

# STATUS OF COMMERCIAL AQUACULTURE IN ARKANSAS IN 1975

by  
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## ABSTRACT

*A telephone and personal survey of all known Arkansas fish producers was made during the first quarter of 1976 to determine the extent of change in aquaculture production during the past three years. The survey indicated that although intensive pond production has been reduced by about 4,050 hectares, the economic value since 1972, because of higher prices received for the products, has increased by 16.8% to \$24,191,700. Growth in the industry has slowed in recent years due to narrowing profit margins and changes in prices and allotments for other agricultural crops.*

It was suggested by Hulsey (1965) that the delta lands of the lower Mississippi Valley might someday be thought of as the "fish belt" since all factors for fish production were favorable. Factors mentioned were soil, water, topography, climate, know-how, capital, and labor. These favorable factors, in addition to consumer demands, have brought about tremendous growth of the industry during the last ten years. Arkansas' fish farming industry has been monitored during the last ten years as part of the Commercial Fisheries Industry Survey, partially funded as a Public Law 88-309 Project by the National Marine Fisheries Service. This survey documents the changes in the industry during the most recent three year period. It appears that some of the factors which were so favorable in the past are now not so favorable. This has caused numerous fish farms to go out of business and caused the total production to be down from 1972. Farmers cite non-availability of labor and high cost of construction, labor, and water as reasons for reducing the production of fish. Competition for farm land from other agricultural crops, such as rice and soybeans, has reduced the availability of land for the production of fish.

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## METHODS

A list of all known fish farmers was compiled by combining the fish farmer permit sales list of the Arkansas Game and Fish Commission; a list compiled by the Soil Conservation Service; and the list compiled from extension contracts by the Fish Farming Experimental Station, U. S. Fish and Wildlife Service. Farmers were interviewed by telephone until this method became inefficient, then personal contacts were made by the authors and Game and Fish Commission Enforcement officers. In this manner, almost all known farmers were contacted. In most cases, valid information was obtained, however, some farmers pleaded ignorance of certain production figures or simply refused to provide information. In these cases, an average was determined from those which gave complete information, then it was applied to those with deficient information. A total of 459 farmers were contacted. One hundred fifty seven were out of business or had erroneously been reported to be fish farmers, leaving 302 known operating farms.

## RESULTS AND DISCUSSION

Over 70% of the intensively farmed water in Arkansas is in bait fish production, Table 1. Historically, this has been the case, Table 2, 3, and 4. Major species produced include

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Table 1. Commercial Fish Production in Arkansas During 1975.

	Acre (X .4047 = Hectare)	Lbs/Acre (X 1,123 = kg/ha)	Total Lbs (X .4545 = kg)	Price/Lb-\$ (X 2.2 = Price/kg)	Total Value-\$
<i>Bait Fishes</i>					
Golden Shiner	17,986	383	6,888,600	\$1.54	\$10,608,400
Fathead Minnows	2,380	306	714,000	1.62	1,156,700
Goldfish	851	564	480,000	1.58	758,400
Total	21,217		8,082,600		12,523,500
<i>Food Fishes</i>					
Channel Catfish	6,814	1,651	11,249,900	60	6,749,900
Blue Catfish	26	527	13,700	.73	10,000
Buffalofish	80	1,050	84,000	.26	21,800
Buffalo (Polyculture with catfish)	—	365	121,300	.28	34,000
Trout	8	5,000	40,000	1.50	60,000
Cage reared Trout	—	—	80,400	.925	74,400
Cage reared Catfish	—	—	647,700	.599	388,000
Tank and Raceway Trout	—	—	102,500	.961	98,600
Tank and Raceway Channel Catfish	—	—	4,500	.50	2,250
*Extensive Farming All Species	8,486	1,423	120,700	.543	65,600
Fee Fishing (Intensive) Channel Catfish	236	536	126,500	.889	112,500
Fee Fishing (Intensive) Trout	18	11,900	214,200	1.442	308,900
*Fee Fishing—(Non-Intensive)					
All Species	3,171	—	—	—	12,200
Total Food Fish	18,839		12,805,400		7,938,150
<i>Ornamental Exotics</i>	93	1,772	164,800	4.921	811,000
<i>Fingerlings and Miscellaneous</i>					
	Acre (X .4047 = Hectare)	Number/Acre (X 2.471 = No./ha)	Total No.	Price Each	Total Value
Largemouth Bass	3	4,000	17,500**	1.05	18,450
Channel Catfish (Fingerlings)	862	34,112	29,404,500	.091	2,675,800
White Catfish Fingerlings	10	20,000	200,000	.20	40,000
White Amur	290	586	170,000	1.00	170,000
Trout Fingerlings (Raceway)	—	—	50,000	.146	7,300
Crawfish	38	6,579	250,000	.03	7,500
Total	1,203		30,092,000		2,919,050
GRAND TOTAL	41,352		21,052,800 lbs. *30,092,000 Individuals		\$24,191,700

\*These totals should not be included when comparing intensive culture of 1975 to that of previous years.

\*\*This includes Polyculture.

golden shiners (*Notemigonus crysoleucas*), fathead minnows (*Pimephales promelas*), and goldfish (*Carassius auratus*). They are raised in ponds which are well fertilized and fed with commercial feeds. With good management, harvest may reach 1,123 kg per ha in individual ponds, however, the average for all farms is just over one-third of that. The area in bait fish farming decreased by 27.1%, but increased productivity has allowed total minnow harvest to remain within 22.8% of the 1972 levels. Price increases have resulted in a 19.5% increase in the value of the bait fish industry.

Production of food fishes is the objective on 23.5% of the intensively farmed area, and also the major fisheries objective on many private lakes, fee fishing lakes, and irrigation reservoirs which are partially harvested. This secondary use of water for fish production is reported as extensive (non-intensive) farming in the accompanying tables. When this mass of extensive fish farming acreage is included in the totals, food fish were raised on 45.5% of the total area devoted to fish farming in 1975.

Major species produced for food in intensively farmed ponds, cages, or raceways are channel catfish (*Ictalurus punctatus*), and rainbow trout (*Salmo gairdneri*), with some production of blue catfish (*Ictalurus furcatus*), buffalofish (*Ictiobus cyprinellus*), and white amur (*Ctenopharyngodon idella*), and in polyculture or fee fishing ponds, largemouth bass (*Micropterus salmoides*), crappie (*Pomoxis* spp), and various sunfishes (*Lepomis* spp).

Intensive farming of food fishes has decreased by 31.3% in total area since 1972 (including polyculture and intensive fee fishing acreages). Total production, by weight, has decreased by 35.7%, but, again due to higher prices, the total value of the food fish industry has only decreased by 15.4% since 1972.

One segment of the food fish industry which has increased during the last three years is cage culture. Production of channel catfish in cages has increased by 66.7% over 1972. Trout production in cages during winter months is also on the increase. Most of the cage culture is done in large, infertile public lakes on lease areas.

Table 2. Commercial Fish Production in Arkansas During 1972.

	<i>Acres</i> (X .4047 = Hectares)	<i>Lbs/Acre</i> (X 1.123 = kg/ha)	<i>Total Lbs</i> (X 4545 = kg)	<i>Price/Lb</i> (X 2.2 = Price/kg)	<i>Total Value</i>
<i>Bait Fishes</i>					
Golden Shiner	26,527	339	8,992,700	\$.98	\$ 8,812,800
Fathead Minnow	1,848	384	709,600	.97	688,300
Goldfish	520	1,058	505,200	.79	434,700
Israeli Carp	196	1,333	261,300	.57	148,900
Total	29,091		10,468,800		10,084,700
<i>Food Fishes—Intensive (Harvested)</i>					
Channel Catfish	8,433	1,892	15,955,200	.44	7,020,300
Blue Catfish	54	2,000	108,000	.40	43,200
Buffalofish	363	529	192,100	.188	36,100
Trout	27	61,296	1,655,000	.89	1,473,000
Total	8,877		17,910,300		8,572,600
<i>Food Fish in Polyculture (Intensive)</i>					
Channel Catfish	515	1,243	640,000	.44	281,600
Buffalofish	Same	651	335,400	.188	63,100
Sport Fishes	Same	23	11,800	.954	11,300
Total	515		987,200		356,000
<i>Food Fishes (Extensive)</i>					
Buffalofish	9,959	25	256,000	.188	48,100
All Other Species	Same	4.4	44,000	.35	15,400
Total	9,959		300,000		63,500
<i>Fee-Fishing</i>					
Channel Catfish	1,049	431	452,100	.60	271,300
Sport Fishes	Same	22	23,000	.60	13,800
Total	1,049		475,100		285,100
		<i>No/Acre</i> (X 2.471 = No/ha)	<i>Total No.</i>	<i>Price Each</i>	
<i>Fingerlings</i>					
Channel Catfish	1,540	22,246	34,258,800	.051	1,747,200
Blue Catfish	20	15,000	300,000	.05	15,000
White Catfish	4	6,000	24,000	.20	4,800
Trout	4	62,500	250,000	.11	27,500
Total	1,568		34,834,800		1,794,500
<i>Specialty Cultures</i>					
Koi Carp	13	16,385	213,000	.077	16,400
Fancy Goldfish	—	—	200,000	.06	12,000
White Amur	—	—	50,000	1.00	50,000
Mixed Tropical	—	—	10,000	.25	2,500
Total	13		473,000		80,900
			<i>Total Lbs</i>	<i>Price Lb</i>	
<i>Cage Culture</i>					
Channel Catfish	—	—	215,700	.44	94,900
TOTALS (Intensive)	40,064				\$20,983,600
OVERALL TOTALS (Intensive and Extensive & Fee-Fishing)					\$21,332,200

After Bailey et al 1974.

Ornamental fish production, including koi and fancy goldfish, increased in acreage by seven times and the value of the crop is ten times greater than three years ago. Production figures were obtained by weight during 1975 and are not comparable to the 1972 figures. This crop yielded the greatest gross returns per hectare of all pond cultured fishes.

Fingerling channel catfish production was 85.8% of the 1972 production, although the area devoted to this crop was reduced by 44.1%. Higher prices pushed total returns in 1975 to 153% of 1972 values. Trout fingerling production was only one-fifth as great in 1975 as in 1972. This corresponds with the decrease in the production of food sized trout to one-fourth the 1972 level.

White amur production and sales as a weed control agent have increased steadily since initial sales during 1972. Sales in 1975 amounted to 340% of the previous survey estimate.

Tables 1, 2, 3, and 4 of production and monetary returns from Arkansas fish farming for 1975, 1972, 1969, and 1966, respectively, are offered for comparison and to illustrate changes and trends which have occurred in the industry.

## CONCLUSION

There are many successful and profitable fish farms in Arkansas, as indicated by the \$24 million in returns during 1975, however, the fluctuations in production, acreage, and

Table 3. Commercial Fish Production in Arkansas During 1969.

	<i>Acres</i> <i>(X .4047 = Hectares)</i>	<i>Lbs./Acre</i> <i>(X 1.123 = kg/ha)</i>	<i>Total Lbs</i> <i>(X .4545 = kg)</i>	<i>Price/Lb</i> <i>(X 2.2 = Price/kg)</i>	<i>Total Value</i>
<i>Bait Fishes</i>					
Golden Shiner	20,200	313	6,341,700	\$1.04	\$ 6,595,300
Fathead Minnow	871	300	261,300	1.39	363,200
Goldfish	204	660	134,600	1.00	134,600
Israeli Carp	280	880	224,000	.65	145,600
Total	21,555		6,961,600		7,238,700
<i>Food Fishes (Intensive)</i>					
Channel Catfish	9,841	1,769	17,407,300	.379	6,440,700
Blue Catfish	569	1,415	805,200	.40	322,000
Buffalo	2,042	830	1,695,200	.08	135,600
Trout	26	71,000	1,576,200	.615	961,500
Total	12,478		21,483,900		7,859,800
<i>Food Fishes (Extensive)</i>					
Sport Fishes (All species)	378	39	14,850	.455	6,700
Mixed Species	4,320	200	864,000	.12	103,700
Total	4,698		878,850		110,400
		<i>No./Acre</i> <i>(X .4047 = Hectare)</i>	<i>Total No</i>	<i>Price/Fish</i>	
<i>Fingerlings</i>					
Channel Catfish	1,401	46,241	64,819,000	.38	1,944,600
Blue Catfish	40	26,650	1,012,600	.05	50,600
Buffalo	45	35,000	1,575,000	.075	118,125
Trout	4	51,675	206,100	.104	20,600
Total	1,490		67,612,700		2,133,925
OVERALL TOTALS	40,221		--		\$17,342,825

After Meyer et al 1971

Table 4. Commercial Fish Production in Arkansas During 1966.

	<i>Acres</i> <i>(X .4047 = Hectare)</i>	<i>Production</i> <i>In Lbs./Acre</i> <i>(X 1.123 = kg/ha)</i>	<i>Lbs./Total</i> <i>Production</i> <i>(X .4545 = kg)</i>	<i>Price</i> <i>Per Pound</i> <i>(X 2.2 = Price/kg)</i>	<i>Total Value</i>
<i>Bait Minnows</i>					
Golden Shiners	13,000	250	3,250,000	\$ 1.25	\$ 4,000,000
Fathead Minnows	1,000	400	400,000	.75	300,000
Goldfish	1,000	1,000	1,000,000	1.00	1,000,000
Israeli Carp	50	1,000	50,000	.50	25,000
Total	15,050		4,700,000		5,325,000
<i>Sport Fishes</i>					
Fingerlings: Bass, Sunfishes, Crappie	600	200	120,000	1.00	120,000
Food Size: Bass, Sunfishes, Crappie	5,000	50	250,000	.50	125,000
Trout	5	10,000	50,000	1.00	50,000
Total	5,605		420,000		182,500
<i>Food Fishes</i>					
Mixed Species	5,000	200	1,000,000	.12	120,000
Buffalo	250	2,000	500,000	.20	100,000
Catfish (Intensive)	4,250	1,000	4,250,000	.45	2,000,000
Catfish (Extensive)	5,000	25	125,000	.30	37,500
Catfish Fingerlings	500	500	250,000	4.00	1,000,000
Total	15,000		6,125,000		3,257,500
<i>Fee Fishing</i>					
All Species (Extensive)	10,000	20	200,000	15.00/Acre	150,000
Catfish (Intensive)	250	1,000	250,000	1.00/Lb.	250,000
Total	10,250		450,000		400,000
GRAND TOTAL	45,655		11,695,000		\$ 9,165,000

After Meyer et al 1968.

number of farms in Arkansas, demonstrate the great demands of fish farming. The potential problem areas for the industry include nutrition, diseases, construction costs, water management, marketing, crop land allocation, and the large, initial investment capitol required. These areas must be considered by those contemplating entering the business.

It is difficult to predict the future from trends which are indicated here, however, it appears that growth in the fish farming industry has leveled off, allowing consumer demand to have a greater influence. During early 1976, there was a shortage of fingerling catfish which caused the price of this product to climb to an all time high. This is expected to result in increased fingerling production and subsequent food fish production in future years. This type of demand caused fluctuation can be expected rather than the "new industry growth" which has been experienced in the past.

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