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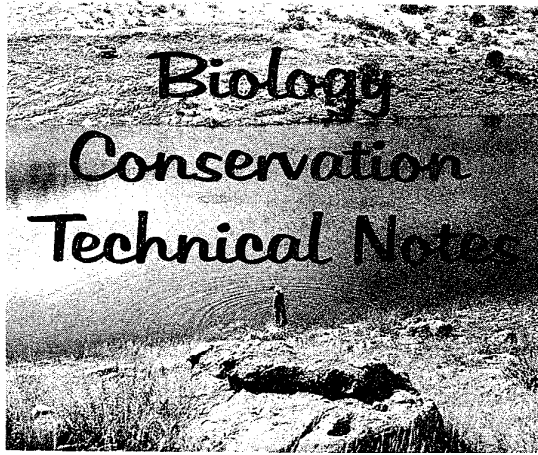


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U. S. DEPARTMENT OF AGRICULTURE    NEW MEXICO    SOIL CONSERVATION SERVICE

BIOLOGY NOTE NO. 19

June 11, 1973

SUBJECT: Animal Guides

Attached are copies of a new issue in the Animal Guide Series entitled "Pond Management for Fathead Minnow."

This animal guide is intended as a technical reference for field offices, as well as for distribution to landowners interested in producing bait minnows for both commercial and personal use.

The guide will be used in planning the practices, Commercial Fish Ponds (397) and Fishpond Management (399), as applicable.

This guide was prepared by David Chalk, Area Biologist.

Additional copies may be ordered from the state office, Plant Sciences Section.

Attachments

AC's & DC's

Area Biologists

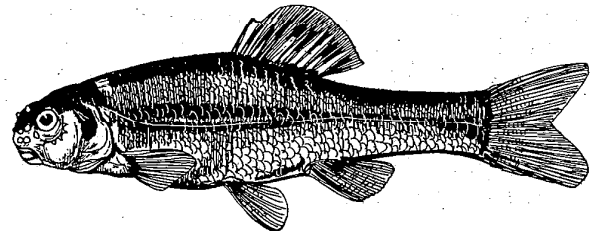
Regional Biologists: Portland, Lincoln, Fort Worth, Upper Darby

State Biologists: Arizona, California, Colorado, Idaho, Montana, Nevada, Oregon, Utah, Washington, and Wyoming

## Pond management for

minnow, fathead

# FATHEAD MINNOW



The fathead minnow, *Pimephales promelas*, is one of the most popular bait fishes used in New Mexico. This species is native in all the basins east of the Continental Divide and is well adapted for pond culture and thrives under cultivation. Research and experience have developed successful techniques for raising fathead minnows in other areas and the following guidelines should be followed until techniques are developed for the waters of New Mexico.

### HABITAT NEEDS

Water temperatures: Fathead minnows grow best when water temperatures are between 55° and 85° F. Spawning will begin when water temperatures reach 62° to 65° F.

Water depth and ponds: Water depth should range from 2 feet at the upper ends sloping to at least 6 feet or more at the drainage outlet. The water level must remain constant during the breeding season and fairly constant when a feeding program is being carried out. A supplemental water supply is necessary to maintain the required water level. Construction of a catchment pool near the drainage outlet is required by Specification Practice 397. Fathead minnow ponds should be at least  $\frac{1}{4}$  surface acre in size and no larger than 1 acre in size to allow for ease of management. Several ponds varying in sizes of  $\frac{1}{4}$  to  $\frac{1}{2}$  acre to 1 acre in size would be ideal.

Breeding habits: Fathead minnows usually mature and spawn during their second year. Spawning will begin in the spring when water temperatures reach 62° to 65° F. and continue throughout the summer. Females may spawn several times during one season. Both sexes usually die after spawning, the males usually within 30 days and the females within 60 days. Eggs are deposited in nests located on the undersides of rocks, boards, and other material found or placed on the bottom of the pond. Incubation periods vary with temperature. The young normally hatch in five days at 65° F., three days at 77°, and fifteen days at 55°.

## STOCKING

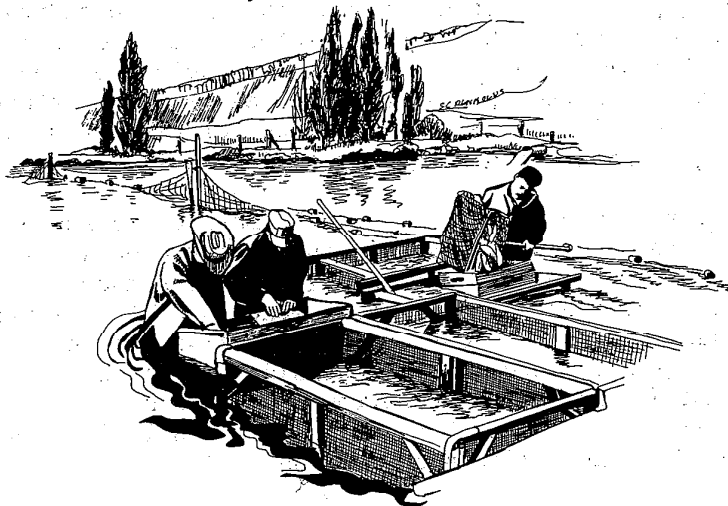
Stocking rates: Fathead stocking rates are based on the surface size of the pond. The pond should be stocked in April with breeders. Stock approximately 1,000 minnows per surface acre with 60 percent being mature adults and 40 percent immatures. This rate will insure a harvestable crop the first summer and enough breeders to carry over to the next year.

Growth rates: It is expected that after hatching, young minnows will reach  $1\frac{1}{2}$  inches in approximately 80 days and 2 inches in 105 days. With stocking at the above rate, you can expect a harvest of 100 to 250 pounds of saleable minnows each year. There are approximately 325 minnows to the pound in the  $1\frac{1}{2}$  to 2 inch size class, and 225 to the pound in the 2 to  $3\frac{1}{2}$  inch size class. The minimum size minnows that should be considered saleable is  $1\frac{1}{2}$  inches. At this size there would be approximately 32,500 minnows per 100 pounds produced.

## FEEDING

Supplemental feeding: Fertilization of the ponds to produce single cell algae is recommended.

Minnows should be fed once a day at a rate not to exceed 1 to 3 percent of the total weight of the fish in the pond. This makes periodic sampling to determine weight in pond a necessity. When total weight of the fish in the pond approaches 1,000 pounds per acre, it is advisable to add water to the pond for 5 to 8 hours after feeding. Water should be drawn off the bottom of the pond at the same rate it is added. Feed a balanced or complete commercial fish ration, using the smallest pellet size available. Discontinue feeding when water temperatures fall below  $45^{\circ}$  F. or go above  $90^{\circ}$  F. Fathead minnow ponds where supplemental feeding is practiced require complete control of water entering and leaving the pond. Flood water should be diverted and outlets screened with hardware cloth to prevent escape of fish. Inlets should also be screened where necessary to prevent wild fish from entering the pond. Harvest basins 18 to 24 inches below the main pond bottom are also required for complete harvests.



## MANAGEMENT

Large adult fathead minnows usually reach 2½ to 3½ inches in length. Since they die shortly after spawning, large adults should be removed from the pond throughout the summer and sold for bait. Nesting sites for egg attachment can be provided by spawning boards, concrete tile, and 6 to 12 inch rocks placed in the pond at depths of two to four feet. These nesting sites will provide additional opportunities for increased production.

The male fathead is noticeably larger than the female, and during the breeding season the male has an appearance of a blackhead with breeding tubercles on the snout and chin. He also has a soft swollen pad on top of the neck region.

Removal of surplus minnows from the pond should be done with seines and traps. Avoid handling these fish as much as possible. The use of minnow graders will allow a uniformity in size of saleable fish with a minimum of handling.

When removed from ponds, fathead minnows should be placed in cool water for 24 hours before they are sold. This will cause a hardening effect in the fish. Water in storage vats should be kept below 70° F. Fathead minnows are extremely hardy and can tolerate low oxygen content in the water (as low as 1 ppm). It can also tolerate temperature changes of 20° F. within a few minutes without harm. However, these stressing factors should be avoided in normal operations. Storage vats should be well aerated to avoid a high percentage of death loss. Holding tanks and storage vats should never be crowded, especially when water temperatures are high. These tanks should be constructed of concrete or metal and painted with an asphalt base paint. Tanks should drain separately without passing through other tanks. Each tank should be small enough so that the entire contents can be sold in a few days. Drain and disinfect the tank after each time the tanks are used to avoid the spread of any diseases. All dead fish should be removed and disposed of immediately.