Fresno Canyon Renovation 2007

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Fresno Canyon is a major tributary to Sonoita Creek which is a major tributary of the Santa Cruz River located in Southern Arizona approximately 15 miles northeast of Nogales Arizona (Map 1). Fresno Canyon is located within the Sonoita Creek State Natural Area and is managed by Arizona State Parks (AZSP). The canyon currently contains Gila topminnow, Sonora mud turtles, and canyon treefrogs. Non native species found within the canyon include green sunfish, bullfrogs and crayfish. In an effort to remove non native aquatic species from the drainage, Arizona Game and Fish Department (AZGFD) in cooperation with Arizona State Parks planned a chemical renovation of the canyon to restore aquatic habitat to conditions suitable for native species conservation.

During the week of June 18th, 2007 the chemical renovation was completed within Fresno Canyon to remove the green sunfish. The piscicide Prentox® Synpren-fish™ was used to treat approximately 1.40 acre feet of standing water in a series of pools of various depths throughout a 600 meter wetted section of the canyon. To ensure complete eradication of the green sunfish the piscicide was administered at a concentration of 10ppm as listed on the label for pre impoundment. Additionally, Fintrol-15™ sand was used in the deeper pools to increase treatment success. No de-tox station was established due to the fact that no water was leaving the prescribed treatment area however equipment for the de-tox station was present on site if conditions changed and it was needed.

On Monday June 18th 2007 a small crew consisting of AZGFD and AZSP employees removed approximately 1200 Gila topminnows from Fresno Canyon prior to the chemical renovation through the use of dip nets. Fish captured in Fresno were transported by quad in coolers from Fresno Canyon approximately 3 miles from the renovation site to Coal Mine Spring located in Coal Mine Canyon, a major tributary to Fresno Canyon and the source of Gila topminnows within Fresno Canyon. Prior to transport, fish captured were tripled sorted by trained biologists and any fish not positively identified as a Gila topminnow were released back into Fresno and not transported off site. During capture of the topminnows it was observed that while it appears topminnows and green sunfish were co-existing, the topminnows were severely limited to locations of shallow water (< 6 inches) uninhabitable by green sunfish. Once the fish arrived at Coal Mine spring, they were once again sorted prior to their release at Coal Mine spring.

Once the fish had been safely removed from the prescribed treatment site, Jason Kline and I delineated the aquatic habitat and divided the 600 meters of aquatic habitat into two stream reaches (Map 2). Each of these two reaches was then broken down into smaller reaches or sub reaches. Water amounts in each of these sub reaches were calculated and the correct amount of Prentox® Synpren-fish™ to achieve the prescription rate of 10ppm was then measured out into individual spill proof containers and labeled accordingly for each sub reach. Because of the remote location, all equipment for the renovation was

packed to the site with the use of quads and staged near the prescribed treatment location. The piscicide was not left on site and was transported to the site each day.

On Monday evening a safety briefing and project overview was provided to all participants. This safety briefing was mandatory for all crew members assisting with the renovation.

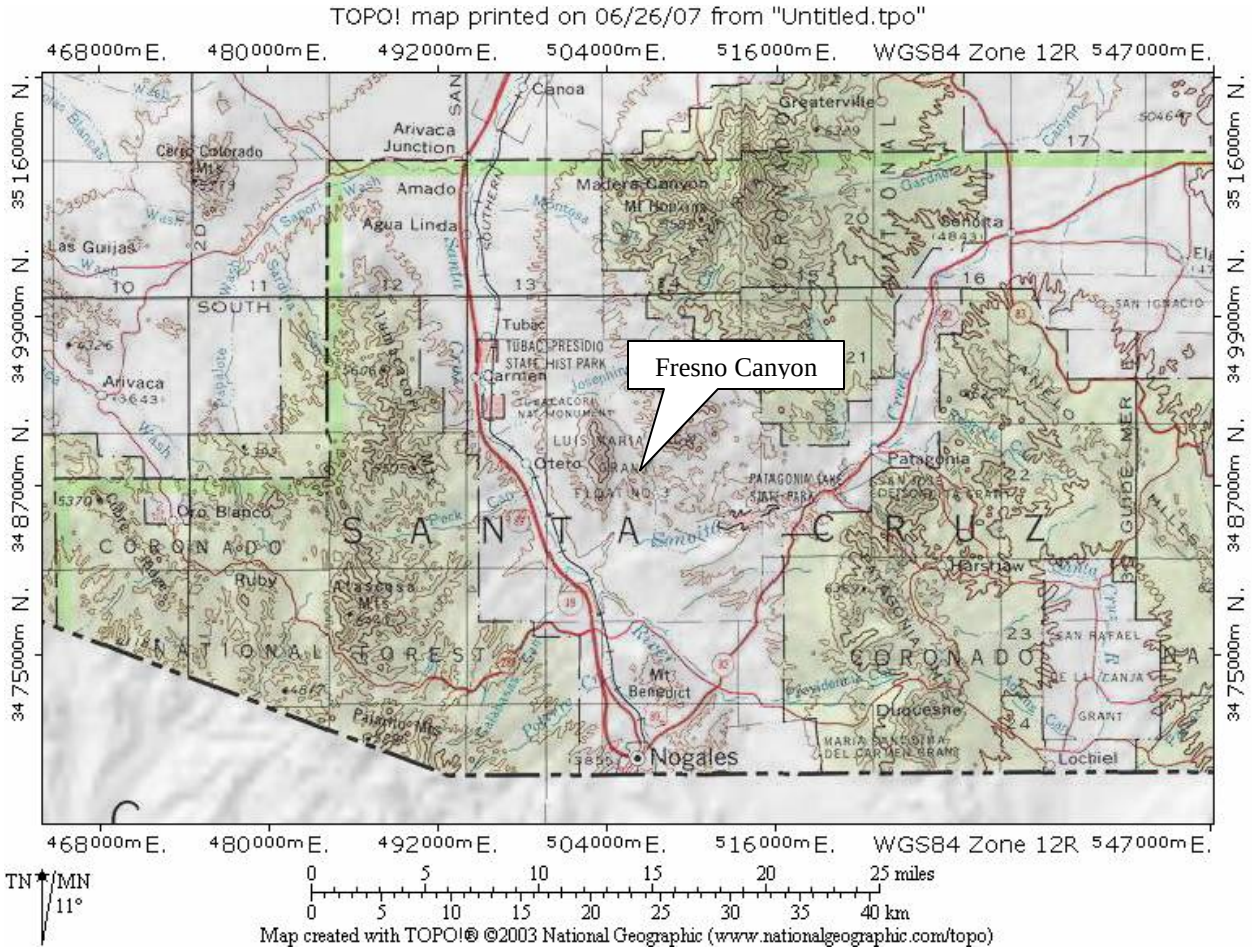
Tuesday June 19th marked the first day of the chemical application. A crew consisting of AZGFD employees was divided into two teams consisting of 4 people in reach 1 and 3 people in reach 2. Because there was only a small amount of flowing water in each reach it was decided that no drip stations would be established and that all of the piscicide would be applied through the use of backpack sprayers. A total of 2 sprayers were used in each reach. To apply the correct amount of piscicide, at the start of each sub reach, each back pack sprayer would be filled with water, then the pre-measured amount of rotenone required to treat each sub reach would be divided equally between each sprayer. Crew members would then begin spraying the piscicide while moving down stream. Once the end of the sub reach was reached, crew members that still had piscicide in their sprayers would begin walking back up stream spraying the sub reach again. This re-spraying would occur in the sub reach until all liquid had been removed from the sprayer effectively spraying the required amount of piscicide to treat the calculated water amounts in each sub reach.

Approximately 1 hour after the initial application of piscicide began fish begin showing signs of being effected by the piscicide. Green sunfish became lethargic and where not as quick to seek cover when approached. By the end of two hours green sunfish had began to die and whole pools where showing the affects of the piscicide and many fish had already succumbed to the treatment.

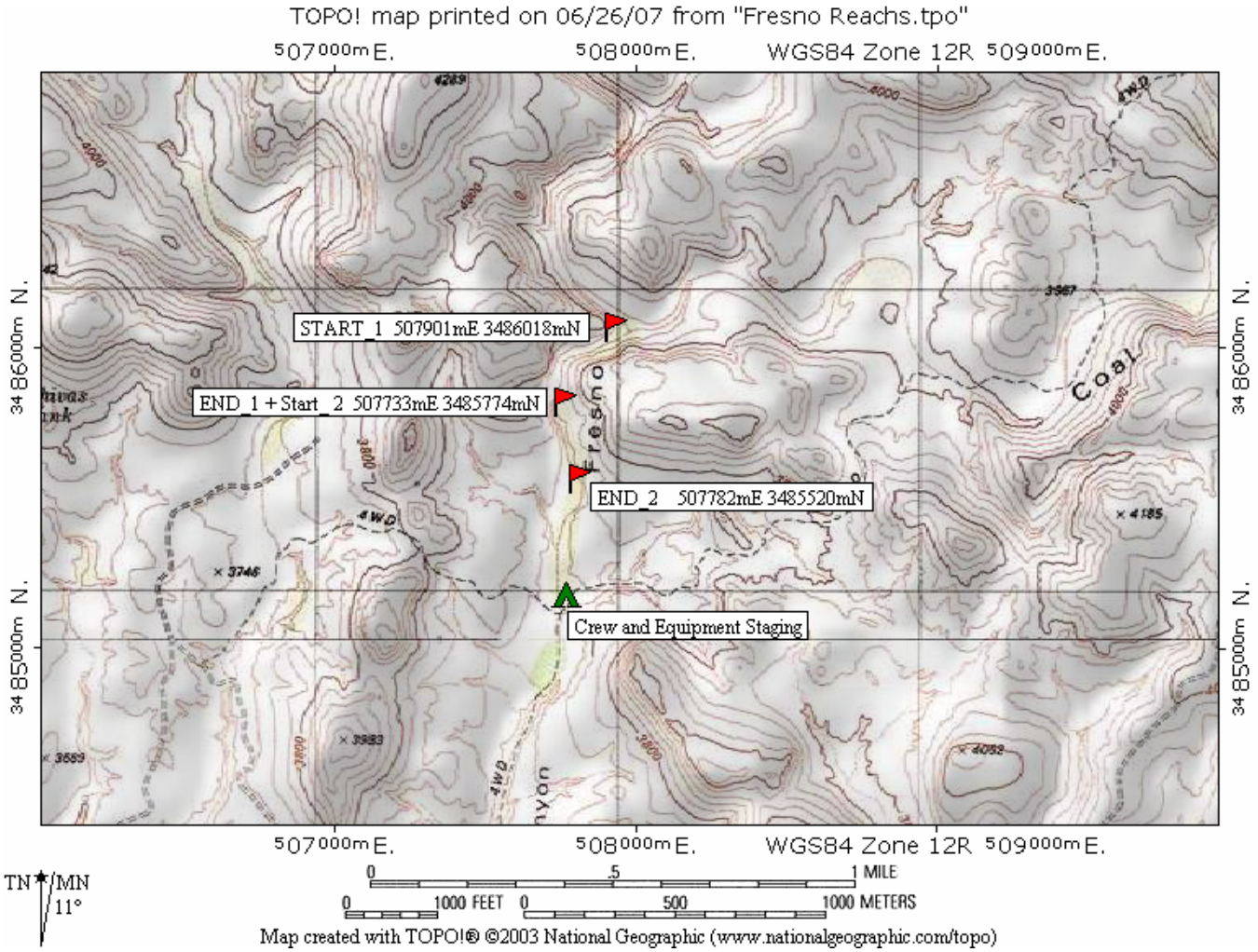
Wednesday June 20th was the second day of planned treatment. Crews arrived on site and the treatment was carried out identically to the first day. Neither team reported seeing live fish during the treatment on the second day. Additionally it was reported during the second day that several mud turtles had died overnight in the treatment location. The majority of the loss of the turtles appeared to be localized to a few pools situated in bedrock with steeper sides and fewer fish. Turtles observed in other pools with shallower sides and many fish of various size classes appeared to be doing fine and were in fact observed feeding on dead fish. Reasons for the death of the turtles are unknown but it's possible that the turtles that were stressed from the shrinking habitat in the bedrock pools and a lack of prey observed in these pools they were found in. Future renovations should be sensitive to these observed impacts to turtles during the Fresno renovation and steps should be taken to limit these impacts on future renovations. Once this second treatment was completed, crews cleaned up the area and began packing equipment out of the prescribed treatment location.

Thursday June 21st was used to complete post treatment surveys in an effort to determine success. Suzy Ehret, Jason Kline and I returned to Fresno and walked the entire treated portion of the canyon. Sampling with dip nets and visual observations found no living

fish in the treated habitat. At this point it appears the application was successful. Follow up surveys will be conducted over the next several weeks with the use of electrofishing gear to further evaluate success. Once these surveys have been completed, planning for the return of Gila topminnows will be made and the fish will be captured from Coal Mine spring and transported back to Fresno.



Map 1. Location of Fresno Canyon



Map 2. Location of Major reaches within Fresno Canyon

Application of piscicide by back pack sprayer in Fresno Canyon

Green sunfish deeply affected by the application of piscicide approximately 2 hours after initial application.