

Texas Aquaculture Production: Overview and Trends of the Industry from the USDA Census of Aquaculture (2013)

Todd Sink, Ph.D.

Assistant Professor and Extension Fisheries Specialist
Department of Wildlife and Fisheries Science
Texas A&M AgriLife Extension Service
Texas A&M University

Hannah Gerke

Department of Wildlife and Fisheries Science
Texas A&M AgriLife Extension Service
Texas A&M University

The 2013 Census of Aquaculture was the third national census conducted by the USDA, National Agricultural Statistics Service (NASS), to collect data about the aquaculture industry in the United States as a whole. Data for the Census was collected during the 2012 calendar year. The first aquaculture census was conducted in 1998, in response to the need for an accurate measure of the aquaculture sector. The second aquaculture census was conducted in 2005, and is used throughout this publication to determine aquaculture trends relative to 2012 production.

The collective Census of Aquaculture series is a critical tool for measuring the viability, growth, and sustainability of the national aquaculture industry, and at the same time the census yields valuable data necessary to assess the robustness and growth of state aquaculture industries. Fisheries Extension specialists at the Texas A&M AgriLife Extension Service have filtered the data below pertaining to Texas aquaculture production from the 2013 Census of Aquaculture in order to provide a precise overview of aquaculture production specific to Texas. All data contained within this publication should be cited as:

NASS (National Agricultural Statistics Service). 2012. Census of aquaculture (2013). Volume 3, special studies, part 2, AC12-SS-2. U.S. Department of Agriculture, NASS, Washington, D.C.

Non-data comments are the opinions of the authors only, formed by working with the Texas aquaculture industry and speaking directly with Texas aquaculture producers, and do not reflect positions or



Aerial photograph of a coastal aquaculture facility near Victoria, Texas.

statements held by the USDA National Agricultural Statistics Service.

Texas Aquaculture Production

In the U.S., Texas ranked 9th for the greatest total number of aquaculture farms per state in 2012, and 7th for total sales of aquaculture products. From

2005 to 2012, the total value of Texas aquaculture products sold nearly doubled from \$35,359,000 to \$69,770,000, representing a 97% increase in sales compared to 2005. Increased total sales occurred in conjunction with several other aquaculture trends; 1) Aquaculture remains the fastest growing segment of agriculture, 2) world demand for seafood products continues to rise with increasing population and affluence, 3) aquaculture is producing ever greater amounts of seafood products from the same or fewer acres of water, and 4) the value of aquaculture products is increasing due to high demand, input costs, and inflation.

Despite nearly doubling total sales, Texas only gained three aquaculture facilities, increasing from 95 farms in 2005 to 98 in 2012 (3% increase). More than half of Texas facilities accounted for in the census are small facilities required to hold an aquaculture license for home aquaculture, aquaponics, or seafood retail sales (grocery stores and other live fish holding facilities) and produce few fish for sale in open markets. The majority of production volume has been generated from less than 50 commercial producers, and combined with total sales data indicates: 1) the total value of aquaculture products increased dramatically, 2) existing farms greatly increased production, or most likely 3) a combination of these two factors.

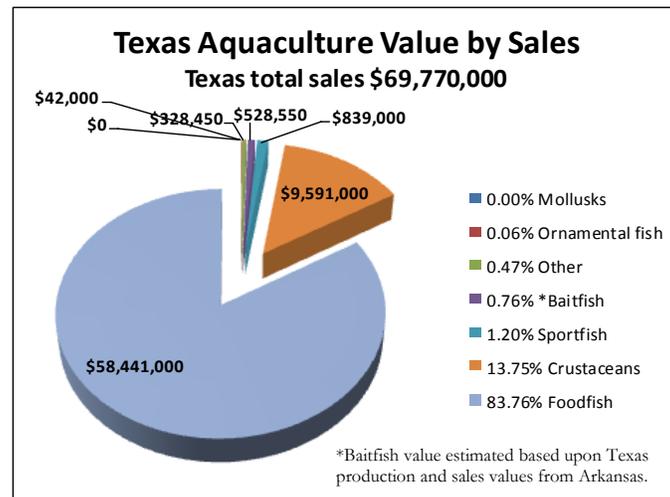
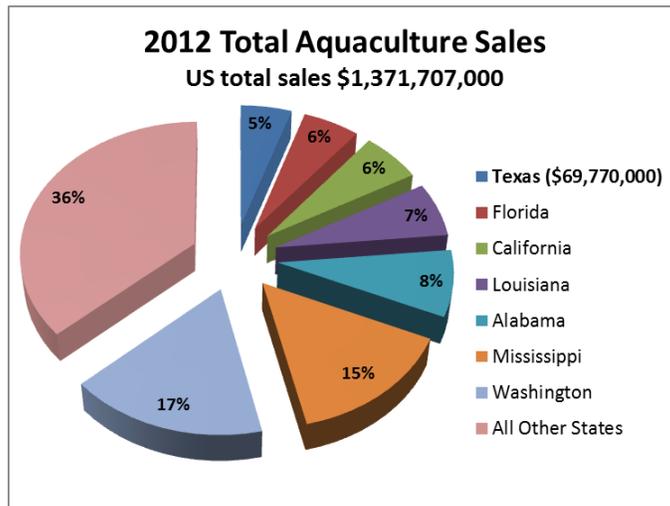
However, most industry professionals agree that increased total value of aquacultured products has not significantly increased income for producers. Farm-gate values of aquacultured products have

not risen proportional to retail values, scarcely covering increased input costs of power, feed, fuel, and labor. This demonstrates most price point increases occurred at the wholesale and retail segments with price increases likely based upon increased demand, but wholesalers and retailers also cite increased operational costs.

Texas ranked 4th for both the greatest number of foodfish farms and foodfish sales. The number of foodfish production farms increased from 63 to 72 (14%), and sales increased from \$17,917,000 to \$58,441,000, a 226% increase. Again, aquaculture license holders for sustenance production (home aquaculture or aquaponics) that produce few fish for sale in open markets represented the bulk of farm facility increases, with a few large-scale facilities actually discontinuing production or being assimilated into other existing aquaculture facilities.

Despite increased growth in the number of farms and sales, there remains substantial room for foodfish production development in Texas. The political, land-/water-use, and to a certain extent, the cultural climate of Texas has kept development of aquaculture enterprises suppressed, yet the economy, increased population, and demand for quality seafood products in Texas and nationally has increased the potential for foodfish production. Texas has equal or

superior climate and natural resources for development of production compared to the states ranked above it in foodfish production. However, regulatory and/or economic restrictions will likely be necessary for Texas to sustain any increase in foodfish production.



Texas was tied with Georgia for 5th greatest number of farms producing sportfish in 2012, and also ranked 5th for sportfish sales. The number of sportfish farms increased by 125%, from eight to eighteen. Sportfish sales also doubled from \$412,000 to \$839,000, a 104% increase from 2005. With more than 1.2 million private ponds, Texas stocks more sportfish on private lands per year than any other state, yet sportfish production within the state is minimal. The vast majority of sportfish stocked in Texas are produced in Arkansas, and to a lesser extent, Oklahoma.

There exists vast potential for sportfish production development within Texas, and the increased number of producers in Texas reflects the need for in-state production. Although challenging in their own right, the greatest obstacle to developing a sportfish production facility in Texas is not the political, economic, or cultural climate, but rather infiltrating the historical, relationship-based supply chain that has been dominated by out-of-state suppliers for more than three decades.



Production of sportfish, such as the largemouth bass fingerlings shown above, has increased dramatically in Texas, yet there continues to be ample room for expansion of the industry.

Baitfish farms increased 200% from three to nine, ranking Texas 6th in number of baitfish farms. Total sales data for baitfish in 2012 and 2005 was withheld to avoid disclosing data for individual farms due to the low number of producers. As with sportfish, baitfish supplies and sales in Texas (and

the rest of the nation alike), are dominated by production from Arkansas.

Like sportfish, there is potential to expand the baitfish production industry in Texas. However, unlike sportfish, development of baitfish production is arguably much more limited. Both industries must contend with the historical, relationship-based supply chain dominated by out-of-state suppliers, but baitfish production is an extremely high volume and very low return per production unit industry. Baitfish producers seeking to enter the industry must become very large, very quickly in order to have a large enough production volume to generate the revenues necessary to become sustainable. This limits possible entry to the industry due to the substantial land and infrastructure costs that must be addressed in a short period of time to be capable of producing the volume necessary to become sustainable.

Those seeking to enter the baitfish industry in Texas may consider the culture of marine baitfish. The baitfish production represented in the census data represents almost entirely freshwater baitfish species. However, significant research on and production of several marine baitfish species has been undertaken in the last decade. Several of these species are potential candidates for culture in Texas, and unlike freshwater baitfish, the return per production unit is significantly greater and limited supply leads to demand-based increases in sales and price.

Texas remained steady at 23 crustacean farms, but sales dropped 41% from \$16,316,000 in 2005 to \$9,591,000 in 2012. Despite this, Texas had the 2nd largest number of crustacean farms and ranked 4th in sales of crustaceans in 2012. The steady number of crustacean farms, but decreased total sales, is contributed to the exit of some marine shrimp producers and the entrance of an equal amount of crawfish and freshwater prawn producers. Shrimp are a high value crop compared to crawfish, so total crustacean sales fell while the number of producers remained unchanged. This demonstrates that despite a lower crop value per pound, crawfish may be more viable for Texas producers than marine shrimp when faced with competition from low-cost foreign imports.

Texas remains the top marine shrimp producer in the U.S., but the clearly dominate state in total crustacean culture is Louisiana due to its massive crawfish

production industry. Despite this, potential for expansion in crustacean culture in Texas is vast, with crawfish remaining among the most viable and actively growing aquaculture industries in the state as a result of increased popularity and demand. Production of freshwater prawns also demonstrated significant increases in production, yet remains a very minor component of crustacean culture in Texas. There may exist further opportunities for increased freshwater prawn production, but the industry is largely unexplored in Texas. The continued development of marine shrimp production in Texas is uncertain at this time, but is not likely unless market price to input cost inequality can be reconciled with that of foreign imports or there are dramatic improvements in U.S. shrimp production technologies.



The potential for expansion of crawfish culture in Texas is vast with crawfish remaining among the most viable and actively growing aquaculture industries in the state.

Ornamental fish farms decreased by 50% (from eight to four), and subsequently, sales decreased 259% from 2005 to 2012 (\$151,000 to \$42,000). Texas was part of an 8-way tie for 4th place in the number of ornamental fish farms, and was 5th for sales. While opportunities for development of specialized or small-scale ornamental fish production in Texas may exist, at this time it is difficult to ascertain the scope and scale of ornamental aquaculture production in the future. Although freshwater ornamental species of either domestic or foreign origin that are tolerant of large-scale produc-

tion in outdoor-pond systems offer the most practical means of increasing ornamental production in Texas, marine ornamental species are considered higher value and offer greater profit potential per fish.

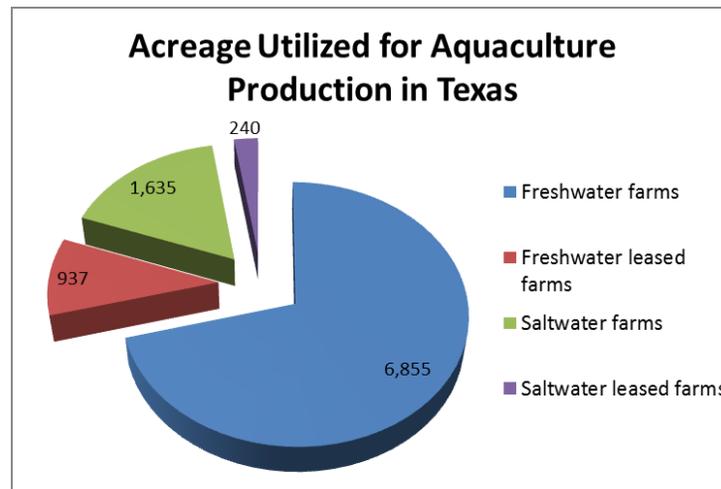
Texas Aquaculture Acreage

In 2005, the number of freshwater aquaculture farms was 79, but increased 8% to 85 in 2012. The total number of acres used for freshwater aquaculture production increased by 47%, from 4,651 in 2005 to 6,855 in 2012. Most of the reported “increase” in production acreage cannot be attributed to development of new facilities or ponds, but rather to production being re-initiated in existing ponds that had been left fallow due to dramatically increased feed costs and stagnant fish prices in the mid 2000s. Many producers could not afford to feed fish on hand while others were driven completely from the industry, resulting in ponds being left dry, unstocked, or re-purposed for other agriculture crops. Around 2010, feed costs began to decrease to price points that allowed producers to increase stocking again while stagnant fish prices began to make subtle gains. Current and near term production in Texas appears to be relatively stable at between 6,200 to 7,000 acres.

Leased freshwater farms dropped 31% from thirteen to nine, but the leased acreage increased from 740 to 937, a 27% increase. Texas tied for 7th with Arkansas for most freshwater farms and had the 5th most acres used for freshwater aquaculture production. Texas also tied with three other states for the 9th most leased freshwater farms, and had the 6th most leased acres used for freshwater farms. The decreased number of leased farms was largely due to purchase and incorporation of production ponds into existing aquaculture operations, after foodfish production made positive gains in profitability. Leased acreage increased mostly due to increased rental and utilization of existing ponds that were previously left fallow.

Saltwater aquaculture farms in Texas dropped 27% from nineteen to fourteen, and acreage decreased 33% from 2,432 in 2005 to 1,635 in 2012. The number of leased saltwater farms decreased 25% from four to three and the number of leased acres was 240. Texas was 16th in total number of saltwater farms, and

9th in total acres used for saltwater aquaculture production. For leased saltwater farms, Texas was 18th in number of farms, and 15th in acres used. Decreases in the number of saltwater aquaculture farms in Texas is alarming due to lost diversity and production despite the increased need for aquatic protein sources. However, loss of production acreage was mitigated as a quarter of the acreage from operations that were vacated due to producers leaving the industry was leased by existing operations, resulting in lower net loss. Culture of saltwater species in Texas has tremendous potential in Texas, but rising cost of coastal real estate, increased regulatory requirements, water rights issues, and sustainability/high input costs of piscivorous marine species present significant hurdles to expanding the industry.



and water usage issues remain considerable hurdles for maintaining current and increasing future aquaculture industries in Texas. Texas aquaculture producers must continually battle the public and sometimes political misconception that aquaculture is a major consumptive user of water resources. However, this is far from the truth as Texas aquaculture producers exhibit some of the highest aquaculture yields per acre of water in the nation, and most aquaculture facilities in Texas release zero water discharge. In reality, after

ponds are filled, they are rarely drained and often produce 8-10 year's worth of aquaculture crops using only the quantity of water required to replace any evaporation not replenished by rainfall. For example, a 10-acre pond that is between 5 and 6 feet deep can typically produce between 1.2 and 1.4 million pounds of catfish during a 10 year production cycle

between draining.

Texas Aquaculture Water Use

The number of farms increased 3% to 98 in 2012 from 95 in 2005. Farms using groundwater sources for aquaculture increased from 47 to 50, a 6% increase. On-farm, surface water farms ("surface supply not controlled by a water supply organization, such as streams, drainage ditches lakes, ponds, springs, and reservoirs") had a larger increase of 25% from 32 in 2005 to 40 in 2012. Off-farm water ("water from a Federal supplier; irrigation district; mutual private or cooperative ditches; commercial company; or municipal or community water system") was the least used source of water, and it dropped 16% from thirteen to eleven farms in 2012. The number of farms using saltwater decreased 27% to fourteen in 2012. Saltwater was defined as "...water from a sea or ocean, including brackish water. Also, freshwater converted to saltwater by adding chemicals."

Texas was 8th in aquaculture farms using groundwater, 9th for on-farm surface water, 5th for off-farm water, and 17th for saltwater. Water rights

Texas Aquaculture Production Methods

Pond culture systems dominate aquaculture in Texas. Of the 98 Texas aquaculture farms, 75 farms used 1,371 ponds for aquaculture production. The total pond production acreage was 6,796 with a mean size of approximately five acres per pond, although pond size is highly variable and dependent upon species, production practice, and producer preference. Texas had the 7th highest number of farms using ponds for aquaculture production, and the 6th most ponds used. Texas was 6th in terms of total pond acres used for aquaculture production, and had the 7th most acres per pond.

The flow through raceway method was used on three farms, tying Texas for 28th along with six other states. Fifteen farms used recirculating systems, with a combined 827 tanks. Texas was tied for 6th with Hawaii for farms using recirculating systems, and was 2nd for the combined number of tanks. The total volume of the tanks was 1,611,430

gallons, with an average volume of 1,949 gallons per tank, ranking Texas 6th and 10th, respectively. In comparison, there was only one farm using a non-recirculating tank system (Texas tied for 33rd with eight other states) and one farm using cages or pens (Texas tied for 27th with five others).



Earthen ponds, similar to those shown above, are the predominate culture system utilized for aquaculture production in Texas.

There were four farms with a combined sixteen tanks using aquaponics systems, making Texas tied for 6th with two other states. This data is highly disputed as there are significantly more “commercial-scale” aquaponics producers in Texas than are reported in the census. Part of the discrepancy is due to non-respondent aquaponics producers who are not aware they are required to respond and aquaponics producers that do not hold an aquaculture facility permit in Texas despite rearing fish. Both of these circumstances have been noted by the authors from first hand experience with aquaponics growers.

With seven farms, Texas had the 2nd most farms using croplands (rotational agricultural crop systems not including permanent ponds) for crawfish production. Cropland used for crawfish production totaled 632 acres for an average of 90 acres per farm. Texas had the 2nd largest total acres and average acres per farm.

Texas Foodfish Sales by Species

In 2005, total sales from the 63 foodfish farms were \$17,917,000. By 2012, the number of foodfish farms increased to 72, and sales rose to \$58,441,000; a

14% increase in farms and 226% increase in sales. Texas ranked 4th in total number of foodfish farms and 4th in total foodfish sales.

With an increase of three farms (43%), there were a total of ten farms raising hybrid striped bass in 2012, and according to the census, sales increased by 408% (from \$5,050,000 to \$25,674,000 in 2012). It is important to note the production and sales production figures for hybrid striped bass in Texas have been disputed as inaccurate by some hybrid striped bass producers in Texas. There are major inconsistencies between the census data and the data collected during the same reporting year by the Striped Bass Growers Association, with the census values being nearly double those of the Striped Bass Growers Association. True production sales values are likely between \$12,600,000 to \$16,770,000, but still demonstrate a clear and substantial growth in the Texas hybrid striped bass production industry. Nevertheless, Texas had the 2nd most farms raising hybrid striped bass and is undisputedly ranked 1st in total sales no matter the source of the sales data.

The trend of increased hybrid striped bass production is likely to continue in Texas throughout the remainder of the decade due to existing foodfish producers switching more acreage from catfish production to hybrid striped bass. The conversion to hybrid striped bass production from catfish production has resulted from stable fingerling supply and increased product awareness, demand, and profit potential for hybrid striped bass, as compared to somewhat immobile farm-gate prices, lower profit margins, and stagnant or shrinking markets for catfish. Hybrid striped bass foodfish production, in addition to crawfish and sportfish production, currently represent industries with abundant potential to increase freshwater aquaculture production in Texas before the next census of aquaculture.

Texas was tied with Georgia for the 2nd most number of farms raising carp species, which rose 133% from three to seven. Increased awareness and use of triploid grass carp for aquatic vegetation control resulted in a significant growth in production of triploid grass carp by Texas producers. For grass carp specifically, an increase of one farm raised the total 33% to four farms in 2012, accompanied by 876% leap in sales from \$21,000 in 2005 to \$205,000 in

2012. Texas tied for 3rd with three other states for the number of farms raising grass carp, and had the largest total sales from this species. In 2005, there were no farms in Texas raising species of carp other than grass carp, but by 2012, there were three (sales data withheld). It is unclear at this time which market the other species of carp were being cultured for, but markets could include use as foodfish, baitfish, sportfish, or even manufacturing.

Texas had 51 farms raising catfish in 2005, with sales of \$5,186,000. By 2012, Texas gained three more farms and increased 315% to \$21,521,000. Increased sales were not attributed to new production acreage, but rather to increased stocking densities and renewed production in ponds that had been left fallow due to increased feed costs and stagnant fish prices in the mid 2000s. Texas was ranked 4th in the U.S. for both the number of farms raising catfish and the resulting sales. Note—the data for Alabama was withheld, resulting in Texas being ranked 3rd in the census, but the National Agricultural Statistics Service Catfish Production data places Alabama 2nd in both catfish sales and production, bumping Texas to 4th.

From 2005 to 2012, there was a 300% increase in farms producing red drum, from two to six (sales data withheld), making Texas 1st in the U.S. Despite positive farm growth found during the census, the red drum industry in Texas currently appears to be at a crossroad. Substantial increases in production and sales of red drum necessary to propel it to a top production species in Texas are unlikely, and the probability of maintaining production at current levels is not certain at this time.

Limited saltwater availability inland, rising coastal real estate prices, and danger of losing crops due to thermal sensitivities of red drum, may cause producers considering redfish production to redirect their focus to species tolerant of a wide range of thermal and salinity (including freshwater) conditions that can be cultured in other areas of the state, such as hybrid striped bass. While red drum production in Texas has proven to be success story in the development of a new species for culture, major hurdles still impede the industry's growth including lack of a steady fingerling supply for growout producers as well as product establishment in non-coastal markets of the U.S. The single greatest prospect for dramatic increases in

redfish production is by establishing production offshore in net-pen operations, which may become a reality in the very near-term as current laws are being revised to allow more opportunity for offshore aquaculture production in the Gulf of Mexico. This scenario eliminates saltwater availability limitations, rising costs of coastal land, and reduces the threat of crop loss due to temperature.

Tilapia farms increased by 13%, from eight farms in 2005 to nine in 2012. Sales data were withheld in 2005, but sales were \$799,000 by 2012. Texas tied with two states for the 4th most tilapia farms, and had the 6th largest sales of tilapia. The tilapia industry in Texas faces the same industry issues found throughout the U.S. for tilapia; high feed and labor costs, narrow margins between production cost and sales value, and fierce competition from abundant, low-cost foreign imports. While tilapia production in Texas may vary by as much as 100% of the 2012 levels or more in some years, tilapia production as a foodfish industry is not expected to be a major segment of aquaculture production growth in the state for the remainder of the decade.



Tilapia production has found a niche in east Texas, yet high feed and labor costs, narrow margins between production cost and sales value, and fierce competition from abundant, low-cost foreign imports hinder large-scale expansion.

Although no sturgeon were produced in 2005, there was one farm in 2012 (sales data withheld), creating a tie with Hawaii for the 5th most sturgeon farms. The number of farms producing trout did not change with only one farm (sales data withheld), tying Texas with four states for 29th in the U.S.

Texas Catfish Sales by Species and Size

In 2012, there were 49 farms that sold a combined 10,582,000 food-size catfish. The total live weight in pounds of food-size catfish was 18,992,000, with an average of 1.8 pounds per fish. Total sales were \$21,366,000, with a mean sales price of \$1.13 per pound. There were only seven farms selling stocker catfish, eight farms selling fingerlings and fry, and one selling broodfish; thus, weight and sales data were withheld for these categories.



Catfish continue to be the dominate and most economically important aquaculture species in Texas, but a few other species, such as hybrid striped bass, are achieving gains in production within the state as well.

Texas was 4th in the U.S. for number of farms raising food-size catfish, total number sold, total live weight, and total sales. The data for Alabama was withheld, resulting in Texas being ranked 3rd in the census, but the National Agricultural Statistics Service Catfish Production data places Alabama 2nd in both catfish sales and production, bumping Texas to 4th overall. Texas was part of a five-way tie for 3rd place regarding the average live weight per food-size

catfish, but only the 7th highest price per pound for food-size catfish. Texas ranked 2nd in a tie with Missouri for farms selling stocker catfish, 4th in a tie with California for farms selling fingerlings and fry, and 5th in a five-way tie for farms selling broodfish.

Texas Sportfish Sales by Species

Farms selling sportfish in Texas increased 225% from eight in 2005 to eighteen in 2012, with a 104% sales increase from \$412,000 to \$839,000. Texas tied with Georgia for 5th in the US for the total number of farms selling sportfish, and was 5th for total sportfish sales.

Farms selling largemouth bass increased 86% from seven to thirteen, with sales of \$388,000 in 2012 (2005 sales data withheld). Texas tied with Arkansas for 2nd largest number of farms selling largemouth bass, and was 5th in sales. Although there were no farms selling smallmouth bass in 2005, there were two farms by 2012 (sales data withheld), making Texas part of a six-way tie for 4th most number of smallmouth bass farms.

Six farms sold crappie in 2012, compared to just one in 2005 (sales data withheld), a 500% increase that created a tie with two other states for largest number of farms selling crappie. In 2012, fourteen farms sold sunfish with sales of \$414,000, representing a 100% increase in farms and an 82% increase in sales from 2005. Texas had both the 3rd most farms selling sunfish as well as the 3rd most total sunfish sales. Farms selling sportfish other than those species above increased from none in 2005 to three in 2012 (sales data withheld), making Texas 3rd in the US.

Texas Baitfish Sales by Species

In 2012, nine farms in Texas sold baitfish, produced in a total of 48 acres of water-surface used. In 2005, there were only three farms producing baitfish (sales data withheld). This marks a 200% increase, making Texas 6th in the U.S. for number of baitfish farms as well as water surface acres used to produce baitfish. Although there was one farm in 2005 that produced bait crawfish, there were none reported in the census by 2012 (sales data withheld). However, this appears to be an omission of reporting or the data, as several crawfish farms we contacted in Texas sold "bait",

“small”, “field-run”, or “pond-run” crawfish classifications in bulk for the use as bait. Farms selling fat-head minnows increased by 150% (from two to five), with sales of \$275,000 in 2012 (2005 sales data withheld). Texas was tied with Missouri for 6th most fat-head minnow farms, and was 4th in terms of sales. Goldfish (feeder and bait) weren’t sold by any farms in 2005, but by 2012 there was one farm (sales data withheld), making Texas a member of a six-way tie for 4th most goldfish farms. Farms selling golden shiners rose 400% from one to five, with sales of \$266,000 in 2012 (sales data withheld for 2005). Two farms sold baitfish species other than those specified above in 2012. This was one more farm than in 2005 (sales data withheld), making Texas 6th for other bait-fish species farms.

Texas Ornamental Fish Production and Sales by Species

The total number of ornamental fish farms in Texas fell from eight to four in 2012, with a sales drop from \$151,000 to \$42,000 (72% decrease). Texas was 11th for the total number of ornamental fish farms, tied with seven other states. Farms selling freshwater egg layers increased from one to two in 2012, but farms selling freshwater live bearers remained at one farm (sales data withheld for all). Texas was 4th for freshwater egg layers, along with three other states, and tied with seven states for 5th in the U.S. for freshwater live bearers. Goldfish farms decreased from three to one (sales withheld) making Texas 8th, tied with eight other states. In 2005, there were six farms selling koi with sales of \$117,000. In 2012, that number dropped to three farms that sold a total of 3,000 koi (sales data withheld). Along with six other states, Texas was 15th in the U.S. for farms selling koi. Texas produced no saltwater ornamental fish in 2005 or 2012. There was one farm in both 2005 and 2012 that sold ornamental fish species other than those previously mentioned (sales data withheld), making Texas 4th along with four states.

Texas Crustacean Sales by Species

Although the number of farms from 2005 to 2012 remained steady at 23, sales dropped 41% from \$16,316,000 to \$9,591,000. Texas was 2nd for num-

ber of farms and 4th for crustacean sales. Farms selling crawfish for food increased 123% (from eight to nine), with sales of \$452,000 in 2012 (2005 sales data withheld); Texas had the 3rd largest number of farms selling crawfish for food, and the 2nd highest sales. Farms selling freshwater prawns rose from two to three (sales data withheld), tying Texas with two states for the 6th most farms. Saltwater shrimp farms showed a decrease of 36% from fourteen farms with sales of \$16,076,000 to nine farms in 2012 (sales data withheld). However, Texas tied with Florida and Louisiana for the highest number of farms.

Texas Mollusk Sales

There were no mollusk species sold by Texas farms in 2005 and 2012. Due to elevated regulatory requirements compared to other states, mollusks including oysters, cannot be produced in an economically feasible manner in Texas. While Texas historically had aquacultured oyster producers, the implementation of current regulatory requirements prompted the few remaining producers to close operations or relocate to nearby states with more favorable regulatory requirements. Until changes occur in the regulatory requirements for Texas, creating regulations more consistent with other Gulf coast states, mollusk aquaculture has very little chance of establishing within the state. This is regarded by many as overly restrictive and the cause of significant economic harm to Texans from loss of potential sales revenue and opportunity. Aquacultured oysters generated \$180 million in sales for the U.S. in 2012, with \$68 million in sales from the eastern oyster, which is the primary native species along the Texas Gulf coast.

Miscellaneous Texas Aquaculture Production and Sales

In 2012, there were a total of two Texas farms with miscellaneous aquaculture production (sales data withheld); Texas placed 13th with six other states. One Texas farm sold whole alligators (data withheld), but there were no Texas farms that sold only alligator hides or meat. Of the four states that sold alligators, Texas had the least number of farms. There was also one farm that sold tadpoles (data withheld), making Texas 4th, along with six states. The following cate-

gories were not sold by any Texas farms: algae, microalgae, sea vegetables, caviar, eels, frogs, sea urchins, snails, whole turtles or turtle eggs, live rock, or other miscellaneous aquaculture.

Texas Trout Produced and Distributed for Conservation, Recreation, Enhancement, or Restoration Purposes

In 2012, two Texas farms produced trout excluding eggs to be distributed for conservation, recreation, enhancement, or restoration purposes. In this category, Texas was 34th in the US and tied with three other states. There were no farms that produced and distributed only eggs.

Texas Acres Used for Hybrid Catfish Production

In Texas, there were 15 farms raising hybrid catfish on a total of 1,607 acres in 2012. Hybrid catfish production was not a reporting category in 2005.