

# LOCH TAY FRESHWATER FISH STUDY, 2000

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## Introduction

Over recent years reports from the western end of Loch Tay suggests there has been an increase in the abundance of pike there. In addition, within the last five years anglers report seeing roach in abundance, a species formerly unknown. In western Ireland in recent decades roach have also been introduced into a number of loughs and pike numbers have increased as a consequence, which it has been feared could have negative consequences for salmonid fish. The concern must be that a similar phenomenon had occurred on Loch Tay.

To obtain some insight into the status of pike, roach and salmonids in western Loch Tay a gill netting survey and dietary analysis was conducted at weekly or fortnightly intervals in the mouth of the River Dochart at Auchmore between late April and early July 2000. The findings are presented here.

## Methods used

Initially the gill net used was a 10 metre multi-monofilament gill-net with 70mm “stretched” mesh – that is 140mm circumference. The net was set in a standard location close to reed beds near the mouth of the Dochart, out of the main salmon migration route. The net was typically set in an evening and lifted the following morning at about 8.30.

However, on 3 June a different net was used. This was a 30m “multi-mesh sampling net”. This monofilament net, consisted of short panels of different mesh size so as to sample all sizes of fish present. While it was found to be well capable of catching roach, this net was not strong and could not hold pike. On 8 July, the last sampling occasion, both nets were set.

## Results

### *Pike*

The overall numbers of pike caught are displayed in Figure 1 in terms of length and sex. Most of the pike were in the 50 – 70 centimetre range. The numbers of pike caught on each sampling occasion and the presence or absence of stomach contents are presented in Table 1. This shows that the proportion of pike which had recently fed tended to increase with time. Early on, when the water was still cold, the majority of pike had empty stomachs but these were a distinct minority by early summer. Individual food items in pike stomachs, where identified, are presented in Table 2. The most common food item was roach, with wild trout second in importance. In terms of weight of fish consumed, only the roach and trout are likely to be significant food items (except for what was eaten by very small pike, but these were not adequately sampled), given that lampreys and minnows are very small fish.

Owing to the state of digestion it did not prove possible to measure all food items, but some roach and trout were measured and these are given in Table 3. While too much should not be read into this, for example small fish will be digested more quickly and will have a lower probability of still being measurable, it does indicate that there is wide variation in the sizes of fish consumed. Also many of the roach eaten were substantial sized fish, therefore by weight, roach do account for a major part of the pike’s diet.

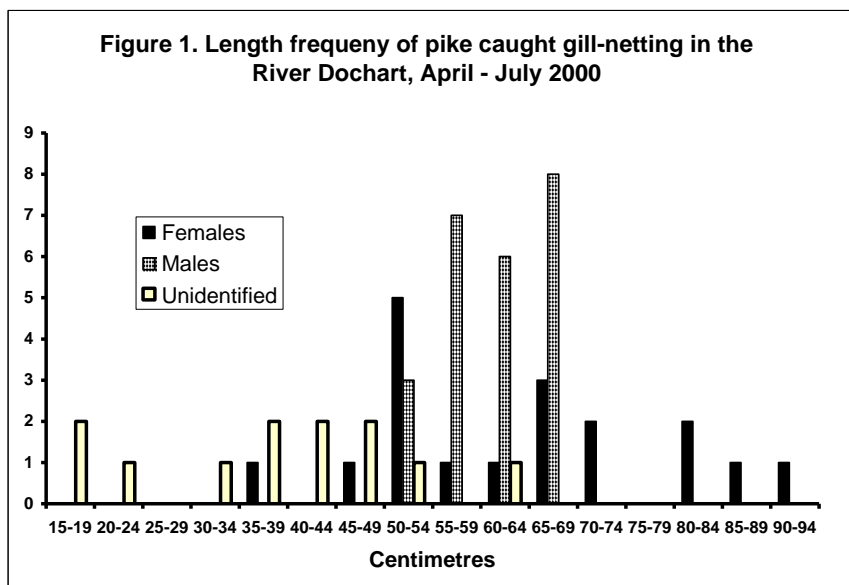


Table 1. Numbers of pike caught with food items in their stomachs and those without

Date	Food present	No food present	Total caught
24 April	2	2	4
30 April	2	4	6
6 May	4	5	9
13 May	6	1	7
22 May	3	1	4
27 May	4	3	7
24 June	4	1	5
8 July	10	1	11
<b>Total</b>	<b>35</b>	<b>18</b>	<b>53</b>

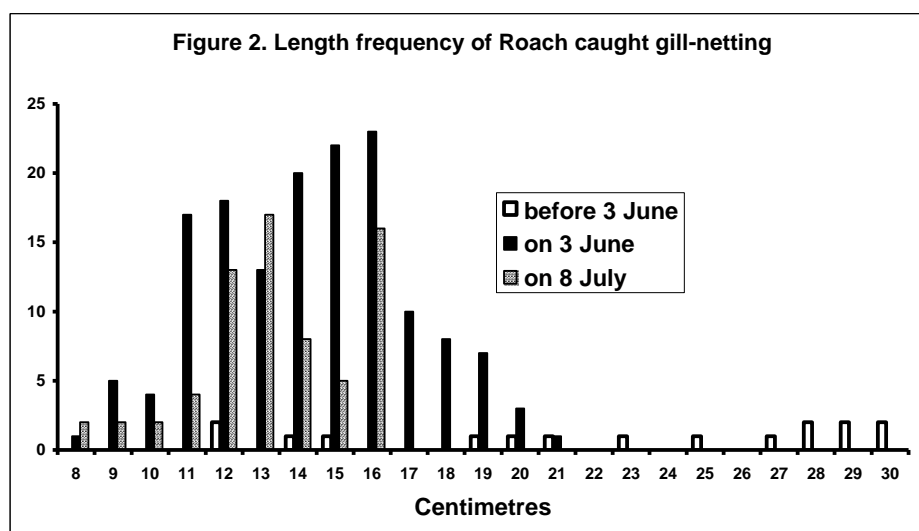
Table 2. Food items present in pike stomachs

	Char	Lamprey	Minnow	Perch	Roach	Trout (wild)	Trout (stock)	Unknown
24 April		2				1		
30 April	1							1
6 May				1	2	1		
13 May					5		2	
22 May		2			1	1		
27 May					1	1		2
24 June					5			
8 July			7	1	3	4		1
<b>Total</b>	<b>1</b>	<b>4</b>	<b>7</b>	<b>2</b>	<b>17</b>	<b>8</b>	<b>2</b>	<b>4</b>

Table 3. Approximate lengths of individual fish found in pike stomachs which were intact enough to measure.

Roach	12cm, 14cm, 16cm, 5 x 20cm, 22cm and 24cm
Wild Trout	12cm, <15cm, 19cm, 25cm, 28cm, 30cm and 30cm

## Roach



The length frequency distribution of roach caught in gill-nets is presented in Figure 2. Data are amalgamated prior to 3 June, when the multi-mesh net was first used. Without the multi-mesh net, roach were inadequately sampled, only big fish being caught in the large mesh deployed. However, on the first setting of the multi-mesh net a very large catch was obtained of small roach. Another good catch of small roach was also made on 8 July. It was noted that of roach opened up on 3 June around 15cm in length, many were sexually mature of both sexes.

Analysis of the scales of the roach suggests that those around 15 cm are around 4 years old, but the 30 cm roach are of the order of 10 – 12 years old. Thus, roach must have been present in Loch Tay for over 10 years, albeit in smaller numbers. If these oldest roach were the first in Loch Tay, it would only have been recently that they became a size to be noticeable. However, they would have been able to breed at least five years ago, which may account for the large number of smaller roach present, which themselves are now breeding. The roach are, therefore, well established.

## Conclusions

The large roach population which has become established in the lower Dochart is clearly providing a major food source to pike in the area, at least during the period of this study. However, during the period of the study, trout were also a major food item of the pike. Therefore, if the presence of a new and abundant food item, roach, has resulted in increased growth and survival of pike, then the potential exists for overall levels of predation on trout to have increased. Though none were found in stomach samples, the potential for increased predation on salmon smolts may also be a possibility. While we do not know for sure how the roach arrived in Loch Tay (they could have migrated up from the lower Tay where they were introduced during the Second World War or they may have been discarded live bait from pike anglers) this is a graphic example of the knock on effects of introductions of alien species and why it is essential that there should be legislation to control such fish movements.

## Acknowledgements

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