

AN EMBRACE-A-STREAM RESEARCH PROPOSAL FOR
THE GUADALUPE RIVER, COMAL COUNTY TEXAS

SUBMITTED BY THE GUADALUPE RIVER CHAPTER
OF TROUT UNLIMITED, CHAPTER # 066

PARTICIPANTS:

TEXAS PARKS AND WILDLIFE DEPARTMENT,
INLAND FISHERIES OFFICE,
SAN MARCOS TEXAS

SOUTHWEST TEXAS STATE UNIVERSITY,
BIOLOGY DEPARTMENT-AQUATIC STATION,
SAN MARCOS TEXAS

GUADALUPE RIVER CHAPTER,
TROUT UNLIMITED,
NEW BRAUNFELS TEXAS

TROUT UNLIMITED
1995 EMBRACE-A-STREAM GRANT APPLICATION

Applicant (TU Chapter or Council): Guadalupe River Chapter (#066)

Project Category: Research
(Resource, Research, or Education)

Project Title (Name of Stream a/o Watershed): Guadalupe River Trout Habitat Improvement Study

Project Location (City, County, State): New Braunfels, Comal County Texas

Salmonid Species: Brown and Rainbow Trout

Threatened or Endangered Status (if applicable): N/A

Agency Partners: Texas Parks and Wildlife Department Inland Fisheries Office and Southwest Texas State University Biology Department Aquatic Station

TU Project Contact:

Dr. Alan V. Bray 512-263-2101 (day) 263-9619 (night)
name phone

113 S. Cuernavaca Austin Texas 78733
street city state zip

[Signature] 12/1/94
signature date

Sponsoring Professional (Identify 2 for research projects):

Drs. Tom Arsuffi and Bobby Whiteside 512-245-2284
name & title phone

601 University Drive San Marcos Texas 78666-4616
street city state zip

[Signature] Dec 1, 1994
signature date

(over)

TU Chapter President:

Jeff Schmitt 512-444-1961 (day) 282-6016 (night)
name phone

2512 Star Grass Cir Austin Texas 78745
street city state zip

 12-1-94
signature date

TU Council Chairperson:

N/A
name phone

street city state zip

signature date

(My signature shows that I have reviewed this application and am aware that it occurs within my Council area and that the proposed project complements TU national resource policies.)

Landowner (if applicable):

name phone

street city state zip

signature date

Amount Requested from Embrace-A-Stream: \$ 6,000

Beginning & Ending Dates of Proposed Project: May 1995 to May 1996

Has project received EAS funds before? If so, indicate date and amount: No

EMBRACE-A-STREAM BUDGET . JRM

EAS Grant Request: \$ 6,000

Item	EAS Cost	Other Cost	Contributors	Total Project Costs
Personnel/Consultants	\$6,000 All EAS \$\$ go to SWTSU	\$3,000	GTRU R&D FUND	\$9,000
TU Volunteer Labor* (600 HRS) \$4.25/hr. x # of hrs.		\$2,550		\$2,550
Agency Volunteer Labor**		\$450		\$450
Other Volunteer Labor				
Paid Contractors/Consultants				
Materials/Equipment Purchases				
Equipment Rentals				
Materials/Equipment Donations				
Other Expenses				
TOTAL	\$6,000	\$6,000		\$12,000

Notes:

Please provide detailed itemizations for each EAS cost. Attach additional pages if necessary.

* value of TU volunteer labor must be placed in "Other Cost" column

** agency labor must be placed in "Other Cost" column

In "Contributors" column, identify type & amount of donation & name of donor

**GUADALUPE RIVER TAILRACE
TROUT PROJECT**

BUDGET

Salaries

**Karen Quinonez (undergraduate honors thesis
and MS thesis)**

Undergraduate

- 10 hours per week x \$6.00 hr x 20 weeks
(January-May 1995) = \$1,200.00

Fringe (16%) = \$ 192.00

Subtotal = \$1,392.00

Graduate

- 40 hours per week x \$8.00 hr x 12 weeks
(June, July, August 1995) = \$3,840.00

Fringe (16%) = \$ 615.00

Subtotal = \$4,455.00

**undergraduate assistant
(field assistant of sample processing)**

- 10 hours per week x \$6.00 hr x 12 weeks
(June, July, August 1995) = \$ 720.00

Fringe (16%) = \$ 115.00

Subtotal = \$ 835.00

Salary Total = \$6,682.00

Supplies (vials, preservatives, photocopying, etc) = \$ 800.00

Rental = \$ 583.00

Supplies & Rental Total = \$1,383.00

Indirect (14% of salaries) = \$ 935.00

GRAND TOTAL = \$9,000.00

Equipment, time and expertise of Drs. Arsuffi and Whiteside are provided pro bono.



TEXAS
PARKS AND WILDLIFE DEPARTMENT
4200 Smith School Road • Austin, Texas 78744 • 512-389-4800

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Executive Director

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P.O. Box 947
Inland Fisheries Management
San Marcos, TX 78667
December 1, 1994

Alan Bray
Vice President, Fisheries
Guadalupe River Chapter Trout Unlimited

Dear Alan:

Thank you for involving us in your proposed research of the Canyon Reservoir Tailrace. There are some interesting possibilities for improving this fishery. Your proposed research will fit in nicely with our oversummering study.

I will gladly participate in GRTU's Embrace-A-Stream (EAS) project and will offer my technical support to the Guadalupe River Chapter of Trout Unlimited (GRTU) whenever possible. I also agree to be a cooperator on the project as outlined in section 3.3 of the 1994 EAS proposal. I look forward to working with GRTU in the future.

Sincerely,

Handwritten signature of Steve Magnolia in black ink.

Steve Magnolia
TPWD Fisheries Biologist
San Marcos

1.0 INTRODUCTION AND EXECUTIVE SUMMARY

This Embrace-A-Stream (EAS) proposal for trout habitat research is submitted by the Guadalupe River Chapter of Trout Unlimited (GRTU). The team GRTU proposes includes Southwest Texas State University (SWTSU) and Texas Parks and Wildlife Department (TPWD) Inland Fisheries Office. The EAS proposal guide is followed rigorously, but to aid reviewers we include here the project goal, objectives, methods, and expected results:

Project Goal: Conduct the research necessary to prepare GRTU trout population improvement and habitat enhancement guidance for the Canyon Reservoir Tailrace of the Guadalupe River.

Project Objectives:

1. Survey the Canyon Reservoir Tailrace for trout and aquatic insect habitability. Identify sections of the tailrace with habitat suitable for trout and the invertebrates important to the trout food chain.
2. Examine the brown and rainbow trout food chain in the tailrace, determining species and abundance of macroinvertebrates (insects, mollusks, etc.) and identify those important to trout diet.
3. Review fisheries management methods for southern tier trout tailwaters for applicability to the Guadalupe River trout fishery.
4. Prepare guidance for trout habitat enhancement in the Guadalupe River, including optimal locations for restrictive angling regulations and stocking of adults, eggs and fingerlings.

Methods Proposed to Meet the Objectives:

1. Conduct a literature search on trout and trout food habitat survey methods and prepare guidance for conducting the survey.
2. Conduct a trout habitat survey of the river below Canyon Dam.
3. Make a quantitative assessment of macroinvertebrate abundance and diversity and conduct stomach analyses of captured trout.
4. Prepare an annotated bibliography of tailwater fisheries management methods in the southern U.S.
5. Summarize the results above into GRTU's trout habitat enhancement plan for the Guadalupe River tailwater.

Expected Results:

Sections of the river with the best potential for trout survival and growth will be identified as candidates for restrictive angling regulations, informed stocking, and possible habitat enhancement.

2.0 PROJECT SCOPE

2.1 Background/Purpose

The Guadalupe River Chapter of TU (GRTU) has some good news in its guardianship of the trout which inhabit this tailwater fishery - the fish are doing better than ever! The trout are over summering in significant numbers and may be naturally reproducing. However, the trout of the Guadalupe also face a number of challenges, the greatest of which is over-harvesting, followed by civilization encroachment and drought condition water flows.

The Guadalupe has been impacted in the same manner as a number of southern tailwater fisheries. The dam had an unnatural effect on stream flows, and civilization, in the form of houses and other streamside structures, has invaded. The macroinvertebrates in the Guadalupe River were investigated in 1970 [1] to compare fauna above and below Canyon Reservoir. Findings show that insect number and diversity 24 kilometers (15 miles) below the dam were comparable to those above the reservoir, however immediately below the dam there were dramatically reduced insect populations due to colder temperatures and the presence of hydrogen sulfide in the summer. Recent (1987 - 1992) changes in both the operation and structure of the dam have improved trout habitat in the river, and GRTU has been instrumental in helping obtain improvements. They include:

1. The Canyon Dam outflow is now continuously monitored for dissolved oxygen. Oxygen is added when critical levels are reached.
2. Summer stream flow levels have been stabilized through agreement with the Army Corps of Engineers and the Guadalupe Blanco River Authority (GBRA) to establish minimum flow guidelines.
3. The occurrence of hydrogen sulfide, which had dramatically reduced macroinvertebrate populations just below the dam, has been reduced through oxygenation and changes in dam operations.

In addition to improvement in water quality and flow there is also good news from results of an over summer survival study conducted by Texas Parks and Wildlife Department (TPWD):

1. There are a good number of trout remaining in the river in the fall, even though the last stockings take place in March.
2. There is some evidence of rainbow trout reproduction.
3. Because of the substantial over summering the possibility of fishery enhancement through the use of special length and bag limit regulations is under consideration by TPWD.

What had been only a dream before now seems possible - a self sustaining wild trout population in the Guadalupe river.

The problem GRTU faces today is that the improvements in the fishery have out paced the research needed to establish a clear coldwater fisheries enhancement program. GRTU needs well founded guidance to structure an enhancement program that will improve spawning, over summering, and the trout food chain. We have an opportunity to make the Guadalupe a top notch trout tailwater fishery. We have the volunteer energy to execute an enhancement effort. What we need now is informed guidance on what needs to be done. The Embrace-A-Stream (EAS) program is the right vehicle to help GRTU achieve its goal of an enhanced tailwater fishery.

2.2 Regional/National Importance

The Canyon Dam tailrace of the Guadalupe river is the southern most trout stream in the United States. The peak fishing season is from November to March, with good fishing year round. Its reputation as a trout fishery continues to grow - for example it now hosts an annual fly fishing school. It is comparable in water volume and flow to the middle section of the Chama river in New Mexico, or a bit larger than the Yellow Breeches in Pennsylvania. This is a great opportunity for TU to contribute to an emerging tailwater fishery and to share in the rewards of a job well done.

Interest in the river regionally is evident from the TU award given GRTU in 1993 for having the most new members of any chapter in the country in 1992. The chapter continues to grow as interest in the river and its trout fishery grows. With 890 members GRTU is second in size only to the Northern Virginia chapter of TU which has 900 members. Out of state fishermen visit the Guadalupe because it can be fished for trout in February with outside temperatures in the 50's and 60's.

2.3 Previous Applicable Work

Evidence of over summer survival in the early days of the Guadalupe trout stockings stimulated interest in the development of put-grow-take fisheries management. It was felt that if adequate numbers of trout could avoid post-stocking harvest and survive through the summer, a more diverse fishery might be developed through changes in management strategy. Suggestions have included restrictive angling regulations [2] on part of the tailwater, or stocking of specialized trout strains [3]. Pre 1980 electro-fishing surveys by Butler and White [4,5,6] are valuable for their historic insight, but the changes in Canyon dam tailrace configuration and dam operation made in the late 1980's are not reflected in the results. This is also true of the data on insect populations generated by Young et al [1] in 1970. Almost all of the research done to characterize the river for its coldwater fishery potential is now obsolete.

Basic river data, such as temperature and dissolved oxygen

levels, are routinely taken by the U.S. Army Corps of Engineers. An example is the temperature data [7] plotted in figure 1. The last time water temperatures got close to a point which could threaten trout, i.e. over 25 degrees centigrade, was in 1992 when Canyon Reservoir did not stratify due to flooding in the watershed.

A study by Texas Parks and Wildlife [8] has quantified over summer rates for 1993 and 1994. Changes in fishing regulations for the tailwater may be recommended based on these results. Data from the study are shown in Figure 2. Note that the data show evidence of natural reproduction in the 1994 spring survey when a number of 4-7 inch trout were collected. The natural reproduction thesis is based on the fact that no trout this small were stocked in the river during this period.

2.4 Approach/Solution

The Guadalupe River below Canyon dam is an important Texas fishery and will always have a component of put-take angling. With special angling regulations the river is clearly capable of a put-grow-take fishery. Evidence of natural reproduction suggests it may also be capable of a self sustaining a wild trout population. In order to foster this process GRTU proposes:

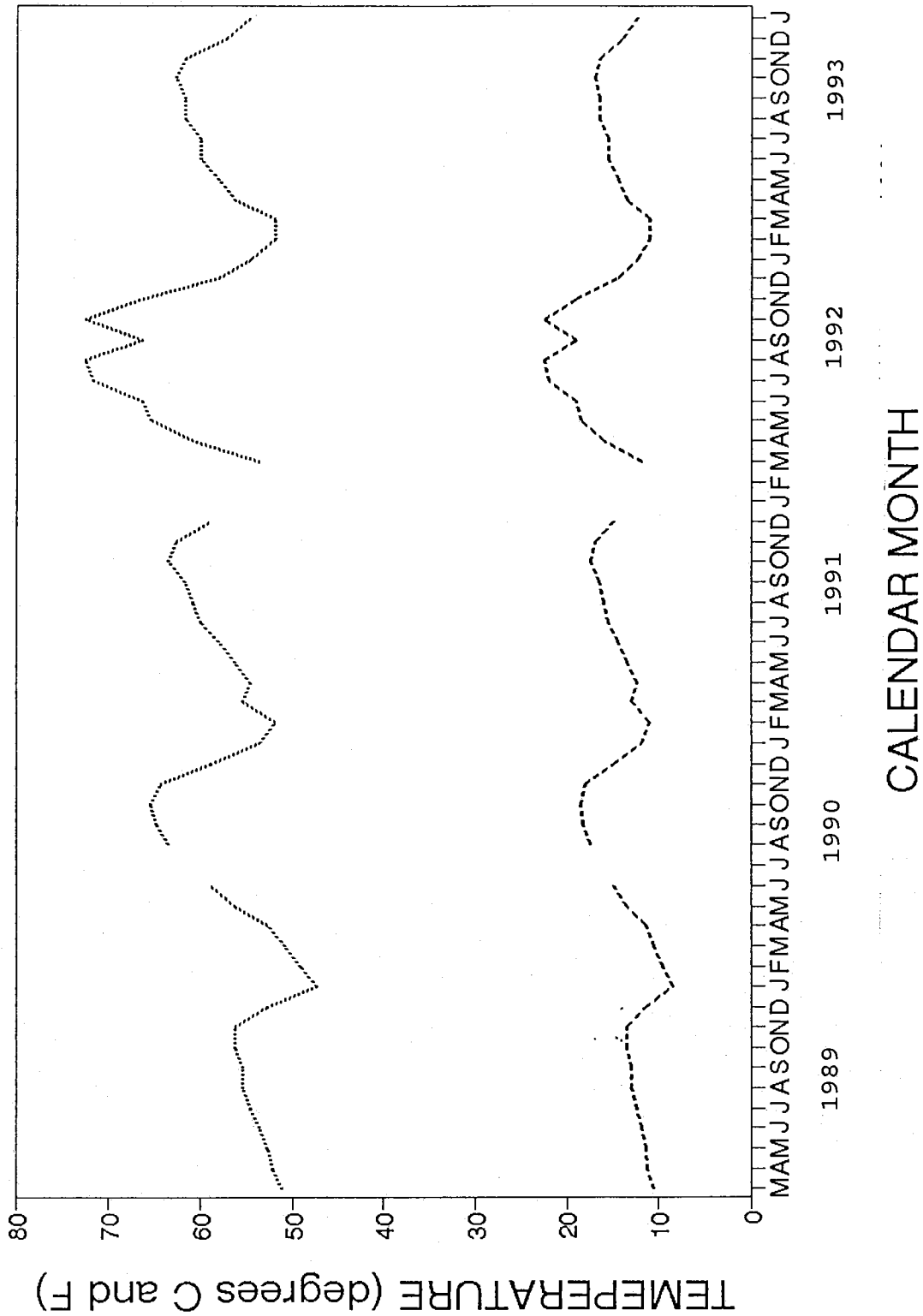
- o Identification of suitable trout habitat to provide guidance for special angling regulations, stocking and egg rearing projects.
- o Update Guadalupe River trout food chain data to reflect the physical changes brought about by Canyon dam structural and operating modifications.
- o Review fisheries management methods in southern tailwater fisheries for applicability to Guadalupe River trout habitat and population improvement programs.
- o Publish guidelines for landowners living along the river to avoid non-point source pollution.
- o Use the research results from above to prepare a trout population and trout habitat enhancement program.

3.0 Significance

3.1 Coldwater Fisheries Benefits

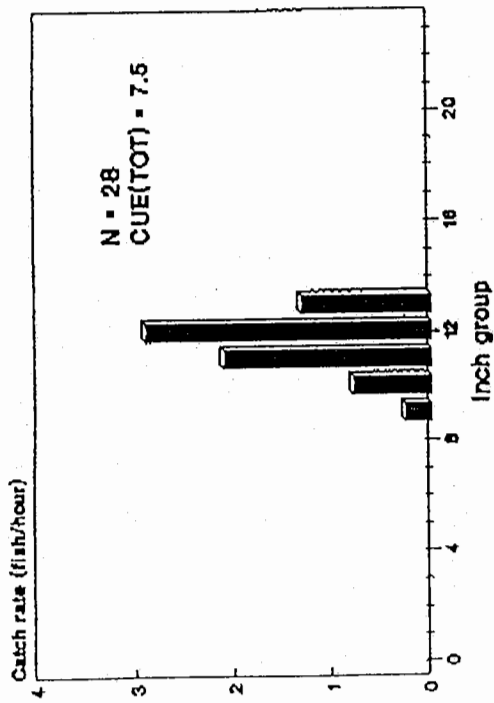
Medium size tailwater rivers represent a unique class of coldwater fishery. An opportunity to add quality trout water to the world coldwater inventory is rare. The Guadalupe River below Canyon Dam can become a permanent fixture on the world list of trout waters with informed stewardship. This is particularly important in the southern U.S. where there are many coldwater fisherman and not many coldwater fisheries.

Figure 1. GUADALUPE RIVER TEMPERATURE MEASURED BELOW CANYON DAM

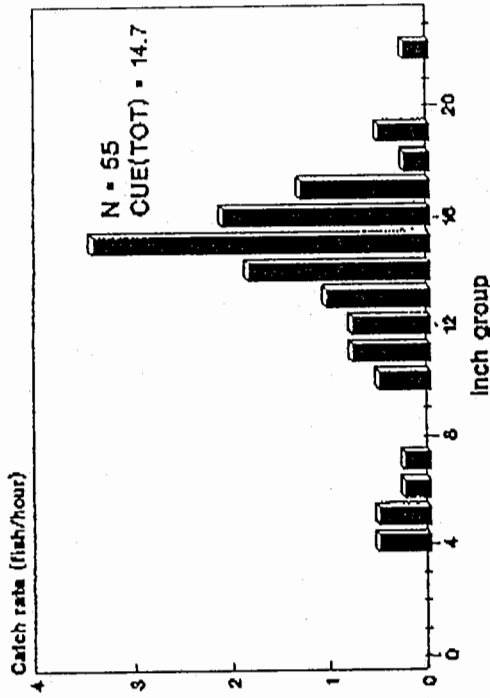


..... DEGREES F DEGREES C

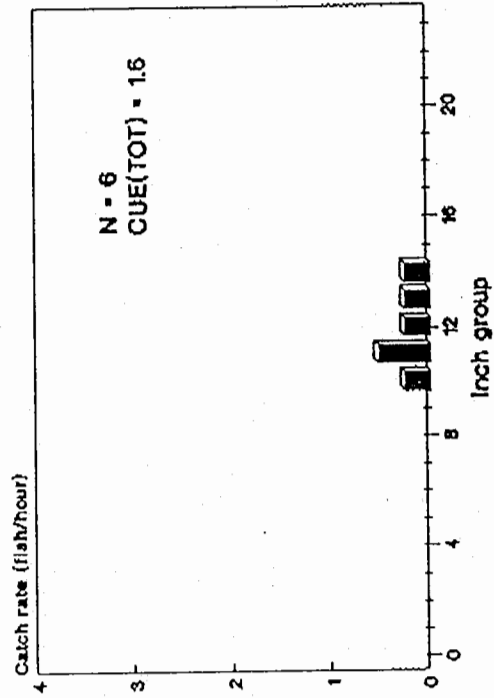
Spring 1993



Spring 1994



Fall 1993



Fall 1994

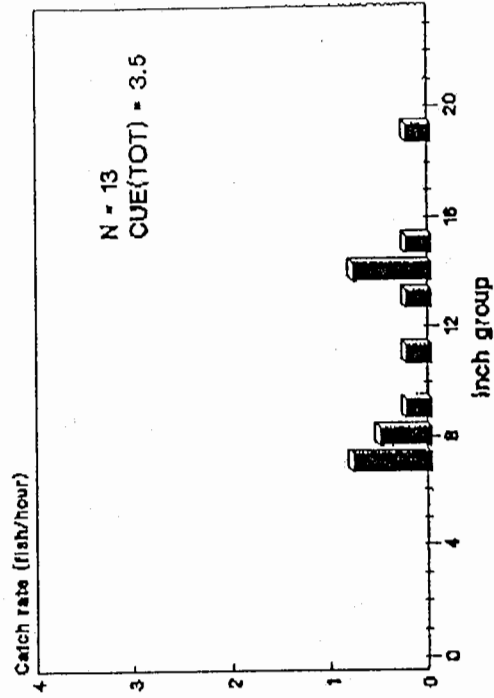


Figure 2. Length Frequency Histograms of Rainbow Trout Captured by Electro-Fishing in June and October of 1993 and 1994, Canyon Reservoir Tailrace, Comal County Texas.

Benefits of this project applicable to other tailwater fisheries include:

1. Quantification of changes brought about in benthic invertebrate density and diversity through improved dam structure, dam operations, water quality and stable flows.
2. Determination of the relative importance of tailwater macroinvertebrate diversity and abundance to trout survival.
3. Guidance for river property owners about what non-point source pollution can do to the river.
4. (Eventually) Quantification of the changes in trout hold-over and reproduction rates which can result from aggressive enhancement of insect and trout habitat in southern tailwater fisheries.

To illustrate the first item, Figure 3 is a plot of the mayfly (Ephemeroptera) and caddis fly (Trichoptera) density and diversity from the 1970 Young et al study [1] on the Guadalupe River. Stations 4 and 5 are just below the dam and 24 kilometers (15 miles) downstream respectively, while station 1 is above the dam, and stations 2 and 3 are in the impoundment. This project will re-measure the number and density of these and other macroinvertebrates at stations 4 and 5, and at an intermediate point between these stations. This will be a quantitative measure of the improvement which can result from better water quality and flow, and can be compared to other trout streams to establish fish carrying capacity of the river.

3.2 TU Participation and Publicity

The Guadalupe River chapter of TU has a long history of volunteering time and money to improve the fishery. GRTU participation in this project will take two forms:

1. Fund raising efforts to provide a portion of the matching funds for the project. Inter-chapter activities will include rod raffles, silent auctions, and direct donations. Soliciting help from businesses with a vested interest in fishing on the river, such as fly and tackle shops, and businesses with general river enhancement interests like canoe rentals and bed and breakfast establishments. These activities are proven GRTU fund raising options.
2. Participation in actual survey work as spotters, collection of downstream temperature data in likely habitat areas, stomach content sampling and preservation for SWTSU study, directed stocking and/or Vibert box placement in those areas deemed best trout spawning habitat, and conducting the publicity campaign for Embrace-A-Stream on the Guadalupe.

As a demonstration of GRTU's commitment to fund raising activities

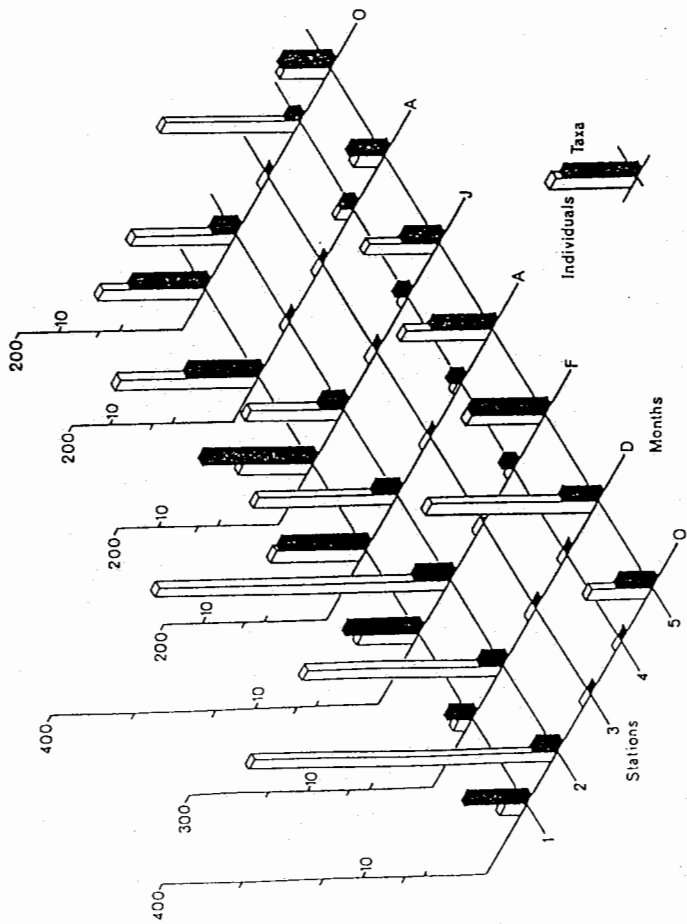


Figure 3a. Ephemeroptera: Number of Individuals per Square Meter and Number of Taxa for Each Collecting Period at Each of Five Collecting Stations (River Stations are 4 and 5).

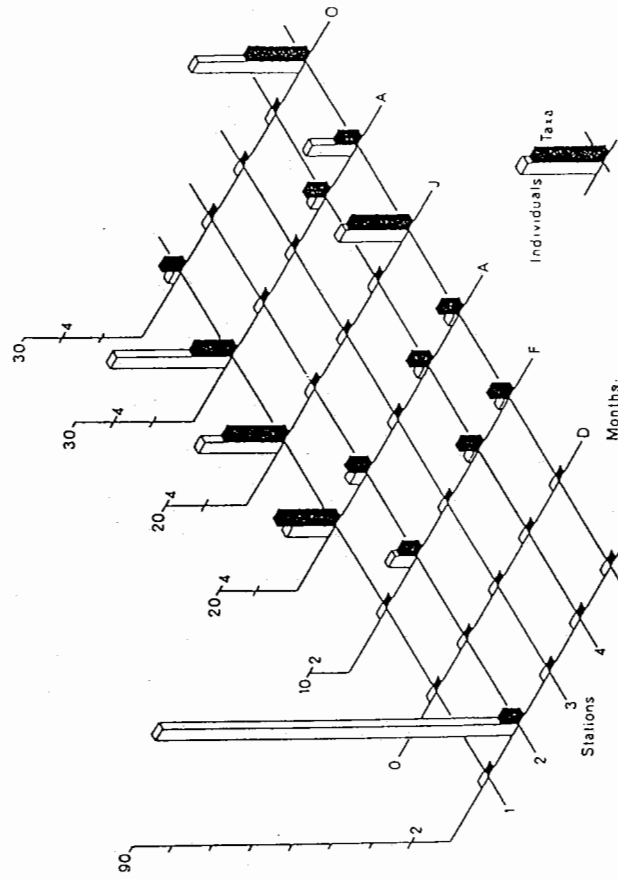


Figure 3b. Trichoptera: Number of Individuals per Square Meter and Number of Taxa for Each Collecting Period at Each of Five Collecting Stations (River Stations are 4 and 5).

Figure 3. Mayfly and Caddis Species and Abundance Data Taken From Table 1 of Young et al [1].

SWTSU was issued a \$1500 check in November 1994 to fund the start of this project.

Publicity for TU projects is an important aspect in achieving the recognition necessary to succeed in coldwater fisheries preservation. GRTU will conduct a publicity campaign for the Guadalupe River Embrace-A-Stream project which will include:

1. Submission of articles describing the project to the following periodicals:

- o San Antonio Express News
- o Austin American Statesman
- o Texas Parks and Wildlife Magazine
- o Houston Chronicle
- o Texas Highway Magazine
- o Streamside Magazine (Colorado TU)
- o Dallas Tribune
- o Trout (TU national magazine)

The first four above have published GRTU submitted articles on the Guadalupe River trout fishery in the past. Articles will also be submitted to TU local chapter newsletters in Arkansas, New Mexico, and Colorado.

2. Getting local radio and TV coverage of stocking events and river clean up activities which include discussion of TU EAS and river enhancement efforts.

3. Presenting project results and progress at the TPWD EXPO, Federation of Fly Fisherman Texas Conclave, and commercial fishing shows in Austin, Houston, Dallas and San Antonio. GRTU has participated in all of these activities in the past and is routinely invited to present TU and GRTU PR material.

3.3 Cooperative Efforts

The Texas Parks and Wildlife Department has been an ally of the river and GRTU for a long time. They have agreed to participate in the project in a number of ways, including:

1. Continue to share electro-shocking data from the Guadalupe tailwater.
2. Participate in a habitat survey of the river.
3. Provide rainbow trout samples from previous and future electro-fishing operations to SWTSU for stomach content evaluation.

GRTU recently (June 1994) purchased an aluminum boat and trailer and donated it to TPWD for electro-fishing smaller waters like the Guadalupe. This was done in recognition of TPWD's ongoing research directed at enhancing the trout fishery below

Canyon Dam. This cooperation is uncompensated in this project, and will be integrated as part of TPWD's ongoing trout programs. Mr. Steve Magnelia will lead the field operations of TPWD's involvement.

The Aquatic Station of the Biology department of Southwest Texas State University is a leading research institution in the study of Texas waters and associated flora and fauna. SWTSU participation will include:

1. A food chain study and analysis of trout stomach contents.
2. Sampling of the macroinvertebrate population in the river at selected sites and times.
3. Measure physical and chemical characteristics of the river at the monitored sites. These include pH, dissolved oxygen, temperature and conductivity.
4. Conduct a literature search on trout and insect habitat survey methods, and prepare an annotated bibliography of southern tailwater fisheries management and enhancement methods.

GRTU began funding SWTSU for an initial literature search and to prepare for the macroinvertebrate survey in November 1994 with a \$1500 research grant. Dr. Thomas Arsuffi will lead the SWTSU team.

4.0 Feasibility/Project Work Plan

4.1 Goals and Objectives

OVERALL

The goal of the EAS project fits directly into the goals of GRTU's long term fisheries improvement program for the Guadalupe:

Establish a sustaining wild trout population in the lower Guadalupe river, and foster its growth through support of special harvest regulations, water quality improvement, and stream enhancement.

Man has dammed the river permanently, causing changes in the food chain and the fish habitat of the river. Establishing a wild trout population is a means to recoup the rivers bounty.

SPECIFIC GOALS OF THE 1995 GUADALUPE RIVER EMBRACE-A-STREAM PROJECT

The Texas Parks and Wildlife Department, Southwest Texas State University, and the Guadalupe River Chapter of Trout Unlimited will accomplish the following tasks in this project:

1. Survey the Guadalupe River below Canyon Dam for trout and insect habitability. Specifically:

- a. Conduct a literature search on trout habitat survey methods and prepare a plan for survey conduct. (SWTSU).
 - b. Conduct the habitat survey using the guidance developed in a. above, prepare maps reporting data and observations of prime habitat areas. (TPWD and GRTU).
2. Examine the brown and rainbow trout food chain in the lower Guadalupe River. Specifically:
- a. Make a quantitative assessment of macroinvertebrate (aquatic insects, mollusks, crustaceans, etc.) abundance and diversity in the lower Guadalupe. (SWTSU).
 - b. Examine the stomach contents of juvenile and adult brown and rainbow trout. (SWTSU, samples from GRTU and TPWD).
3. Prepare an annotated bibliography of tailwater fisheries management methods in the Southern U.S.

Concentration will be on Southern U.S rivers which historically held no trout, e.g. the Colorado River at Lee's Ferry or the Chatahootchie River below Sidney Lanier Dam in Georgia. (SWTSU and GRTU).

4. Prepare guidance for efforts by TPWD and GRTU to enhance the Guadalupe River trout population. Specifically:
- a. Determine optimal locations for restrictive angling regulations and stocking of trout adults, eggs, or fingerlings. (TPWD and GRTU).
 - b. Determine fisheries management methods which may be applicable to Guadalupe River tailwaters (SWTSU, TPWD and GRTU).
 - c. Develop guidance for streamside dwellers to help reduce non-point source pollution (GRTU).
 - d. Determine if a need exists for enhancing aquatic insect densities in the river (SWTSU, TPWD, and GRTU).

4.2 Schedule

The overall GRTU project began in November 1994 with the grant to SWTSU. Assuming success in this Embrace-A-Stream application all goals for enhancement planning and guidance could be met as early as April 1996, followed by selected execution of the plan over the next two years. Figure 4 is a milestone chart for the project.

Figure 4. Guadalupe River Chapter Trout Unlimited Fisheries Improvement Research and Development Program

Calendar Quarters	94	1	95		96				
	4	1	2*	3*	4*	1*	2	3	4
Food Chain Study									
Lit. Search	xxxxxx		(SWTSU)						
Stream Sampling			xxxx		(SWSTU & GRTU)				
Habitat Survey									
Lit. Search			xxxxxx		(SWTSU)				
Stream survey			x x x		(TP&W & GRTU)				
Data Share		(TP&W)	xxxx			xxxx		xxxx x	>
Management Methods									
Technique Search			xxxxxx		(SWTSU)				
Annotated Biblio.					xxxxxx				(SWTSU)
EAS Report			xxx		(GRTU)				
Enhancement Plan									
Preparation						xxxxxx			(GRTU)
Review						xxxx			(SWTSU & TP&W)
Final Guidance						xxxx			(GRTU)
Execute Enhancement Plan						(GRTU)		xxxxxxxxxxxxx>>>	

* Embrace-A-Stream period for this proposal

4.3 Specific Tasks and Responsibilities

The assignment and scheduling of tasks is summarized in Figure 4. The responsibilities in the project are summarized below:

GRTU Responsibilities:

1. Provide matching funds and reporting to TU national.
2. Conduct PR program to educate public of project and the embrace-a-stream program.
3. Assist in the conduct of on-stream activities in food chain and habitat surveys.
4. Prepare a draft guidance document for GRTU Guadalupe River trout habitat improvement program.

SWSTU Responsibilities:

1. Conduct food chain literature search and sampling.
2. Conduct literature search on habitat surveys for trout rearing and spawning areas.
3. Develop an annotated bibliography of trout management techniques in southern tailwater fisheries.
4. Review and comment on GRTU guidance document for future trout habitat improvement efforts on the Guadalupe.

TPWD Responsibilities:

Note: TPWD's participation is uncompensated and is estimated currently to fit within department guidelines for fisheries activities.

1. Participate in habitat survey of the first 24 kilometers (15 miles) below the dam.
2. Assist in preparing Guadalupe trout habitat improvement guidance.
3. Continue to share data from the electro-shocking project and other Guadalupe related efforts by TPWD.
4. Review and comment on GRTU guidance document for future trout habitat improvement efforts on the Guadalupe River below Canyon Dam.

4.4 Capabilities of Participants

A brief vignette of each of the three lead investigators in the participating groups (GRTU, SWTSU and TPWD) is included below. Should more detail on key investigators be required GRTU has obtained and reviewed the resumes of all cooperating participants and can forward them to the EAS reviewers as required.

GRTU Coordinator: Dr. Alan V. Bray - Dr. Bray is a research physicist for a small R&D firm in Austin Texas. He has over four years experience as a GRTU board member and is just completing his first year as Vice President of fisheries. He is an experienced volunteer organizer for GRTU, including trout stockings, show participation, and river clean-ups. Other GRTU participants include Jim Vynalek, Ex-President and TU national representative for Texas, and Jeff Schmitt, current GRTU president and experienced fund raiser.

SWTSU Principal Investigator: Dr. Thomas Arsuffi is a member of the SWTSU Biology Department - Aquatic Station. His research specialization is in aquatic biology, and has

included projects in benthic invertebrate ecology, aquatic entomology, and water quality assessment. He has served on a number of state and local boards and committees concerned with water quality and conservation of Texas stream ecology. He has studied the Guadalupe and is knowledgeable of the rivers' insect fauna and fish sustaining capacity. Other SWSTU participants are Dr. Bobby G. Whiteside for review of GRTU guidance and Ms. Karen Quinonez who will provide student services for the project.

TPWD Coordinator: Mr. Steve Magnelia is lead investigator on TPWD's investigation of trout over summer survival in the Canyon Reservoir Tailrace. He is a fisheries biologist with 8 years of experience in Texas fisheries management.

4.5 Strategy for Evaluating Success

Success for the entire trout habitat improvement project will be measurable in a number of ways, including project products:

1. The 95/96 EAS project includes five written products:
 - o Memorandum on result of food chain study (SWTSU)
 - o Habitat survey results (TPWD & GRTU)
 - o Southern tailwater trout management annotated bibliography (SWTSU)
 - o TU final report (GRTU)
 - o Guadalupe river trout habitat enhancement guidance (GRTU)
2. Public relations products include:
 - o Newspaper articles
 - o Magazine articles
 - o Fishing/outdoor show and exhibition displays

The true measure of the success of the project will ultimately depend upon improvements the Canyon Reservoir Tailrace trout fishery. Annual measurements of fish number and size by TPWD in their ongoing electro-fishing survey program will be the ultimate success metric for the project. The EAS is also a means of demonstrating to TPWD and other state agencies that interest in the river as a trout fishery is high enough to continue this and similar state supported programs.

5.0 Cost

5.1 Project Matching Fund Strategy

GRTU is requesting a total of \$6,000 from EAS. Matching funds will come from:

1. Donations (GRTU R&D Fund) \$3,000
2. Member Labor (600 hrs. @ \$4.25/hr.)..... \$2,550

3. TPWD Samples and Electro-shocking data ... \$450
Total..... \$6,000

The value of the TPWD contributions in terms of samples and data is clearly undervalued considering the cost of obtaining these data by other means. TPWD's part in the EAS project is included here more to recognize their contribution than to put a dollar value on it.

In addition to the above GRTU has already begun the project with a \$1,500 stipend to SWTSU to conduct the literature search on the food chain study. As SWTSU is the only receiver of cash portions of the EAS their total expenditures will comprise \$10,500 in the November 1994 to April 1996 time frame. These expenditures will be solely for the support of Ms. Quinonez who will receive these funds as part of her stipend for completing her masters thesis in aquatic biology. The extensive involvement of Drs. Arsuffi and Whiteside are to be at SWTSU expense, and represent an unaccounted benefit for the project.

From a longer term viewpoint the time frame from May 1996, the projected end of this EAS, to the following May 1997, is a period for which GRTU hopes to submit another EAS proposal. The 96/97 EAS application would be a Resource Project proposal to implement the trout habitat improvement plan which will result from this proposed project.

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GUADALUPE RIVER CHAPTER TROUT UNLIMITED

POSSIBLE TU/TP&W/SWT RESEARCH PROJECTS

1. Identification of parameters of interest for trout habitat

- Water temperature
- Water chemistry
- Flow rates
- River structure
- Habitat and cover
- Food supply (bugs, baitfish, other)
- Etc.

2. Basic Background Information and Literature Search on :

- Rainbow trout habitat requirements
- Brown trout habitat requirements
- Trout incubation, artificial and natural spawning
- Installation of trout fisheries in the southern US

Assemble a library of articles, books and other reference sources

Create a summary report on these reference sources

3. Guadalupe River's suitability for development of a trout fishery

- Water temperature
- Water flow
- Stream structure, habitat, cover, etc
- Food chain
- Other uses

4. Studies of the Guadalupe as a trout fishery (essentially the existing TP&W study)

5. Recommendations for future development of the river.

Other issues :

When is the fall shocking?

Do you want to clip again this year?

Where do you think we stand on the regulation change recommendation?

INITIAL
PART
OF
STUDY

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