



August 31, 2009

Ms. Cherrie-Lee Phillips
Natural Resource Specialist
U.S. Army Corps of Engineers
Canyon Lake Office
601 COE Road
Canyon Lake, TX 76513

RE: GRTU Proposal for Habitat Restoration Projects on the Guadalupe River Below Canyon Dam

Dear Ms. Phillips,

Guadalupe River Trout Unlimited (GRTU) would like to thank you for the opportunity to meet with you to discuss potential restoration plans for the Guadalupe River below Canyon Dam. In response to our 30 July 2009 meeting, GRTU is pleased to present this proposal for implementing initial Guadalupe River restoration initiatives. As we discussed in our meeting, GRTU wishes to restore habitat at two locations on the Guadalupe River. Since the proposed activities are the first restoration efforts GRTU plans to implement, they will help us develop planning and implementation knowledge for future initiatives and are therefore critical to GRTU's overall plans.

In e-mail messages following our meeting, USACE requested that bank stabilization and/or restoration of the Gorge area be included in our initial plans. As indicated in your e-mails the Gorge restoration would be completed in a cooperative effort between Texas Parks and Wildlife Department (TPWD), GRTU, USACE, Guadalupe Blanco River Authority (GBRA), and Water Oriented Recreational District (WORD). As we expressed in our meeting, GRTU believes that restoration of the Gorge area is vital to any habitat improvement efforts completed on the river and we support such effort.

Restoration of the Gorge will be a significant undertaking, with substantial logistical and financial requirements. Our preliminary estimate is that restoration of the Gorge may require four to five years or more to complete. GRTU is committed to restoration of the Gorge area and equally committed to restoring other sections of the river. Therefore, GRTU requests that we be allowed to proceed with our initial restoration projects as described below while planning for the Gorge restoration gets underway.

Introduction

Trout Unlimited (TU) is a conservation organization whose mission is to conserve, protect and restore coldwater fisheries and their watersheds. From its founding 50 years ago by 16 fishermen concerned about the future of trout fishing in Michigan to its current position with over 140,000 members in 400

chapters around the US, TU has been at the forefront in conservation of cold-water fisheries, specifically those supporting trout and salmon populations.

GRTU, the sole TU chapter in Texas, is the largest TU chapter in North America, with over 4300 members that are dedicated conservation volunteers. Consistent with TU's charter, GRTU is committed to conserving and restoring the cold-water fishery of the Guadalupe River. GRTU coordinates annual river cleanups and trout stockings to improve conditions within the fishery. Additionally, GRTU conducts or contributes to numerous conservation, community education, and local charitable causes.

Over the past few years, GRTU has become concerned about changes to the in-stream and riparian habitat of the Guadalupe River as the result of flood events and urban developments within the watershed. To address identified habitat impairments, GRTU has established a Habitat Restoration Committee responsible for identifying areas where restoration is needed and implementing the appropriate restoration efforts. GRTU's committee has identified two areas on the river and has developed plans for those initial restoration activities. These projects will serve as pilot studies aimed at defining our procedures and techniques for future restoration activities. With preliminary plans established, we are eager to start our restoration efforts.

Background

In 2002, a major flood swept down the Guadalupe River, wreaking havoc on the in-stream and riparian habitat of the river downstream of Canyon Dam. In early summer 2002, Canyon Lake was above its normal conservation pool. During the first week of July, the area received over 35 inches of rain rapidly filling the lake. According to local records, the lake rose 40 feet in four days. As a result of this heavy rain, water ultimately began flowing over the emergency spillway to the south of Canyon Dam, carving a deep gorge through virgin forest and down to bedrock as it raced to join the river, carrying a tremendous amount of sediment with it. At peak flow during the flood, the flow rate in the river was estimated at approximately 70,000 cubic feet per second (cfs).

Besides scouring a deep gorge from the emergency spillway to the river, the flood affected the aquatic habitat of the river in many ways.

- The river has become wider and shallower in many places, resulting in increased water temperature.
- A large scour area was formed at the confluence of the gorge and the river, eroding the river banks and washing away the large trees which shaded the river.
- A tremendous volume of sediments was washed into the river at the gorge area, filling some deep pools such as the one below Horseshoe Falls.
- In-stream vegetation beneficial to the macro-invertebrate population within the river was washed away, removing a vital food source for aquatic animals.
- Riparian vegetation was lost in many areas leading to subsequent bank erosion.

In the seven years since the flood, many of these effects have been further compounded. The river remains wide and shallow in many areas, creating an unfavorable temperature profile. Recovery of riparian areas scoured during the flood has been slow in some areas, resulting in increased bank erosion and further loss of riparian habitat. The presence of unstable banks and loss of river-bank vegetation has

removed the in-stream habitat for aquatic organisms which benefit from cover provided by under-cut banks and stream-bank vegetation. In-stream habitats were also damaged by the loss of in-stream cover structures (rocks, boulders, and logs) that were either washed away during the high flows or removed during the subsequent river cleanup.

Most notably affected is the area where the overflow gorge empties into the river. Severe bank erosion and scouring occurred. Although the northern bank in this area has been rebuilt and is currently a community park (see Figure 1 attached), the riparian zone in this area has not been restored.

Additionally, the river is wider and shallower along this reach and when combined with the loss of overhead shade cover, significantly higher solar heating occurs as the water passes through this area, raising water temperatures and reducing its ability to hold dissolved oxygen so vital to coldwater fish.

In-stream vegetation lost during the flood has been slow to recover, affecting the macro-invertebrate population, an important food source for aquatic animals. Prior to the flood, an area of the river close to the dam contained numerous watercress beds as well as other in-stream plants. Numerous macro-invertebrate species thrived in these beds, most notably *hyalella spp.* (aka., scuds), which were shown by a pre-flood university study conducted under the sponsorship of GRTU to be one of the primary food sources for trout and other aquatic animals in the river. With the loss of a majority of the in-stream vegetation during the 2002 flood, the scud population all but disappeared.

The gorge created during the flow of water from the emergency overflow to the river continues to affect the river. Water believed to be originating as seepage from the dam continues to flow through the gorge and into the river. This water has a much higher temperature than the river and also carries a relatively high sediment load comprised primarily of fine-grained materials (silt and clay). The addition of flow from the gorge increases the temperature of the river and adds fine-grained sediments which can damage trout spawning beds. Because the banks of the gorge are deeply incised and unstable, the gorge can be expected to contribute high sediment loads in rainfall runoff.

Proposed Habitat Restoration Activities

To address the habitat impairments resulting from the 2002 flood, GRTU has been working closely with the Texas Parks and Wildlife Department (TPWD) to develop plans for the restoration of the Guadalupe River. Two projects were chosen due to their ease of implementation and low budgetary requirements. They involve instream and riparian restoration and bank stabilization. The two areas, designated as Area A and B are depicted on Figure 1 and described in detail in the following sections. Results from these projects will be used to guide similar projects in the future.

Area A: Scour Area Riparian Habitat Restoration

Area A is the area at the confluence of the overflow gorge and the river, heavily scoured during the 2002 flood. The area includes approximately 300 feet of river reach with little vegetative cover and virtually no trees, especially on the western bank. The eastern bank was restored following the flood and sycamore trees have been planted along the bank. However, with little additional vegetation stabilizing the bank, this area will be subject to bank erosion. Additionally, the river is subjected to elevated amounts of solar heating due to lack of shade cover on both banks along this reach.

River banks will be stabilized and riparian areas restored on both river banks in this area using willow trees. Although other native plants may be incorporated into the planting scheme, using willows is a proven and cost efficient method. Willow stem cuttings will be collected from nearby willow trees. The willow planting will be performed following the instructions contained in *How to Plant Willows and Cottonwoods for Riparian Restoration, USDA Technical Note, January 2007*. Planting of larger longer-life trees such as cypress, sycamores, and oaks will not be conducted at this time but may be incorporated into the plan at a later date.

Area B: In-stream Planting and Watercress Bed Restoration Area

Area B is an area close to the dam that contained numerous beds of watercress prior to the flood. The watercress beds were an important habitat for macro-invertebrates (most notably scuds), a very important food source for the fish prior to the flood. With the loss of the watercress due to the flood, there has been a decline in scud population and a general decline in food sources within the river.

GRTU will transplant watercress from existing beds in an attempt to establish new seed beds in this area. The watercress will be established by transplanting entire plants or propagated clippings in shallow gravel beds within the river channel. The watercress plants and clippings will be taken from suitable locations within the Guadalupe River watershed so as to reduce the potential for introducing non-localized vegetation and microorganisms into the river. TPWD will assist GRTU with locating suitable watercress beds to use as sources for the plants and clippings to be transplanted. TPWD will also assist in the development of procedures for transplanting the watercress.

Planning and Reporting

Before starting the restorations, GRTU will prepare a work plan describing the restoration efforts to be completed. The plan will include a description of the areas where the restoration work will be conducted, procedures to be used to propagate or transplant the vegetation in each area, a list of plants that will be used to re-vegetate each area, and follow-on monitoring for each area. The work plan will also identify all regulatory permitting and notification requirements for completing these projects.

The work plan will be submitted to USACE for review and comment. Following receipt of USACE review comments a final work plan will be submitted. TPWD will provide guidance on selecting suitable vegetation for in the restoration efforts and developing procedures for transplanting the vegetation.

Following completion of the restoration efforts, GRTU will prepare a brief summary report describing the restoration activities completed. The report will include a description of the transplanting of vegetation in the two areas. The report will also include pictures of the transplanting process and copies of all required permits.

Staffing and Financial Considerations

A majority of the restoration work will be completed by volunteers from GRTU's membership. TPWD will provide technical assistance in preparing the work plan and completing the restoration efforts. GRTU may be assisted by volunteers from other conservation organizations.

Since the proposed restoration efforts will be involve transplanting existing plants from within the watershed, the financial requirements for completing these restoration activities are anticipated to be

Ms. Cherrie-Lee Phillips

August 31, 2009

Page 5

minor. GRTU will responsible for all funding for the proposed restoration activities. In the event that the funding exceeds our financial resources, GRTU will pursue grants to defray the restoration costs.

Schedule

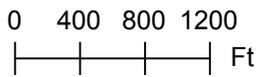
Upon approval of our proposal, GRTU is prepared to develop a technical work plan and secure all necessary permits for these projects. GRTU anticipates that the work plan will take one to two months to prepare. Following USACE review and approval of the work plan, GRTU will carry out the restorations. GRTU anticipates that the restoration work can be started within one month of the work plan approval and will be completed in two to three weekends.

We appreciate the opportunity to present this proposal for habitat restoration projects on the Guadalupe River. As previously stated, GRTU supports USACE's interest in restoring the Gorge area and we look forward to working with you to complete those efforts. However, we respectfully request that we be allowed to proceed with other habitat restoration initiatives along the river while the Gorge restoration is being developed and implemented.

Best Regards,

Bill Higdon
GRTU President

Gary Cobb
GRTU Conservation Chair



River Base Material

- Bedrock/Boulder
- Bedrock/Cobble
- Bedrock/Large Gravel
- Boulder/Cobble
- Cobble/Large Gravel
- Large Gravel/Small Gravel



Figure 1
Location of Proposed
GRTU Habitat
Restoration Projects
August 2009