

Sakakawea Salmon Fishery in Survival Mode

By Ron Wilson

In the early 1980s, the average weight of a chinook salmon in Lake Sakakawea was nearly 20 pounds. A quarter-century later, the average weight is about 4 pounds.

The weight loss is telling; it's what seven years of continued drought will get you.

In 1971, rainbow smelt were stocked in Sakakawea by the North Dakota Game and Fish Department to develop the lake's forage base. Five years later, salmon were introduced.

The smelt flourished, salmon ate the smelt and grew big ... things were good. Both species prospered because there was plenty of water in the reservoir, which meant an abundance of coldwater habitat smelt and salmon need to survive. "Like all plants and animals, fish have specific habitat requirements. Chinook salmon require plenty of cool (at or less than 59 degrees Fahrenheit) and well-oxygenated water," wrote Greg Power, Department fisheries division chief, more than a decade ago.

Those requirements haven't changed any, which is why, in the short-term, the forecast for Lake Sakakawea's salmon fishery is not good. "Until water levels and, ultimately, smelt conditions improve, numbers and sizes of salmon will both remain poor," said Dave Fryda, Department Missouri River System supervisor, Riverdale. "In the short-term, we are managing the Sakakawea salmon fishery in what could be called survival mode."

What that means, Fryda said, is that Game and Fish will continue stocking a reduced number of salmon in the reservoir to make certain a remnant salmon brood population remains until conditions improve.

"The return of water to Lake Sakakawea is the key to the salmon's comeback," Power said. "It would be nice to say something different, but I can't."

In typical water years, Sakakawea has plenty of coldwater habitat. Yet in years when the lake elevation drops below 1,825 feet above mean sea level during summer – this



Salmon fishing in Lake Sakakawea isn't what it once was, but anglers and fisheries biologists are awaiting a rebound once conditions in the Missouri River System improve.

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summer's high will be about 1,817 feet msl, the same level of the last three years – the amount of coldwater habitat reaches levels detrimental to coldwater fish populations. Salmon and smelt get stressed – and sometimes die – when high water temperatures and low oxygen levels combine.

“It use to be that 1,825 (feet msl) was a place we didn't want to be,” Power said. “Now we look at it as ‘Man, it would be nice to get there again.’”

In 2006, the estimated rainbow smelt population was the lowest measured since hydroacoustic surveys began in 1999. Hydroacoustics uses the same technology as fish locators, or fish finders, only on a much larger scale. Areas throughout the reservoir are surveyed in August to estimate a total smelt population. Compared to 2001 when Sakakawea's salmon fishery was in good condition, the estimated smelt population declined by 90 percent in five years.

“Rainbow smelt seldom live longer than four years in Lake Sakakawea and the last decent spawn was in 2002,” Fryda said. “Consequently, the combination of predation, continued poor recruitment and a short lifespan lead to a dramatic decline in smelt abundance in 2006.”

As the smelt go – the top food item of Sakakawea's chinooks – so go the salmon. “While cisco, another forage fish species, contributes to the diet of salmon, they have far from met the need of salmon with a depressed smelt population,” Fryda said. “While greatly reduced in abundance, smelt are still the most important diet item for salmon. Not surprisingly, the smelt shortage is manifested in the continuing decline in average size of Sakakawea salmon.”

While Department fisheries biologists are stocking fewer salmon in spring until habitat conditions improve, they are releasing some fish in fall as an insurance plan in case spring-stocked salmon die because of the lack of coldwater habitat. “By stocking some fish after the summer bottleneck, we can feel fairly confident that we have at least somewhat of a year-class each year,” Fryda said.

For the avid Lake Sakakawea salmon angler, we are in a time when patience is a virtue, Fryda said. “Better times are ahead, unfortunately our crystal ball does not reveal how far down the road the new good old days will be,” he said. “The North Dakota Game and Fish Department will continue the salmon program and we are fully committed to again providing a successful salmon pro-

gram for anglers once conditions improve.”

There is some good news on the salmon fishing front and it's the Garrison Dam Tailrace. Fryda said the Tailrace salmon fishery is a contrast to Lake Sakakawea. “The condition of the Tailrace fish is excellent as there are many salmon weighing over 10 pounds available to anglers,” he said. “The short-term future is much brighter than Sakakawea.”

Historically, salmon found in the Tailrace were Sakakawea-stocked fish that made it through the dam. Today, recognizing that the Tailrace provides the best habitat for maintaining salmon in North Dakota, fish were stocked there in 2006-07. “When these fish mature in a couple of years, we anticipate a very good fishery to develop with the quality of salmon far better than what Lake Sakakawea can currently produce.”

In 2000, the Tri-state Trout and Salmon Work Group, made up of fisheries personnel from the Dakotas and Montana, was established to work on issues that help maintain the disease-free salmon population in the upper Missouri River System. “Fisheries workers have long realized that we are a team working to maintain the overall integrity of the Missouri River disease-free salmon

Avid Lake Sakakawea salmon anglers continue to fish in the face of seven years of continued drought. The hope is that higher water levels will return soon, followed by increased rainbow smelt populations.



stock,” Fryda said. “As such, there has been and will continue to be a team approach to managing salmon in the Dakotas and Montana.”

In the past, North Dakota has supplied both states with excess salmon eggs harvested during fall spawning. Fryda said he’s confident South Dakota and Montana would do likewise if the need were to arise in North Dakota. “The small size of Sakakawea salmon and the greatly-reduced number of eggs per female has resulted in some challenges in recent years,” he said. “We have to capture and handle a lot more females than in the past to get the same number of eggs.”

For example, the average number of eggs collected from each female chinook during fall spawning has dropped from more than 4,000 per fish in 2000, to 1,400 eggs per fish in 2006. As a result, the amount of time, effort and cost to collect the number of eggs needed has significantly increased due to the ongoing drought. The Department’s cost for acquiring 100,000 eggs, for instance, has nearly doubled from \$900 in 2000 to more than \$1,600 in 2006.

Drought conditions have forced Game and Fish Department fisheries biologists to abandon use of the salmon spawning ladder in fall. All fish in recent years have been captured via electrofishing.

Because the number of salmon stocked has declined of late, fisheries biologists have to collect fewer eggs in fall to meet production goals for the following year. “Our greatest need for assistance from South Dakota or Montana will likely be when the lake ultimately refills and the forage base recovers,” Fryda said. “There will likely be a few years where our production needs may not be met with only North Dakota salmon.”

It’s long been recognized by the Tri-state group that they must rely on their own upper Missouri River System fish to maintain the disease-free stock. Recognizing that drought may someday temporarily suspend the salmon program in the basin, a plan was



Left: This green machine sucks young chinook salmon from hatchery raceways and deposits them temporarily into stocking tanks.

Above: Young salmon spill into stocking tanks at Garrison Dam National Fish Hatchery. Life will soon get interesting as they will be released into the wild where bigger, hungry predators await.

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developed to get fish from the Great Lakes and reintroduce them once they were deemed disease-free. Growing aquatic nuisance species concerns, however, have halted those plans.

“As a result, it is even more important that the states work together to maintain our salmon stock,” Fryda said. “Fortunately, the Lake Oahe salmon fishery has improved dramatically the last few years, and our recent efforts at bolstering the Tailrace population should guarantee we maintain a source of eggs for the future.”

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Above: Jerry Weigel, Department production/development supervisor, sweeps the few remaining salmon young from a fish tocking tank earlier this spring.

Right: Fewer chinook salmon are stocked in the Missouri River System these days as water levels remain low.