TECHNICAL NOTES

U.S. DEPARTMENT OF AGRICULTURE WYOMING SOIL CONSERVATION SERVICE

Biology No. 311 January 1986

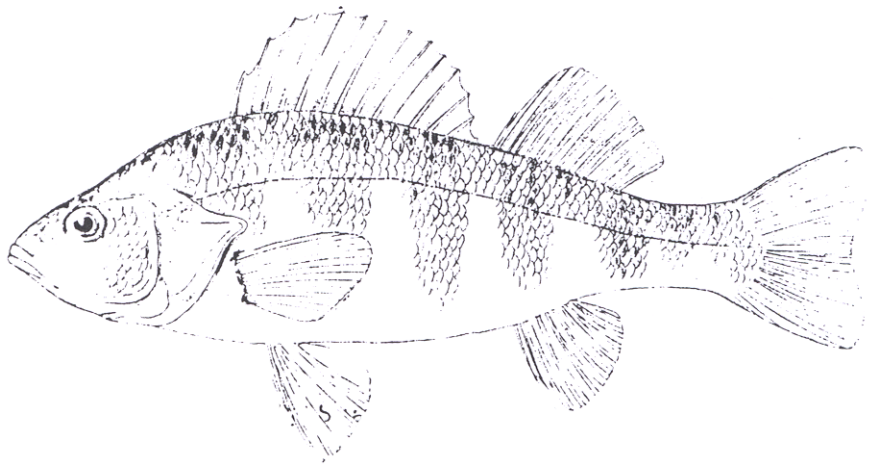
Subject: YELLOW PERCH*

General

The native distribution of yellow perch (Perca flavescens) extends from Nova Scotia south to Georgia and west to the Mississippi and in Canada across Ontario, central Manitoba, and Saskatchewan to Great Slave Lake. The range has been extended by introductions to include areas in the United States south to Florida and Alabama, most states west of the Mississippi to the Pacific Coast and as far north as British Columbia.

Age, Growth, and Food

In Canadian and northern United States waters, female yellow perch mature at 3 to 4 years of age, one year later than males. Maximum age is usually 9 to 10 years. Few fish live longer than 5 years in southern reservoirs.



Prepared by: Richard Rintamaki, State Biologist

State Resource Conservationist

*Information taken from Ecoregion M3113 Handbook and Habitat Suitability Index Models, Wildlife Species Narratives (literature searches), U.S. Fish and Wildlife Service, various dates between 1978-1984.

Yellow perch larvae (6 mm) feed on copepod nauplii, cyclopoid copepods and cladocerans, including Diaptomus and Diaphanosoma. Fry survival, and ultimately year-class strength, are dependent on a plentiful supply of zooplankton at the onset of feeding. Turbidity may lower visibility of prey and restrict zooplankton to upper water strata where they are unavailable to feeding young. After becoming bottom dwelling in the littoral areas, juveniles feed on amphipods, ostracods, and chironomid larvae. Larger yellow perch (120 mm) prey on aquatic insects, fish, and crayfish. One study concluded that the composition of the diet is determined more by the relative availability of different prey types than by preference for certain prey types.

Reproduction

Yellow perch begin spawning migrations from deep water into tributaries, lake shallows, or low velocity areas of rivers from April to June when water temperatures reach 7° to 13°C. Photoperiod, rising water temperatures, and/or completion of maturation may trigger spawning. Adults must be exposed to an extended period of cold water temperatures to ensure ripening of eggs. A winter minimum temperature of 10°C is near the upper limit of maturation of gonads.

The female releases a gelatinous, semibuoyant string of eggs near aquatic or inundated terrestrial vegetation. Rocks, sand, or gravel may be used if submerged vegetation is not available. There is no parental care.

Year-class strength is positively correlated with the rate of warming during incubation and hatching. Rising water levels during spawning season in Missouri River reservoirs led to large year classes due to increased inundation of terrestrial vegetation.

Specific Habitat Requirements

Yellow perch are frequently associated with shoreline (littoral) areas in lakes and reservoirs where there are moderate amounts of vegetation present. These areas provide both cover and spawning habitat. Suitable riverine habitat resembles the lacustrine habitat; i.e., pools and slack water areas with moderate amounts of vegetation (>20 percent of area).

Several laboratory and field studies have examined winter dissolved oxygen (D.O.) requirements of yellow perch and determined that levels from 0.2 to 1.5 mg/l are lethal. At a summer temperature of 26°C, D.O. concentrations below 3.1 mg/l were lethal. Because these studies were of a short duration (<5 days), it is concluded that a D.O. level of 5 mg/l would be the lower optimum limit.

Yellow perch are found in brackish water at river mouths (up to 13 ppt in Chesapeake Bay) and in Manitoba lakes with salinities as high as 10.3 ppt. However, they require fresh water for spawning.

In general, yellow perch are most common in clear water and numbers decrease with increasing turbidity. Yellow perch are found in Ontario

lakes with a pH range from approximately 3.9 to 9.5. Yellow perch are relatively tolerant of low pH, but reproductive success if reduced in lakes with pH 5.5.

Adult. Preferred temperatures of adult perch during the growing season are between 17.6° and 25.0°C with 19° to 24°C being optimum. Growth is initiated at 6° to 10°C. The upper lethal summer temperature is 32.3°C.

Yellow perch adults can be found in moderate currents, but prefer sluggish currents or slack water habitat, particularly during spawning.

Embryo. Yellow perch egg strands are broadcast in water depths of 1.0 to 3.7 m. Minimum winter water temperatures (4° to 10°C) should be maintained for 145 to 175 days to allow for normal gonadal development of adults so that viable gametes will be produced. Two researchers reported that 7° to 20°C was the temperature range for embryo incubation and hatching. Temperatures of 10°C increasing 1°/day to 20°C are optimum for embryo development.

Spawning occurs in low (<5 cm/s) current velocities. Velocities above 25 cm/s have been found to fragment egg strands in the Klamath River, California.

A moderate amount of vegetation in littoral areas (either aquatic or flooded terrestrial) is important for spawning and cover. Reduction in water levels during spawning may lead to desiccation of eggs. Drawdown of mainstem Missouri River reservoirs resulted in the elimination of inundated terrestrial vegetation used for spawning and a corresponding decrease in perch abundance. Hatching success may be higher in areas of sparse aquatic vegetation than in areas of very dense vegetation.

Fry. Perch fry are susceptible to a number of environmental factors which affect year-class strength. Fry tolerate temperatures from 3.0° to 28.0°C, but they are inactive below 5.3°C, and survival is better at 20°C than at 10°C. Young fry (before swim bladder formation) have a tendency to move to warm water areas.

Fry move to open water during the first two months of life. Larvae (<9.5 mm) are unable to maintain position in current 'velocities greater than 7.5 cm/ s. One researcher determined that larval survival and wind velocity are inversely related.

Juvenile. Habitat requirements of juvenile perch are similar to those of adults. Temperatures selected in summer months are in the range of 20° to 23°C. This range is slightly higher than that for adults, and juveniles can be expected to inhabit slightly shallower water. The ultimate upper incipient lethal temperature for yellow perch between 29.20 and 35°C.