

## Maintaining Self-Sustaining Bluegill (*Lepomis macrochirus*) and Largemouth Bass (*Micropterus salmoides*) Populations as a Method of Low Input Aquaculture

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Freshwater ponds are built to provide water for livestock production, domestic purposes, crop irrigation, aquaculture, rural fire control, recreation, aesthetics, flood control and to provide a source of soil which results in borrow pits ponds. Ponds which were not constructed specifically for aquaculture, may be of limited potential, or inappropriate for intensive fish production. Some physical limitations of these ponds include: difficult vehicle access, remote location, benthic and shoreline obstructions, pond size, shape, depth, or the lack of a drain structure. These factors can prevent a complete harvest of fish either by seining or by draining the pond. Lack of crop security from theft and conflicting pond uses can further limit fish production.

In the southern United States, bluegill (*Lepomis macrochirus*) and largemouth bass (*Micropterus salmoides*) are stocked into ponds to provide recreational fishing. Swingle (1956) recommended the stocking of these two species to create a balanced, predator/prey relationship. Such balanced fish populations result in long term, quality sport fishing by providing harvest size fish of both species. Annual reproduction replaces fish that have been harvested or have died.

In new or reclaimed ponds, 1,250 – 2,500 small bluegill (2.5 cm), are stocked per ha during the fall or winter. By the following summer, a successful bluegill spawn will provide forage for the recently stocked largemouth bass fingerlings that are approximately 5 cm. Ratios of 5:1 to 10:1 bluegill to largemouth bass are stocked into unfertilized and fertilized ponds, respectively. Largemouth bass are used to control multiple spawning populations of bluegill. Bluegill can reach a weight of more than 60 g in one year, if their prolific reproduction is controlled by largemouth bass predation. Crowded populations of stunted bluegill rarely reach a harvest size of 114 g.

Following one to two years of growth, some largemouth bass can be harvested at weights of over 450g, without damaging the balance of the pond's fish population. When harvested from balanced populations, both species are valued as sport fish. Fish populations can be monitored by the test seining method described by Swingle (1956). Shoreline seining should be conducted during the summer and fall months to determine the presence, or absence of young of the year bluegill and largemouth bass. A larger seine is used to determine the relative abundance of intermediate size (8 – 13 cm) bluegill. Large numbers of intermediate size bluegill would indicate a deficient population of adult largemouth bass. Relatively small numbers of intermediate size bluegill caught per seine haul would suggest a strong population of bass preying on fish of this size.

Red ear sunfish (*Lepomis microlophus*) and channel catfish (*Ictalurus punctatus*) may be stocked as supplemental species in a bluegill and largemouth bass population. However,

neither species is critical to the creation or maintenance of a balanced population. Red ear sunfish spawn once a year and can contribute slightly to the largemouth bass forage base. Channel catfish offspring are typically consumed by largemouth bass. Catfish fingerlings (25 cm) must be restocked periodically to insure catfish reach harvest size.

Maintaining self sustaining bluegill and largemouth bass populations provides a viable, low cost method of producing fish in waters that are not suitable for more intensive aquaculture production. Swingle (1950) reported an average fish yield of 364 kg/ha recovered from 29 drained ponds that contained balanced bluegill and largemouth bass populations. Where feasible, the addition of agricultural limestone, fertilizer, supplemental feeding and aeration may increase fish production to 500 kg/ha, or more.

Fish may be harvested by traditional angling methods, seining, netting, trapping or by trot line, where local laws permit. Caution should be used to avoid the over harvest of largemouth bass, particularly when seining small ponds. The removal of too many largemouth bass could create an unbalanced fish population. Physical characteristics, such as large or deep ponds can limit fish harvest efficiency. Harvest method and its associated labor can influence fish marketing strategy and determine profitability.

Harvested fish can be sold live, or whole on ice to provide supplemental income to growers. Provided federal, state and local health department regulations are followed, processed fish may also be sold. Trade and barter, truck sales or more conventional retail sales are potential marketing possibilities. Since annual U.S. per capita consumption of fish products is near 7 kg, even a small pond could provide adequate amounts of fish for family subsistence. Opening ponds to fee or lease fishing provides customers a recreational experience by harvesting their own fish.

Managing self sustaining fish populations allows efficient utilization of aquatic resources by producing fish inexpensively in waters that are less suited for more intensive aquaculture. Maintaining balanced populations of largemouth bass and bluegill in ponds can be considered an exercise in extensive polyculture, or as simply a common practice in freshwater fisheries management. Regardless, the development of this effective predator/prey relationship to produce foodfish, combines both of these disciplines. This practice offers a sustainable and low cost method of producing foodfish in ponds.

## **Notes**

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## **References**

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