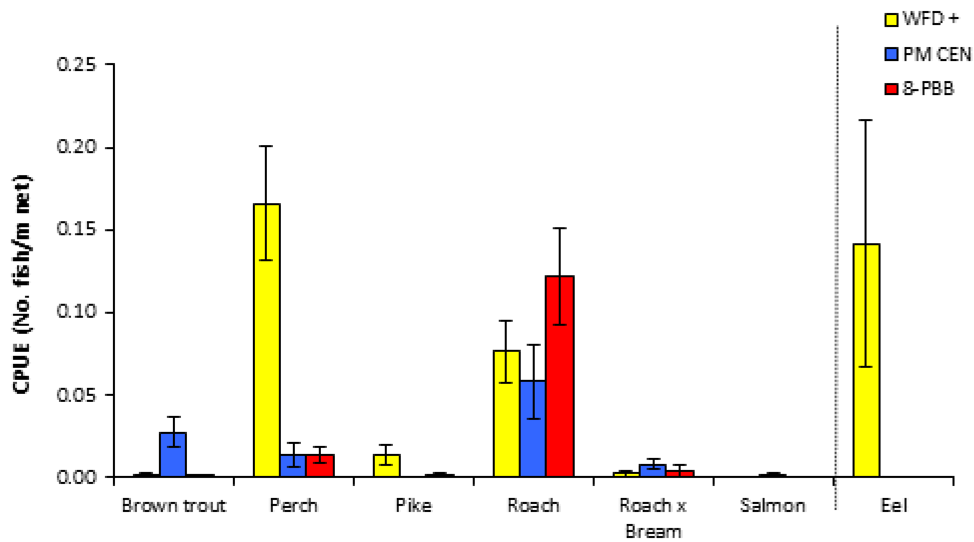

Fig. 3.1. Mean (±S.E.) CPUE for all fish species captured in Parteen Basin (Eel CPUE based on fyke nets only), 2016

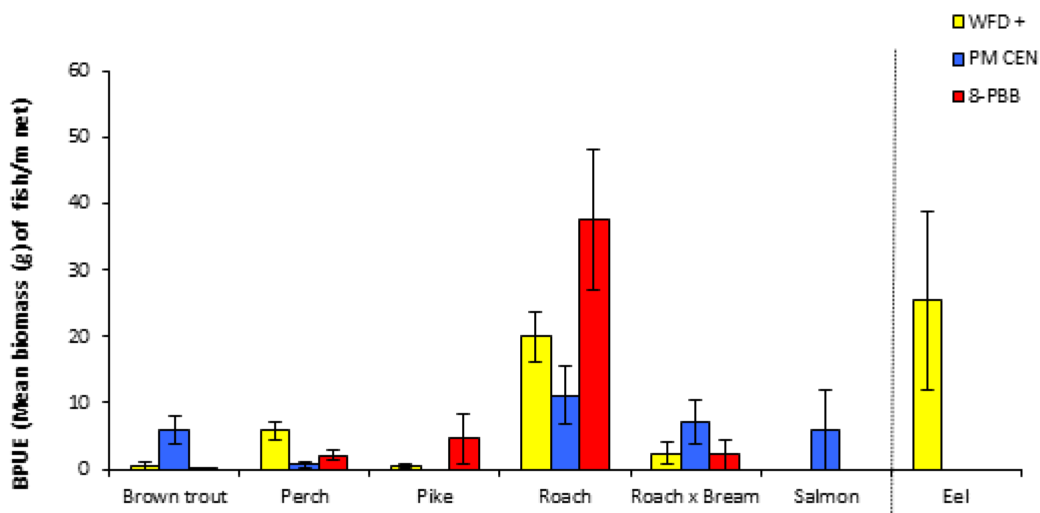

Fig. 3.2. Mean (±S.E.) BPUE for all fish species captured in Parteen Basin (Eel BPUE based on fyke nets only), 2016

3.2.1 Percentage occurrence of fish species in the pelagic zone

The percentage occurrence of roach, brown trout, perch, roach x bream hybrids and salmon in the pelagic zone was 53%, 25%, 13%, 8% and 1% respectively. The percentage occurrence of fish species in reservoir was also calculated for the small (5.3 to 10.0cm), medium (10.0 to 20.0), large (20.0 to 33.0) and very large size (33.0 to 123cm) classes respectively (Fig. 3.3).

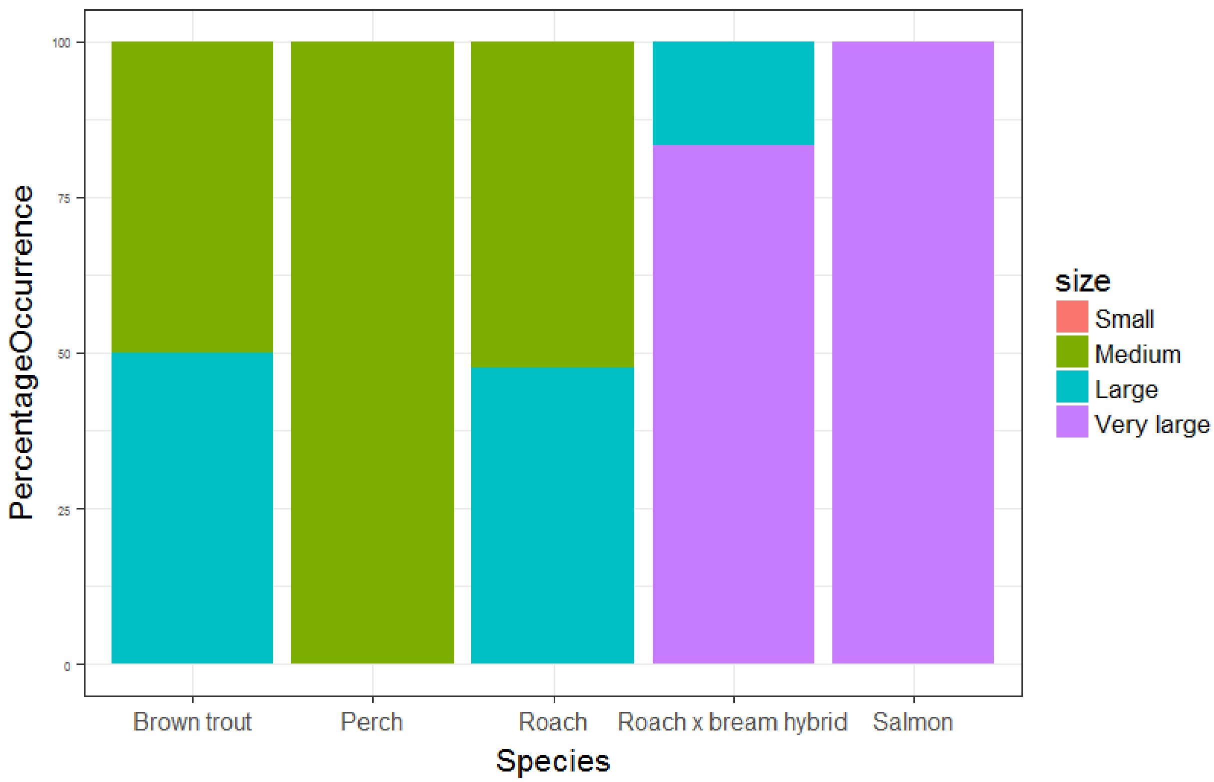

Fig. 3.3. The percentage occurrence of all fish species captured in acoustic pelagic gillnets used to ground-truth Parteen Basin acoustic estimates

3.2.2 Acoustic abundance of fish in the pelagic zone

The total abundance of fish in the deeper areas (>6m; Fig. 2.2) of Parteen Basin was estimated as 13.31 fish ha^{-1} (Table 3.3). Estimates are not provided for individual species as the deep section available for hydroacoustic assessment was very narrow with high levels of variation therefore extrapolations at this scale would be erroneous.

Table 3.3. Arithmetic mean acoustic total fish abundance (fish/ha) and biomass (g/ha) for four fish sizes and total in the pelagic zone of Parteen Basin, June 2016

Size category	**Small**	**Medium**	**Large**	**Very Large**	**Total**
dB Range	**-50 to -45dB**	**-44 to -39 dB**	**-39 to -35dB**	**-34 to -23dB**	**-50 to -23dB**
Size class (cm)	**5.3 to 10.0**	**10.0 to 20.0**	**20.0 to 33.0**	**33.0 to 123**	**4.5 to 123**
			Abundance (fish ha^{-1})		
Parteen Basin	5.23	3.58	0	4.50	13.31
			Biomass (g ha^{-1})		
Parteen Basin	14.23	228.20	0	48,370.14	48,612.57

3.3 Length frequency distributions, age and growth

Perch

Perch captured during the 2016 survey ranged in length from 3.2cm to 30.5cm (mean = 12.8cm) (Fig.3.4). Perch in the pelagic zone ranged in length from 11.0cm to 18.2cm. Eight age classes were present, ranging from 1+ to 8+ and the mean L1 was 6.2cm (Table 3.3). While recruitment was regular, modal peaks at 9-10cm and 14-15cm corresponding to 1+ and 2+ year classes indicated that the perch population were dominated by younger year classes. Asymptotic length was estimated as 25.3cm (23.5-27.7) (Fig. 3.5).

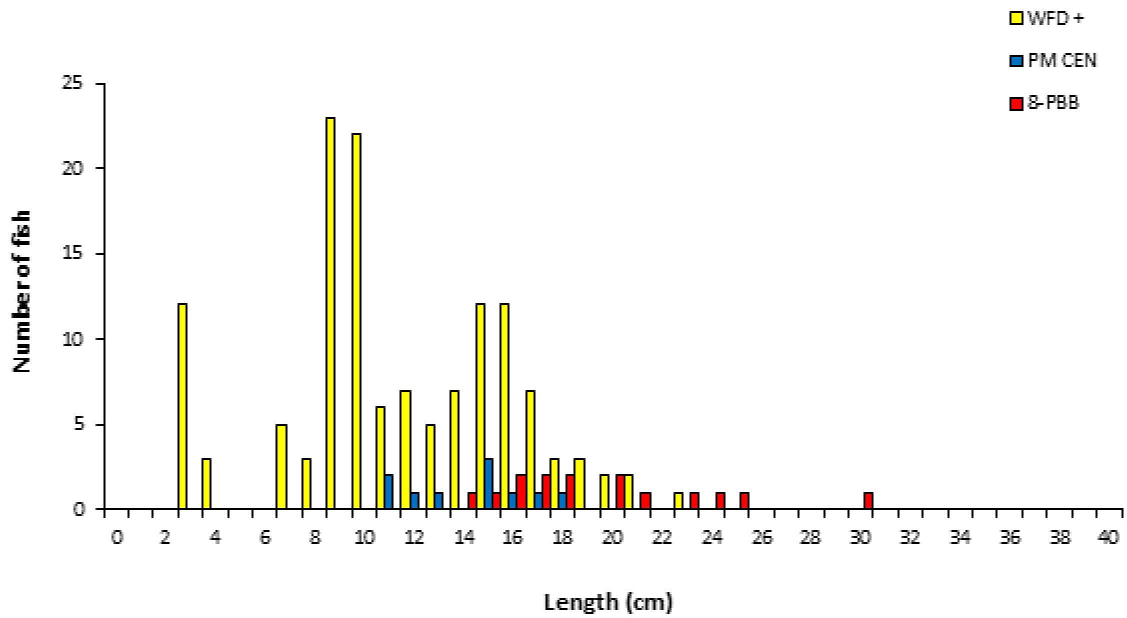

Fig. 3.4. Length frequency of perch captured on Parteen Basin, June/July2016

Table 3.3. Mean back calculated (±SE) perch length (cm) at age for Parteen Basin, June/July 2016

	L_1	L_2	L_3	L_4	L_5	L_6	L_7	L_8
Mean (±SE)	6.2 (0.1)	11.4 (0.3)	15.6 (0.5)	16.9 (0.9)	19.6 (1.0)	21.9 (1.7)	24.3 (2.4)	23.4
N	43	35	22	6	5	4	3	1
Range	4.3-7.8	7.6-14.5	11.2-20.2	14.2-19.2	16.2-21.9	18.0-25.5	21.3-29.1	-

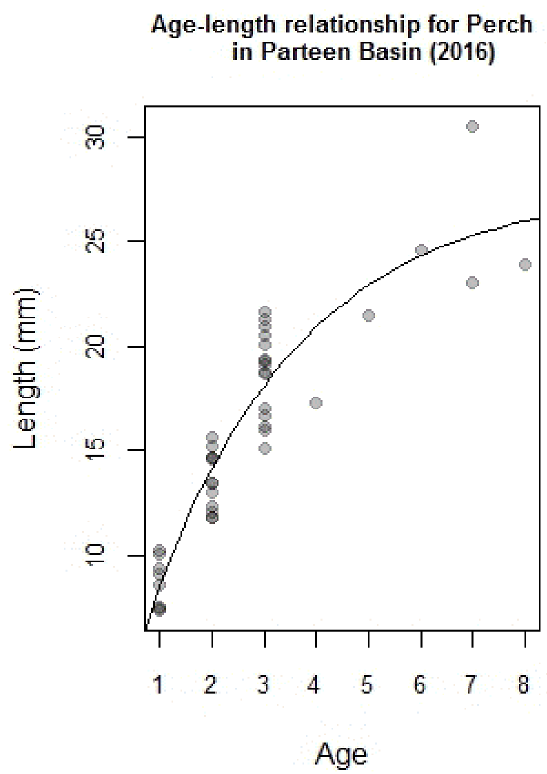

Fig. 3.5. Age-length relationship of perch captured on Parteen Basin, June/July 2016

Roach

Roach captured during the 2016 survey ranged in length from 6.0cm to 33.3cm (mean = 23.5cm) (Fig.3.6). Roach in the pelagic zone ranged in length from 14.0cm to 29.7cm. Seven age classes were present, from 1+ to 12+ and the mean L1 was 3.7cm (Table 3.4). The dominant age class was 7+ and fish captured in the survey were dominated by larger individuals (Fig. 3.6 and 3.7). The majority of fish aged were estimated to be between 3+ and 7 + years old. Just one older fish was recorded, which was estimated at 12+ years old (32.0cm and 670.0g). Furthermore, no 2 + fish were recorded in the sample aged, and, with the exception of one 6cm individual, no roach less than 15 cm in length were recorded in the nets deployed. Asymptotic length was estimated as 35.4cm (30.8-41.6).

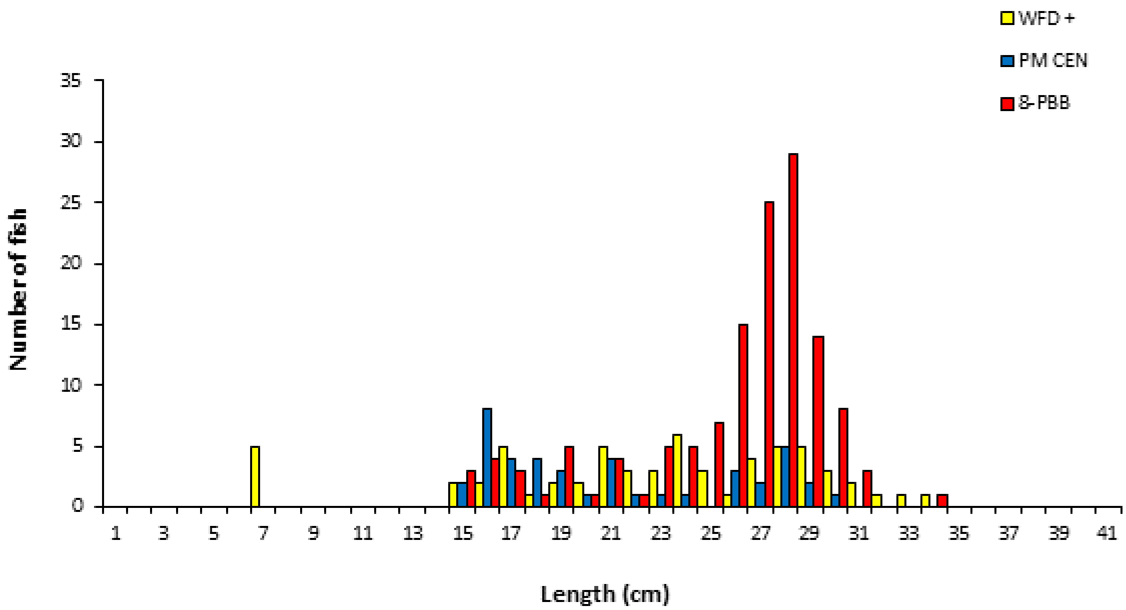

Fig. 3.6. Length frequency of roach captured on Parteen Basin, June/July 2016

Table 3.4. Mean back calculated (±SE) roach length (cm) at age for Parteen Basin, June/July 2016

	L_1	L_2	L_3	L_4	L_5	L_6	L_7	L_8	L_9	L_{10}	L_{11}	L_{12}
Mean (±SE)	3.7 (0.1)	8.2 (0.3)	13.1 (0.4)	17.5 (0.5)	20.3 (0.5)	23.5 (0.5)	24.2 (1.8)	21.1	24.2	26.6	27.8	29.7
N	33	30	30	26	21	16	15	1	1	1	1	1
Range	2.5-5.3	5.7-11.8	9.0-16.9	11.7-21.2	14.1-23.8	17.6-26.7	19.3-28.2	21.1	24.2	26.6	27.8	29.7

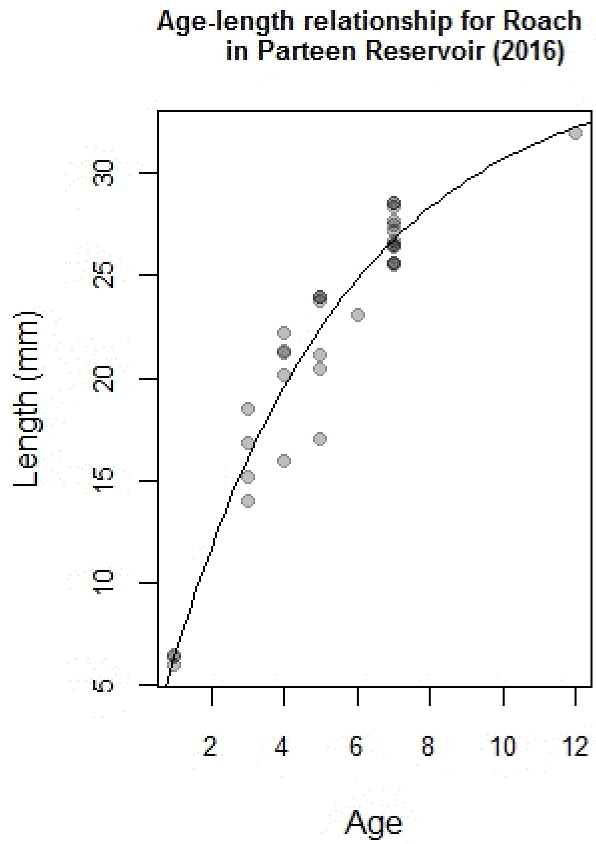

Fig. 3.7. Age-length relationship of roach captured on Parteen Basin, June/July 2016

Brown trout

Brown trout captured during the 2016 survey ranged in length from 13.5cm to 47.2cm (mean 23.6cm) (Fig. 3.8). Only two brown trout were captured outside the pelagic zone and were measured at 19.5cm and 33.0cm. Three age classes were present, ranging from 1+ to 3+, with a mean L1 of 6.8cm (Table 3.5). The dominant age class was 2+ (Fig. 3.8).

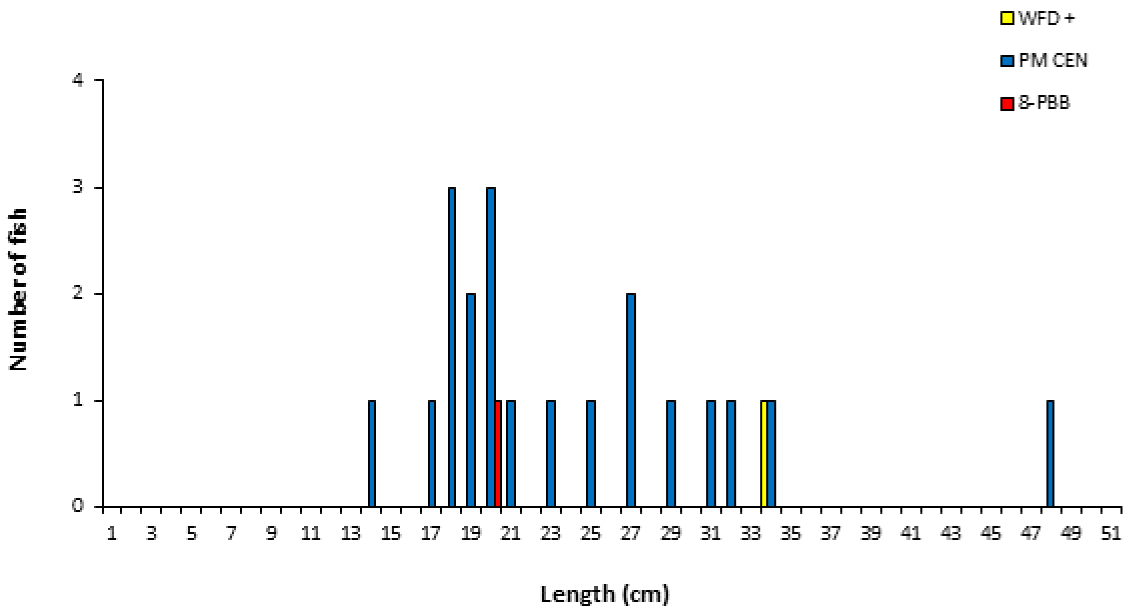

Fig. 3.8. Length frequency of brown trout captured on Parteen Basin, June/July 2016

Table 3.5. Mean back calculated (±S.E.) brown trout length (cm) at age for Parteen Basin, June/July 2016

	L_1	L_2	L_3
Mean (± S.E.)	6.8 (0.2)	15.1 (0.6)	26.2 (1.3)
N	18	15	5
Range	5.1-8.5	11.5-19.9	22.1-29.6

Pike

Pike captured during the 2016 survey ranged in length from 8.5cm to 78.0cm (mean 20.8cm) and the sample was dominated by juvenile fish (8.5cm to 19.6cm) (Fig. 3.9).

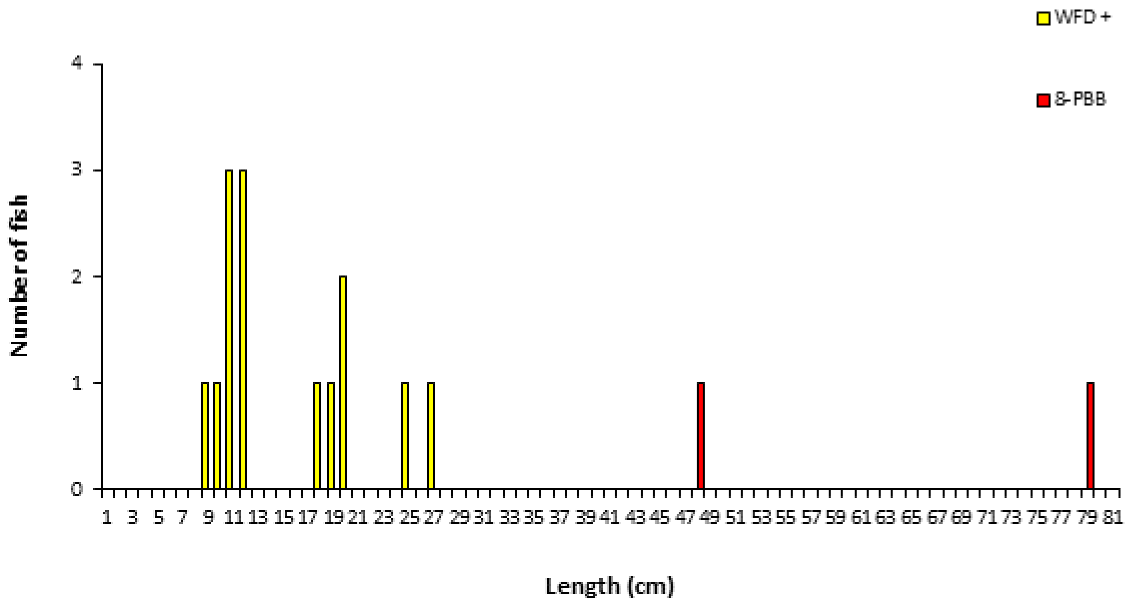

Fig. 3.9. Length frequency of pike captured on Parteen Basin, June/July 2016

Other fish

Eels captured during the 2016 survey ranged in length from 35.5cm to 57.1cm. Roach x bream hybrids ranged from 22.7cm to 38.0cm and one salmon was measured at 75.0cm.

3.4 Diet analysis

Dietary analysis studies provide a good indication of the availability of food items and the angling methods that are likely to be successful. However, the value of stomach content analysis is limited unless undertaken over a long period as diet may change on a daily basis depending on the availability of food items. The stomach contents of a subsample of perch and pike captured during the survey were examined and are presented below.

Perch

Perch initially start to feed on pelagic zooplankton. Once they reach an intermediate size (approximately 14-16cm) they start feeding on benthic resources eventually moving on to feed on fish when they are large enough (Hjelm *et al*., 2000). A total of 36 stomachs were examined. Of these 11 were found to contain no prey items. Of the 25 stomachs containing food, 36% contained unidentified digested material, 32% fish, 20% invertebrates, 8% zooplankton and 4% zooplankton/invertebrates (Fig. 3.10).

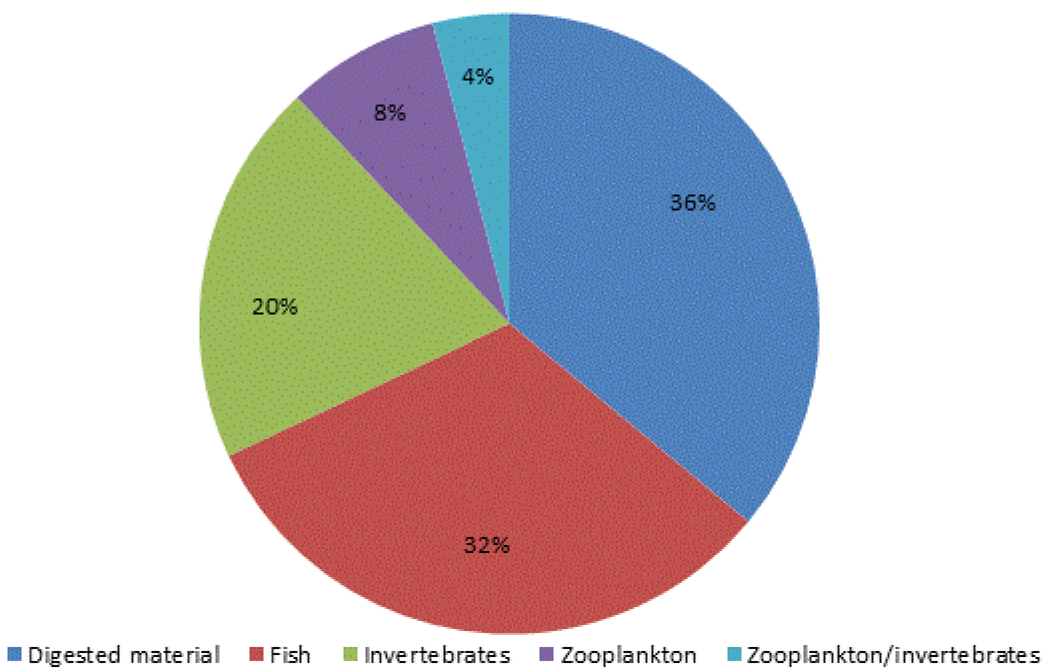

Fig. 3.10. Diet of perch (n=25) captured on Parteen Basin, June/ July2016 (% occurrence)

Pike

A total of 14 pike stomachs were examined. Of these one was found to contain no prey items. Of the 13 stomachs containing food, 77% contained fish, 15% invertebrates and 8% fish/invertebrates (Fig. 3.11). Identifiable fish diet consisted of perch fry and stickleback. The smallest piscivore in the sample measured 8.5cm.

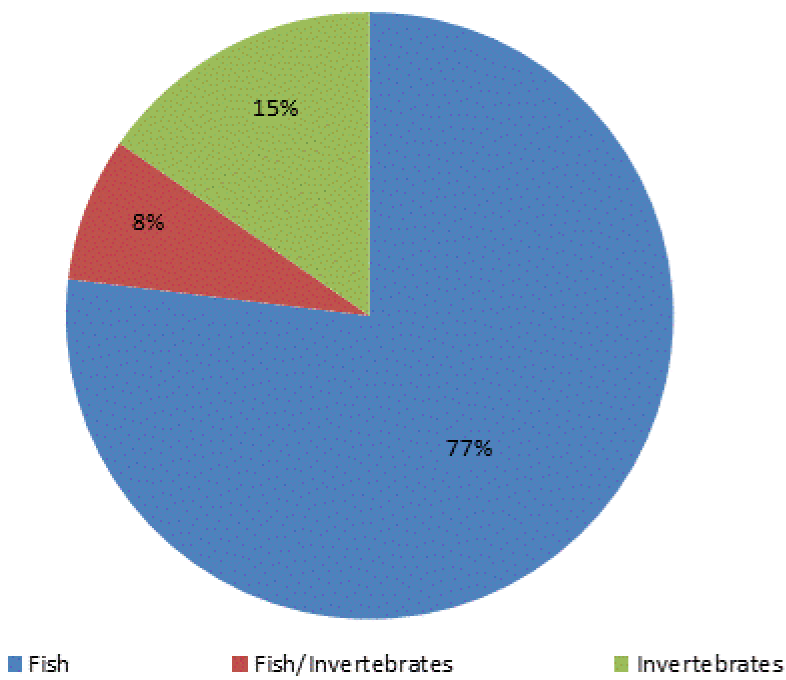

Fig. 3.11. Diet of pike (n=13) captured on Parteen Basin, June/July 2016 (% occurrence)

4. Summary

Perch was the dominant fish species in terms of abundance (CPUE) and roach was the dominant fish species in terms of biomass (BPUE) captured in the 2016 survey gill nets.

The total abundance of fish in in the deeper areas (>6m) of the reservoir was estimated as 13.31 fish ha^{-1}. Acoustic estimates were not calculated for individual species as the deep section available for hydroacoustic assessment was narrow with high levels of variation; therefore extrapolations at this scale would be erroneous. No pollan were captured in the ground truth pelagic survey nets; therefore it was not possible to confirm if pollan were present in the reservoir.

Perch ranged in length from 3.2cm to 30.5cm, with eight age classes present and ranged in age from 1+ to 8+, indicating reproductive success in eight of the previous nine years. The dominant age class was 1+ and the population was dominated by younger fish in general. Of the 25 stomachs examined and containing food items 32% had fish present, followed by 20% invertebrates, 8% zooplankton and 4% zooplankton/invertebrates.

Roach ranged in length from 6.0cm to 33.3cm, with seven age classes present and ranged in age from 1+ to 11+, indicating reproductive success in seven of the previous twelve years. However, the dominant age class was 7+. Successful recruitment of roach in Parteen Basin would, therefore, appear to be irregular and limited in recent years. Whether this is due to natural or anthropogenic influences (i.e. fluctuating water levels in the reservoir) is unclear.

Brown trout ranged in length from 13.5cm to 47.2cm with three age classes present, ranging from 1+ to 3+, indicating reproductive success in three of the previous four years. The dominant age class was 2+. Brown trout accounted for 25% of the total pelagic catch and there was a peak in abundance in the 17-21cm range which corresponds to 2+ fish. It is possible that these trout were using Parteen Basin as a nursery habitat before migrating into the lake.

Pike ranged in length from 8.5cm to 78.0cm (mean 20.8cm) and the sample was dominated by juvenile fish (8.5cm to 19.6cm). Many of these fish were captured in survey nets set on or near to large charophyte beds which were evident in the reservoir at the time of the survey. Recruitment success of this species has been found to be dependent upon the amount of submerged macrophytes in the waterbody (Grimm, 1981). Interestingly, no small pike were recorded in the survey of Lough Derg conducted at the same time (Kelly *et al*., 2017). It is possible that Parteen Basin may play an important role in the recruitment success of pike in the lake as a whole. Further work would be needed elucidate the degree of its importance in this regard.

Previous studies in Ireland have suggested delayed piscivory in pike compared to other locations where this species is found (Pedreschi *et al*., 2015). However, most of the stomachs examined from Parteen Bain, contained fish prey even in the very small (< 12cm) young of year (YOY) pike captured. Many of the prey items were YOY perch fry (c.3cm in length) and small 3-spined stickleback. This evidence suggests that pike may adopt a piscivorous habit when prey of a suitable size is readily available.

Classification and assigning lakes with an ecological status is a critical part of the WFD monitoring programme. It allows River Basin District managers to identify and prioritise lakes that currently fall short of the minimum “Good Ecological Status” that is required if Ireland is not to incur penalties.

A multimetric fish ecological classification tool (Fish in Lakes – ‘FIL’) was developed for the island of Ireland (Ecoregion 17) using IFI and Agri-Food and Biosciences Institute Northern Ireland (AFBINI) data generated during the NSSHARE Fish in Lakes project (Kelly *et al.*, 2008). This tool was further developed during 2010 (FIL2) in order to make it fully WFD compliant, including producing EQR values for each lake and associated confidence in classification (Kelly *et al*., 2012). Using the FIL2 classification tool, Parteen Basin has been assigned an ecological status of Good based on the fish populations present in 2016.

In the 2010 to 2015 surveillance monitoring reporting period, the EPA assigned Parteen Basin an overall ecological status or potential of Good.

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