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Survival of Paddlefish Fingerlings Stocked with Large Channel Catfish

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Abstract.—Fingerling paddlefish (*Polyodon spathula*; 9–15 cm total length, TL) were stocked with two densities of large channel catfish (*Ictalurus punctatus*; >38 cm TL). No paddlefish were recovered from any of the six ponds at harvest, probably due to predation by the large channel catfish. Advanced paddlefish fingerlings (25–30 cm TL) may be required for polyculture in ponds that contain large channel catfish.

Interest in the culture of paddlefish (*Polyodon spathula*) is high, and more growers may become involved as wild stocks become depleted, markets become better developed, and production techniques are improved (Semmens and Shelton 1986). Polyculture allows producers to diversify, and it

may be the best method of introducing paddlefish into commercial aquaculture. Paddlefish are desirable as a complementary polyculture species because they utilize natural foods and do not compete with the primary species for formulated feeds; also, because paddlefish are native to much of the USA, their use is not restricted in most regions. The channel catfish (*Ictalurus punctatus*) has been suggested as the ideal primary species in such polyculture systems (Graham et al. 1986).

For production of paddlefish to be successful in catfish production ponds, paddlefish fingerlings must be compatible with all sizes of channel catfish. However, results of stocking paddlefish fingerlings with large channel catfish have not been reported. The purpose of the present study was to investigate the growth and survival of fingerling paddlefish (9–15 cm total length TL) stocked with large channel catfish (>38 cm TL). This represents the size of paddlefish fingerlings normally produced during a 40-d nursery period (Semmens and Shelton 1986) and is the approximate stocking size of channel catfish fingerlings in a mixed-size, continuous-production pond.

Market-size channel catfish (mean weight, 586 g; mean TL, 40 cm) were stocked at 2,470 fish/hectare or 4,940 fish/hectare into 0.04-hectare ponds on 7 April 1988. Three ponds were stocked at each density. On 12 May 1988, paddlefish fingerlings (mean weight, 4.6 g; mean TL, 13 cm) were stocked into the six ponds at a density of 1,234 fish/hectare. Channel catfish were fed a floating commercial catfish feed (32% crude protein; Nunn Milling Co., Evansville, Indiana) at 3% body weight/d. Feeding rates were adjusted based on an assumed feed conversion (amount fed/weight gain) of 1.5.

Fish were harvested by seine on 12 October 1988. No paddlefish were recovered by seining. The ponds were then drained, and all remaining channel catfish were removed. No paddlefish were recovered from drained ponds.

We believe these results strongly suggest predation on paddlefish fingerlings by large channel catfish. During the 153-d paddlefish culture period, no problems were detected with water quality, bird predation, or disease problems, and no dead paddlefish were observed. Dense phytoplankton blooms were maintained by feeding the channel catfish, so zooplankton availability to paddlefish should not have been a problem. Channel catfish survival averaged 91%. Paddlefish of the same size and production history as the polyculture fish were stocked at the same time into a separate high-density monoculture system. Survival in those ponds averaged 73%, indicating that stocking mortality was not a problem.

Paddlefish are pelagic and susceptible to predation. Graham (1986) found that advanced fingerlings (25–30 cm TL) were required for high survival in reservoirs that contained predator populations. It appears that first-year paddlefish (9–15 cm TL) are subject to predation by, and so are not compatible in culture with, large (>38 cm TL) channel catfish. Stocking with second-year paddlefish (advanced fingerlings, 25–30 cm TL) may be required in grow-out ponds containing mixed sizes of channel catfish.

References

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