



Ruffe

Gymnocephalus Cernuus (Linnaeus, 1758)
syn. *Gymnocephalus cernua*, *Acerina cernua*, *Perca cernua*

ALBERTA REGULATION:
FISHERIES ACT

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Overview:

The ruffe is a freshwater, ray-finned fish belonging to the perch family; it is native to Europe and Asia, found near the Arctic circle down to the Black and Caspian seas.¹ This fish is undesirable for human use throughout its range, so introduction to other areas is thought to be accidental; for instance, it was used as bait in Europe and introduced via ship ballast water in North America.¹ Ruffe were first discovered in Lake Superior in 1987 and have since colonized the rest of the Great Lakes and surrounding tributaries.¹

Ruffe bear all the hallmarks of a successful invader: quick maturity, high reproductive capacity, multiple spawning, widely adaptable and have a varied diet.¹ Ruffe also tolerate a wide range of environmental conditions.¹ Additionally, their sensitive lateral line system (used to detect movement and vibrations in the water) combined with night adapted vision makes them very effective foragers in poor light conditions.⁴

Ruffe have sharp spiny dorsal and anal fins, which tends to discourage predation, as well as a highly sensitive lateral line to detect predators.¹ However, in North America, northern pike, burbot, lake trout, smallmouth bass, walleye, and yellow perch prey on ruffe.¹

Ruffe are similar looking to young walleye, yellow perch, and trout perch but can be distinguished by glassy eyes, downturned mouth, spiny and fused dorsal fins, sharp spines on the anal fins, rows of dark spots between the spines, gill covers, and no scales present on the head.⁵

As of January 1, 2016, the possession, sale, or transport of this species in Alberta is illegal under the Fisheries Act.

Habitat:

Ruffe are bottom-dwellers but can tolerate a wide degree of water temperatures, oxygen concentrations, substrates, salinities (up to 10-12 ppt), and depths (up to 85 m).¹ They can inhabit still or flowing water, nutrient-

poor to nutrient-rich, dark, turbid waters. Ruffe prefer slow-moving water with soft bottoms and no vegetation; populations tend to increase with eutrophication of a water body.¹

Identification:

The ruffe body is slimy when handled,¹ oval in cross-section and total length is typically less than 20 cm. Body colour is olive-brown to golden-brown on the back and yellowish-white undersides. The eyes are glassy, the head is narrow, and the mouth is slightly downturned.¹

Ruffe have two dorsal fins, one spiny, which are fused with no notch between them. The dorsal fin has 12-19 spines followed by 11-16 soft rays. The rays bear rows of dark spots between the spines.¹ The anal fin has 4-7 rays, the first two bear sharp spines. The caudal fin has 16-17 rays and the pectoral 13-17 rays. There is one opercular spine and 7-16 preopercular spines.¹

The lateral line bears 33-42 scales with 10-



Ruffe *(continued)*

18 scales below and 5-10 scales above the line. Ruffe have 31-36 vertebrae. There are 6-14 gill rakers on the first arch. The bony rays support the gill membranes behind the lower jaw (branchiostegal), which have 6-7 rays.¹

Ruffe morphology varies somewhat between waterbodies. Sexual dimorphism is weak in the ruffe and females are only distinguishable generally during spawning, having enlarged bellies.¹

The common length of ruffe is 12 cm, maximum reported length 25 cm, and maximum weight 400 grams. Males live up to 7 years and females to 10 years.³

Ecology:

Sexual maturity is reached by 2-3 years of age with body lengths of approximately 11-12 cm, but ruffe can mature by age one. First spawning occurs at water temperatures between 6-20°C, followed by a second batch, typically within 30 days. Spawning occurs over plants, logs, sand, clay, or gravel at depths less than 3 m.¹

Female ovaries contain three types of eggs: small and colorless; larger and opaque with a white to pale-yellow to yellow-orange color; and lastly, large, glassy, translucent eggs with a yellow-orange color. However, females typically do not release the small and colorless eggs, but rather the other two types.¹ Females can release between 4,000 and 200,000 eggs on first spawning, and 350 to 6,000 on the second spawn. Eggs are sticky, 0.34-1.3 mm and hatch in 5-12 days at temperatures of 10-15°C.¹

Embryos are 3.3-4.4 mm and remain at the bottom for 3-7 days until a size 4.5-5 mm when the yolk sac is absorbed. Survivability is decreased at water temperatures below 10°C.¹

Juveniles feed on zooplankton and switch to small crustaceans after reaching 1 cm in total length.¹ Whereas, adults feed on fly larvae, leeches and macrocrustaceans like mayflies and caddisflies; they will also eat small fish.¹

Economic Impacts:

Ruffe compete directly with native fish for food and habitat.¹ The decline of native sportfish or commercial fish populations could have impacts on industry, recreation and tourism.

Environmental Impacts:

Ruffe compete directly with native fish for food and habitat.¹ Egg predation negatively impacts native fish populations. Ruffe have a competitive advantage over other bottom fish due to its unique adaptation of lateral line and vision, as well as its aggressive feeding habits.² Ruffe are able to thrive in wide variety of habitats, which out-competes other species with narrow ecological requirements.²

Sociological Impacts:

The transformation of native aquatic communities results in the intrinsic loss of natural capital and enjoyment of natural areas.

Prevention:

Learn how to identify ruffe and how to prevent spread. Do not use ruffe for bait and do not dispose of unwanted bait in water bodies: accidental bait releases are responsible for ruffe introduction and spread. Inspect your boat, trailer, and equipment after use and clean, drain and dry it of all debris. Leave debris at the site or bag and dispose of in landfill-bound garbage. Never empty your aquarium into natural water bodies.

In the Great Lakes, St. Lawrence Seaway area, a cooperative ballast water management program is in place to prevent introduction and spread of invasive species. A Fisheries and Oceans Canada study published in 2011 found that since the 2006 regulations, no new introductions have been attributed to ballast water.⁶

Control:

Currently, there are no established control options for ruffe other than preventing introduction and harvesting by fishing. If caught, ruffe should be killed and not released.

Control by stocking predator species failed in Europe as the predators preferred native fish over the ruffe.²



Ruffe (continued)



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Illustration by Joe Tomelleri

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