

## **Weed reduction with use of carp at the Oakes Test Area**

The Garrison Diversion Oakes Test Area (OTA) irrigation facilities' staff has been battling aquatic weed infestation in the water supply canals for over ten years. They have tried every possible method to deter the invasion, including chemicals and removing the weeds by hand. In 2003, Dale Esser, OTA Supervisor, decided to use nature, in the form of common carp, to solve the problem.

"Pondweeds have been a consistent problem in the irrigation system," Esser said. "We've known for a long time that high common carp densities reduce desirable aquatic vegetation in lakes and rivers. The same vegetation can create problems in an irrigation canal." The idea to try carp for weed control grew out of a Fish Barrier Value Engineering study that was conducted at Arrowwood National Wildlife Refuge in 2003. The study aimed to identify methods to prevent carp from swimming up the James River and entering the refuge.

"It occurred to a study member that if carp are a problem for refuges trying to grow pondweed, they should be able to reduce pondweed levels in a canal," Esser said. "This helped us decide to test carp as weed control in our facilities. It was a solution that could be less costly than chemical applications and would be safer for the people and the environment."

The initial study was small, but showed a significant decrease in the weeds in the canal pool where the carp were released. With the help of North Dakota Game and Fish, white sucker and common carp were netted from the James River and Lake LaMoure. Two separate areas of the canal were stocked at a rate of 554 pounds of white sucker per surface acre and 250 pounds of carp per surface acre.

"We had no knowledge of what to expect with the stocking," Esser stated. Results surprised most involved. "We were excited to see what happened where the carp were placed. Our goals weren't for 100% weed control, but the carp were able to adequately control the weeds, and we are looking forward to continuing the study."

While the white sucker failed to produce any measurable results in weed control, the common carp kept the water free of visible weed infestation. At the time of stocking the carp, pondweed was reaching the surface of the shallower areas of the canals, with weed size up to 24 inches in length. During the first three weeks, the carp had visibly destroyed a majority of the pondweed and what remained was reduced to small, scattered patches that were too small to cause water delivery problems.

Dave Koland, Garrison Diversion Manager, is excited about the potential to use fish to keep the OTA operational. "The benefits of the carp were numerous. By stocking the fish, we were able to reduce our use of chemicals," Koland said. "Garrison Diversion is committed to providing a reliable, high quality and affordable water supply. This is one way we can help meet those commitments to the people and environment in North Dakota."

It was unlikely that any fish escaped back to the James River system. In order for the fish to leave the canal system, they would have had to enter the Oakes Pumping Plants discharge line while a pump was operating, be conveyed to the pump when backflow occurs after the pump was shut off, pass through the pump and then through water screen and trash rack with two inch gaps.

“To limit potential for escape during fall canal drainage, a one-half inch mesh screen was placed at the furthest downstream radial gate,” Esser said. “Even though these fish were going back into the same watershed basin, we wanted to limit the potential for any escape.”

The 2004 study will help the Garrison Diversion OTA staff understand how to improve the outcomes. Esser is enthused about how the study will work for his area.

“Because we didn’t see many of the fish die out, we were able to keep some of the fish over winter and use in this irrigation season. We have much to learn about stocking rates and how to catch enough carp to do the job, but carp for weed control has promise.”

One of the surprising issues the OTA personal will have for this test season seem simple... catching the fish. “The lowly carp has also earned my respect,” Esser exclaimed. “They demonstrated quite an ability to avoid a net. Once, while seining, we had a carp trapped in shallow water. Nothing we did could chase that fish out of the cattails and into the net. After all that work I could hardly believe it when the carp jumped over the net and escaped!”

The 2004 season will only use common carp as other stocked fish did not yield benefits. The testing areas of the OTA will be the same as last year in hopes of duplicating the success and eventually being able to expand the use of carp to the entire irrigation canal area.

For more information on the carp study or the Oakes Test Area, contact Dale Esser, OTA Supervisor, 701-742-2189 or [desser@drtel.net](mailto:desser@drtel.net).

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