Pike – Fecundity Data
1963-2002
Dataset Documentation

Pike Fecundity Data 1963-2002

Document Version: 1. 29-8-2013

Description:

One of a set of data files used in Vindenes et al. (2013) American Naturalist (Effects of climate change on trait-based dynamics of a top predator in freshwater ecosystems).

This dataset consists of fecundity (number of eggs) data on Pike (*Esox lucius*) from net sampling. Data collection began in 1963. The data were initially collected by the Freshwater Biological Association (FBA) but have been collected by CEH and its predecessor Institute of Freshwater Ecology (IFE) since 1989. (In this data set only females are included).

Related datasets

- *Metadata record for data series (Pike 1944-2002):*
  http://data.ceh.ac.uk/metadata/58357e70-d79b-4149-aa02-762c20b01198
- Pike – Growth Data 1944-1995
  http://data.ceh.ac.uk/metadata/637d60d6-1571-49af-93f7-24c1279d884d
- Pike – Survival Data 1953-1990
  http://data.ceh.ac.uk/metadata/813e07dd-2135-49bc-93c6-83999e442b36
- Windermere Lake Temperature 1944-2002
  http://data.ceh.ac.uk/metadata/9520664c-eb4d-4700-b064-5d215d23e595

FecundityData1963_2002.csv file details:

- *Format: comma separated values (csv)*
- *Size: 81kb*

Columns:

YEAR	Year of capture of individual fish
LENGTH	Length of individual fish at capture (cm)
EGGS	Estimated number of eggs for individual fish

Sampling site location: Windermere lake, Cumbria, Great Britain.
Approximate grid reference of lake centre:
SD393960 (OS Grid Reference)
339385,496080 (OSGB36 Easting/Northing)
54.360193 -2.935836 (WGS84)

Fish Species Measured :

Esox lucius Pike

Pike (*Esox lucius)*

Experimental design/Sampling regime

Pike have been monitored in the north and south basins by gill netting with variations in sampling sites and efforts from 1944 to the present.

Collection Methods & Fieldwork and Laboratory instrumentation

The first gill-nets used in the 1940s had a mesh of 5 inches when stretched (64 mm knot to knot) and were 30 yards x 10 feet (27 m x 3 m) in size. They were set on the bottom in shallow water at sites all round the lake, being lifted every two or three days, and were moved to a new site when it appeared that no more pike were being caught. The mesh was large enough to avoid catching any other species except the very occasional large trout and perch. This methodology had variations until 1982 (Le Cren, 2001) [1] but has since been rigorously standardised (Winfield *et al.*, 2008)[2].

Since 1982, the methodology has been standardised as follows. Pike were sampled by means of 64 mm bar mesh multifilament gill nets. Each net was 40 m in length and 3 m in depth and set singly on the bottom between mid-October and late December at depths of approximately 4–5 m at 10 sites in each of the north and south basins.

Nets were usually set at five sites during daylight on a Monday, inspected and catch removed during daylight on a Wednesday and then lifted during daylight on a Friday, although the precise time of lifting was occasionally influenced by weather conditions. The settings were then repeated at that site during the following week. All pike taken in the nets were killed and taken to the laboratory for processing. Five nets were in the water at any one time and the sites fished were rotated during the course of a sampling season, ensuring a systematic coverage of the entire lake. Any one site was thus fished for two weeks during each sampling season. A small amount of additional such netting was undertaken within the same months during the period from 1982 to 1989, resulting in a total annual sampling effort for that period of c. 348 net days distributed approximately equally between the two basins.

Since 1990 the total annual sampling effort has been held at c. 240 net days, again distributed approximately equally between the two basins.

Analytical Methods

In the laboratory, each pike was measured (fork length to 1 mm) (This is the data in the column LENGTH) and weighed (wet weight to 100 g), before being dissected to determine sex. The left opercular bone was removed and aged as described by Frost & Kipling (1959)[3] with a nominal birth date of 1 April.

Female pike were further examined to determine their individual fecundity (number of eggs) as described by Kipling & Frost (1969)[4]. (This is the data in the column EGGS).

Quality Control

For quality control, measurements are taken and checked by permutations of three individuals.

[1]Le Cren, E. D. (2001). The Windermere perch and pike project. Freshwater Forum 15, 3–34.

[2]Winfield, I. J., James, J. B. & Fletcher, J. M. 2008. Northern pike (*Esox lucius*) in a warming lake: changes in population size and individual condition in relation to prey abundance. Hydrobiologia 601, 29-40.

[3]Frost, W. E. & Kipling, C. (1959). The determination of the age and growth of the pike (*Esox lucius* L.) from scales and opercular bones. Journal du Conseil permanent international pour Exploration de la Mer 24, 314-341.

[4]Kipling, C. & Frost, W. E. (1969). Variations in the fecundity of pike *Esox lucius* L. in Windermere. Journal of Fish Biology 1, 221-237.

Further reading:

Pike netting, Pike analysis

- Winfield, I. J., James, J. B. & Fletcher, J. M. (2008). Northern pike (*Esox lucius*) in a warming lake: changes in population size and individual condition in relation to prey abundance. Hydrobiologia 601, 29-40.

- Kipling, C. & Frost, W. E. (1969). Variations in the fecundity of pike *Esox lucius* L. in Windermere. Journal of Fish Biology 1, 221-237.

- Frost, W. E. & Kipling, C. (1959). The determination of the age and growth of the pike (*Esox lucius* L.) from scales and opercular bones. Journal du Conseil permanent international pour Exploration de la Mer 24, 314-341.