

SALVELINUS ALPINUS



Arctic char or Arctic charr (*Salvelinus alpinus*) is both a freshwater and saltwater fish in the Salmonidae family, native to Arctic, sub-Arctic and alpine lakes and coastal waters. No other freshwater fish is found as far north. It is one of the rarest fish species in Britain, found only in deep, cold, glacial lakes, mostly in Scotland, and is at risk from acidification. In other parts of its range, it is much more common, and is fished extensively. In Siberia, it is known as golets (from the Russian голец).

Arctic char are closely related to both salmon and trout and has many characteristics of both. Individual char fish can weigh 20 lb (9 kilograms) or more with record sized fish having been taken by angling in Northern Canada. Generally, whole market sized fish are between 2 and 5 lb in weight (900 g and 2.3 kilograms). The flesh colour of char varies; it can range from a bright red to a pale pink.

Arctic char farming

Research aimed at determining the suitability of Arctic char as a cultured species has been ongoing since the late 1970s. The Canadian government's Freshwater Institute of the Department of Fisheries and Oceans at Winnipeg, Manitoba, and the Huntsman Marine Science Laboratory of New Brunswick, pioneered the early efforts in Canada. Arctic char is also farmed in Norway.

Arctic char were first investigated because it was expected that they would have low optimum temperature requirements and would grow well at the cold water temperatures present in numerous areas of Canada. It was also expected that char would be an alternate species to rainbow trout and could provide producers with a different niche in the marketplace.

The initial research efforts concentrated on identifying the culture needs and performance characteristics of the species. The Freshwater Institute was responsible for distributing small numbers of char eggs to producers in Canada, these producers in return helped determine the suitability of char in a commercial setting. Commercial char breeding stocks have now been developed largely from these sources.

PHOXINUS PHOXINUS



The Eurasian minnow (*Phoxinus phoxinus*) is a species of freshwater fish. It is a member of the carp family (family Cyprinidae) of order Cypriniformes, and is the type species of genus *Phoxinus*. It is ubiquitous throughout much of Eurasia, from Britain and Spain to eastern Siberia, predominantly in cold (12–20 °C) streams and well-oxygenated lakes and ponds. It is noted for being a gregarious species, shoaling in large numbers.

The species is of drab coloration and unremarkable appearance, although the males display a red belly during the spawning season. It reaches a maximum overall length of 14 cm.

This fish is the archetypal minnow, and is also known as the common or European minnow. It is known by a great variety of names in the various languages spoken across its range: the French *griset*, the German *Elritze*, the Russian *гольян* (*gol'jan*), etc. There are also many obsolete binomial synonyms; the original name assigned by Linnaeus was *Cyprinus phoxinus*.

The Eurasian minnow is used commercially primarily as bait; it is also important in laboratory research. This is due to its stereotypical fishlike qualities. They are also some of the slowest fish.

LEUCISCUS CEPHALUS



Family: Cyprinidae (Minnows or carps)

Order: Cypriniformes (carps)

Class: Actinopterygii (ray-finned fishes)

Fish base: European Chub

Max size: 60.0 cm TL (male/unsexed; Ref. 556); max. published weight: 8,000 g (Ref. 2196); max. reported age: 22 years

Environment: benthopelagic; potamodromous (Ref. 51243); freshwater; brackish; pH range: 6 – 7.8; dH range: 8 - 25; depth range - 0 m

Climate: temperate; 4 – 20°C; 64°N - 35°N, 10°W - 60°E

Importance: fisheries: minor commercial; gamefish: yes

Resilience: Medium, minimum population doubling time 1.4 - 4.4 years (K=0.12-0.28; tm=3-7; tmax=10; Fec=20,000)

Distribution: Eurasia: widely distributed in the basins of the North Sea, the Baltic Sea, the Black Sea and the Sea of Azov, in western Caspian drainage from Volga and Ural to Iran and in the Tigris-Euphrates basin.

Morphology: Dorsal spines (total): 3 - 3; Dorsal soft rays (total): 7 - 9; Anal spines: 3; Anal soft rays: 7 – 10; Vertebrae: 42 – 48. Caudal fin with 19 rays (Ref. 2196).

Biology: Occurs in creeks and fast flowing rivers, occasionally in lakes (Ref. 30578). Enters brackish water in the eastern Baltic. Feeds on algae, bits of vegetation and various seeds that have fallen into the water (Ref. 9696). Also feeds on worms, mollusks, crustaceans, and various insect larvae; large chub eat considerable numbers of small fish, such as chub, eels, dace, roach, gudgeon and minnows; also frogs, crayfish, voles and young water birds (Ref. 6258). Pale yellow eggs are found attached to gravel, weed and stones in flowing water (Ref. 41678). Popular with amateur sport fishermen. Can be caught with various baits and lures. The flesh is of mediocre quality (Ref. 38587).

COREGONUS LAVARETUS



The gwyniad is a whitefish - a kind of land-locked herring. In Wales the only known population lives in the depths of Llyn Tegid (Bala Lake) in the Welsh Dee catchment. In recent years there have been concerns that eutrophication (over-enrichment by nitrates and phosphates running off the farmland around the lake) might threaten the survival of the gwyniad in this the largest natural lake in Wales. Environment Agency Wales,

Countryside Council for Wales, Gwynedd County Council and others have been developing a plan to reduce the input of these damaging chemicals to the lake.

Another threat to this rare species is the ruffe that have been introduced to the lake recently; these bottom-dwelling perch-like fish are quite likely to be eating some of the gwyniad eggs. The rare vendace (*Coregonus alba*) of Bassenthwaite Lake, in Cumbria, are similarly threatened now that ruffe have been illegally introduced also to that upland lake.

The Environment Agency Wales hatchery at Maerdy has been rearing gwyniad from Llyn Tegid stock; the idea is to help maintain the natural population until the waters of Llyn Tegid can be restored to a satisfactory standard

LOTA LOTA



The burbot (*Lota lota*) is a freshwater fish related to the cods. It is also known as the lawyer, and eel-pout, and closely related to the ling and the cusk. It is most common in streams and lakes of North America and Europe above 40°N latitude. They are fairly common in Lake Erie.

Burbot are the only freshwater fish that spawn in the winter, usually in late January.

In Britain, the burbot is possibly an extinct fish as it is believed that there have been no documented catches of the species since the 1970s. If the burbot does still survive in the UK, the counties of Cambridgeshire and Yorkshire (particularly the River Derwent or River Ouse) seem to be the strongest candidates for areas in which the species might yet continue to survive. There have been plans to re-introduce this freshwater member of the cod family back into British waters but these have yet to come to fruition.

Burbot are fair to good eating (recommended use is boiling), but rarely used as food, as most fishermen are put off by their "eely" appearance. The town of Walker, Minnesota holds an International Eel Pout Festival every winter on Leech Lake.

The genus and species name "lota" comes from "la lotte," the old French word for "codfish." The Inuktitut word for burbot was used to name the extinct species Tiktaalik.

PERCA FLUVIATILIS



The European perch (*Perca fluviatilis*) is a species of perch found in Europe and Asia. In some areas it is known as the redfin perch or English perch, and it is often referred to by the shortform perch. The species is very popular and has been widely introduced beyond its native area, into Australia, New Zealand, and South Africa.

European perch are greenish with red pelvic, anal, and caudal fins. They have 5-9 dark vertical bars on their sides.

European perch size can vary greatly between bodies of water; in Australia the fish are sometimes much larger than in their native Europe. The perch can live for up to 22 years, and older perch are often much larger than average; the maximum recorded length is 20 inches (51 cm) and the largest recorded weight is 10.4 lbs (4.75 kg).

The perch spawns at the end of April or beginning of May, depositing it upon weeds, or the branches of trees or shrubs that have become immersed in the water; it does not come into condition again until July.

LEPOMIS GIBBOSUS



The pumpkinseed (*Lepomis gibbosus*) is a species of freshwater fish. It is a member of the sunfish family (family Centrarchidae) of order Perciformes. It is native to northeastern North America, from New Brunswick to South Carolina, but has been introduced elsewhere in North America as well as throughout much of Europe.

These fish reach a maximum overall length of about 40 cm (16 in),

although sizes of 15–20 cm (6–8 in) are more typical. They normally weigh less than 450 grams (1 lb, although larger specimens are encountered). The fish present an oval silhouette and are very narrow laterally; it is their body shape, resembling the seed of a pumpkin, which got them their common name. The coloration includes (orange, green, yellow, or blue) speckles on the olive back and sides with a yellow to orange belly and breast. They have sharp spines and care must be taken in handling them.

Pumpkinseeds prefer shallow water with some weed cover. They are often found in ponds and small lakes, preferring water temperatures of 4–22 °C (39–72 °F). They are active during the day and rest near the bottoms during the night.

These fish reproduce rapidly and are low on the food chain. They eat a variety of insects, including mosquito larvae, along with small molluscs and crustaceans. They also feed on smaller fish, including smaller pumpkinseeds. These fish exploit the entire underwater region from bottom to surface. In turn, they provide food for fishing birds and mammals (including humans).

Sexual maturity occurs at age two. Males prepare nests in colonies on gravel bottoms in late spring. The males are territorial and chase even early-arriving females away. When a female reaches a nest, she is joined by the male, and eggs are deposited in a cloud of milt. The eggs settle and stick to the pebbles. This process may be repeated with other females because they depart as soon as they drop the eggs. Males guard the nests for many days, and the eggs hatch in a few days. The males continue to guard the offspring for about a week and then leave. Pumpkinseeds are known to interbreed with the closely-related bluegills, which resemble them in form and coloration.

The pumpkinseed, like other sunfishes, is very popular among anglers, especially the young, although less prized than its cousin, the bluegill. Pumpkinseeds feed all day and can be caught with live bait or lures. They actively fight the line as they are reeled in. When one finds a large school (kiv-land) which is in a feeding-frenzy, it is widely known as "kiv-mania". This species is regarded as a panfish due to its size and tasty edibility.

L. gibbosus is known by many other common names, including "punky", kivet, pond perch, sun bass, *crapet-soleil* (in Québec), yellow sunfish, and simply sunfish (or "sunny"). A common name

in the northeast is the kiver. The specific epithet, *gibbosus*, derives from the Latin *gibb(er)ōsus* (hunch-backed).

RUTILUS ERYTHROPHthalmus



The Rudd (*Scardinius erythrophthalmus*) is a small fish, a widespread member of the family Cyprinidae.

The rudd is a benthic-pelagic freshwater fish, widely spread in Europe and middle Asia, around the basins of the North, Baltic Black, Caspian and Aral seas. It has been artificially introduced to Ireland, USA, Morocco, Madagascar, Tunisia, New Zealand, Canada and Spain.

Morphologically, this species is very similar to the Roach (*Rutilus rutilus*), with which it can be easily confused. It can be identified by eye colour (deep blood-red as opposed to yellow) or counting the soft rays in the dorsal fin (8-9 compared to 10-12). Confusingly, these species can hybridise, producing intermediate forms. The rudd can also hybridise with the carp bream *Abramis brama*.

In New Zealand and Canada it is considered a pest fish due to impacts on native speci

ESOX LUCIUS



The Northern Pike (*Esox lucius*) is a carnivorous fish of brackish and freshwaters of the northern hemisphere. It is also known by the somewhat misleading folk-name, "Water Wolf."

Northern pikes are most often olive, shading into yellowish or whitish on belly with short, light barlike spots on body and some dark spots on the fins. The lower half of their gill cover lacks scales and they have large pores on their head and lower jaw. Unlike the similar-looking Muskellunge, the Northern pike has light markings on a dark body background and less than six pores on the underside of its jaw.

Pike grow to a relatively large size: lengths of 150 cm and weight of 25 kg are not unheard of. A non-metric measurement estimates the size of the Northern Pike as usually over 1' and running to over 4', with a weight of 50 pounds. There are reports of far larger pike, but these are either misidentifications with its much larger relative the muskellunge, or simply have not been properly documented and belong in the realm of legend.

Pikes are found in sluggish streams and shallow, weedy places in lakes, as well as in cold, clear, rocky waters. The pike generally hides in wait for prey, holding perfectly still for long periods, and is then capable of remarkable acceleration, sometimes propelling it a meter into the air (though it rarely leaves the surface). It catches its prey sideways with its sharp teeth, in order to kill it, before turning lengthwise to swallow. It eats mainly fish, but on occasion water voles and ducklings have also been known to fall prey to pike. It is moreover a cannibal and this cannibalism serves in maintaining stability in the pike population. Young pike have been photographed eating pike of a similar size. Northern Pike also feed on others of their kind, insects, and leeches. It has a tremendous appetite.

Releasing pikes into lakes where it has previously been unknown often has a significant impact on the local ecosystem. Trout populations in particular tend to drop dramatically. There are northern pike populations in Eastern New York, northern New England, most of Canada (though pike are rare in British Columbia), Alaska, the Ohio Valley, the Great Lakes basin and surrounding states, Missouri, and Nebraska.

Whilst a worthy adversary for any rod and line fisherman, pike are often caught and released by fishermen since its flesh is bone-filled. However, the larger fish can be filleted, and pike have had a long and distinguished history in cuisine and are popular in Germany, with historical references to its cooking going back as far as the Romans. Pike have very white, mild flesh, and are considered one of the best tasting freshwater fish. When eating pike, be sure to chew carefully, as their "y-bones" are not always easily visible.

Fishing for pike is very exciting with their explosive hits and aerial acrobatics. The pike are some of the biggest freshwater fish.

ANGUILLA



The common or European eel has a very unusual and fascinating life cycle. Adults have long, narrow bodies, with a continuous dorsal, anal and tail-fin. The skin is slimy, the lower jaw is longer than the upper jaw, and the scales are tiny or absent. The colour of adults depends on their age; they are often brown, black or olive-green with yellowish bellies. Some adults may be silvery (known as 'silver eels'); the lifecycle stages differ greatly in appearance.

Range

Found in the rivers of the North Atlantic, Baltic and Mediterranean Seas; it also occurs along European coasts from the Black Sea to the White Sea in Russia. Spawning takes place in the Sargasso Sea in the western Atlantic.

Habitat

Part of the life cycle is spent in the sea, and part in freshwater rivers. It is often common on the shore.

Biology The common eel has a fascinating life-cycle; it is a 'catadromous' species, breeding in the sea and migrating to freshwater in order to grow before returning to the sea to spawn. It is thought that all European eels spawn in the Sargasso Sea. The larvae, which look like curled leaves and are known as 'leptocephalli', drift in the plankton for up to 3 years, and are carried by the Gulf Stream towards the coasts of Europe. They then undergo metamorphosis into young eels; at this stage they are known as 'glass eels' because they are transparent. They become darker in colour and start to migrate up freshwater streams in large numbers; they are known as 'elvers' at this time and measure around 50 mm in length. The eels, now called 'brown' or 'yellow eels', grow in freshwater, with males and females spending 6-12 and 9-20 years in freshwater, respectively. Towards the end of this time, they become sexually mature; they turn a silvery colour and migrate back towards the sea on dark, moonless and stormy nights; during this time they are known as 'silver eels'. Upon returning to the sea, the common eel lives in mud, crevices, and under stones. Spawning occurs during winter and early spring in the Sargasso Sea. This is a very long-lived species with a maximum life span of 85 years.

This eel is predated upon by birds, including cormorants and gulls, as well as a number of species of fish. Remarkably, they can survive out of water for several hours on damp nights; they may travel overland on dark rainy nights

Threats

The population of the common eel is threatened at present, and eel stocks have declined in recent years. However, there is currently very little scientific knowledge of this species, which would aid its management. The threats facing the species are unknown, however, pollution, overfishing, habitat degradation, parasite infection and changes in climate have all been forwarded as potential causes of the decline

Conservation

The European Union is currently funding research that aims to halt the decline of the common eel population

TINCA



Tench are a widespread species of freshwater fish native to temperate Europe and Asia. Popular as an angling species, they have been introduced to a number of countries as a sports fish. Their omnivorous diet and tolerance of a wide range of environmental conditions has led to some countries labelling tench as an invasive species, due to concerns over competition with native fish.

Description

Tench are a heavy-built, thick-set fish with a small barbel at each corner of the mouth. Colour ranges from deep blackish-olive to pale golden tan, with a bright reddish eye. The body is slimy, with the small scales being covered by a thick layer of mucus. Very large specimens may reach 800 mm in length and 8 kg in weight.

Occurs in:

lakes, water courses, wetlands

Habitat description

Inhabits slow-moving, weedy waterways with muddy substrates. Found in streams, lake shallows and lagoons. Able to tolerate low oxygen concentrations and a wide range of temperatures, from 4 to 24°C. Often found amongst weeds or in deep holes.

General impacts

Impacts specific to tench are difficult to find, as this species is often lumped together with others

in the Cyprinidae family, such as koi and common carp. In Australia it is thought that tench may directly compete with trout and native fish for food resources. The ability of tench to survive in degraded environments causes some confusion, as it is unclear whether they contribute to this degradation or simply inhabit a niche that native fish cannot occupy. Most impacts are likely to be related to the wide range of organisms consumed by tench. An experimental study by Beklioglu & Moss showed that tench can increase periphyton (algal) biomass through selective predation on gastropods, which keep periphyton under control through grazing. This 'trickle-down' effect could have negative impacts on aquatic communities if it occurs to a significant extent in the wild. There is no evidence that they affect other fish directly, however, a number of studies have implicated them in water quality decline.

Uses

Highly valued as a sports fish by coarse fish anglers.

Notes

Becomes dormant in winter, staying in the mud without feeding

Nutrition

Consumes a wide variety of benthic organisms (crustaceans, insect larvae, midges), as well as aquatic snails, small fish and algae

Reproduction

External fertilization. Spawns during summer, releasing thousands to millions of tiny eggs (c. 1mm diameter) amongst aquatic weeds. Fry hatch in around a week

PERSICO TROTA

Micropterus salmoides



The largemouth bass is marked by a series of dark blotches forming a ragged horizontal stripe along the length of each side ("lateral lines"). It can also be totally black. The lateral lines are used by a largemouth bass as motion detectors to locate prey or avoid being prey at night or in other dark water conditions. The upper jaw of a largemouth bass extends beyond the back of the eye. The average largemouth bass weighs 1 to 2 pounds and between 8 and 18 inches long. The largest of the black basses, it has reached a maximum recorded overall length of 97 cm (38 in), and a maximum recorded weight of 22 lb, 4 oz (10 kg, 113 g). It can live as long as 23 years, and, along with the black crappie, is also known as the Oswego bass.

Largemouth usually spawn in shallow bays in the spring. Females can lay up to a million eggs during each spawn in a shallow depression in the ground formed by the male. The male will then

guard the eggs and the newly-hatched fry until they disperse, driving away any predators that come too close to the nest site.

Largemouth put up a very respectable fight for the sport fisherman, though many say their cousin species the smallmouth bass can best them pound for pound. Largemouth, though preyed upon by larger animals or other fishes when young, usually occupy the apex predator niche when older, which dignifies them with a level of sporting prestige as quarry. Largemouth are usually fished for with lures, and it is common amongst anglers to release them alive. Largemouth respond well to catch and release because of their hardiness, and the ability of their large mouth to withstand repeated hook injuries without compromising their ability to feed or damaging their gills.

The IGFA's officially recognized heaviest largemouth bass on record was caught by George Perry at Montgomery Lake in Telfair County, Georgia, on June 2, 1932, and it weighed 22 lb. 4 oz. (10.1 kg). This was surpassed in March 2006 when Mac Weakley, of Carlsbad, California, pulled a 25 lb. 1 oz. largemouth bass into his fishing boat. [1] However, the bass was not hooked in the mouth, was weighed on an uncertified hand-held digital scale, and then released, placing its' official recognition by the IGFA as the new world record in an ongoing dispute.[2]