Overview

Short description of *Sander lucioperca*, Pikeperch
Piscivorous fish. Grows to a maximum length of 130 cm total length, weighs up to 20 kg, and has a lifespan of up to 16 years on average. The Zander has a long slender body with no spines on the gill covers. It has two dorsal fins, the anterior of which has 13–20 spines and the other has 1-2 spines and 18-24 soft rays. The anal fin has 2-3 spines and 0-14 soft rays, and the caudal fin has 17 soft rays. Zander have 45-47 vertebrae and have many small sharp teeth and fewer large teeth in the mouth for catching their prey. Colouration is a greyish brown back with light silvery sides marked with between 8-12 dark vertical stripes (often broken into spots).

Description of *Sander lucioperca*, Pikeperch status in GB
Growth of self-sustaining populations of Zander in introduced range, reintroduction in some of native range.

Habitat summary: *Sander lucioperca*, Pikeperch
Zander prefer deep, calm, temperate waters. They are found in both clear and turbid waters but require a high oxygen concentration. Within the suitable habitat they use different microhabitats during different seasons. In the autumn they prefer waters with a depth of 1.2-1.8 m with a substrate made of large pebbles. They then move to much deeper waters where they spend the winter. Following this they migrate to shallower waters with a gravel/pebble substrate for spawning. Habitat preferences are more varied in the summer. Optimal conditions for egg development: water temperature between 12-20°C; high oxygen concentration (> 4.5 mg O₂/l); low salinity.

Overview table

<table>
<thead>
<tr>
<th>Environment:</th>
<th>Freshwater</th>
</tr>
</thead>
<tbody>
<tr>
<td>Species status:</td>
<td>Non-Native</td>
</tr>
<tr>
<td>Native range:</td>
<td>China, Afghanistan, Armenia, Austria, Azerbaijan, Bosnia-Herzegovina, Bulgaria, Belarus, Switzerland, Czech Republic, Germany, Denmark, Estonia, Finland, Gruzlya, Greece, Croatia, Hungary, Iran, Italy, Kirgizistan, Kazakhstan, Lithuania, Latvia, Moldova, Macedonia, Norway, Pakistan, Poland, Romania, Russia Central, Russia East, Russia North, Russia Northwest, Russia South, Sweden, Slovenia, Slovakia, Tadzhikistan, Turkmenistan, Turkey, Ukraine, Uzbekistan, Kosovo, Montenegro, Serbia</td>
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<tr>
<td>Functional type:</td>
<td>Predator</td>
</tr>
<tr>
<td>Status in England:</td>
<td>Non-Native</td>
</tr>
<tr>
<td>Location of first record:</td>
<td>Wobourn Abbey (Beds)</td>
</tr>
<tr>
<td>Date of first record:</td>
<td>1878</td>
</tr>
</tbody>
</table>

Invasion history: *Sander lucioperca*, Pikeperch
Origin
Eastern and Central Europe (Armenia, Austria, Bulgaria, Czech Republic, Estonia, Georgia, Germany, Greece, Hungary, Latvia, Lithuania, Moldova, Poland, Romania, Russian Federation, Serbia & Montenegro, Slovakia, Ukraine), Scandinavia (Finland, Norway, Sweden) and Western Asia (Afghanistan, Azerbaijan, Iran, Kazakhstan, Uzbekistan).
First Record
First introduced in 1878 to lakes at Woburn Park, Bedfordshire from Germany.

Pathway and Method
In GB the Zander was first introduced in 1878 to lakes at Woburn Park, Bedfordshire, from Germany. Further introductions from Germany to Woburn and from Sweden to Mepal Pit in Cambridgeshire occurred in 1910 and stocks from Woburn Park were successfully relocated to enclosed waters in the southeast of England between 1945 and 1962. It was then introduced to the Great Ouse Relief Channel, Norfolk, in 1963 which resulted in the first documented self-sustaining populations which subsequently spread rapidly into the adjoining rivers of East Anglia. Since then there have been more illegal introductions of Zander to other parts of the UK with populations established in major rivers such as the Severn, Trent and Thames.

Zanders have been introduced for both commercial and recreational fishing and for biomanipulation of other fish populations, especially cyprinids. In GB, it has been introduced for recreational fisheries and caught specimens are rarely removed for consumption by anglers.

Species Status
Zanders have been recorded from many European countries (Azores Islands, Belgium, Croatia, Denmark, France, Italy, Netherlands, Portugal, Slovenia, Spain, Switzerland, GB) and a range of other countries (Algeria, China, Kyrgyzstan, Morocco, Tunisia, Turkey, USA).

Ecology & Habitat: *Sander lucioperca*, Pikeperch

Dispersal Mechanisms
Migration into tributaries from main rivers and between lakes and rivers via floods. Zander can tolerate saline environments so have the potential to migrate between different catchments via brackish coastal habitats. Eggs may be transported on aquatic macrophytes and in substrate. Continued re-introductions.

Reproduction
Zander undergo small migrations about a month prior to spawning from outer and deeper wintering areas to shallow inlets. There is one clear spawning peak per year. In GB this occurs between April and June over a substrate made of large pebbles and gravel in moving water. The male constructs a nest (approximately 5-10 cm in depth and 50 cm in diameter), often containing plant roots, by cleaning the substrate from mud. Fertilisation is external. The number of eggs laid by a female depends on her size and ranges between 150-400 eggs per g. These eggs are yellowamber measuring between 0.9 and 1.5 mm and are attached to the substrate andor vegetation. The male then guards the eggs. Zander have a chromosome number of 24 haploid/gametic (n) and 48 diploid/zygotic (2n).

Known Predators/Herbivores

Resistant Stages
None known.

Habitat Occupied in GB
Rivers and lakes. Zander prefer deep, calm, temperate waters but can cope with high salinity waters.

Distribution: *Sander lucioperca*, Pikeperch

In GB the Zander was first introduced in 1878 to lakes at Woburn Park, Bedfordshire, from Germany. Further introductions from Germany to Woburn and from Sweden to Mepal Pit in Cambridgeshire occurred in 1910 and stocks from Woburn Park were successfully relocated to enclosed waters in the southeast of England between 1945 and 1962. It was then introduced to the Great Ouse Relief Channel, Norfolk, in 1963 which resulted in the first documented self-sustaining populations which subsequently spread rapidly into the adjoining rivers of East Anglia. Since then there have been more illegal introductions of Zander to other parts of GB with populations established in major rivers such as the Severn, Trent and Thames.

Impacts: *Sander lucioperca*, Pikeperch

Environmental Impact
Zander has been documented to have strongly adverse effects on prey fish densities, including salmonid smolts and especially cyprinids. In some populations the effect on
Cyprinid densities has been desirable as a method of biocontrol. In most however, especially where other native predatory fish are present, the effect has caused cyprinid population crashes and in the Turkish Lake Egredir, zander introduction has been linked with the extinction of two endemic cyprinid species. In Britain, zander has been shown to cause predator-prey imbalances which are particularly pronounced during periods of poor prey recruitment. The threat posed has been deemed so serious in East Anglia that a policy of protection of open fisheries from the species has been adopted in this region.

Population densities of the native predators, pike and perch, may potentially be reduced by its introduction and spread both directly through predation and competition and indirectly by forcing native predators into less favourable habitats.

There are also concerns regarding the loss of genetic diversity of native S. lucioperca populations in some countries where there has been enhancement stocking with non-native individuals.

Health and Social Impact

Whilst there are no documented human health effects in GB, there have been reports of high concentrations of toxic compounds from anti-fouling paints designed to prevent algal growth in some of the Finnish zander populations.

Similarly, whilst it was introduced for recreational fisheries in GB it has attained only a low social impact and recent views are associated with the control and extirpation of zander populations rather than the enhancement. In other countries it is considered a highly desirable species for recreational fisheries.

Economic Impact

In GB zander is not consumed and has no economic value in recreational fisheries. However, elsewhere it has a high market value and has great importance in commercial and recreational fisheries. The high value of zander in fisheries has resulted in over-fishing in some populations in Finland, and in Denmark it is protected by the Danish Fishery Act.

References & Links: Sander lucioperca, Pikeperch

Identification


Larsen, L.K., & Berg, S. NOBANIS – Invasive Alien Species Fact Sheet – Stizostedion lucioperca. – From: Online database of the North European and Baltic Network on Invasive Alien Species – NOBANIS www.nobanis.org, Date of access 12032008

Biology, ecology, spread, vectors


Management and impact


