



Lake Sapojok. G. Markevich

Plotnikova River is currently facing extinction as well. Meanwhile, in the 1980s relict charrs were still numerous in both lakes and grew to half a meter, being as dominant predators.

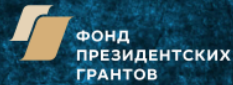
At the end of 2017 the relict Kamchatkan Taranetz charr was included in the regional Red Book by Kronotsky Natural Reserve. However, responsible attitude to local nature with its unprecedented richness remains the only hope to preserving these populations.

G. Markevich, E. Esin



Kamchatkan lakes populated with the relict Taranetz charr. G. Markevich

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КРОНОЦКИЙ
ЗАПОВЕДНИК



THE LACUSTRINE CHARRS OF KAMCHATKA.
RELICTS OF THE LAST ICE AGE



Lake Kopyl'ye. G. Markevich

GLACIAL FAUNA

The peculiar diversity mosaic of fish fauna in the Northern latitudes was shaped by multiple glacial age cycles clearly visible in the last two millions of years and promoting revolutionary environmental transformations throughout the northern hemisphere. Some cold-water species which expanded deep to the south during the periods of cooling turned out to be locked in the coldest sites during later warmings.

Such mutually isolated populations found beyond the southern border of the species' main range are known as the glacial relicts. To adduce just a couple of examples: the landlocked populations of riverine brown trout in North African and Central Asian mountain districts or the lacustrine populations of sockeye salmon in the Japanese archipelago.

The modern range of lacustrine Taranetz charr (genus *Salvelinus*, of the salmonid family) in the North Pacific is a notable example of southward expansion of cold-water species which is duly brought to the limelight here.

Nowadays in a comparatively warm period, Beringia and the Canadian Arctic form the core of its habitat. Relict populations inhabit the lakes of the Alaskan Peninsula and Kodiak Island.

NEW FINDINGS

A number of previously either unknown or poorly described populations related to the Taranetz charr have recently been discovered in small glacial mountain lakes on the Kamchatka peninsula and the continental coast of the Okhotsk Sea. It has been found out that anadromous charrs fostered south at the end of the last Ice Age. Their descendants have been isolated from each other in deep cold-waterbodies. The high temperatures prevent them from migrating to the sea.

LACUSTRINE RELICTS BIOLOGY

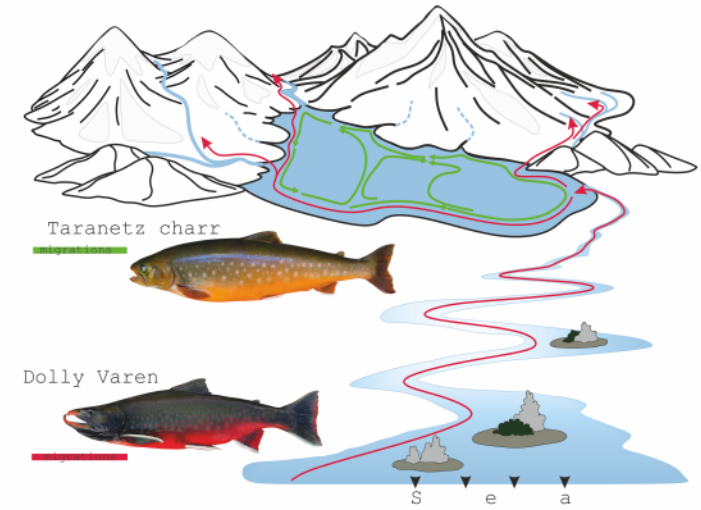
Lacustrine charrs are characterized as piscivorous feeding mostly on sticklebacks and Pacific salmon juveniles. Sometimes older individuals become cannibals. Juveniles kept at depth and feed on invertebrates. The Taranetz charr is defined by long lifespan (up to 17 years), late maturation (at the 6-7th year of life) and small population number. In some lakes fish grow up to 60 cm and 3 kg. Spawning takes place in winter under the ice cover.



Lacustrine charr in breeding dress



Lacustrine charr in summer colouration



Charrs life tactics. G. Markevich

The lacustrine relicts can be easily distinguished from the indigenous Dolly Varden and white-spotted charr by their low caudal peduncle and a deeply forked caudal fin. On the palate the bunch of teeth is present, and not one or two rows of teeth. Behind the stomach, on average, 40-50 pyloric caeca are located on the intestine, while only 20-30 such appendages are present in Dolly Varden and white-spotted charr. The differences become particularly visible during spawning, when the body of the relict charr turns bright red or yellowish. That is why, along the Russian north they are called "paliya" that means something of a highly contrasting colour as well as saturated.

PROTECTION MEASURES

The Taranetz charr is particularly vulnerable to anthropogenic influence. Apart from the alarming impact of global warming thus considerably overheating the glacial lakes, the greatest threat comes from unregulated fishing and poaching. The sustainable improvement of transport have led to an increasing pressure from recreational fishing. The southernmost relict population on Earth from Lake Dal'nee in the vicinity of Vilyuchinsk - once described as a separate species due to its unique characteristics - has lately been destroyed by overfishing. The population from Lake Bolshoy Sokoch in the upper reaches of the

E. Esin

