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SOME FISHES FROM THE UPPER MISSOURI RIVER SYSTEM IN COLORADO

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Fishes present in tributaries of the upper Missouri River system in Larimer County, Colorado, were studied during the summer of 1961. Going out from Colorado State University at Fort Collins, it was possible to visit streams, observe the fishes in their natural habitats, and obtain specimens from the area.

The first report concerning collections of Colorado fishes was published by Cope and Yarrow in 1875 from collections made during the years 1872 to 1874 as a part of the Wheeler Survey. Colorado collections made by Jordan and Evermann in 1889 for the United States Fish Commission were reported in 1891. A local list of Colorado fishes was published by Juday in 1903 from specimens collected at Boulder and Longmont. In 1908, a list of the fishes of the Rocky Mountain Region was compiled by Cockerell.

Three distinct river systems, the Mississippi, the Rio Grande, and the Colorado, are represented in the state of Colorado. The Missouri-Mississippi drainage system in Colorado includes all of the streams east of the Continental Divide excepting the Rio Grande and its tributaries and consists of the North Platte, the South Platte, the Republican, and the Arkansas, with their tributaries. The South Platte and its tributaries drain most of the northeastern quarter of the state. Coming from the Hoosier Pass area at an altitude of about 11,000 feet, the South Platte is joined by Clear Creek, St. Vrain Creek, Thompson River, and the Cache La Poudre River. The Cache La Poudre River begins in the area of Poudre Lake and Milner Pass at an altitude of about 10,000 feet. At a short distance beyond the Continental Divide are headwaters of the Colorado River.

Observations and collections were made in tributaries of the Cache La Poudre River near Fort Collins, Colorado, during August, 1961. Specimens collected included the plains sand shiner, *Notropis stramineus missouriensis* (Cope); northern fathead minnow, *Pimephales promelas promelas* Rafinesque; western white sucker, *Catostomus commersoni suckleyi* Girard; and central Johnny darter, *Etheostoma nigrum nigrum* Rafinesque.

FOOD AND GROWTH OF SIX CENTRARCHIDS FROM SHORELINE AREAS OF BULL SHOALS RESERVOIR

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ABSTRACT

Stomach contents were examined from 579 longear sunfish, 381 green sunfish, 173 bluegill, 206 largemouth bass, 264 smallmouth bass, and 328 spotted bass collected from the shoreline area of Bull Shoals Reservoir, April 1964 - March 1965. The food of the six species by seasons and size groups (0-1.9, 2.0-3.9, 4.0-7.9 and 8.0 plus inches) is presented.

Fish contributed 85 to 99% of the total volume of food of the black basses four inches or more in length. Threadfin and gizzard shad were the most common prey species (50% or more of the volume). Consumption of longear, green, and bluegill sunfish by the basses was also significant (19% of volume). Longear sunfish over four inches in length relied heavily on terrestrial insects (37%), green sunfish on crayfish (63%), and bluegill on terrestrial insects (23%) and filamentous algae (23%). Utilization of fish by the larger sunfishes was minor, except for heavy consumption of dead or dying threadfin shad during a winter mortality.

The same species of Entomostraca and aquatic insects found only in the littoral browsing area constituted the primary foods of all six species of centrarchids under four inches in length, with greatest utilization by those under two inches. Basses, two to four inches in length, included fish in their diets. All the sunfishes consumed large quantities of black bass eggs in May. Bryozoa were seasonally important in the diets of longear and bluegill sunfish.

Growth of these centrarchids in Bull Shoals Reservoir was slow compared with that of the same species in other U. S. waters.