

## Chapter 8. Harvest

The low-intensity production technology used in farming crawfish requires a harvest method unlike those used to harvest fish. A passive system is used, employing baited traps beginning as early as November and continuing through the following April-June. If fall and winter production of juveniles is low, or where crawfish are grown in northern portions of the state, initiation of harvest seldom begins before March and is often extended into late July.

Crawfish recruitment is continual over much of the 7- to 10-month growing season. Regular, frequent harvests are necessary, in contrast to the infrequent batch harvest with seines common with fish culture operations. Harvesting crawfish with seines or trawls is typically not feasible because of dense vegetation. Crawfish may be harvested with traps from well-managed ponds 40 to 90 days per year. In Louisiana, two-thirds of the crop is generally harvested from March through June, when densities of marketable crawfish are highest and crawfish are most active. Trapping is labor intensive, and over half of all production expenses are associated with harvest. Bait and labor are typically the major harvesting costs. Efficient harvesting is essential for crawfish farming profitability.

### Factors Influencing Catch and Harvest Size

Crawfish catch from production ponds can vary two- or three-fold from day to day (Figure 8.1) and is influenced by many factors. Water temperature and density of marketable crawfish are the primary factors that govern seasonal changes in crawfish catch. However, water quality, type and quantity of vegetative forage, weather, lunar phase, as well as crawfish reproduction, growth and molting patterns all play significant roles in the variation observed in daily catch. A summary of the major factors affecting crawfish catch is outlined in Table 8.1.

Size at harvest is largely influenced by environmental conditions – much more so than genetic factors. Crowding reduces growth and usually leads to stunting. Crawfish are aggressive and territorial. Larger crawfish intimidate and out-compete smaller individuals, thereby suppressing growth. To ensure

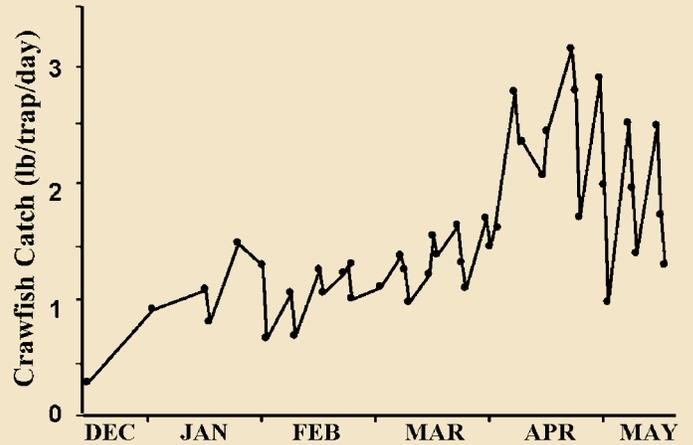


Figure 8.1. An example of seasonal trend in crawfish catch from a Louisiana crawfish pond.

growth of smaller size classes and achieve high yields, crawfish should be harvested soon after attaining acceptable marketable size. Harvesting removes larger individuals from the population, reducing aggression and leaving space and food resources for undersized animals.

The minimum acceptable size for crawfish for consumption varies with season, abundance and price; however, consumer preference is typically for 23 individuals (“count”) per pound and larger (3 1/2 inches and longer). Large crawfish, 10- to 15-count per pound, usually command premium prices.

### Traps

During the early history of crawfish farming, many styles and sizes of traps were used by crawfish farmers, and all caught crawfish with varying degrees of efficiency. Presently, the “pyramid trap,” with three entrance funnels has become the industry standard (Figure 8.2). For years, most traps were made from 3/4-inch mesh, plastic-coated hexagonal-shaped (hex) poultry

Table 8.1. Some factors that influence daily and seasonal crawfish catch.

Factor	Catch Decreases	Catch Increases	Reason
Water temperature	With cooling	With warming	Regulates crawfish feeding activity.
Crawfish density	When sparse	When abundant	Regulates amount of harvestable crawfish.
Relative abundance of vegetation	When abundant	When sparse	Abundance of natural foods and bait attractants not easily dispersed.
Short-Duration Rain Showers and Flowing Water	-	Usually	Aids in bait attractant dispersal and reduced light and stimulates crawfish movement.
Mass molting	Usually	-	Crawfish cease feeding during pre-molt, molt and post-molt phases.
Lunar phase	With full moon	-	Appears to increase the frequency of molting.
Cold fronts	Usually	-	Cooling water decreases feeding activity.
Harvesting intensity	With intense harvesting	With less intense harvest or after a “rest” period	Influences the amount of harvestable crawfish.

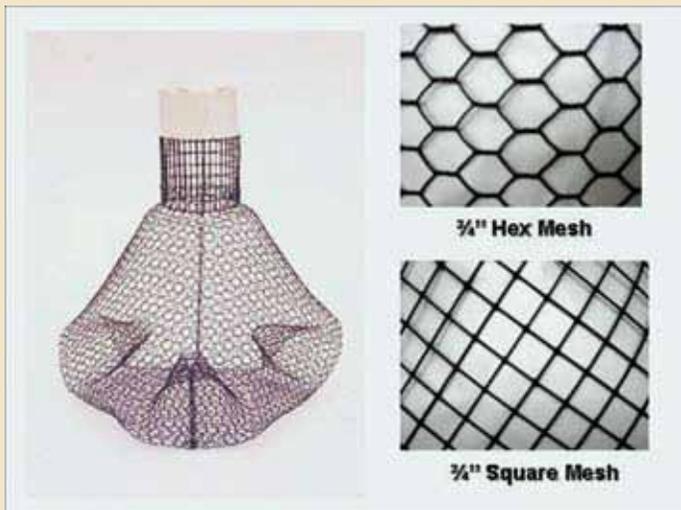


Figure 8.2. Pyramid crawfish trap with optional vertical extension.

wire (19 or 20 gauge). These mesh-sizes typically retained crawfish of minimum marketable size, about 3 inches and longer (35 count per pound). Although hex wire traps dominated the industry prior to 2003, today most traps are made from 3/4-inch or 7/8-inch welded square mesh wire. Traps made of square mesh wire are more durable. Traps made from square mesh wire also retain smaller crawfish than comparable size hex-mesh wire. Research by the LSU AgCenter has shown that 3/4-inch square wire will catch on average about one-third more crawfish than 3/4-inch hex wire traps with an overnight set. The catch with 7/8-inch square mesh traps is roughly equivalent to that of 3/4-inch hex mesh traps.

Pyramid traps are constructed from wire formed into a three-sided, three-dimensional form shaped like a pyramid. Optional cylindrical vertical extensions, usually 6 inches long, are often added to increase the height of the trap for use in deeper water (see Figure 8.2). A 6-inch diameter plastic pipe (or extruded collar) is placed at the top of the trap to function as a handle and prevent crawfish escape through the open top. Traps made from 24-inch wide by 44-inch long to 24-inch wide by 54-inch long wire are the most prevalent sizes. Final overall dimensions of the traps are approximately 17 inches wide at the base and, with a 6-inch extension, about 26 inches tall.

The inside diameter of entrance funnels is usually 1 3/4 to 2 inches. Since wind and wave action and avian predators (herons and egrets) that perch on the plastic collars can cause traps to topple, metal supporting rods (5/16-inch diameter) are often added to minimize toppling. Crawfish traps do not have bait protection containers (bait wells) as is often found in crab traps because catch is usually substantially reduced with their use.

## Baits

Bait, which is required to attract crawfish into traps, is the single highest expense in crawfish production and accounts for nearly one-third of production costs. Bait cost depends on the type, amount used per trap, trap density and trapping frequency. Two types of bait commonly used are natural fish baits and formulated baits.

Fish baits are usually sold frozen in 80-pound or 100-pound boxes. Clupeid or “sardine-like” fishes, specifically gizzard shad and Gulf menhaden or “pogy” (Figure 8.3) are the most widely used natural baits in Louisiana where commercial fisheries exist for both species. Common carp, buffalofish,



Figure 8.3. Commonly used crawfish baits: (top) gizzard shad; (middle) menhaden or “pogy”; and (bottom) manufactured baits.

herring (“slicker”), suckers and catfish are also used. Shad, menhaden and carp are superior to other natural fish baits as attractants. Beef pancreas (“beef melt”) commonly used by recreational trappers, is an effective attractant but too expensive for commercial use. When a shortage of bait occurs in the Louisiana bait fisheries, significant quantities are shipped in from other states.

Formulated crawfish baits, often referred to as “artificial” or “manufactured” baits, were commercialized in the early 1980s and are produced by several feed companies, both within and outside of Louisiana. These cylindrical pellets consist mainly of cereal grains, grain by-products, commercial flavoring agents and a binder. They are generally one-half to 2 inches in diameter and 1 1/2 to 3 inches long and sold in 50-pound bags.

Fish baits are seasonal in supply and price and more expensive than formulated baits. Large farms may have freezers or coolers for storage, but smaller farms require daily deliveries. Labor is needed to cut the fish to puncture the swimbladder so it will sink and to portion it into efficient sizes, which further adds to its cost. Formulated baits do not require refrigeration and are easier to handle. Some companies offer different formulations for use in cool or warm water.

## Baiting Strategies

Significant cost reductions can be achieved by employing efficient baiting strategies. The main considerations are selection of bait type relative to season and quantity of bait used per trap. Shad and menhaden are more effective attractants than formulated baits at water temperatures below 70 F (Figure 8.4), and, in Louisiana, fish baits are used almost exclusively during winter and early spring trapping (November through March). Even though fish baits are more expensive, the average two- to three-fold increase in catch over formulated baits under these conditions compensates for the additional bait cost. When water temperature exceeds 70 F to 75 F and ponds become depleted in forage (corresponding to late March to early April in South Louisiana), formulated baits become equally effective or more effective than fish baits, and they are the most cost-effective

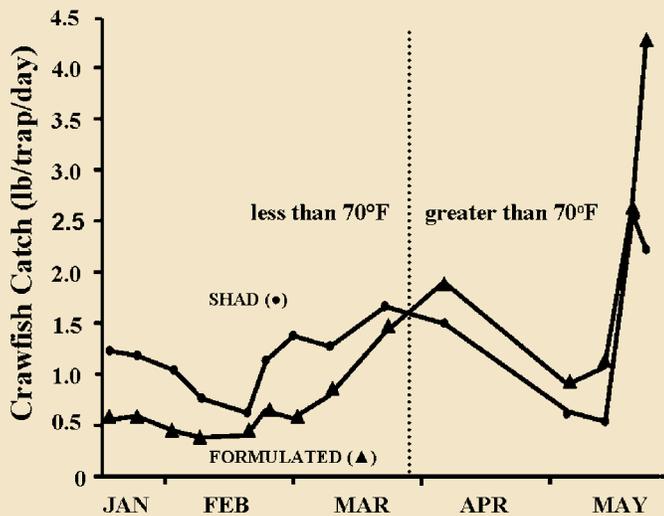


Figure 8.4. Example of the effect of water temperature on attractability of shad (●) and a formulated bait (▲).

attractants. At water temperatures of 65 F to 75 F, a combination of fish and formulated bait added to traps in approximately equal portions can increase catch as much as one-third over fish alone or formulated bait alone; however, the logistical inconvenience of handling two baits at the same time in harvesting boats must be considered when employing this strategy.

During winter, when crawfish feeding activity is minimal and the number of harvestable crawfish is still relatively low, studies suggest that one-fourth pound of bait per trap is sufficient to harvest available crawfish. When waters warm in the spring and the crop of harvestable crawfish nears maximum levels, the quantity of bait should be increased to about one-third pound per trap. Although it is not practical to portion bait into each trap carefully, farmers can gauge and monitor bait use by keeping good records on the total quantity used for the number of traps in a pond or the farming operation. For example, when using one-third pound of bait per trap per day, a 100-pound box of fish bait should be sufficient to bait 300 traps. If only 200 traps are baited, too much bait is being used. A 50-pound bag of formulated bait is sufficient to bait 150 traps. The trapper should pay attention to the amount of bait remaining in the trap after a 24- or 48-hour soak (set time). If significant bait residue remains in the trap the amount can be reduced somewhat. If bait is rapidly consumed, however, consideration can be given to increasing the amount of bait. Fresh bait should be used each trapping day, especially with fish baits. To maximize crawfish movement to freshly baited traps, bait residue should not be disposed of in the pond.

## Trapping Strategies

Traps are placed in rows to facilitate harvesting by boat (Figure 8.5). Distance between traps depends on trap density (Table 8.2) and a spacing of 40 to 60 feet between individual traps and between rows is most common. Where annual yields of harvestable crawfish are expected to exceed 1,000 pounds per acre, a trap density of 18 to 22 square-mesh pyramid traps per acre, baited and emptied three to four days per week is recommended. It is not uncommon for farmers to use a lower trap density of 10 to 15 per acre if a low-standing crop of crawfish is present or if large areas are to be trapped and labor is limited. Trap density should be increased by two to three traps per acre if hex-mesh pyramid traps are used. If buyers require daily delivery of crawfish, or the price is high and catch justifies the effort, crawfish can be harvested five to six days per week,

Table 8.2. Spacing between rows (in feet) and the distance between traps (in feet) to obtain a specified number of traps per acre.

Distance Between Traps	Distance Between Rows	Traps Per Acre
40	40	27
40	50	22
40	60	18
40	72	15
50	40	22
50	50	17
50	60	15
60	40	18
60	50	15
60	60	12
66	66	10



Figure 8.5. Spacing of pyramid traps in a commercial crawfish pond.

but the average size of crawfish and catch per trap will usually decrease after a few days. If multiple ponds are present on the farming operation, harvesting activities can be rotated among production ponds.

Normally, traps are emptied 24 or 48 hours after baiting. The 48-hour soak time is generally employed in late fall and winter when crawfish activity is slow and standing crop of harvestable crawfish is low. Typically, it is best to harvest three or four consecutive days per week with several days rest between trapping episodes when crawfish are abundant and active.

Following nonharvest days, unbaited traps need not be lifted from the water and emptied prior to baiting because no additional yield is obtained by removing these crawfish (often referred to as “walk-ins”) prior to baiting. To some extent the average size of crawfish caught is correlated with the time traps remain in the water. The shorter the trap set, the higher the number of small crawfish caught. After the bait has been consumed, or the attractants in the bait have dissipated, some crawfish are able to escape through the entrance funnels, and escape is easier for the smaller animals. After several days of intense trapping, the average size of crawfish decreases and the catch often declines as larger animals are removed and the standing crop of market-size crawfish decreases.

Insufficient harvesting in ponds with dense crops of crawfish hastens forage depletion and increases aggression among animals, resulting in growth suppression and stunting. Ultimately, yields and profitability can be greatly reduced. Conversely, excessive trapping may reduce harvest size by removing crawfish before they have had sufficient time to grow to larger sizes, and harvest efficiency is decreased in this way. Because of the basic inefficiency in current trapping methods and gear, there is no evidence to indicate crawfish can be over-harvested. The more farmers monitor and understand the structure of their populations, the better equipped they can be to make decisions regarding harvest intensity.

Occasionally, harvesting schedules and strategies must be adjusted to accommodate markets. Buyers may prefer to have the product delivered only on certain days, such as Thursday through Sunday, when demand is usually highest. Additionally, market demand for crawfish early in the season may allow for various sizes of crawfish to be sold with little problem, but when supplies are more abundant, trapping strategies may need to be adjusted to maximize crawfish sizes, even at the expense of overall yield. As markets evolve and conditions change, maximizing profits in crawfish production no longer automatically means maximizing yields. Planning and good communication with potential buyers early in the season can allow trapping strategies to be developed that respond to market preferences and improve a producer’s competitive position.

### Harvesting Machinery

Methods used to empty traps vary within the industry. Producers with ponds less than a few acres in size rarely use motorized boats because of the added expense. Traps may be emptied by harvesters who walk shallow-water ponds while

pulling or pushing a small boat. One person can empty about 400 traps per day. Other trappers use small, flat-bottom boats propelled by push-pole or paddle, but this method is no more efficient than walking.

In larger ponds, a boat propelled with an engine and drive mechanism adapted for use in shallow water is the most efficient harvesting equipment. One approach used widely in the crawfish industry is the Go-Devil® or similar designs, with 8- to 18-hp air-cooled engines or larger and long shafts with weedless propellers (Figure 8.6). The boats have flat bottoms, are made from aluminum and are typically 14 to 16 feet long by 4 to 6 feet wide. It is common for

### Crawfish Harvest Recommendations at a Glance

- Three-funnel pyramid trap, 3/4-inch or 7/8-inch square wire
- 18-22 traps/acre in high-density ponds, (typically permanent monocropping ponds)
- 10-15 traps/acre in low-density ponds, (typically rice-crawfish field rotations)
- Trap 3-4 days/week
- 24-hr or 48-hr trap soak time
- 40-90 trapping days per season
- Use fish baits below 70°F, formulated baits above 70°F



Figure 8.6. Crawfish harvesting boat powered by Go-Devil® propulsion unit.