

MISSOURI CONSERVATION COMMISSION PHOTO





Graduate student Tom McComish, holding plump bluegill, is doing study on the growth and bioenergetics of the familiar forage fish.

## HOW SMART IS OLD FIGHTER ?

**I**F FISHERMEN'S STORIES have any degree of veracity, every farm pond in America has "Old Fighter," the wily luncker who can't be caught. And each angler seems to outdo the other with stories of the amazing "brainwork" exhibited by his particular champion.

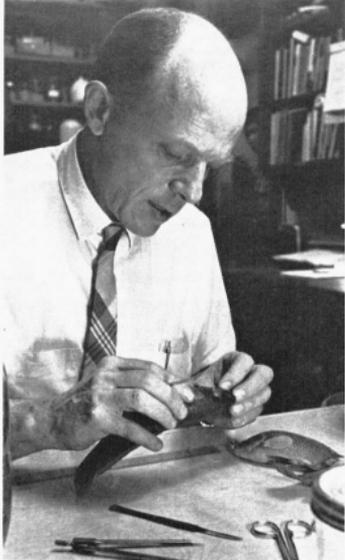
Now, according to research done by Missouri's Cooperative Fishery Unit on the Columbia campus, there may be some basis for their boasts: Fish, apparently, can learn. The more they are exposed to fishing pressure, the less likely they are to end up in the frying pan.

The unit's work, of course, is considerably more than a study of fish I.Q. Associated with the Zoology Department in the College of Arts and Science, the unit was established in late 1962 as a cooperative venture of the University, Missouri Department of Conservation and the Federal Bureau of Sports Fisheries and Wildlife. It is a corollary to the Missouri Cooperative Wildlife Research Unit, established in 1937 and one of the first in the nation. The fishery unit is interested in fish and water research and management as well as educating men for work in the field.

Certainly there is need for the unit's efforts. Missouri stands fifth among all states in number of fishing licenses and permits sold annually (almost three-quarters of a million). And a survey by the Midwest Research Institute for the Missouri Interagency Council for Outdoor Recreation revealed that fishing outranked such sports as hunting, golf, attending sporting events and boating as favorite outdoor recreational pursuits of adult men in the state.

Some of the unit's research deals with farm pond ecology and management, again important to Missouri. Of the state's 236,000 acres of impounded water, 70,000 acres, or 30 per cent are represented by ponds.

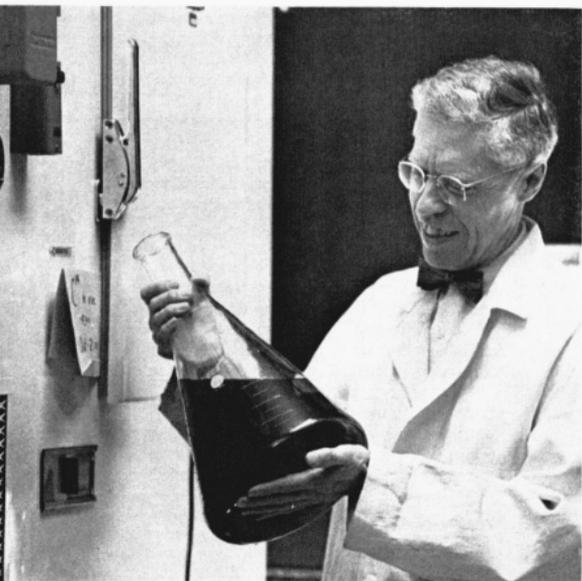
The unit's leader is Dr. Richard O. Anderson, a federal employee who came to Missouri in 1963. Serving in dual roles as unit cooperators and regular members of the Zoology Department are two professors, Dr. Robert S. Campbell and Dr. Arthur Witt, Jr. All



Dr. Arthur S. Witt is expert on fish of Thailand.



Getting ready to check bass vulnerability is the unit leader, Dr. Richard Anderson.



Dr. Robert S. Campbell is a veteran researcher of limnology of strip mine lakes.

## How Smart Is Old Fighter?

three men teach classes and are involved in a variety of studies.

For 30 years Dr. Campbell has been interested in the limnology and ecology of waters receiving acid runoff and warm water discharge. A grant from the U.S. Public Health Service is supporting his study on pollution of strip mine lakes. And all the unit's research is not limited to this country. Dr. Witt has done work in Thailand with the United Nations Food and Agriculture Organization. He presently is studying Thai fishes with graduate students from that country toward the end of ultimately providing more food for Southeast Asia.

One project of Dr. Anderson's compares the rate of growth of large-mouth bass, spotted bass and small-mouth bass in ponds. On the basis of the study, it appeared that the northern small-mouth bass has a good potential as a pond fish in Missouri. Another project is investigating whether minnows might be a better forage fish for bass than the bluegill in some situations. Other research is aimed at the possibility of catfish as the only sport fish in weedy or muddy ponds. In all 19 research projects were completed, continued and initiated during 1966.

Now, back to the study about "Old Fighter's" brainpower. Made possible because of the cooperating and available facilities of the Missouri Conservation Commission the study is more correctly called, "Vulnerability of Large-mouth Bass to Angling."

The project involved stocking three ponds at the Little Dixie Fishery Research Area with bass from fished and unfished ponds.

Then Dr. Anderson and a graduate student had the "arduous" task of fishing the three ponds. Each pond was fished approximately half an hour on two dates, one in the fall and the other the following spring.

Although the results of the angling are only tentative, they do seem to be significant.

As the table accompanying this story indicates, there appears to be a marked difference in the vulnerability of various-sized bass from fished and unfished ponds.

"I believe this data suggests that small bass may not learn to avoid capture as quickly as larger bass or that they do not retain the learning for a very long period,"

says Dr. Anderson. "Intermediate sized bass learn rather well but do not retain this conditioning over winter. Large bass may learn to avoid capture; and can retain this conditioning for some time."

These results have some important implications. "Overexploitation for bass populations may be a potential problem in new or reclaimed waters when the fish are exceptionally vulnerable to angling," Dr. Anderson says. "A balance between predator and prey

VULNERABILITY OF LARGEMOUTH BASS TO ANGLING			
Size of fish, source	No. stocked	Number Caught	
		Fall	Spring
<b>7.0 to 8.9 inches</b>			
Fished ponds .....	22	5	4
Unfished ponds .....	20	6	5
<b>9.0 to 11.9 inches</b>			
Fished ponds .....	30	3	7
Unfished ponds .....	30	12	7
<b>12.0 inches and larger</b>			
Fished ponds .....	20	2	3
Unfished ponds .....	20	10	8

may be quite fragile in small ponds because of the relatively small number of catchable bass."

Long-time fishermen probably can think of several cases where fishing has been fantastic in a new impoundment for the first season, only to drop off to practically nothing in a few years. What may have happened is that most of the large bass, unfamiliar to fishing pressure, were taken out. One answer, Dr. Anderson believes, may be to have the numbers harvested based on a quota system (30 to 40 percent of catchable sized bass in a pond per year or no more than 25 percent of the total number of bass originally stocked).

Although all the details have not been worked out, Dr. Anderson plans to continue bass vulnerability studies this summer.

This will be a more sophisticated project, involving tagging individual bass in order that it can be personally identified later. The bass will take part in conditioned reflex experiments to check their learning or conditioning ability. One investigation will determine whether some fish are caught more than once.

If they take the bait a second time, it could indicate that some bass, like some people, are just plain dumb. □