AN AUGMENTATION PLAN FOR RAZORBACK SUCKER IN THE SAN JUAN RIVER

ADDENDUM # 2: JUSTIFICATION FOR CHANGING THE BEGINNING DATE OF THE EIGHT-YEAR STOCKING PERIOD

Draft

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INTRODUCTION

Experimental stocking of razorback sucker into the San Juan River began in 1994, as outlined in An Experimental Stocking Plan For Razorback Sucker In The San Juan River (Ryden and Pfeifer 1994). Between 1994 and 1996, a total of 940 razorback sucker were stocked into the San Juan River by personnel from the U.S. Fish and Wildlife Service's (Service) Colorado River Fishery Project (CRFP) office in Grand Junction, Colorado (Ryden 2000). Based on the success of this experimental stocking study the decision was made to implement a full-scale augmentation program for razorback sucker in the San Juan River.

In August 1997, a Five-Year Augmentation Plan for Razorback Sucker in the San Juan River (Ryden 1997) was finalized. The five-year augmentation plan, recommended the stocking of 73,482 razorback sucker into the San Juan River between 1997 and 2001. Stocking of razorback sucker from various sources into the San Juan River began in early September 1997. However, between 3 September 1997 and 1 November 2001 a total of only 5,896 razorback sucker were stocked into the San Juan River (Ryden 2003). If razorback sucker stocked as part of the experimental stocking plan (1994-1997) are included, 6,836 razorback sucker have been stocked into the San Juan River since 1994. The 5,896 razorback sucker stocked as part of the five-year augmentation effort represents a shortfall of 67,586 fish when compared to numbers recommended in the five-year augmentation.

The inability to achieve San Juan River razorback sucker augmentation goals has been due to a suite of circumstances all of which ultimately result in a lack of fish. However, the main problem is that rearing facilities outside of the San Juan River Basin lack the capabilities to hold and rear razorback sucker for the San Juan River Recovery Implementation Program (SJRIP). To alleviate this problem, the SJRIP undertook efforts to obtain or build grow-out ponds within the San Juan River basin that would afford a measure of self-sufficiency (for holding/rearing fish) to the San Juan River razorback sucker augmentation program. Beginning in 1997, a series of grow-out ponds were established on Navajo Agricultural Project (NAPI) lands southwest of Farmington, New Mexico. Presently there are about 25 surface acres of grow-out ponds (i.e., nine individual ponds) being used to rear razorback sucker.

Because of the large shortfall in numbers of stocked fish during the 1997-2001 augmentation effort, the San Juan River Biology Committee adopted an addendum to the 1997 stocking plan (Addendum # 1 -- finalized in February 2003; Ryden 2003) that extends the intensive stocking period for razorback sucker for an additional eight-year time period. This addendum called for stocking a minimum of 11,400 age-2 razorback sucker (i.e., $\geq$ 300 mm TL) per year, with the goal of establishing an adult population of 5,800 adult razorback sucker in the San Juan River. This eight-year stocking period was originally supposed to begin in 2004 and continue through 2011. However, in 2004, a total of only 2,989 razorback sucker were stocked into the San Juan River (Ryden 2005 In Prep). While this represents the largest number of razorback sucker stocked into the San Juan River in any single calendar year since 1994, it is still well below the number specified in the 2003 augmentation plan addendum (Ryden 2003).

The ongoing shortfalls between target stocking numbers in the razorback sucker augmentation plan addendum (Addendum # 1; Ryden 2003) and numbers of fish being harvested from grow-out ponds and stocked into the San Juan River has numerous causes. First, grow-out ponds have yet to produce fish at the densities that were originally anticipated (i.e., 500 lbs. of fish per surface acre per year) when they were constructed. This is caused at least in part by very dramatic differences in both primary and secondary productivity, due to wide variations in water chemistry and nutrient loads, among the nine ponds. Second, the NAPI grow-out ponds harbor large populations of tiger salamanders. When larval razorback sucker (the only size-class currently available to the SJRIP for stocking into these ponds) are stocked into the grow-out ponds in the

spring of the year, initial losses to salamander predation are very heavy. Third, avian predation upon young razorback sucker in ponds can also be heavy, especially during periods of bird migrations (e.g., mergansers), or in less-mature ponds where there is no emergent shoreline vegetation to prevent wading birds from prowling the shorelines (e.g., herons). Fourth, West Avocet Pond experienced a fish kill in May 2004 that took this pond completely out of production. Indications point to the presence of an artificial chemical (perhaps a pesticide) having been dumped into West Avocet Pond that likely initiated the fish kill. Three of the nine grow-out ponds currently have no perimeter, security fencing around them to prevent such dumping of toxic substances or other adverse activities. In addition, the SJRIP has only just recently contracted with the Navajo Nation to provide an "on the ground" pond manager to specifically oversee the day-to-day management, security, and maintenance of the razorback sucker grow-out ponds. In past years, the local Bureau of Indian Affairs office (BIA-NIIP) in conjunction with personnel from Keller-Bliesner Engineering have performed maintenance and very basic pond management activities (e.g., filling, draining, fertilizing) gratis. However, maximizing the success of these ponds will likely require the presence of a trained, locally-based, fish culturist/pond manager.

JUSTIFICATION FOR CHANGE TO AUGMENTATION PLAN

The eight-year stocking period specified in the 2003 razorback sucker stocking plan addendum (Ryden 2003) was originally supposed to begin in 2004 and continue through 2011. However, since corrective measures to remedy the previously-listed limiting factors have not yet been implemented, the San Juan River Biology Committee has decided to delay "starting the clock" on this eight-year stocking period (i.e., waiting until the SJRIP can realistically expect to meet the annual stocking goals of 11,400 age-2 fish, $\geq$ 300 mm TL as specified in the 2003 stocking plan addendum; Ryden 2003) until all corrective measures are completed/in-place. The exact date when this eight-year stocking effort will officially begin is unknown, but it is hoped that it will be during calendar year 2007 at the latest.

METHODS

The SJRIP operates under an approach known as "Adaptive Management." The Adaptive Management approach lets the SJRIP Biology and Coordination Committees make appropriate modifications to annual workplans, field studies, monitoring and augmentation programs, and guiding documents, as new information becomes available that would suggest that a change would be advantageous in helping to more quickly and efficiently achieve the recovery of the two San Juan River endangered fishes (i.e., Colorado pikeminnow and razorback sucker {*Xyrauchen texanus*}).

The SJRIP Biology Committee has developed, approved, and implemented workplans aimed at correcting the factors that are currently known to be limiting the production of sufficient numbers of razorback sucker to meet the annual stocking goals. These corrective measures currently include:

1) Getting West Avocet Pond back into production. Scraping, reshaping, and refilling West Avocet Pond is scheduled to be performed in 2005. In addition, a gravity drain will be added to West Avocet Pond. If these actions are completed in time, restocking the pond could occur as early as 2005, but will more likely occur in spring 2006. Security fencing will also be installed around the perimeter of the two Avocet ponds and Hidden Pond during 2005.

2) Finalizing a comprehensive pond management plan. A study designed to identify sound pond management strategies and ways to maximize razorback sucker growth in the NAPI grow-out ponds is currently underway. A pond management plan will be produced at the end of this study.

3) Hiring and training an "on-the-ground" pond manager. The Navajo Nation's Department of Fish and Wildlife is being funded (starting in 2005) to oversee day-to-day operations at the NAPI grow-out ponds. The pond manager will be responsible for performing routine pond monitoring and maintenance, providing security, assessing the impacts of (and developing solutions to) avian predation, responding to critical events (such as fish kills), and implementing the strategies/actions outlined in the pond management plan.

4) Stocking grow-out ponds with razorback sucker that are large enough to avoid predation by tiger salamanders. Dexter National Fish Hatchery (NFH) has been awarded a contract to produce and deliver 200+ mm TL razorback sucker (n = 20,000) to be stocked into the NAPI grow-out ponds, annually. These fish will then be reared in the existing grow-out ponds until they have reached $\geq$ 300 mm TL, at which time they will be harvested and stocked into the San Juan River. However, since this contract was issued in early 2005, it will take some time for Dexter NFH to get "up to speed" in producing, rearing, and delivering these annual shipments of fish. In reality, the first full shipment of 200+ mm TL fish (n = 20,000) will likely occur in 2007.

Once these corrective actions have been fully implemented, it is anticipated that it will be feasible for the SJRIP to annually meet or exceed the target number of 11,400 razorback sucker ($\geq$ 300 mm TL) specified in the 2003 razorback sucker augmentation plan addendum (Addendum # 1; Ryden 2003).

Other than "starting the clock" on the eight-year stocking period at a later date than was originally specified, all objectives, goals, and methods specified in the 2003 augmentation plan addendum (Addendum # 1: Ryden 2003) will remain unchanged. In the interim, the SJRIP grow-out ponds will continue to be stocked annually (in the spring) with larval razorback sucker of appropriate lineage. Harvest efforts (to remove, PIT tag, and stock fish that are $\geq$ 300 mm TL) will also continue during this interim period.

LITERATURE CITED

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