



Figure 1.1. Although they are outwardly similar at first glance, a number of characteristics distinguish the red swamp (left) and white river crawfish (right).

Whether from managed ponds or wild habitats, Louisiana's crawfish harvests are composed of two species – the red swamp crawfish (scientific name: *Procambarus clarkii*) and to a lesser extent the white river crawfish (scientific name: *Procambarus zonangulus*) (Figure 1.1). Although scientists in other parts of the world use the term “crayfish” for these and all related species, in this manual we refer to these two species as “crawfish” to reflect not just their common names, but also the widespread use of the word by producers, marketers and consumers in Louisiana and elsewhere in the United States.

Louisiana's crawfish farming industry has grown to include more than 1,200 farms occupying more than 120,000 acres. Production from wild habitats, mainly the Atchafalaya River basin, varies from year to year. Total production for the 2004-2005 season was more than 82 million pounds, with almost 74 million pounds from farms and more than 8 million pounds harvested from natural habitats by approximately 1,100 fishermen. The farm-gate and dockside value of the 2004-2005 harvest exceeded \$45 million.

Crawfish ponds have no standard size, but most are between 10 and 40 acres, and most producers manage 150 or fewer acres (Figure 1.2). Occasionally, a single pond may include more than 1,000 acres, especially in bottomland areas where water levels are manipulated in natural habitats for crawfish production (Figure 1.3).

Formulated feeds are not used to produce crawfish. Instead, rice, sorghum-sudangrass or natural vegetation is grown in the summer (when ponds are drained) to serve as the base of a natural food chain for crawfish. Crawfish ponds are not stocked



Figure 1.2. Although there is no “standard” crawfish pond, a successful pond must be built on flat land that will hold water and support a forage crop for the crawfish.



Figure 1.3. In some parts of Louisiana, semi-natural habitats are impounded to allow for crawfish production through control of natural hydrological cycles.

with hatchery-reared young as in other forms of aquaculture. Farmers rely on reproduction by unharvested crawfish from the previous year or on mature crawfish that are stocked to produce young naturally.

Educational and technical assistance in all aspects of crawfish production and marketing is provided by the LSU AgCenter through the Louisiana Cooperative Extension Service in every parish. Help is available through individual consultation, on-farm visits, production meetings and publications (Figure 1.4). Anyone considering going into crawfish farming should review current financial budgets available from the LSU AgCenter and discuss the feasibility of their projects or business plans with an extension professional who can identify the best available data for making decisions as to how to proceed. Louisiana Cooperative Extension Service agents and specialists are the best source of information on the feasibility of farming crawfish in your area.

History

Crawfish have been consumed for centuries by American Indians and in many parts of Europe. Commercial sales of crawfish in Louisiana began in the late 1800s. At that time, crawfish were harvested from natural waters throughout the southern region of the state. The first record of a commercial crawfish harvest in the United States was in 1880. That year, a harvest of 23,400 pounds was recorded, with a value of \$2,140. By 1908, a U.S. Census

Profitability Varies

The profitability of crawfish farming changes from year to year because of the variable supply of wild and farm-raised crawfish, and resulting fluctuations in wholesale and retail prices. As a result of the unpredictable yields from pond to pond and year to year, few people make their living only from farming crawfish. Overall production on a crawfish farm depends greatly on whether the crawfish are grown in rotation with rice or in permanent crawfish ponds and on the size and management level of those ponds. Breakeven prices vary greatly from farm to farm and in different regions of the state.



Figure 1.4. Field faculty and state specialists with the LSU AgCenter are available to visit producers throughout the state.

report listed Louisiana's crawfish production at 88,000 pounds, with a value of \$3,600.

In the years following the Great Depression, crawfish sold for as little as 4 cents per pound. During this period, with the development of improved transportation and cold storage, crawfish markets within Louisiana shifted from local consumption in rural areas to higher-volume markets in cities such as Baton Rouge and New Orleans. During this same period, the introduction of wire mesh crawfish traps provided fishermen a much more efficient method of harvest (Figure 1.5).

In 1950, the Louisiana Legislature funded the Wildlife and Fisheries Commission to study the life history of crawfish in small ponds. By this time, the practice of re-flooding rice fields after grain harvest was occasionally practiced to produce crawfish for family consumption. This practice of crawfish "farming" eventually spread to closed-in woodlands and marshland as well.

Up until this time, most of the crawfish available for people to consume had come from wild harvests in natural habitats. Although crawfish were abundant some years because of high water levels in the Atchafalaya Basin and other natural wetland



Figure 1.5. Even though the first crawfish traps were fairly simple designs, they enabled the industry to increase supply rapidly. Over the past two decades the construction and efficiency of commercial traps has improved tremendously.

How are Crawfish Classified?

Over the centuries, biologists have devised classification systems to represent groupings of animals and to better define where individual species fit within those groupings. With time, these systems have become more and more complicated, but this in turn provides more information about the relationships between species and groups of species. According to the most commonly accepted classification system, the red swamp crawfish and white river crawfish can be described as follows:

Kingdom: Animalia (animals)

Phylum: Arthropoda (crustaceans, insects, spiders, scorpions, etc.)

Subphylum: Crustacea (crustaceans)

Class: Malacostraca (crabs, pill bugs — rollie-pollies, krill, and related species and groups)

Order: Decapoda (meaning ten legs: lobsters, shrimp, crabs, crayfishes — also called crawfishes, and relatives)

Sub-Order: Pleocyemata

Superfamily: Astacoidea (all crayfishes)

Family: Cambaridae (cambarid crayfishes — one of three major groups of crayfish)

Subfamily: Cambarinae (a group of North American crayfish species, with more than 300 members)

Genus: *Procambarus*

Subgenus: *Scapulicambarus* (for red swamp crawfish), *Ortmanicus* (for white river crawfish)

Species: *clarkii* (for red swamp crawfish), *zonangulus* (for white river crawfish, which was previously called *acutus* for many years)

Scientists often refer to animals and plants by their genus and species classifications. Thus, the red swamp crawfish is referred to as *Procambarus clarkii* and the white river crawfish is *Procambarus zonangulus*.

areas, in other years crawfish were scarce and difficult to come by. This variation in supply made it difficult for markets to grow, but once crawfish farming began, more consistent supplies were possible.

By the mid-1960s, the amount of land devoted to crawfish farming had increased to approximately 10,000 acres of managed ponds. At this point, an industry based on peeling crawfish became established, and the new markets for crawfish meat allowed both crawfish farming and wild harvests to increase even more (Figure 1.6). Acreage continued to increase in Louisiana, from approximately 44,000 acres in the mid-1970s to current levels of roughly 120,000 acres.

Small harvests of farmed crawfish for human consumption occur in other states, such as Texas, Arkansas, Mississippi, Alabama and the Carolinas, but Louisiana is by far the largest producer of crawfish in the United States. Official estimates are not available, but industry experts estimate that Louisiana usually accounts for 90 percent to 95 percent of the total U.S. production from year to year. The vast majority of crawfish aquaculture in the United States is focused on production for human consumption, but some pond-cultured crawfish are sold for fish bait or marketed as aquarium or scientific specimens.

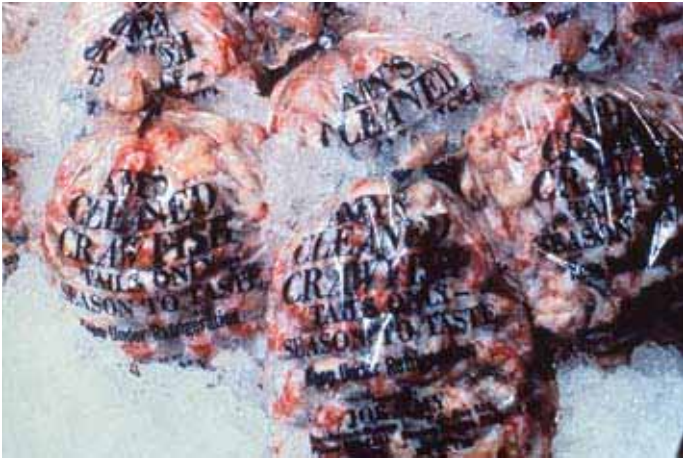


Figure 1.6. The earliest efforts at commercializing markets for crawfish tail meat involved simple methods, but allowed for marketing of fresh product to a wide consumer base.

As the crawfish farming industry began to expand during the 1950s and early 1960s, a number of people felt that for economic growth and benefits to take place, harvests would have to become even more predictable from year to year. Predictability, however, would require research to develop recommended production practices. In 1964, researchers in Louisiana State University's School of Forestry and Wildlife Management began conducting research on crawfish biology and improved methods for pond production.

Initial research focused on how best to manage crawfish ponds to provide a productive habitat, including what type of vegetation to plant, when to plant it, when to flood the ponds, how many crawfish to stock, how to discourage natural predators such as insects and wild fish and other basic topics (Figure 1.7). As time went on and the industry continued to grow, research focused on solving more problems, such as improving trap designs, developing formulated baits that would not have to be refrigerated or frozen, managing the amount and quality of water used in producing crawfish, evaluating the possibility for genetic improvement of crawfish, looking at new ways to process crawfish, developing new products made with crawfish meat and many other topics.

A large portion of Louisiana's crawfish aquaculture, in excess of 50 percent, is practiced in conjunction with rice production. Crawfish farming fits well into many existing farm operations by using marginal agricultural lands, crop rotations, and permanent farm labor and equipment during off-peak farming periods. Crawfish can be produced either in permanent rotation with a rice crop year after year in the same location or in a field rotation with rice and occasionally some other crop, with restocking of crawfish each rotational cycle. As the economics of rice production in Louisiana have weakened over recent decades, many rice producers have turned to crawfish as an accessory crop that can be integrated into their existing farming operations.

Additional Sources of Information

Additional information on crawfish aquaculture and the crawfish industry, including news articles, crawfish statistics, fact sheets and newsletters that do not appear in this production manual can be found on the LSU AgCenter's Web site. Several fact sheets on crawfish farming and other very informative

fact sheets on aquaculture in the southern United States can be found on the Southern Regional Aquaculture Center's Web site. To locate this Web site, type in "Southern Regional Aquaculture Center Fact Sheets" in the search command of your favorite Internet search engine. Personnel in your local LSU AgCenter extension office can assist you in obtaining the most current information available on crawfish farming or other aspects of agricultural production associated with crawfish farming.

Natural Fishery

Historically, significant harvests of wild crawfish have occurred in Louisiana. This production moves through the same market channels as farmed crawfish, affecting prices received by farmers. In recent years, however, many of the traditional areas of wild harvest have failed to produce large volumes of crawfish. To what extent this reduction in wild harvest might reflect long-term trends in water management, climate and habitat alteration remains uncertain. Since 2000, less than 20 percent of Louisiana's harvests on average have come from the wild fishery.



Figure 1.7. Crawfish research has been conducted for many years by the LSU AgCenter in a number of administrative units, including the Aquaculture Research Station and the Rice Research Station.