

Table 1. Toxicity of Abate(R) to channel catfish.

Dosage	No. dead/no. treated			Comments
	1 day	3 days	7 days	
Control	0/20	0/20	0/20	No symptoms
0.2 ppm	0/20	0/20	0/20	
2 ppm	0/20	0/20	3/20	Symptoms
5 ppm	1/20	1/10	1/10	
7 ppm	7/10	10/10	--	Dead within 1 hour
10 ppm	10/10	--	--	
20 ppm	20/20	--	--	Dead within 1 hour

*1 day = 24 hours

STAKE BEDS AS CRAPPIE CONCENTRATORS

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ABSTRACT

In 1968 fisheries personnel of the Tennessee Game and Fish Commission began constructing and evaluating stake beds made of sawmill strips as tools to help fishermen harvest more crappie from Kentucky Reservoir. They are: hammer driven type; driver driven type; portable pre-fab type. Crappie concentrate readily on all three types with variations occurring due to location and seasonal fish movement. Over 128 hours of documented fishing on stake beds by the author produced 6.6 crappie per hour as opposed to 1.8 crappie per hour on control cover areas. A five year mean for crappie fishermen on the same reservoir is 0.998 crappie per hour.

INTRODUCTION

It is generally considered relatively difficult for average anglers to consistently harvest fish from large reservoirs. This is particularly true when initial boom years are passed, and in some reservoirs, such as 158,000 acre Kentucky Reservoir, the situation is further complicated when originally productive cover areas are silted in, rotted away, or otherwise destroyed.

Tennessee began a broad-scope study of the sport fishery in the Tennessee portion of Kentucky Reservoir (about 98,000 acres) on July 1, 1965. This multifaceted approach included a year-round creel survey. By 1968, it became clear that the white crappie (*Pomoxis annularis*) was the bread and butter fish in this reservoir, and that most crappie anglers were having trouble harvesting this species unless ideal shallow water spring fishing conditions occurred. Data indicated adequate crappie populations existed.

As a result of documented declines in angler harvest of the white crappie, a decision was made to investigate methods of getting this particular species and the fishermen together on a more regular basis. Several approaches, including local area fishing reports, marking existing cover, word of mouth direction by creel clerks, and building different types of crappie concentrators, were tried.

Based on clerk and biologist observations, it became apparent marking existing cover was effective, but it became even clearer that construction of new crappie concentrators was more effective. This was found to be particularly true in areas devoid of natural cover.

Part-time work began on stake beds in the fall of 1968, and since then three basic types of workable stake beds have resulted. They are: hammer driven type - see figures A(1), A(2); driver driven type see figure B; pre-fab portable type - see figure C.

EVOLVEMENT

The first Commission-built stake beds were of the driver driven type, and they were placed in 8 to 15 ft. full pool depths. It quickly became apparent that most anglers would not go to the trouble involved in building this type, so alternate construction methods were sought.

Three basic portable pre-fab types were constructed, and the particular design which produced a 4' x 8' stake bed built of nine two-by-fours was by far the best of the three because they resulted in fewer hangs and could easily be built by fishermen.

Experimentation was carried one step further, and the third basic type, hammer driven type, came into being. These can be driven with relative ease in water up to five feet deep by one person.

Figure A(1) - Hammer Driven on Foot

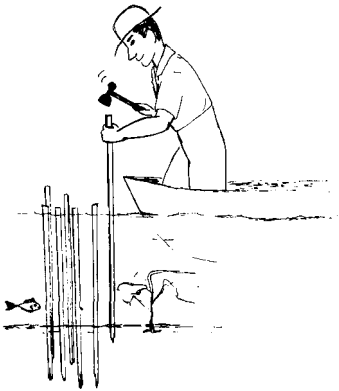
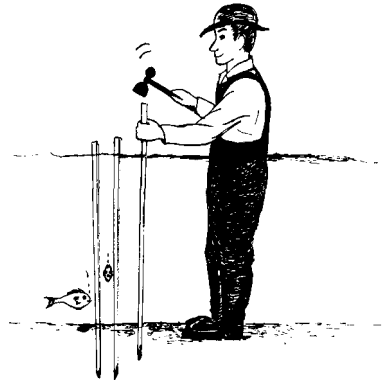


Figure A(2) - Hammer Driven From Boat

Figure B - Driver Driven

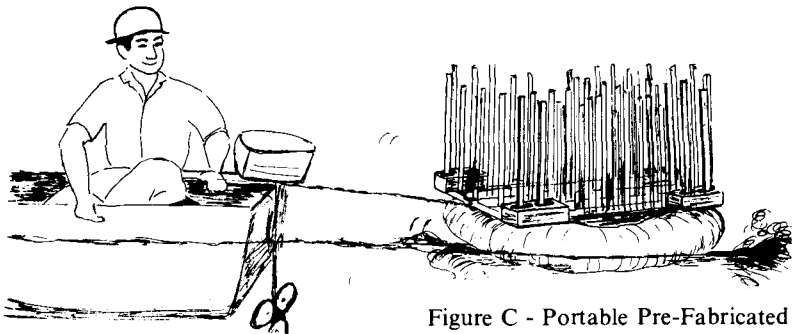
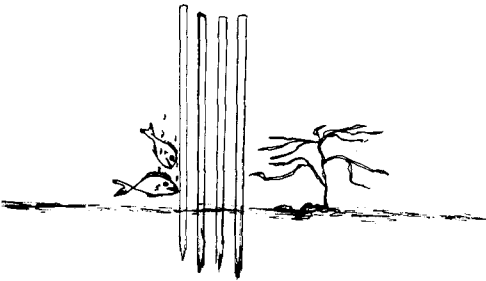
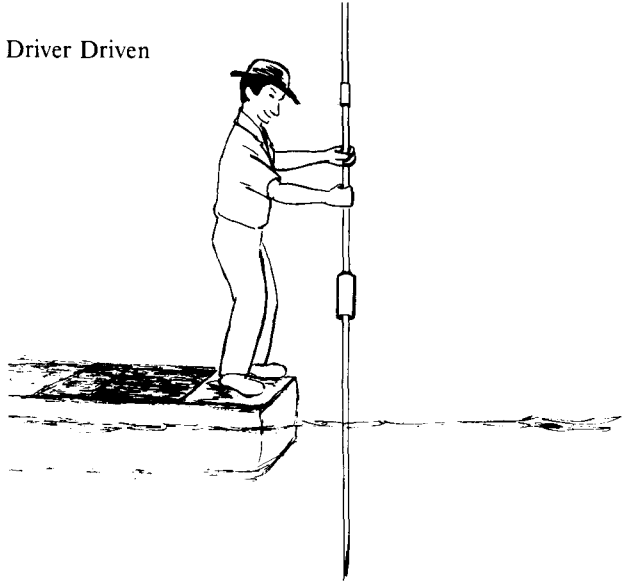


Figure C - Portable Pre-Fabricated

I. HAMMER DRIVEN TYPE - See Figures A(1), A(2)

Construction

Hammer driven type beds are easiest to build, require little equipment, entail little cost, and can be constructed by one man. Availability of stakes and the accessibility of construction site will dictate total time involved, but actual construction involves about two hours per bed.

This type has particular application where a body of water is subject to annual drawdowns. The builder can simply walk to a selected site dragging or carrying his stakes, or he can place the stakes in a small boat, motor to a selected area, and drive a bed from the boat. In the latter case, it is necessary to anchor the boat both front and rear, preferably in depths up to 5 feet.

Presharpening of green sawmill stakes is of value, particularly when hard substrates are encountered. The builder hammers from 50 to 100 green 4' to 7' long sawmill stakes into bottom substrates trying to place the stakes 6" to 8" apart. Shape of the bed does not seem critical as long as the stakes are at least ten deep in any direction. On Kentucky Reservoir this type bed was located with extreme caution to prevent navigation hazards.

Materials

1. 50 to 100 green 4' to 7' long pre-sharpened sawmill stakes.
2. One large headed, short-handled hammer, preferably riveting or blacksmith type.
3. Waders or stable 14-foot boat.
4. If boat is used, at least two heavy anchors will be needed.
5. Hatchet or small ax.

II. DRIVER DRIVEN - See Figure B

Construction

Driver driven stake beds are the hardest, most time consuming, and require between two and three man-days to construct. A stable boat is a necessity.

By using an aluminum shafted driver, presharpened green sawmill strips - up to 500 per bed - are driven into bottom substrates. The boat is anchored in a selected area anywhere from 8' to 15' deep. One man drives stakes with the driver, a second man places a stake in the sleeved end of the driver each time it is raised above water level, and the third man supplies stakes to the second worker. The sleeve on the driver should be 2½ feet long, and 4" in diameter. A combination of buoyancy and sleeve depth keep the individual stakes upright as they are lowered through the water to the bottom. In normal mud bottoms two or three raps with a driver will adequately drive each stake.

Materials

1. 200 to 500 green sawmill stakes 4 to 7 ft. long pre-sharpened on the smaller end.
2. Sectioned driver constructed of 1" aluminum pipe with a 4" diameter 2½ feet long weighted driving sleeve attached.
3. Stable, broad beamed boat.
4. Four 25 lb. boat anchors.

III. PORTABLE PRE-FAB BED (See Figure C)

This particular type can be prefabricated at home by one man in less than two hours. It can then be assembled and trailered to the lake or left in sections and assembled on the lakeshore.

Construction consists of nailing 4 to 7 ft. long green sawmill strips along the outer edges of eight green sawmill run 2" x 4" x 8' pieces of lumber. The thick ends of the stakes are nailed at 6" to 8" intervals along one outer face of each of

the two-by-fours. Oak or poplar two-by-fours are preferred because they hold nails well and resist splitting. Once the eight two-by-fours are equipped with upright strips, two 4 foot lengths of two-by-four are used to butt the other eight two-by-fours into a unit.

Portable beds once assembled are floated on one or more truck tire tubes and towed to a desired area. At this point two boats and four men are necessary. Two lengths of rope are placed under the bed which is held between the two boats. Once the ropes are in place, two cull 40-pounds-each cement construction blocks are placed over each of the four corner stakes. Once this is done, the inner tube or tubes are cut loose or punctured, and the bed is lowered into place using the ropes.

Materials

1. Four pounds of eight or tenpenny coated nails.
2. Two pounds of twentypenny coated nails.
3. About 150 green sawmill stakes 4' to 7' long.
4. Nine 2" x 4" x 8' green sawmill run oak or poplar lumber.
5. Eight cull 40 lb.-each cement construction blocks.
6. Sufficient inner tubes to float stake bed and blocks.
7. Two lengths of 1/2" rope.
8. Four anchors to hold each of the boats in place.

RESULTS

Since 1968, the author has built, with the help of several people, 29 stake beds on Kentucky Reservoir. At full pool they are located in water from 8 feet to 20 feet deep. All basic types of stake beds readily concentrate crappie, and the success of a given stake bed rests with its placement. Involved therein are seasonal water fluctuations and seasonal movements of crappie.

In 128 hours of sample fishing on stake beds from April, 1969, through May, 1972, crappie of both species were taken at a combined average rate of 6.6 crappie per hour. From March, 1970, through May, 1972, 74.5 hours were spent fishing control cover areas (stumps, brush, tree hides) in similar depths and areas. The resulting catch from controls was 1.8 crappie per hour, or 4.8 crappie per hour less than were taken from stake beds. During the same period creel survey indicated an overall catch rate of 0.988 crappie per hour by crappie anglers on Kentucky Reservoir.

Overall success rate (minimum of one crappie per trip) while fishing stake beds was 93.7% as opposed to 70.3% while fishing control cover. The lakewide average for angler success on Kentucky Reservoir, at time of interview, was 51%.

Fishing techniques used and angler skill have much to do with the rate at which fishermen will become entangled or hang up in various types of fish cover. This is also true of stake beds, and although they are not hang-proof, they were hung at the rate of 1.1 hangs per hour as opposed to 2.0 hangs per hour in other types of cover.

One distinct advantage of stake beds is that a tight-line fisherman can work his bait through the bed without removing it from the water. Then too, if a fisherman gets hung, he can pull his line free without disturbing the cover.

Otherspecies of fish, primarily bluegill and largemouth bass, also frequent stake beds at different times of the year. Experimental fishing for these species was not attempted. Fishermen using jiggle poles rigged with plastic worm and crickets have taken both species from these beds.

Stake beds receive greater use when marked. Once under water, stake beds can become difficult to find even when properly triangulated. Attempts were made to mark them with floats, etc., but these were quickly destroyed or moved. It was found that driving lengths of 1 1/2" to 2" pipe securely into bottom

substrates was the best way to permanently mark a bed. Caution should be taken to make sure pipe markers are clearly visible.

Three beds were driven with aged stakes, and it took fish longer to concentrate on these than it did beds constructed of green lumber. In general, it takes about two months for a bed to efficiently produce. However, some crappie are caught only 24 hours after a bed is built.

Stake beds which are submerged the year round last longer than those which seasonally emerge. It is expected driver driven stake beds will probably hold up better than the prefabricated type, but this is still to be documented.

DISCUSSION

It is possible to saturate an area with cover and thus reduce effectiveness of each individual stake bed. No formula has been developed, but stake beds work best on Kentucky Reservoir when they are located in 8 feet or more of water in an area relatively or completely devoid of other cover. It is suggested a bed be placed at least 100 yards from any existing cover.

When building large numbers of the prefabricated type, time could be saved by properly equipping the work crew with a rack bodied truck and a winch-equipped, self-propelled barge with deck space enough to hold eight or ten beds at one time.

There is a need to find out if beds made of molded material such as plastic would in the long run concentrate fish in the same manner. If so, almost permanent fish hides might be developed.

It may also be possible to bait beds with various organic attractants and increase their yield of fish.

Table I. Documented Crappie Catches, Kentucky Reservoir-April, 1969, through May, 1972

Stake Beds	Control Cover
Total trips=49	Total trips=32
Total hours fished=128	Total hours fished=74.5
Total no. crappie=840	Total no. crappie=134
No. crappie per hour=6.6	No. crappie per hour=1.8
Av. Wt. per crappie=0.3. lb.	Av. Wt. of crappie=0.45 lb.
Hangs per hour=1.1	Hangs per hour=2.0
Rate of success=93.7%	Rate of success=70.3%