SECTION 1

BACKGROUND INFORMATION

BIOLOGY OF THE PADDLEFISH

Characteristics

Kingdom - Animalia
Phylum - Vertebrata
Class - Osteichthyes
Subclass - Actinopterygii
Infraclass - Chondrostei
Order - Aciperserformes
Family - Polydontidae
Genius - Polyodon
Species - spathula

Adult paddlefish
(Photo courtesy Richard Condrey)

Paddlefish (*Polyodon spathula*) are gray to bluish freshwater fish, reaching nearly two meters (7 feet) in length and weighing up to 91 kilograms (200 pounds). In Louisiana, adult paddlefish reach an average of 75 to 80 centimeters (2.5 feet) in length and weigh from 4.5 to 7 kilograms (10 to 15 pounds). As its common name suggests, the paddlefish has a long paddle-shaped snout or rostrum equivalent to one-third of the fish's total body length. On the rostrum of the adult paddlefish there are two minute barbels, which are highly visible in its larval (fry) stage. The paddlefish has a large, toothless mouth on the underside of its head. The fish is scaleless, except for a patch near the caudal (tail) fin. The caudal fin is heterocercal, like that of a shark, with the upper lobe longer than the lower lobe. The skeleton of the paddlefish is cartilaginous except for bone-like material found in the dentary (jaw) region. Although the paddlefish looks like it is related to a shark, it is more closely related to sturgeon, gar, bowfin and tarpon.

The paddlefish is one of the largest freshwater fish in North America and may live for more than 50 years. There are two living species of paddlefish in the world, *Polyodon spathula* in the United States and *Psephurus gladius* in the Yangtze River in China. Unlike the American paddlefish, the Chinese paddlefish feeds on other fish, has a sword-like mouth and reaches lengths of 3 meters (9.9 feet).

Fossil paddlefish
(Photo courtesy National Park Service)

The paddlefish is also one of the oldest living fish, dating back 400 million years. It is considered to be a primitive fish, meaning that it is closely related to an early ancestral form and shows little evolution over millions of years. Like its extinct relatives, the paddlefish has a simple body and organ structure, a cartilaginous skeleton and few scales.

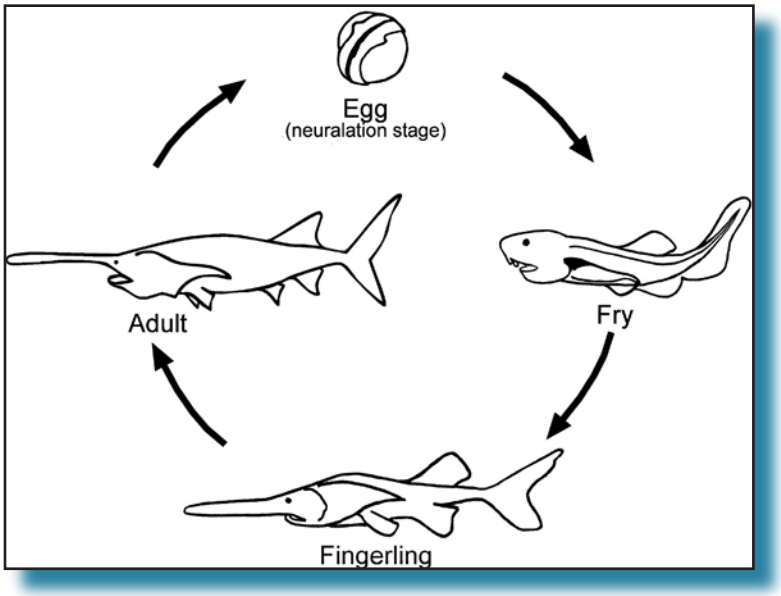
Spawning

Paddlefish spawn only under specific environmental conditions. If all conditions are not present, the fish will not reproduce. The three necessary environmental factors are an increase in the photoperiod, a temperature rise and a river rise of 1 to 3 meters. These environmental conditions occur in Louisiana from late February to early March. In more northern latitudes, such as Montana, they may not occur until May.

Males may spawn every year, but females do not. It takes two or more years for a female to produce mature eggs. When ready, a female can produce up to 4.5 to 5.4 kilograms (10 to 12 pounds) of eggs. Once a female has enough eggs, she still may not spawn if the environmental conditions are not favorable. These conditions include clean gravel bars with strong current flows, water temperatures near 13°C (60°F) and high, rising spring water flows. All of these conditions must occur at the same time in order for the female to successfully spawn.

During spawning, a large female, accompanied by several smaller males, swims over selected gravel bars where males release milt (sperm) and females release eggs in the water simultaneously. In Louisiana, paddlefish have adapted to spawn over hard substrates such as logjams and mussel beds because there are few gravel bars. The naturally sticky fertilized eggs adhere to the gravel bars and are not washed away in river currents. The swift current keeps the eggs well oxygenated and prevents debris and silt from covering them. Eggs hatch in about a week. Larval fish are then swept downstream to quieter waters. In a few days, the yolk sac is absorbed and fry begin to feed on zooplankton.

Paddlefish are born without a rostrum, which begins to form shortly after birth. They grow fast, about an inch per week. Despite their ability to grow rapidly, paddlefish mature late in life. Males reach sexual maturity between 7 and 9 years of age, or at one-fourth of their expected life span. Females mature between 10 and 12 years of age, or at one-third of their expected life span.



Life cycle of a paddlefish

Feeding

With its large size, the paddlefish would be expected to pursue large prey. However, the paddlefish is a filter feeder, feeding on zooplankton and aquatic insects. *Daphnia* spp., copepods and ostracods comprise the majority of the paddlefish's diet. The fish also feed on small-prey items such as larval fish. The mouth of the paddlefish has numerous gill arches containing filaments called gillrakers, which allow the paddlefish to sieve zooplankton out of the water.

Scientists once believed that the paddlefish used its paddle to dig into the sediment for food, but they have since determined that paddlefish have electroreceptors on their rostrums. These electroreceptors can detect weak electrical fields, allowing paddlefish to use their rostrum like an antenna to find zooplankton. The receptors not only detect the presence of zooplankton, but the individual feeding and swimming movements of zooplankton's appendages as well. Sensory pores extend from the rostrum to the top of the head and to the tips of the operculum (gill flaps). These pores take up nearly half the skin surface of the fish. Paddlefish rely on their electroreceptors to find food because they have poorly developed eyes. If the rostrum is damaged, a paddlefish will still be able to locate food items because of electroreceptors located on the head region. Therefore, the rostrum is not the sole means of food detection.

Electroreceptors on the rostrum of a paddlefish fry
(photo by A. Capello)

Adult paddlefish gillrakers
(photo by N. Smith)

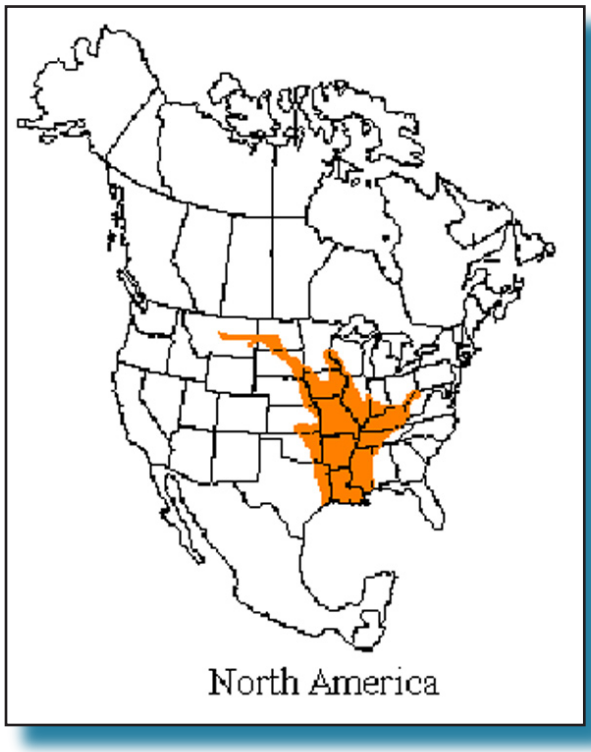
Feeding habits of young paddlefish differ from those of adults. Fingerlings less than 15 centimeters (7 to 8 inches) long do not have well developed gillrakers and are unable to strain zooplankton from the water. At this stage, they are selective feeders, capturing zooplankton one at a time. Some young paddlefish will selectively feed for up to one year or until they reach a total length of 56 to 66 centimeters (22 to 26 inches). Fry and fingerlings also differ from adults because they have teeth. Teeth help them eat food until their gillrakers develop.

Range

In 1542, Spanish explorer Hernando de Soto was the first person to document paddlefish in the Mississippi River (Springer 2000).

At that time, paddlefish were found throughout the Mississippi River drainage basin, including the Great Lakes and rivers in Ontario, Canada. However, paddlefish populations are now extirpated (naturally occurring populations no longer exist) in Canada, Pennsylvania, Maryland, New York and Virginia. Today, the population range is reduced to the Mississippi and Missouri river tributaries and the Mobile Bay drainage basin (Williamson 2003).

Historic range of paddlefish
(Modified from Williamson 2003)



Current range of paddlefish
(USGS Northern Prairie Wildlife Research Center)

In some parts of its current range, paddlefish from stable populations are harvested commercially and as game fish. The meat is considered flavorful. More desirable than the meat are the unfertilized eggs, called roe. Paddlefish roe, like sturgeon caviar, is considered a delicacy. Roe has made the paddlefish an economically valuable species but has had negative effects on the fish's population.

Habitat

Paddlefish are found in many types of river habitats within the Mississippi River drainage basin. Many find homes in deeper, low-current areas of river systems. Some of these areas include side channels, backwaters, oxbow lakes, other river-lakes, and tail waters below dams. The fish are highly mobile and can travel up to 2,000 miles in a river system, typically swimming near the surface.

In Louisiana, paddlefish are found in numerous rivers, lakes and bayous. They are found in the Atchafalaya, Mississippi, Red and Mermentau river basins, and Bayou Nezipique, as well as other freshwater areas. Though primarily a freshwater fish, paddlefish are also found in the estuarine systems of Lake Pontchartrain and Grand Lake.

Causes of Population Decline

Paddlefish populations are declining because human activities have led to habitat alteration, degradation and loss. There are several well-known limiting factors that affect paddlefish populations: dam construction, pollution and overharvesting.

Spawning areas are degraded mainly by human activities to improve flood control and navigation, including dredging of rivers and construction of levees, locks and dams. Dams significantly alter the surrounding environment, affecting all forms of life in the local vicinity in two ways. First, dams form reservoirs with deep, open water and slow currents that may inundate areas that were once ideal paddlefish spawning areas. Secondly, dams reduce water flow downstream, which will increase the release of sediment into the water covering clean gravel bars. Another way dams affect paddlefish populations is by creating barriers that prevent migration to spawning grounds and migration up and down the waterway for food. Pollution from industry, municipalities and agriculture further degrade water quality and remaining paddlefish habitat.

Overharvesting for roe causes additional stress to the declining paddlefish population. This stress becomes more of a concern as sturgeon stocks worldwide rapidly decline and paddlefish, a close relative with similarly sized roe, is sought as a replacement. Paddlefish are found in only 22 states. In many of the states where paddlefish populations are found, the populations are protected under federal or state laws. Only 13 states allow commercial or game fishing.

Caviar Industry

Sturgeon from the Caspian Sea are harvested for their roe. The Caspian sturgeon is the only fish to legally have its roe labeled as “caviar” under the Food and Drug Administration’s (FDA) food labeling regulations, 21 CFR Part 101. If the roe of another species is placed in a container labeled “caviar,” it must include the name of the fish it was taken from with the font of the words the same size and prominence (FDA warning letter 2002).

Overfishing, poaching and industrial pollution have greatly diminished populations of Caspian Sea sturgeon. The five main species of sturgeon from the Caspian Sea used in the caviar trade are all listed as endangered. Therefore, other species of sturgeon and the paddlefish are sought as replacements. With its gray color and nutty flavor, paddlefish roe is very similar in color, size and taste to caviar from Sevruga sturgeon (*Acipenser stellatus*) from the Caspian Sea. In the United States, paddlefish roe can yield fishers $100 to $200 per kilogram ($45 to $91 per pound) and retail at $423 per kilogram ($192 per pound).

Since the 1980s, a trade embargo on Iraq has prevented Caspian Sea sturgeon caviar from entering the United States, limiting U.S. sources of caviar. Five countries - Iraq, Azerbaijan, Kazakhstan, Turkmenistan and the Russian Federation - fish the Caspian Sea for sturgeon. Currently, most caviar comes from sturgeon in the Northern Caspian Sea and is harvested by the states of the former Soviet Union. This population of sturgeon is overfished and poached. Before the Soviet Union broke apart, there were strict regulations on fishing sturgeon, which included efforts by hatcheries to restock the population. Today, hatchery efforts continue, but sturgeon populations are on the decline because sturgeon fishing is an easy and profitable venture for developing countries.

The global demand for caviar is now turning to the United States. At the end of the 1800s, the United States was a major supplier to the global caviar trade. However, overharvesting significantly damaged North American sturgeon populations. Several species of U.S. sturgeon are currently rated endangered or threatened throughout their range, as is the paddlefish in some states. Increased demand for roe from wild fish could have negative impacts on paddlefish populations, since the fish mature slowly.

The U.S. Fish and Wildlife Service (USFWS) has prosecuted several cases of mislabeled paddlefish roe sold as Caspian Sea caviar. One such case was against the owner of a caviar company who was fined and is serving jail time for conspiracy to smuggle a protected species, making false statements to the USFWS, and selling falsely labeled caviar to retail food companies (Department of Justice 2002). In addition to the criminal fine, the owner also paid a community service fine of $25,000 to the Fish and Wildlife Foundation to preserve and restore sturgeon and paddlefish. DNA testing showed he was selling illegally obtained paddlefish, including protected paddlefish from Alabama, as Sevruga caviar (Department of Justice 2002).

At present, legal, regulated markets for U.S. paddlefish and sturgeon roe sustain healthy, wild populations and allow for commercial harvest. However, rising prices and increased demand for roe may overwhelm this balance. These market pressures threaten to increase poaching and diminish the wild population faster than the aquaculture industry can replace them. Inter-jurisdictional management is needed to ensure that history does not repeat itself.

Roe harvested from female paddlefish
(Photo courtesy Bobby Reed)

Conservation

Depending on the state and the health of the population, the status of the paddlefish population varies from federally protected or state protected to unprotected. In 1992, the paddlefish was listed in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). CITES is an agreement among governments to ensure that international trade of a species will not threaten the species' survival. Species that are listed in Appendix II are not necessarily threatened to extinction, but trade of these species is regulated. For the specimen to be exported, the exporter must have a permit that certifies that the specimen was not illegally obtained, it will face minimal risk of injury during transport, and the trade of the specimen will not be detrimental to the survival of the species.

In New York, Pennsylvania, Maryland and Virginia, paddlefish populations have become extirpated, meaning they no longer exist in these areas. In many other states, strict laws protect the population. Minnesota, Nebraska, North Carolina, Ohio, Texas, West Virginia and Wisconsin paddlefish populations are threatened, endangered or rate as critically imperiled.

In Louisiana and Alabama, paddlefish are protected, and the population is stable. In Louisiana, there is no legal harvest or possession of paddlefish. Possession includes an "accidental" catch. If a paddlefish is caught, the fish must be released immediately. It is considered "intent of take" if a person places the fish in a tank or ice chest or leaves the fish on a boat. Possession of a paddlefish carries a fine of $2,750 per fish.

States with sustainable paddlefish populations that can support commercial and/or sport fishing are Arkansas, Illinois, Indiana, Iowa, Kansas, Kentucky, Mississippi, Missouri, Montana, North Dakota, Oklahoma, South Dakota and Tennessee.

A Mississippi River basin-wide conservation effort was formed in 1991 called Mississippi Interstate Cooperative Resource Association (MICRA) to improve inter-jurisdictional management of aquatic resources. MICRA established the Paddlefish/Sturgeon Subcommittee whose mission is to provide information and recommendations to conserve and manage paddlefish through inter-jurisdictional coordination, communication and assessment. The effort of the subcommittee has protected more than 10,000 wild paddlefish and produced 1 million hatchery-reared paddlefish that have been tagged and released throughout the Mississippi basin.

Throughout the paddlefish's natural range there are many programs to help restore the population to healthy, sustainable levels. Hatcheries are very important in this process. Hatcheries raise paddlefish from eggs to fingerlings through artificial propagation of wild stock. Hatchery-raised fish are tagged to monitor populations. Hundreds of thousands of fingerlings are then returned to natural habitat. In Louisiana, the Louisiana Department of Wildlife and Fisheries (LDWF) produces paddlefish fingerlings and releases more than 50,000 into the wild each year. Bobby Reed, LDWF inland fisheries biologist, is the manager of this project.

Timeline Summary of Paddlefish Management in Louisiana

1914 – First state to regulate paddlefish in United States with season closure and 12-inch minimum length
1950 – Established as a commercial fish with a 15-pound minimum size
1983 – Noticed excessive exploitation in early 1980s primarily by non-resident fishers
1986 – Louisiana Department of Wildlife and Fisheries commission responds with emergency closure in May; life history studies begins
1990 – Louisiana joins MICRA and assists in developing basin-wide management strategies for paddlefish
1991 – Louisiana becomes only the third state to successfully spawn paddlefish; implements state management and recovery plan
1992 – Permanent (Secretarial) closure goes into effect
1992 – Paddlefish listed as an Appendix II Species under CITES regulations
1993 – MICRA develops and publishes a strategic plan for the management of paddlefish in the Mississippi River basin
1995 – Paddlefish stock assessment study begins with 18 states participating
1998 – All Acipenseriformes listed as Appendix II Species under CITES
2000 – Stocked 10th year class of fingerlings into Toledo Bend, La.
2001 – Revision of MICRA paddlefish strategic plan; 22 states now participating
2002 – Paddlefish chosen as the native fish species for Native Fish in the Classroom Project
2004 – Stock assessments, spawning and recovery efforts continue

Reed 2004

AQUATIC INVASIVE SPECIES

Plants and animals living outside their natural geographic boundaries can be called by many names: exotic, introduced, nonindigenous, invasive, non-native and nuisance. Some of these organisms have been intentionally introduced by humans for reasons such as use in agriculture, the pet industry, and fish and wildlife management. Others have entered accidentally in ships' ballast waters, in packing materials, as hitchhikers on other plants and animals, or even in hurricanes. Because of its mild climate and geographical location, Louisiana is very susceptible to the introduction of a variety of nonindigenous plants and animals.

When nonindigenous species make their way into natural ecosystems, they can threaten native habitats and the organisms that live there. Once established, non-native species can displace native plants and animals, alter ecosystems, cause disease, and interfere with industry, agriculture and recreation.

Some aquatic nonindigenous species directly affect native populations of aquatic animals living in Louisiana waters by taking over habitat or directly competing for food sources. For example, some invasive fish have no natural predators, so their populations may flourish. Some freshwater invasive fish species from China and other parts of east Asia include the big head carp (*Hypophthalmichthys nobilis*), grass carp (*Ctenopharyngodon idella*), silver carp (*Hypophthalmichthys molitrix*) and black carp (*Mylopharyngodon piceus*).

These invasive carp species affect paddlefish several ways. Bighead carp and silver carp feed on zooplankton, competing with paddlefish for the same food sources. The silver and bighead carp also on encroach paddlefish habitat.

The adult bighead carp weighs about 9 kilograms (19 pounds) and reaches 51 centimeters (20 inches) in length. It has irregular black blotches on its body as well as small scales. The body shape is distinctive with a short body length and large head. It is a filter feeder that eats plankton throughout the water column.

Bighead carp
(Photo courtesy USGS Florida Caribbean Science Center)

Grass carp
(Photo courtesy USGS Florida Caribbean Science Center)

The adult grass carp reaches a length of 127 centimeters (50 inches) and can weigh about 27 kilograms (60 pounds). Its coloring is dark bronze on the back with a silver belly. The scales are darkly colored on the edges, giving the fish a crosshatched appearance. Grass carp feed on soft aquatic vegetation.

The adult silver carp reaches 20 centimeters (47 inches) in length and can weigh about 9 kilograms (19 pounds). It is a silver-colored fish with a toothless, upturned mouth that has fused and sponge-like gillrakers. This fish feeds on plankton in the upper portion of the water column and prefers to inhabit impoundments or backwaters of large rivers.

Silver carp
(Photo courtesy L. Lovshin U of Auburn and USGS NAS)

Black carp
(Photo by Leo G. Nico)

The black carp reaches 132 centimeters (52 inches) in length and weighs up to 68 kilograms (150 pounds). It is brownish-black in color with black-gray fins. The body shape is long and thin, and it has a mouth full of teeth made to crush prey. Found in large rivers and lakes, this fish prefers to inhabit the bottom portion of the water column, closer to its prey. The black carp eats snails, mussels, aquatic insects and crustaceans. It resembles the grass carp.

Another aquatic invasive species that may compete for or have an effect on the paddlefish food source is a mussel. The zebra mussel (*Dreissena polymorpha*) is a small filter feeder. Zebra mussels live in fresh water and have alternating dark and light bands on their 2-inch-long shell. They are known to take more food out of the water column than they can actually use. This action affects all filter feeders in the area by decreasing the amount of plankton in the water column.

Zebra mussel
(Photo courtesy Ohio Sea Grant)

The nonindigenous species issue is very serious and costly. In Louisiana an Invasive Species Taskforce, an interagency partnership headed by LDWF, was formed to create a management plan for the state. The state management plan was completed in 2005.

FISHERIES MANAGEMENT

LDWF is the lead agency in the state to conserve and protect living renewable resources for present and future generations of Louisiana citizens. The mission of the Inland and Marine Fisheries Divisions is to conserve and protect aquatic resources by controlling their harvest and replenishing and enhancing fishery stocks and habitat.

The Inland Fisheries Division manages fish populations and habitats for the conservation and improvement of recreational and commercial fishing, primarily in freshwater areas of the state. These aquatic resources are managed to provide for the needs of consumptive and non-consumptive users and to maintain environmental health. This is accomplished by setting seasons, size and possession limits, gear restrictions, or other means of protecting key resources and replenishing and enhancing species and their habitats. Ongoing research provides insight into the proper functioning of natural systems, and public education programs promote wise use of these resources.

ROLE OF HATCHERIES

What is a hatchery?

A hatchery is a place where fish species such as bass, catfish, crappie and bluegill are hatched, raised and then stocked in waterways to enhance natural populations. Since 1997, the Booker Fowler Fish Hatchery in Forest Hill, La., has spawned paddlefish.

Why are hatcheries important?

Resource managers nationwide acknowledge hatcheries as valuable tools for the preservation of our nation's fish resources. Fish are stocked for several reasons. Some are stocked to enhance recreational fishing, others to restore native species to waters they formerly occupied.

The LDWF fish hatchery system has a rich history of fish production and research. Much of the technology used in modern catfish and striped bass aquaculture practices was developed in the department's hatchery facilities. Historically, the hatchery system functioned primarily as support for technical assistance to pond and small lake owners and for stocking new and renovated lakes with native species, predominately largemouth bass and bluegill.

The department's decision to begin the introduction of the Florida subspecies of the largemouth bass (*Micropterus salmoides-floridanus*) and the adoption of the Louisiana Black Bass Management Plan mandated a hatchery policy change. Today, Louisiana's hatcheries produce fish for bodies of water that have been damaged by habitat destruction or overuse, as well as stocking select lakes with popular sport fish.

LDWF operates four fish hatcheries. Beechwood Fish Hatchery, Monroe Fish Hatchery and Lacombe Fish Hatchery are older facilities constructed in the 1920s and 1930s. The newer Booker Fowler Fish Hatchery began fish production in the spring of 1997. Additionally, the Inland Fish Division operates an egg-taking facility at the Toledo Bend Research Station.

Booker Fowler Fish Hatchery

The Booker Fowler Fish Hatchery was built with federal disaster relief funds that were allocated to Louisiana due to damage to the Atchafalaya Basin in 1992 by Hurricane Andrew. Paddlefish populations were decimated; 100,000 fish were lost to this storm. The total cost to build this state-of-the-art facility was $13 million. It is the largest fish hatchery in Louisiana and has been designated the department's primary fish production facility. The hatchery will produce all fry and provide most of the fingerling production for the state of Louisiana.

Hatcheries can be warm-, cool- or coldwater facilities. Booker Fowler Fish Hatchery is a warmwater station involved in spawning, hatching and rearing young fish (fingerlings). Fingerlings are raised to a size and age that provide them the best chance of survival in the wild. Louisiana's hatchery system supports the management schemes implemented by LDWF's inland fisheries biologists, providing them with healthy sport fish fingerlings to stock into Louisiana's public waters. Booker Fowler Fish Hatchery has artificially spawned paddlefish since 1997 and has produced 1.7 million fry and fingerlings.

The hatchery cannot provide paddlefish with all the environmental factors required to spawn naturally (see spawning section), therefore, paddlefish are artificially propagated in the hatchery. Wild paddlefish stock are collected because they are river inhabitants and do not respond well to living in hatchery ponds. In Louisiana, mature fish are collected from flooded tributaries in February. Once collected, paddlefish are transported in hauling trucks. At the hatchery, the fish are sexed, weighed and tagged. Next, the fish are injected with LH-RH hormone, which stimulates spawning. The female is given two hormone injections 24 hours prior to spawning to help the eggs ripen (become ready to be spawned). Males are given one injection to increase milt (sperm) production. The following morning, female paddlefish are examined for softened abdomens, which is a sign that eggs are mature. When eggs begin to flow from the vent of the female, artificial propagation begins.

Eggs can be removed from the female paddlefish in two ways: the female may undergo a Caesarean section, or she can be stripped of her eggs. During the Caesarean section procedure, the female is placed on a stretcher on her dorsal side (belly up) and kept irrigated via water running across her gills. A small incision is made on her abdomen, and the eggs are quickly removed. The incision is sutured; an antibiotic is administered; and the female is returned to the holding tank to recover. The advantage of this procedure is that more eggs are collected from the female. During the stripping procedure, the female is held by her rostrum while a small incision is made in the urogenital opening. Pressure is applied to the female's abdomen to force eggs out, and eggs are collected. The benefit of this process is that the female is out of the water for a shorter period of time, however, fewer eggs are collected. The female is then returned to her holding tank much faster to recover. After artificial propagation, females are usually held for about seven days to ensure survival before returning them to their collection site.

Through both procedures, eggs are handled in the same manner. They are collected in plastic tubs and kept moist, but relatively dry. Each egg has a small pore (ovipore) located on its surface, which will begin to close once it is inundated with water. Likewise, a sperm does not become active unless it comes in contact with water. Once all the eggs are collected from one particular female, milt is collected from several males in a separate container by applying

pressure to their abdomens. Eggs and sperm are then ready to be mixed. Adding water activates the sperm, which is then poured over the eggs. Fertilization begins when eggs start to clump together.

In the wild, paddlefish spawn over gravel beds. In Louisiana, they may use logjams or mussel beds. The eggs are naturally sticky and adhere to this substrate. However, in the hatchery, a clay mixture called fuller's earth is added to the fertilized eggs to prevent them from sticking together. The eggs are stirred continuously with a turkey feather for 30 minutes to make sure they are sufficiently coated with the clay. Eggs are placed in an incubation jar and tumbled against one another for aeration. Fuller's earth ensures that eggs do not adhere to one another, decreasing the possibility of fungal growth or improper aeration.

After sufficient mixing, eggs are rinsed free of fuller's earth mixture and placed in incubation jars. They hatch in five to seven days. Newly hatched fish, called fry, swim up and out of the incubation jars into water troughs known as raceways. Paddlefish fry will begin to eat a high-protein fish food five to six days after hatching. When fry become fingerlings about 3 centimeters (1 inch) in length, they are transferred to covered raceways outdoors. Covered raceways are used because paddlefish are sensitive to sunlight. At 12 to 15 weeks of age, paddlefish fingerlings are injected with a coded wire tag (CWT) and released into Louisiana river systems.

The timeline of paddlefish management in Louisiana:

- Late February – wild paddlefish stock are collected
- March (first week) – artificial propagation induced and wild stock is returned to collection site
- Early April – paddlefish fry are placed in covered raceways
- Late May to mid-June – paddlefish fingerlings are tagged with CWT and released to natural habitat

Interesting Facts

- The paddlefish was first described by Hernando de Soto during his 1542 exploration of the Mississippi River.

- Hurricane Andrew caused the death of 100,000 paddlefish in the rivers and lakes of Louisiana. The majority of the loss occurred in the Atchafalaya River basin.

- The Louisiana Department of Wildlife and Fisheries restocks the paddlefish population with more than 50,000 25.4-centimeter (10-inch) fingerlings each year.

- Paddlefish are among the largest freshwater fish in the United States.

- Considered a living fossil, the paddlefish dates back 400 million years.

- Like the shark, a paddlefish's skeleton is cartilaginous.

- Paddlefish are filter feeders.

- Paddlefish have smooth skin and few scales. The skin feels like a wet tire.

- The genus name for paddlefish, *Polyodon*, is Greek for "many teeth" and refers to the paddlefish's many diamond-shaped teeth in its fry stage. The species name, spathula, is Latin for "*spatula*" or "blade" and refers to the paddle-shaped rostrum of the fish.

- Common names of the paddlefish include: duckbill cat, Mississippi paddlefish, spadefish, spoonbill cat and spoonbill catfish.