photo-Mike Swartz

Evaluation of Pennsylvania Catfish Spawning Boxes

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Channel catfish are popular sport fish in Pennsylvania. Each year, thousands of angler trips are taken to target channel catfish in water bodies across the state. The Pennsylvania Fish & Boat Commission (PFBC) maintains many channel catfish populations, especially in reservoirs, by stocking. Channel catfish are stocked, because few young catfish are produced naturally to provide a self-sustaining population. A major factor that limits channel catfish spawning in reservoirs is a lack of high quality spawning habitat.

An interesting life history characteristic of channel catfish is their requirement to spawn in cavities or holes. In waterways where successful spawning occurs, channel catfish spawn in depressions in undercut banks, submerged hollow logs, abandoned muskrat or beaver holes and rock crevices. However, these natural spawning habitats are typically absent in most reservoirs in Pennsylvania due to clearing during reservoir construction. To make up for the lack of spawning habitat in reservoirs, the PFBC Lake Habitat Section of the

photo-Phil Thomas

Channel catfish fry

Division of Habitat Management places catfish spawning boxes into several Pennsylvania impoundments to provide cavity habitat necessary for spawning, nesting and nursery for channel catfish.

To determine if channel catfish will successfully spawn in these boxes, the PFBC conducted a study to evaluate spawning success of channel catfish using Pennsylvania-style catfish spawning boxes. This study was conducted at three study sites during the 2012 spawning season. The three sites chosen were ponds at PFBC Linesville State Fish Hatchery, Pymatuning Reservoir Sanctuary and Foster Joseph Sayers Lake. A total of 29 spawning boxes were used during the study. Ten boxes were placed in hatchery ponds at PFBC Linesville State Fish Hatchery, seven boxes were placed in Pymatuning Reservoir Sanctuary and 12 boxes were placed in Foster Joseph Sayers Lake. The spawning boxes were lifted beginning June 1 through the middle of July, and the boxes were inspected for the presence of channel catfish eggs or fry.

At the PFBC Linesville State Fish Hatchery, successful spawning occurred in three of 10 boxes that were placed in hatchery ponds. Linesville State Fish Hatchery staff estimated the number of eggs collected from each of the catfish spawning boxes as well as the number of fry that hatched from each egg mass collected from the spawning boxes. On average, 19,000 eggs were collected from each spawning box. From these eggs, 12,000 fry were produced.

Unfortunately, successful spawning did not occur in the catfish boxes that were placed into Pymatuning Sanctuary. However, this is not overly surprising, because natural spawning habitat in the sanctuary is good. Pymatuning Sanctuary maintains a self-sustaining channel catfish population and is the source of brood channel catfish that the Linesville State Fish Hatchery staff uses for annual production of channel catfish.

The results from the Foster Joseph Sayers Lake portion of the catfish spawning box study were dramatically different from both the Linesville State Fish Hatchery and Pymatuning Sanctuary portions of the study. Channel catfish successfully spawned in all 12 boxes that were placed into Foster Joseph Sayers Lake. Parental guarding by the male channel catfish was high during the study and likely led to increased survival of both eggs and fry due to decreased predation by other fish species. Repeat spawning occurred in 11 of 12 boxes, and 18 nests produced fry during the spawning period. This means that as boxes were vacated by a guarding male, another pair of catfish found the box and spawned successfully. This shows that throughout the spawning season channel catfish were actively searching for suitable nesting sites. Foster Joseph Sayers Lake lacks complex physical habitat in the shallow water areas, which likely limits channel catfish spawning in this lake, and is the reason catfish continued searching for spawning habitat throughout the spawning season.

The results of this study have several implications for catfish production and management in Pennsylvania. First, this may allow fisheries managers to eliminate stocking of channel catfish into some waters or reallocate the hatchery produced catfish into other waters throughout the state. Second, this could reduce the number of channel catfish that need to be produced on an annual basis, which would reduce annual hatchery production costs. Last, fish production staff could concentrate on raising fewer catfish to larger sizes. Stocking catfish at larger sizes typically leads to higher survival and better contribution to the adult population.

photo-Mike Swartz

An adult male catfish in a spawning box is guarding an egg mass.

This study provides valuable information towards management of channel catfish in Pennsylvania reservoirs. However, the implementation of spawning boxes into reservoirs is by no means a cure-all for solving catfish reproduction problems in reservoirs. Further research will be directed towards identifying reservoirs that lack good quality spawning habitat, determining the fate of fry that were produced in the spawning boxes, determining the number of boxes needed to produce enough fry to create a sustainable fishery and identifying the environmental or ecological variables that are most favorable for the survival of juvenile catfish where managing channel catfish is an objective.