

TECHNICAL NOTES

U.S. DEPARTMENT OF AGRICULTURE WYOMING SOIL CONSERVATION SERVICE

Biology No. 300

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Subject: BLACK CRAPPIE*

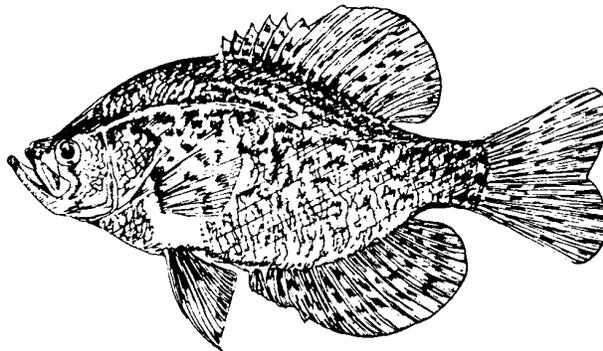
General

The black crappie (Pomoxis nigromaculatus) is native to freshwater lakes and streams from the Great Lakes south to the Gulf of Mexico and the southern Atlantic states, north to North Dakota and eastern Montana, and east to the Appalachians. It has been widely introduced outside this range throughout North America.

Age, Growth, and Food

Black crappie can live up to 13 years and reach maximum sizes of 559 mm and about 2,270 g. Maturation usually occurs at age 2 or 3 at lengths from 175 to 200 mm. Growth varies with population size and productivity and size of the habitat.

Black crappie fry and juveniles feed mainly on microcrustaceans and planktonic insects. However, as total length increases, individual diets include more fish, and adults feed primarily on fish and planktonic insects. The most important parameter limiting crappie growth and population size is the quantity and quality of available food, particularly small forage fish. Black crappie commonly forage in open water over deeper areas.



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*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.

Reproductive Requirements

Male black crappie move into river backwaters or littoral areas in lakes and reservoirs in the spring to establish territories and construct nests. Nests are bowl-shaped, shallow depressions (60 cm) cleared by the male and are usually constructed near or in beds of vegetation on a soft mud, sand, or gravel substrate. Spawning begins in late March, April, or May depending on geographical location and temperature.

Special Habitat Requirements

Black crappie prefer clear water and grow faster in areas of low turbidity. Black crappie are less tolerant of high turbidities than are white crappie and, as a result, tend to dominate the latter species in clear water areas.

Abundant cover, particularly in the form of aquatic vegetation, is necessary for growth and reproduction. Common daytime habitat is shallow water in dense vegetation and around submerged trees, brush, or other objects.

Black crappie are absent from higher gradient streams (2 m/km) and are common in base or low gradient streams (0.5 m/km). The species is common in shallow areas of larger rivers, but may not inhabit adjoining tributaries. Black crappie prefer low velocity waters (i.e., absence of noticeable current). Because of their preference for low velocities, it is assumed that black crappie prefer quiet, sluggish rivers with a high percentage of pools, backwaters, and cutoff areas.

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Lacustrine habitat of black crappie may be characterized by large warm-water ponds, reservoirs, and small- to medium-sized natural lakes. Although this species does not do well in the main body of large lakes, it can become abundant in shallow areas and bays. Populations of black crappie have been established in clear, steep-sided California reservoirs that lack vegetation, but this situation is not considered optimal.

Lacustrine habitat suitability for adequate food production may be described in terms of total dissolved solids (TDS). One study reported a significant positive correlation between TDS levels of 100-350 ppm and sportfish (including black crappie) standing crop. Another report discusses the relationship between lacustrine productivity (TDS) and food availability.

Dissolved oxygen (D.O.) requirements for black crappie are assumed to be consistent with those for largemouth bass and freshwater fish in general. Largemouth bass avoid P.O. concentrations as low as 1.5 mg/l, but will tolerate 4.5 mg/l for short periods. Levels above 5 mg/l are assumed to be optimum for growth and reproduction of freshwater fish.

In a lacustrine environment, oxygen levels must be adequate in the temperature strata that is selected by the species.

Black crappie have been collected in the Mississippi River delta area in waters having salinities of 1.32 ppt. One study reported that black crappie occurred in waters up to 4.7 ppt in North Carolina, but the species was more abundant in the fresher headwaters. Black crappie were rarely found in brackish water in Canada.

A pH range of 5.0-9.0 is considered safe for freshwater fish, and a range of 6.5-8.5 is essential for good growth.

Adult. In 90 percent of the streams where adult black crappie were found in the Mississippi Valley and along the East Coast, the mean weekly summer (July and August) temperatures were 23°-32°C with a mean of approximately 26°C. It may be inferred that these temperatures are adequate for growth of black crappie; it is assumed that optimum growth occurs near the upper end of the range. Only 5 percent of all fish in this study were in waters <20°C.

Embryo. During spawning, temperatures range from 13°-21°C (March to July) with 17.8°-20°C being the most favorable range.

In lacustrine ecosystems, receding water levels caused decreased reproductive success and, consequently, population declines because of the loss of shoreline vegetation and increased turbidity. A rise in water level may create more spawning habitat, clearer water, and increased productivity.

Fry. Black crappie fry first appear in the spring when water temperature is approximately 15°C. In Wisconsin, larval fish were taken in the limnetic zone in the first part of June to July at temperatures of 18°-20°C. Temperatures from April to July in 90 percent of the streams where adult black crappie are found in the Mississippi Valley and along the east coast range from 15°-30°C; it is assumed that fry grow best in the middle part of this range. Fry are most abundant in shallow, vegetated areas with cover and food.

Juvenile. Optimal temperature for growth was reported to be 22°-25°C; no growth occurred below 11°C or above 30°C. Preferred temperatures of 27°-29°C were recorded in a thermal outfall area and in the laboratory.