ENDEMIC SPECIES

The yellowmouth charr, whose origin and evolution are closely connected with this region, also inhabits the Penjina River basin. It spawns on the vast permafrost fields in the upper course of the river. These specific reproduction conditions in Northern Asia were observed only on Kolyma Uplands. The yellowmouth charr with lacustrine lifestyle was first found in the headwaters of the river in 2019.

Yellowmouth charr
(Salvelinus levanidovi)

The second unique species is the Penjian omul which originated from the vendace of the earliest migration wave as a result of a long-term evolution. The omul implements a freshwater life tactic and occurs in floodplain lakes of the lower and middle course of the river migrating to spawn in the main channel.

Penjian omul
(Coregonus subautumnalis)

RARE SPECIES CONSERVATION

The subtle mosaic of fish diversity in the basin turned out to be extremely sensitive to anthropogenic impact. The uncontrolled catch in 1990s significantly undermined the stock of broad whitefish, Penjian omul and vendace. In conditions of high interspecific competition, when some species decrease, they immediately get replaced by other species. This feature poses a major threat to fauna if human impact on natural processes intensifies. Thanks to the efforts of the Kronotsky Reserve, Penjinian whitefishes and the unique endemic yellowmouth char are listed in the Red Book of Kamchatka Krai. However, efficient conservation of fish communities requires additional measures to be taken including control of local fisheries and protection of spawning sites.

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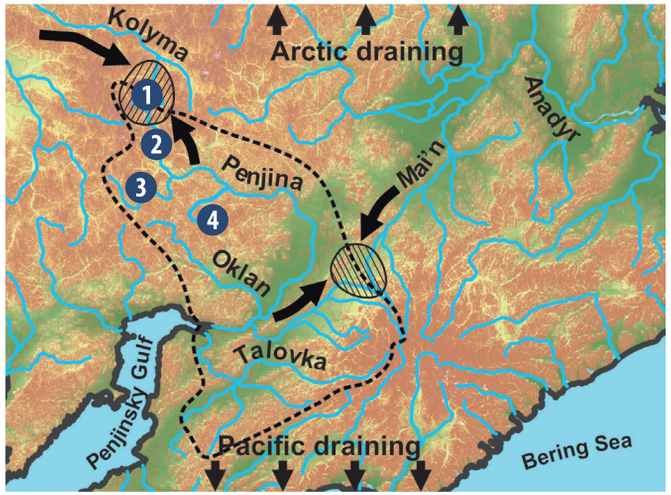
KRONOTSKY RESERVE

FAUNA OF THE PENJINA RIVER: THE BEST OF BOTH WORLDS

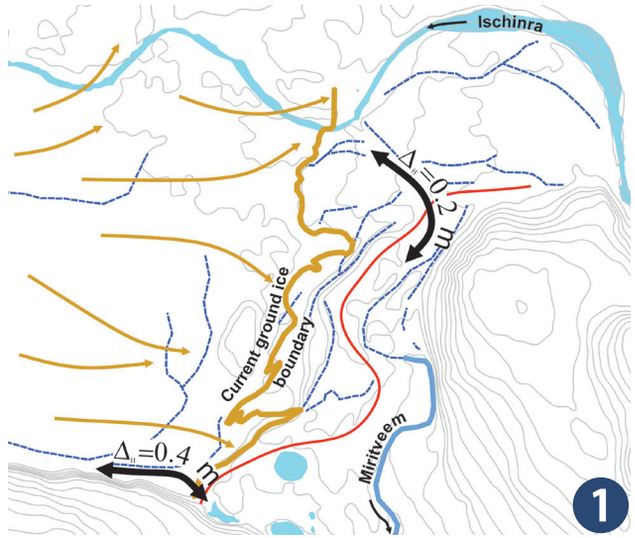
THE ORIGIN OF THE BASIN



The Penjina is one of the largest rivers in the Far East located in the north-west of Kamchatka Krai between the peninsula and the mainland. The river basin was formed about 2.5 million years ago when the Penjino-Anadyr watershed lifted and changed the direction of the catchment flow from the Bering Sea to the Sea of Okhotsk. The river did not dry out during all the Quaternary glaciations remaining one of a few refugia where the freshwater fauna of the region lived. Multiple settlements from the Arctic, Beringia and the south together with the age of the river network brought about a unique community of fish in the basin. Tracing the origins of local fauna may tell a lot about the history of the entire Far East. Still, the region remains poorly studied, in particular, zoogeographic surveys have not been conducted at the headwaters of the river, and the fauna of most lakes in the basin has remained unknown until recently. In 2019, under the auspices of the Kronotsky Nature Reserve and with the support of the Presidential Grants Fund, a large-scale study of the upper course of the Penjina was conducted. Thus, the structure of the local fauna has been revealed and new previously uncharacterized groups of fish have been discovered.

THE BASIN'S FAUNA AND ITS ORIGIN

The unique fish fauna of the river consists of several complexes which settled here in different geological ages. The most ancient species dwelling in the river before it separated from the Anadyr include Siberian bullhead, pike, burbot, minnow, and grayling. These fishes inhabit the river, and in the upper course they prevail in the main channel, tributaries and lakes. When the glaciers melted, temporary water corridors appeared on low marshy watersheds between the Penjina, the Anadyr and the Kolyma rivers. These routes allowed some fish species to migrate southwards from the Arctic, Beringia and Siberia. Taking the scale of such a «leap» it would be like moving to another galaxy. The whitefishes – humpback whitefish, broad whitefish, vendace, and round whitefish, which colonized the area, inhabit only the Penjina River basin and several neighboring watercourses within the Sea of Okhotsk catchment. The third group includes typical anadromous fishes of the North Pacific such as Pacific salmons (chum, humpback and silver salmon), charrs (Dolly Varden, whitespotted charr), sticklebacks (threespine and ninespine), and smelts (pond and rainbow). They form the basis of the Kamchatka and the Magadan coast fish fauna. The anadromous fishes settled the area through Shelikhov Gulf of the Sea of Okhotsk. A typical representative of the Arctic fauna, Taranetz charr, has recently reached the cold-water lakes of the basin through temporary streams of intermountain hollows. A relict population of this species was found in Lake Karovoe. According to the survey data, Taranetz charr is also present in the lake system at the headwaters of the Belaya River.



Runoff direction
Direction of the ground ice
Temporal water paths
Ancestral water channels
Watershed crest
Δ_{11} Elevation difference between basins