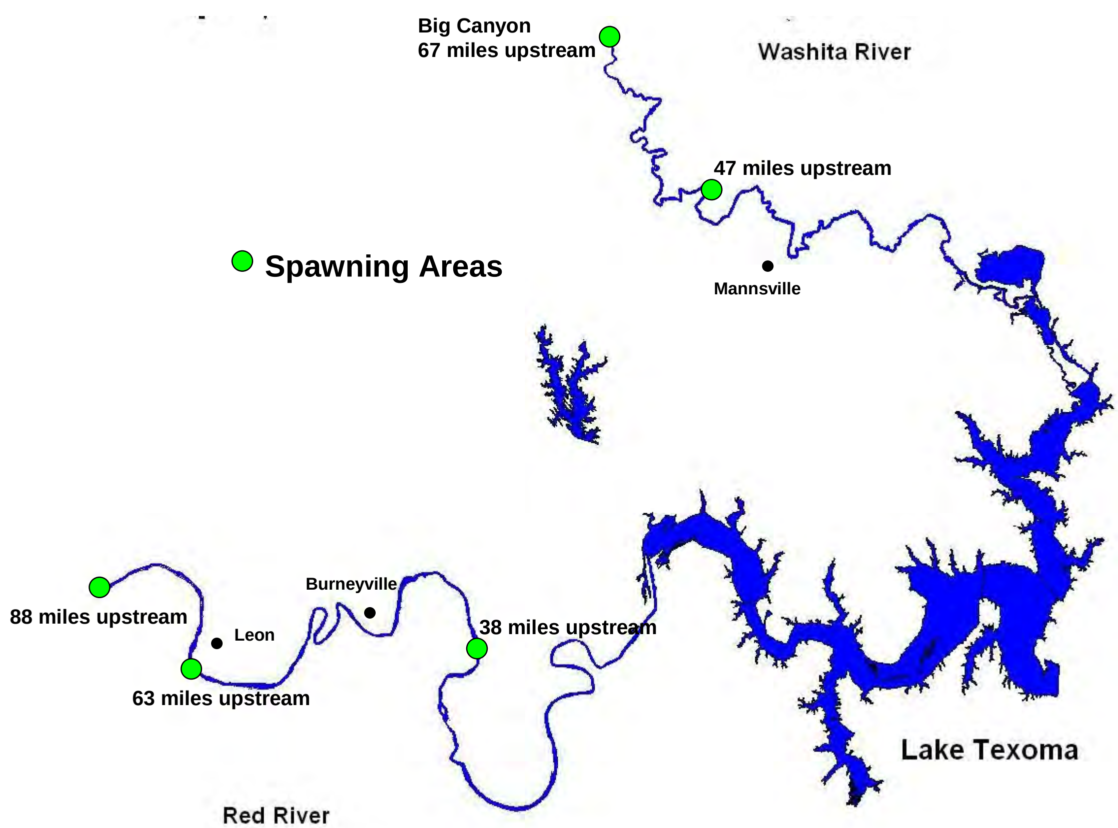
TEXOMA STRIPED BASS MANAGEMENT/RESEARCH

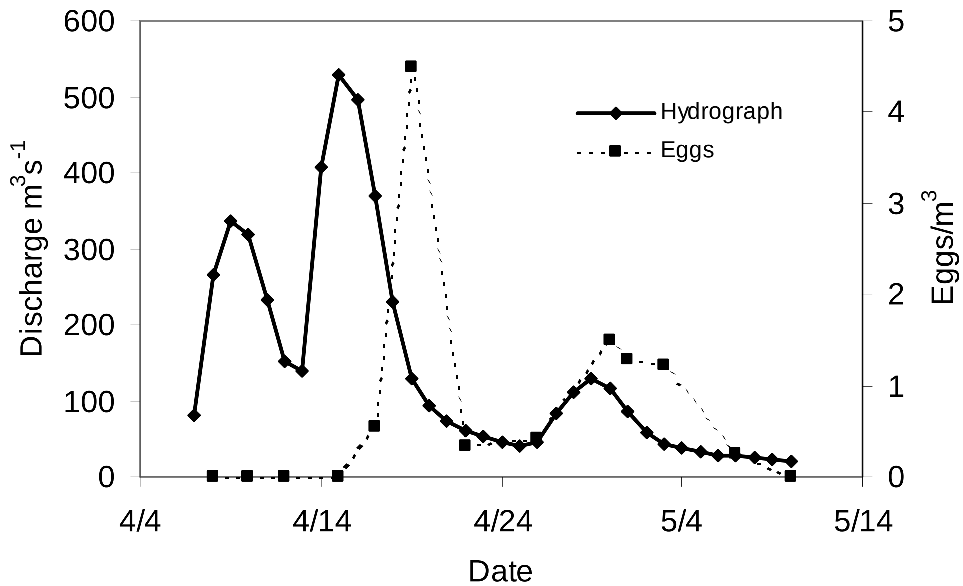
Texoma is one of only about 10 reservoirs in the country that has a naturally reproducing striped bass population. Texoma is set off further from most reservoirs in that striped bass make spawning runs up two separate rivers, the Washita River and the Red River. The Oklahoma Department of Wildlife Conservation (ODWC) has viewed preserving the uniqueness and the economic value of this fishery has a high priority. The Texoma fishery has faced threats from proposed water diversion projects in recent years and in 2000, ODWC increased its research efforts to learn more about the ecology of striped bass in Texoma better understand the impacts of these water diversion projects.

We knew that striped bass spawned in both rivers, but the only site that was verified was the “Big Canyon” area near Dougherty on the Washita River. ODWC along with graduate students from the University of Oklahoma identified one additional spawning site on the Washita River and three sites on the Red River.



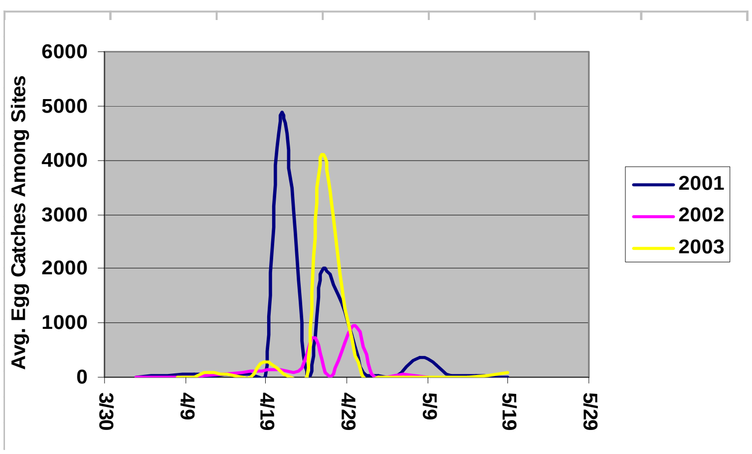
Temperature and stream flow are keys to adult striped bass moving upstream to spawn. Our studies indicated that spawning typically begins around the first to second week of April and continues through mid May. Egg production peaks 2-3 days following a rise in flow.

RED RIVER-2002

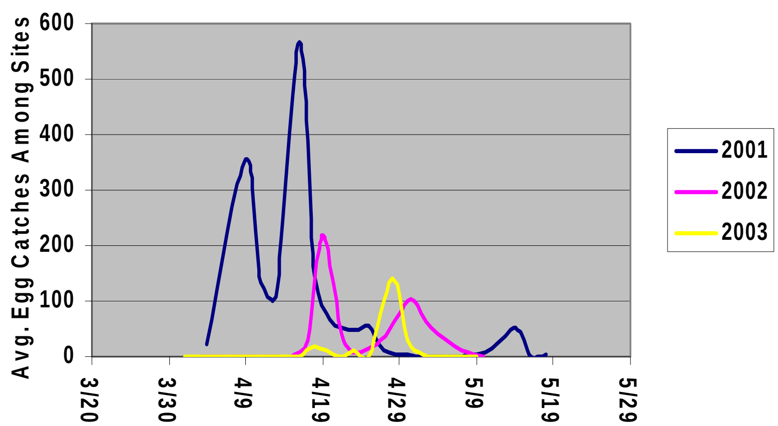


We typically see 2 to 3 pulses of eggs produced in each river, generally related to rises in the river due to rainfall.

Washita River

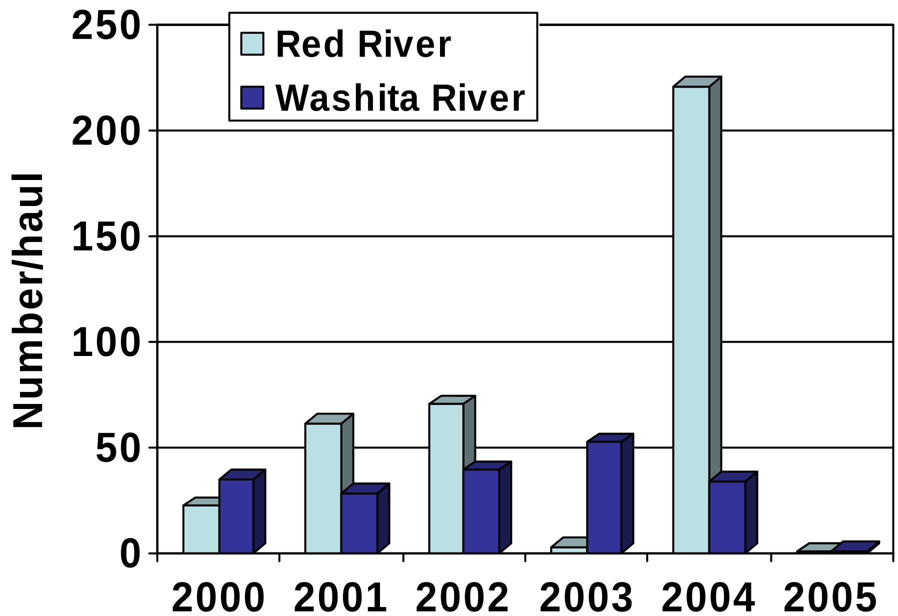


Red River

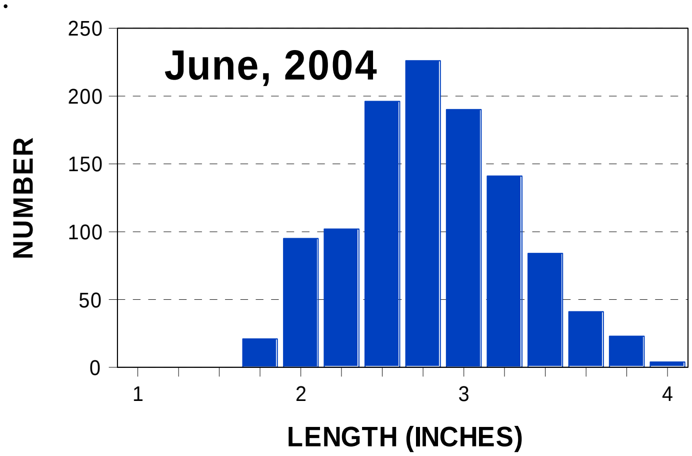


We collected more eggs in the Washita River than in the Red River. However, this was more related to differences in the nature of the rivers than in the number of eggs in each river. The Washita River is a more channelized river than the Red River with the flow being confined within the banks. This made the nets that we used to collect striped bass eggs much more effective on the Washita River than the Red River. Because of the flow being confined within the banks of the Washita River, it also takes less flow in the Washita for striped bass to move up the river and spawn than it does in the Red River.

ODWC has been monitoring juvenile striped bass abundance using seines annually (June) since striped bass were stocked in the late 1960's through the 1970's. Beginning in 2000 ODWC seining efforts increased to get a better idea of the differences in numbers of juvenile striped bass being produced in the Washita River arm and the Red River arm. 2000 and 2003 were years of relatively low spring flows. More juvenile striped bass were collected in the Washita River arm in those years. In years of normal to high spring flows, more juvenile striped bass were collected in the Red River arm. 2005 was an extremely dry spring resulting in poor spawns in both river systems. Fortunately, 2004 was an exceptional year for production of striped bass and should lessen the effect of the poor spawn in 2005 on angler catches.



Graduate students from Oklahoma State University, in conjunction with ODWC staff, conducted research on larval and juvenile striped bass diets and investigated over-winter survival of juvenile striped bass. Striped bass feed on plankton as larvae and small juveniles, switching to insects in mid summer. The size distribution of juvenile striped bass spreads out quickly.



The larger juveniles switch to a fish diet, primarily silversides, by midsummer. By fall, the smaller individuals continue to feed on plankton and insects, but the larger individuals continue to prey on fish, with shad supplementing silversides in the diet. These juvenile striped bass continued to feed throughout the winter and there was no indication of mortality of these smaller striped bass as has been reported from other lakes around the country.

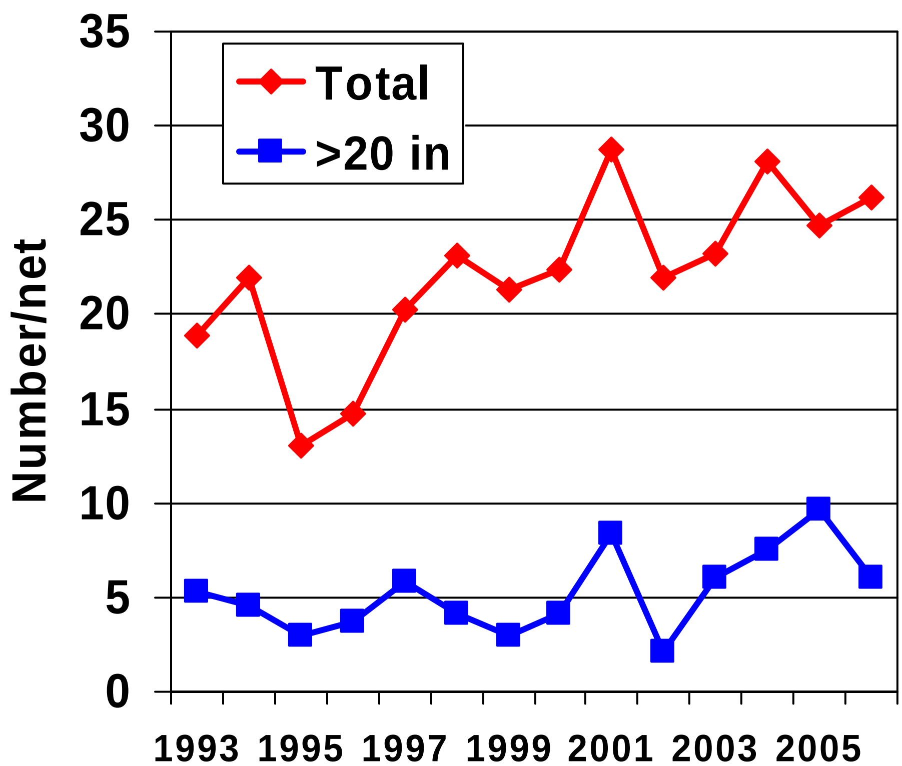
One of the primary questions we are hoping to answer with our research is “will adult striped bass that were spawned in either the Washita or Red Rivers return to that river to spawn or will they simply make their spawning run up whichever river they happen to be near?” Researchers from the University of Oklahoma Biological Station genetically analyzed juvenile striped bass from around the lake and, while genetic differences were found, these differences could not be related to one river system or the other. Researchers from Oklahoma State University have been looking at the chemistry of bony structures from juvenile striped bass and have shown some promising results in identifying differences in fish spawned in each river. This work is ongoing with the ultimate goal of being able to chemically identify the river of origin of adult striped bass collected on their spawning runs. This information has some ramifications related to the proposed water diversion projects. It has already been shown that low flows have a more negative effect on striped bass recruitment in the Red River than on the Washita River. If adult fish will return only to the river that they were spawned in, over the course of time, fewer adult striped bass will be available to run up the Red River to spawn.

Three rate functions determine the abundance and size structure of any fish population; recruitment (number of small fish produced each year), growth, and mortality (percent of the population that dies each year). Most striped bass populations across the country are maintained through stockings. As mentioned previously, Texoma is one of only about 10 lakes that have naturally reproducing populations of striped bass and Texoma is fairly unique in that recruitment occurs in two river systems. Because of recruitment from both the Red and Washita Rivers, Texoma’s striped bass population is one of the most abundant in the country.

ODWC has aged striped bass from 3 of our last 4 winter gill-net samples. Growth rates of striped bass at Texoma are not as high as many of the other striped bass lakes which are supported by stocking. This is due largely to the high abundance of striped bass in Texoma. However, this high abundance allows ODWC and Texas Parks and Wildlife to provide some of the most liberal harvest regulations (10 fish daily creel/2 fish over 20 inches) of any striped bass fishery.

LENGTH (inches)				
AGE	2003	2004	2006	AVERAGE
1	7.3	7.7	8.1	7.7
2	13.7	14.1	13.2	13.7
3	17.9	18.0	20.0	18.6
4	20.8	21.2	21.8	21.3
5	23.2	23.2	23.1	23.2
6	25.8	27.0	25.9	26.2
7		29.0	28.0	29.5

Mortality rate is the last factor which determines the number and size of striped bass in Texoma. Estimates from ODWC’s annual samples indicate that approximately 50% of the striped bass age 1 and older die every year. A 50% mortality rate is not unusual for sport fish populations. The average largemouth bass population has about a 40% mortality rate. The average mortality rate for blue catfish populations in Oklahoma is about 25%. Some crappie populations have a mortality rate as high as 80%. Mortality can be broken down into two categories, natural and angler harvest. Natural mortality includes predation, starvation, disease, old age, and releases through the dam. Starvation is a significant mortality factor in years following threadfin shad winterkills. The summer following a threadfin shad winter kill, fish will be in poor condition and will not have the energy reserves to survive the winter. This will be reflected in the gill net catches the year following the shad kill. The last threadfin shad winterkill on Texoma was in 2000-2001. The graph below reflects a decrease in numbers in the 2002 gill-net sample. The bulk of the decline was in fish over 20 inches. Since then, the numbers have been steadily increasing. The 2004 year class was exceptionally strong and is now averaging 13" in length. Barring another threadfin kill and/or summer flooding, these numbers should continue to increase.



Angler harvest and catch and release mortality are also significant contributors to the 50% total mortality rate. Anyone who has fished Texoma has witnessed the number of boats fishing for striped bass. Approximately 200 full-time guides operate on the lake which far surpasses what most fisheries would support. However, because of high recruitment this level of harvest is needed to reduce the numbers of smaller (less than 20 inches) fish and keep the striped bass in balance with the shad population and maintain growth rates. Catch and release mortality of fish over 20 inches, particularly in the warm summer months, reduces the numbers of large striped bass available to the anglers. Studies have shown that as high as 50% of striped bass caught and released in summer will die. ODWC encourages anglers to move off schools of large fish once the 2 fish/person limit is reached. Large striped bass that are released, particularly in summer, should be "fizzed" by inserting a needle into the air bladder prior to release.

2005 was a banner year for striped bass fishing on Texoma with good numbers and sizes available to anglers. Numbers of striped bass over 20 inches will be down slightly this year but overall, fishing for striped bass should be excellent again in 2006.