Six-to eight-inch juvenile cobia used for nutrition and growth studies.
It's A Spawn!

In a tiny lab at Port Aransas, marine biologists have made tremendous breakthroughs with cobia.

By Doug Pike

ON AN OTHERWISE BARE WALL at the University of Texas Marine Science Institute in Port Aransas, Texas, hangs a simple paper sign that summarizes years of research and hard work with cobia: “It's a spawn!”

That milestone event took place April 27, 2001. It marked the first time ever, anywhere, that cobia raised from sub-adults were spawned naturally indoors.

Known also as ling in Texas and lemonfish in Louisiana, the cobia familiar to CCA members range throughout the Gulf of Mexico and about midway up the Atlantic Coast. Fast-growing to more than 100 pounds, cobia are desired equally for their fight and their flesh. They are reliable but not abundant visitors through spring and summer, and anyone who knows the fish would welcome more of them.

Once no more than incidental, unintentional catches, cobia now are a prized, targeted recreational species as they migrate seasonally within half-day striking distance of sportfishing boats. Jeff Kaiser, in his third year as a research assistant at UTMSI, is knowledgeable and enthusiastic about his role in the facility's successful cobia-spawning program.

"From a scientific standpoint, there really isn't a lot known about cobia," said Kaiser, who enjoys fishing for ling as much or more than he does studying them. "There hasn't been much done with it, but now it's become a mainstream fish."

It was nearly 14 years ago that Dr. Connie Arnold, one of the first people to peer through a UTMSI microscope, began research on cobia and their spawning habits at Port Aransas. Note
should be made here that some of the same equipment used by Arnold, which was old and in need of repair then, remains in use today at UTMSI. The laboratories, meeting rooms and holding tanks, despite being home to some of the field's greatest minds and cutting-edge research, are held together with duct tape and baling wire.

PARALLEL EFFORT

Around the same time that Arnold developed his professional fascination for cobia, Dr. Jim Franks was doing the same at the University of Southern Mississippi.

Ling grow rapidly and don't use up much food in the process.

Cobia are drawn to external stimuli, such as revving outboards, splashes in the water — or fingers tapping against windows in holding tanks.

During their earliest research, both men faced the same hurdle: Short of cutting the fish open, scientists were unable to determine male cobia from female cobia. That single, frustrating characteristic led to predictable disappointments.

UTMSI held fish in captivity for a decade without producing a spawn. After one study group of cobia was deemed a reproductive flop, the fish were removed and sexed. All the fish in that tank were males.

As Arnold and Franks continued their work through the early '90s, scientists in Taiwan managed to induce a natural spawn in outdoor tanks. Shortly thereafter, in 1996, Franks generated a hormone-induced spawn.

Kaiser explained that UTMSI scientists could have mimicked those methods but were more interested in getting the fish to spawn naturally, without outside inducement. Rather than injections, they relied on temperature and photoperiod manipulation.

In a series of tanks, some indoors and some outdoors, ling of various sizes were monitored and manipulated daily into perceiving an accelerated passage of the seasons. By dropping water temperatures and reducing the number of daylight hours, cobia in the tanks were convinced it was winter. When the time was right, warming water and longer “days” lent perceptions of spring and summer.

Those simple (but proven effective in freshwater fishery research) tricks — and a lucky mix of males and females
in the tank — produced that important, natural spawn two Aprils past. The experiment has been repeated successfully several times since, too, and offers great promise for the species’ future.

STANDING OVATION

“Our goal is to produce eggs year-around,” said Dr. Joan Holt, who has been at UTMSI for 25 years and heads the cobia project. “It’s very exciting, fascinating, really, that you can put these big marine fish in such small environments and that they do so well.”

said), she determines the effects of nutrition and disease on the fish through their first hours an days of life.
In the past, any eggs they got from spawning cobia were used in their own research, Holt said. Now that they the fish understand each other better, however, UTMSI is “sending cobia eggs all over the country.”

Recipients to date have included research facilities in Massachusetts, Virginia, South Carolina and Mississippi, and there remains high international interest in UTMSI’s work with

There are cobia of varying ages and sizes at UTMSI now, some as small as a few inches and others that weigh many pounds. Almost all are the products of previous spawns.
The six “designated spawners” live in an outdoor greenhouse. Their tank is covered with a heavy, opaque tarp to keep sunlight out and improve scientists’ ability to regulate temperature. On average, the spawners produce 400,000 to 1 million viable eggs per cycle, said Holt, whose personal work focuses more on the eggs and larvae than the fish.

With help — one post-doctoral student from Japan, four UT students and two more from Texas A&M University at Corpus Christi (who get along fine together until football season, Holt

Cobia at UTMSI produce 400,000 to 1 million viable eggs per cycle.
the species. Scientists around the world share their information so that each might be faster to make some new and mutually beneficial discovery.

The full-time availability of cobia eggs provides fishery managers with something of a safety valve should natural disaster befall the species one day. As has been done so successfully with red drum, for example, hatcheries and rearing ponds could be established to help replenish a struggling population. Recreational anglers have witnessed firsthand what can be done to rejuvenate a species hammered nearly to nothing by commercial overfishing; there is comfort in knowing that science now holds an ace should such a need arise again.

**FOOD FOR THOUGHT**

Sportsmen aren’t the only ones thrilled that cobia eggs are so readily obtainable. Ling have been “farm-raised” for years internationally, and domestic aquaculture operations also see great profit potential.

Kaiser said that ling grow rapidly and don’t use up much food in the process. Indoors at UTMSI, he said, cobia have grown to roughly three pounds in just 11 months. In offshore net pens used by Taiwanese grow-out operations, some fish put on as many as 8–10 pounds annually. Prime market size, he said, is about 15–20 pounds.

The aquaculture industry is most impressed, said Kaiser, by the cobia’s growth rate.

Since cobia spend a good deal of their time idling on the tank bottom, they are considered energy efficient. Their lifestyle translates to an FCR of about 1.5–2. For comparison, high-energy pompano consume nearer six pounds of food per pound of flesh they carry.

As a fisherman, Kaiser has taken great interest in the cobia’s habits. Daily feedings and observation periods are part of his job, and he makes the most of that time.

“They’re very curious,” he said. “All that stuff you hear about cobia responding to revving outboards or shaking rods in the water is true. They’re very social animals, too. A lot of the other fish we have here will go off by themselves, but the cobia usually swim around in groups.” That “one-for-all” thing holds up until feeding time. When the dinner bell rings, it’s every ling for itself.

Fish in the spawning tank at UTMSI range from 15 to more than 60 pounds each. When Kaiser tossed a handful of squid into the tank, water churned and boiled with aggression. Some fish were more forceful than others. One, however, a cobia believed to be a male about 15 pounds, may be smarter than the rest.

**Captive cobia are fed a mixed diet of fish, shrimp and squid in proportions believed to match their wild diets.**

That particular fish eats from Kaiser’s hand and, importantly to the young scientist, can do so without latching onto digits. In exchange for its ability to distinguish between finger and finger mullet, Kaiser rewards that ling with an extra bite or two of food.

The captive cobia are fed a mixed diet of fish, shrimp and squid in proportions believed to match their wild diets. The largest ling they ever held at UTMSI pegged the scale to 106 pounds, just a few meals shy of the 108-pound state record for the species.

It would appear now that the scientists at UTMSI have all the tools necessary to thwart a decline of this magnificent sportfish. As conservationists, we should hope those tools are never needed.”