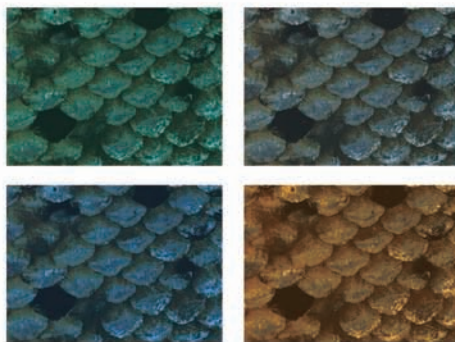


FISH AND FISHING IN KARELIA

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CHARACTERISTICS OF THE FRESHWATER FISH FAUNA OF KARELIA

Karelian waters belong to drainage basins of two seas: the Baltic and the White Sea. The watershed between them runs across the central part of the republic. The hydrographic network is made up of numerous rivers and lakes grouped together into lake-river systems. The republic comprises nearly 50% of the water area of Lake Ladoga and 80% of Lake Onega, which are the biggest freshwater bodies in Europe. If lakes Onega and Ladoga are included, the lake cover of the territory (the ratio of the surface area of all lakes and the land area) is 21%. This is one of the highest values in the world.

Migratory and salt-water fishes in Karelian waters are of marine origin, and the rest are of freshwater origin. Colonization of the region by freshwater fish fauna proceeded from south to north as the glacier was retreating. More thermophilic species (cyprinids, percids, etc.) colonized the waters some 10000 years B.P., and cold-loving species (salmons, chars, whitefishes, etc.) – even earlier.

Contemporary freshwater fish fauna in Karelia comprises 44 fish species, excluding the typically marine species that enter the lower reaches of the rivers emptying into the White Sea (European plaice, Arctic flounder, navaga), farm-reared species (pink salmon, common carp, rainbow trout, longnose sucker, muksun, Arctic cisco, broad whitefish, northern (peled) whitefish, nelma/inconnu), as well as some accidental species (European flounder).

The fish fauna is the richest and most diverse in the Lake Ladoga catchment. All the 44 fish species known for Karelia occur in this catchment. Lake Onega catchment is inhabited by 36 species (missing species such as belica, vimba bream, asp, and weatherfish). Over 20 fish species live in each of lakes Syamozero and Vodlozero. Large lakes in northern and central Karelia are each inhabited by 13–17 fish species. A great majority of lakes harbour 7–12 species, and many small lakes have just 1 to 5 species.

We can see that the diversity of fish in Karelia is largely due to the rich fish fauna of Ladoga and Onega lake catchments. The similarity between the fish faunas of these lakes arises from their pertinence to the same aquatic system of the Baltic Sea drainage basin. Lakes of the White Sea drainage basin lack some species, such as spined loach, weatherfish, eel, some cyprinids. Generally speaking, the cyprinid family dominates in lakes of Karelia.

The most widespread are perch, pike and roach, which live in least 90% of lakes; ruff is present in 75%, burbot – in 60%, vendace, whitefish, bream and ide are found in nearly every third lake. The various combinations of these nine species shape the fish fauna of most lakes in Karelia.

Fish species in Karelia can be conventionally clustered into three major groups: northern psychrophilic (cold-loving), relatively thermophilic, and wide-ranging.

The first group comprises the salmon, brown (sea) trout, lake char, vendace, whitefish, grayling, smelt, burbot, fourhorn sculpin, river and brook lampreys. Members of the second group are the blue bream, white bream, chub, tench, ziege, rudd, gudgeon, crucian carp, spined loach, Wels catfish, pike-perch and bream (the northern limit of their distribution ranges runs across Karelia). The third group includes the pike, roach, dace, bleak, minnow, three-spined and nine-spined sticklebacks, perch, ruff, and bullhead.

As regards the breeding season the species can be spring spawners (pike, smelt, perch, roach, grayling), summer spawners (bream, bleak, ruff, ide, dace), autumn spawners (salmon, brown trout, Arctic char, whitefish, vendace) and winter spawners (burbot).

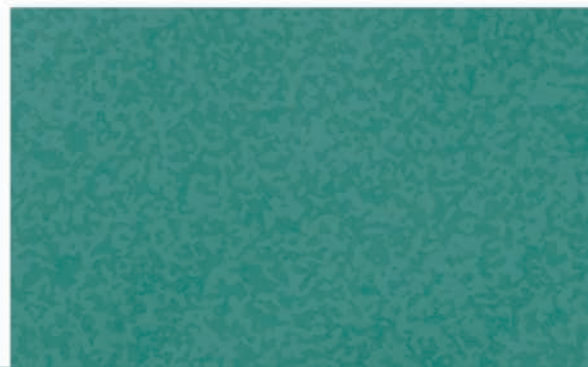
The rare, endangered and regionally red-listed species are sturgeon, landlocked salmon, brown trout in the Baltic Sea drainage basin, chub, rudd, asp, tench, belica, vimba bream, ziege, spined loach, Wels catfish, Alpine bullhead. Fishing for these species is prohibited.



The Pulonga River, Louhsky District



Whitefish from Lake Syamozero





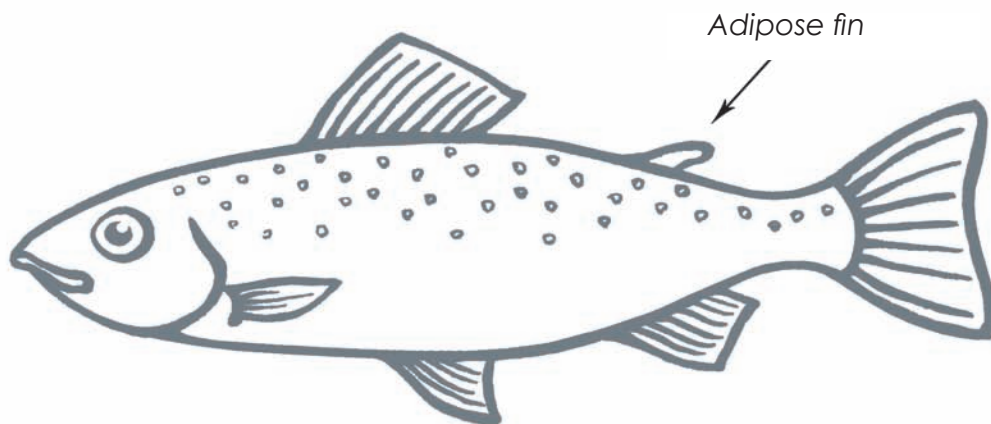
ATLANTIC SALMON

A pinnacle of the Karelian fish fauna is the Atlantic salmon. There are the sea-going and the landlocked forms of salmon in the republic. In fact, the only region in Russia where independent populations of landlocked salmon have survived is Karelia. Sea-going salmon can be found in relatively small rivers flowing to the White Sea (Nilma, Pulonga, Keret, Gridina, Kalga, Sig-reka, Vonga, Kuzema, Pongoma, Letnaya, Kem, Shuja, Vyg, Kuzreka, Suma, Kolezhma, Ruiga, Nyukhcha), and landlocked salmon – in lakes Ladoga, Onega, Janisjärvi, Segozero, Kuito (Upper, Middle, Lower), Kamennoye, Nyuk.

The life cycle of the Atlantic salmon falls into two periods: river- and lake-based (or sea-based). Both landlocked salmon and migratory salmon from the White Sea ascend rivers for spawning. The spawning time is autumn, when water temperature is 2–6°C. The female digs a nest in the bottom to lay the eggs, and then covers the fertilized eggs with gravel to form a redd. In spring, eggs develop into larvae, and late in June the larvae become fry. The fry move to river rapids to stay there for 2–4 years. The duration of stay in the river for juvenile salmon varies depending on the geographic location of the river. The average duration of the river-based period in the Onega and Ladoga catchments is 2–3 years, in the White Sea catchment it is up to 4 years. After that, the parr change their spotted camouflage for a silverish coat (smolts) and migrate to lakes or the sea. The following foraging period lasts for one to four years, and then adult salmon return to rivers to spawn.

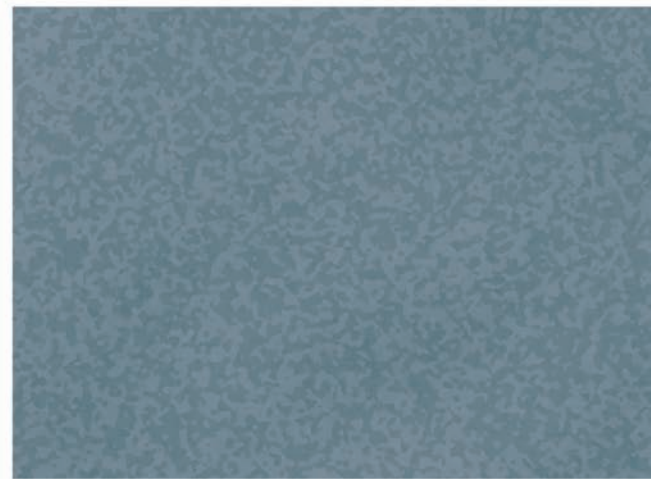
Landlocked salmon can weigh up to 13–15 kg, sea-going salmon – up to 16 kg. The life span of the species is 13–15 years.

The Atlantic salmon is one of the most valuable members of the Karelian fish fauna, a target for sport fishing and fish farming. Landlocked salmon populations in lakes of Karelia are listed in the Red Data Book of the region, except for the Shuja River population, which reproduction is maintained artificially. To enable distinction between wild salmon (which must be released) and hatchery-reared salmon (licensed fishing allowed in Lake Onega), the adipose fin in hatchery-reared fish is cut off.





Salmon from the Kamennaya River system, Kostomuksha Municipality





FISHING AND FISHERIES

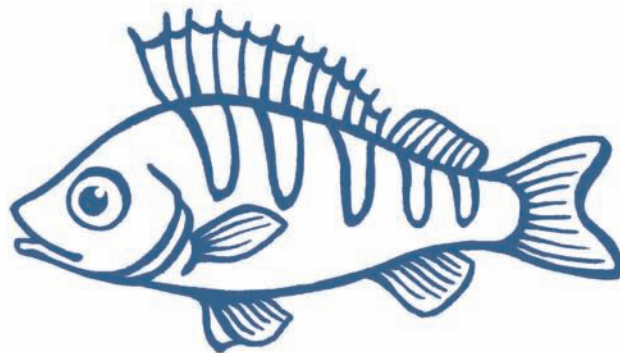
Richness in aquatic resources stimulated the development of fisheries in Karelia. Commercial fishing takes place in lakes Onega, Ladoga, Vygozero, Vodlozero and some others. Its main targets are vendace, smelt, pike-perch, perch, bream, pike, burbot, roach, ruff. Many lakes of Karelia are not used for fisheries because of their remoteness from settlements.

Amateur fishing is very widely practiced in Karelia. Specialists have estimated the harvesting volumes of freshwater amateur fishing not subject to licensing at 550 tons a year. Nearly a half of the volume is harvested during the ice fishing season.

All citizens are allowed to practice amateur and sport fishing for personal use on most waterbodies in Karelia, given that Fishing Regulations are fulfilled. In the current Regulations such waters are termed 'public use waters'. To fish in allocated fishery areas and waters with fish-centered designated use, amateur fishermen should carry along a fishing license and ID.

Fishing in other waterbodies and in certain time periods may be restricted. Thus, fishing is prohibited during spawning and in spawning grounds, in commercial netting areas, at hydro-engineering facilities, etc. Fishing from aboard unregistered vessels is not allowed. Fishing with nets is subject to certain regulations. The position of nets should be properly marked out on the water surface; nets must not be left deployed in the water for more than 2 days in the summer, more than 3 days in the autumn, and more than 7 days in the ice fishing season. Information about prohibited fishing areas, fishing seasons and fishing gear in Karelia is set out in detail in the Fishing Regulations available at <http://fish.gov.ru>.

The stocks of valuable fish species in many waterbodies of Karelia have been declining over the past decades, contradicting the sustainable fishery practice of regulating species abundances to maintain their self-regeneration capacity. The 'catch & release' practice that has become common in amateur and sport fishing in many Western countries proved to be very difficult to plant in our country. Anyhow, a sensible approach should be adopted in fishing. Whenever rare and red-listed fish species or juvenile fish are caught, they should be released back into the water. One should be guided by the 'reasonable sufficiency' principle rather than fish and store – occasions when a rich catch has been lost to spoilage are numerous.





Commercial fishing on Lake Syamozero



Commercial fishing on Lake Syamozero



Amateur fishing



Amateur fishing





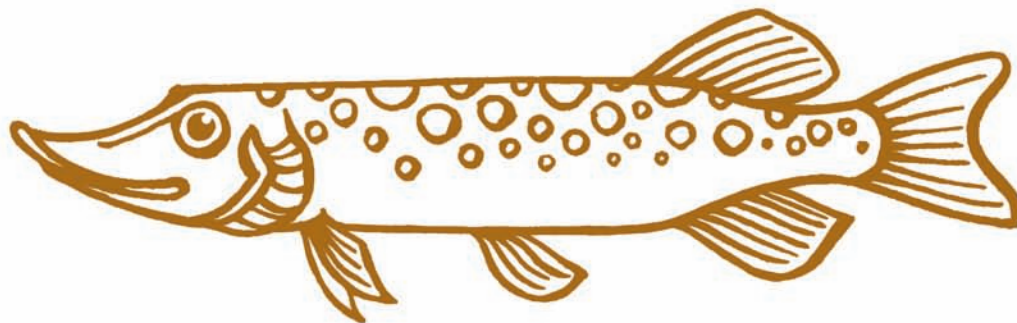
HOW TO COOK FISH

One of the ways to cure fish is dry salting. Preparing fish for salting should be handled carefully. Put the fish on even surface belly towards you. Cut the belly lengthwise with a sharp knife and remove viscera and gills. Make sure the gall bladder, situated on the inner side of the liver, is left intact. Otherwise the spilt bile will stain the flesh making it greenish and bitter. Rinse the eviscerated fish thoroughly in cold water.

After the water had drained off, make a shallow cut on both sides along the backbone, and then rub salt amply onto the fish, including the inner surfaces and the cuts. It's best to use coarse salt, which will dissolve at a slow rate eliminating moisture from under fish skin for a better result. Fine salt will not create the same effect. For the fleshy parts to get salted quicker and more evenly make several punctures on the inner side of the body with a wooden pin. The amount of salt is 25%, and in hot weather up to 30% of the fish weight. The thus prepared fish is stacked into a container belly up. This method of salting requires curing under weight. Watch for the quality of the brine forming during salting. If it turns sour, rinse the fish in fresh-made salt brine, move it to a clean container and pour in concentrated brine to cover the fish. The fish will be ready in 8–12 days.

Thinking of the time allowed for salting one should remember about the possibility of the fish being infected with parasites. The only fish parasite dangerous to man is the broad tapeworm, which can be picked up from pike, burbot, perch and ruff if one eats their raw or poorly salted (roasted) flesh or caviar.

An interesting culinary method is open fire cooking of fish. Bigger individuals make a better choice for that. An incision is made at the gills, and the fish is left to hang head down for five minutes to bleed. The belly is then cut open, and viscera and gills are removed. Before moving on, the fish is rinsed and wiped dry with paper towels. The fish is split along the backbone with a sharp knife to 'butterfly' it, and the backbone, ribs and small bones are removed. Salt is poured evenly all over the fillet, and actual cooking begins in 1–3 hours. The fillets are once again soaked with paper to remove extra salt. The fillet is pinned to the upside of pinewood tablets using birch (or regular) pins. The tablets are arranged vertically (tilted away from the fire) in a circle around the fire and propped up with stones. The fish will be cooked slowly, making the flesh sappy and delicious.





Filleted fish for open fire cooking



A typical catch from Karelian waters



INFORMATION OF PROJECT

The brochure was published as part of the international project «Intellectually driven management of natural resources of Green Belt of Fennoscandia – IntellGreenBelt» implemented within the Karelia Cross-border Cooperation Programme co-funded by the European Union, the Russian Federation and the Republic of Finland..

The project pilot areas (Muezersky and Kalevsky Districts, Kostomuksha Municipality and adjacent Finnish areas) lie within the Green Belt of Fennoscandia (GBF).

GBF is a territory stretching along the Russian-Finnish-Norwegian border with operating and planned protected areas (PAs) of different ranks as its core areas. This unique piece of nature is of pan-European value from the ecological, conservation and recreation points of view.

The overall objective of the project is to contribute to socio-economic development of the Green Belt of Fennoscandia by creating the system of sustainable use and enhanced reproduction of natural resources (hunting, fishing, tourism, recreation). An essential task for the project has been to assess the available fish resources, as well as to produce information materials for a wide audience.

Project lead partner: Karelian Research Centre of the Russian Academy of Sciences (KarRC RAS)

Project partners in the Republic of Karelia: Institute of Biology of KarRC RAS, Forest Research Institute of KarRC RAS, Muezersky Municipal District Administration, Kostomukshsky Strict Nature Reserve, Directorate of Regional Protected Areas of the Republic of Karelia, Hunting Farm Black Stones LLC.

Project partners in Finland: Finnish Environment Institute (SYKE) Joensuu Office, Future Missions Oy (non-profit company), Centre for Economic Development, Transport and the Environment for North Karelia.

intellgreenbelt.krc.karelia.ru



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