

TEXAS STATE SOIL & WATER CONSERVATION BOARD



WATER SUPPLY ENHANCEMENT PROGRAM

2011 ANNUAL REPORT

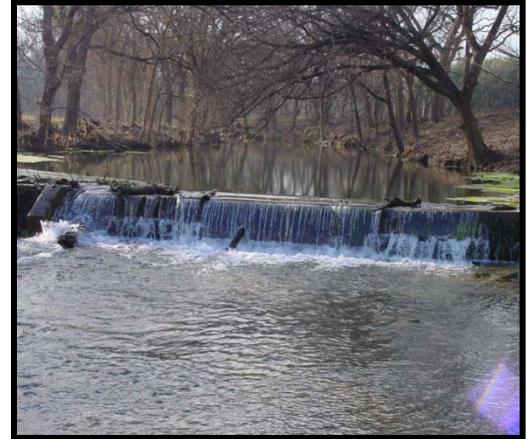
JANUARY 1, 2011 – DECEMBER 31, 2011

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INTRODUCTION

TSSWCB presents this annual report covering the 2011 calendar year. To show trends, some data from previous years is included. In fiscal year 2004, brush projects were funded from Agriculture Water Conservation Bonds and from General Revenue appropriated by the 77th Legislature. Fiscal year 2005 was funded from General Revenue appropriated by the 78th Legislature R.S. The 79th Legislature approved General Revenue funding in the amount of \$1,874,176 for fiscal year 2006, and \$1,816,176 for fiscal year 2007. The 80th Legislature approved General Revenue funding of \$1,848,927 for fiscal year 2008 and \$1,840,926 for fiscal year 2009. The 81st Legislature approved \$4,503,641 of funding for fiscal year 2010 and fiscal year 2011. The Brush Control Program, now referred to as the Water Supply Enhancement program in accordance with HB 1808, has treated 773,341.39 acres. The overall goal of the Water Supply Enhancement Program is to increase available surface water and ground water through:



1. Selective control, removal, or reduction of noxious brush species that are detrimental to water conservation; and
2. Re-vegetation of land on which noxious brush has been controlled, removed, or reduced.

We must thank the Legislature for their vision in making this program a reality and express appreciation to the private landowners who are contributing their time and resources to implement this long-term program to benefit others.

PROGRAM GOAL

The purpose of the water supply enhancement program is to increase available surface water and groundwater through:

- (1) Selective control, removal, or reduction of noxious brush species that are detrimental to water conservation; and
- (2) Re-vegetation of land on which noxious brush has been controlled, removed, or reduced.

2011 ACTIVITIES AT A GLANCE

- Brush Controlled on 773,341.39 acres (FY 00-011)

PROGRAM	BUDGET
FY 00-01	\$9,163,000 General Revenue
FY 02-03	\$9,163,000 General Revenue \$15,000,000 Agricultural Water Conservation Bond
FY 04	\$3,114,794 General Revenue
FY 05	\$607,805 General Revenue
FY 06	\$1,874,176 General Revenue
FY 07	\$1,816,009 General Revenue
FY 08	\$1,848,927 General Revenue
FY 09	\$1,840,926 General Revenue
FY 10	\$4,503,641 General Revenue
FY 11	\$4,503,641 General Revenue
FY12	\$2,135,413 General Revenue

To ensure the targeting concentrated areas for Water Supply Enhancement, the Texas State Soil and Water Conservation Board (TSSWCB) began working with Texas Tech Water Resources Center and Texas A&M AgriLife Water Resources Institute to selectively clear brush using a set of predetermined criteria that will likely have the most profound and positive impact on water salvage, while maintaining the ecological integrity of the landscape.



TWIN BUTTES RESERVOIR/ LAKE NASWORTHY PROJECTS

In September 2002, three water supply enhancement projects were initiated to improve the amount of water flowing into the Twin Buttes Reservoir/Lake Nasworthy complex. Twin Buttes Reservoir is used to maintain sufficient water levels in Lake Nasworthy, which serves as a water supply for the city of San Angelo. Recently, the water level in Twin Buttes Reservoir has fallen to critical levels. Based on water needs and the result of feasibility studies, TSSWCB allocated \$11.3 million for brush control cost-share for three projects in the Twin Buttes Reservoir/Lake Nasworthy Watershed. Additional funding will be needed to complete the treatment of the more than 555,000 acres of eligible brush in the Twin Buttes Sub-basins. To date, over 229,739.2 acres of brush have been treated using state funds with an increase in projected water yield to be 176,458.34 acre feet over the life of the project.

Participating SWCDs in the Water Supply Enhancement Program

Caldwell-Travis	Pedernales	Lower Clear Fork of the Brazos
Bandera County	Comal/Guadalupe	Pecan Bayou
Kerr County	Bandera	Eldorado Divide
Tom Green County	Middle Concho	McMullen County
Archer County	Wichita	Bosque
Little Wichita	Kendall County	Middle Clear Fork
Gillespie County	Hays County	

CANADIAN RIVER PROJECT

In August 2005, in cooperation with the Canadian River Municipal Water Authority, a salt cedar project was initiated to improve water quantity and quality on the Canadian River above Lake Meredith. Funding for this project was based on the Arkansas River Shiner Management Plan for the Canadian River. To date, over 16,850 acres have been treated.

Research has shown a Salt Cedar uses 0.1 to 15 gallons of water per tree per day. Removing one acre of Salt Cedar saves two to five acre feet per year



PEDERNALES RIVER PROJECT

In September of 2002, a Water Supply Enhancement project was initiated to boost the amount of water flowing from the Pedernales River Watershed into Lake Travis, a water supply for the city of Austin. The lake is also used for power generation and has become a popular recreational area; providing opportunities for boating, fishing, swimming and camping. The Pedernales River Watershed has been allocated over \$4.8 million for cost-share. In 2002-2011, 72,242 acres were treated in this watershed with an increase water yield to be 482,846.8 acre feet over the life of the project.

Red Berry Junipers have been documented to use 46.8 gallons of water per tree per day. Removing three to seven acres of Junipers saves one acre foot of water each year.

NUECES RIVER PROJECT

In September 2006, TSSWCB allocated money to the McMullen County SWCD to begin spraying mesquite along the Nueces River, which flows into Lake Corpus Christi. To date, a total of \$685,717.01 has been allocated to the project. Of that amount, 17,482.52 acres have been sprayed and estimated to yield 39,195.90 acre feet of water over the life of the project, according to the Nueces River Watershed Feasibility Study.



Removing seventeen acres of mesquite trees saves one acre foot of water each year.

FRIO RIVER PROJECT

In 2009, TSSWCB allocated \$330,999.51 to the Frio, La Salle and McMullen County SWCDs to spray mesquite trees in selected sub-basins along the river. The Frio River flows into the Nueces River system through Choke Canyon Reservoir. Choke Canyon Reservoir and Lake Corpus Christi, as a system, are operated by the city of Corpus Christi and supply water to over 400,000 people. To date, 12,707.1 acres have been treated.

WICHITA RIVER PROJECT

Beginning in September 2006, TSSWCB allocated money to the Archer County SWCD to spray mesquite trees. The Wichita River flows through Archer, Wichita and Clay counties and feeds into Lake Arrowhead. The Lake Arrowhead Reservoir serves as a water supply for the city of Wichita Falls. To date, \$909,476.30 has been allocated to the project by TSSWCB and 34,024.3 acres have been treated in Archer and Clay counties. According to the Lake Arrowhead Feasibility Study, the project is estimated to yield 169,191.67 acre feet of water over the life of the project.

Mesquite trees use up to forty-four gallons of water per tree per day.

LAKE BROWNWOOD PROJECT

In March 2008, TSSWCB began allocating money to the Pecan Bayou SWCD to treat Mesquite and Juniper in the Lake Brownwood Watershed. TSSWCB concentrated efforts in the Pecan Bayou area located in two sub-basins north of the lake. Lake Brownwood is a major water supplier for the City of Brownwood, as well as the surrounding areas for industrial, agriculture and municipal uses. To date, TSSWCB has allocated \$671,835.15 to the project and treated 1,322.8 acres. The Lake Brownwood Feasibility Studies estimated that 3,884.81 acre/feet of water will be yielded in the two sub-basins mentioned above over the life of the project.

GUADALUPE RIVER PROJECT

In November 2011, TSSWCB allocated \$879,715.50 to the Guadalupe River Project to treat Juniper in the Guadalupe Watershed. TSSWCB has targeted areas in Kerr, Comal, and Kendall counties that have shown to be the highest water yielding areas in the watershed. There have been 5,329.75 acres treated since the beginning of the project in 2008. Research on water yield has shown this project to be comparable to the Pedernales River Watershed.

EDWARDS AQUIFER PROJECT

In March of 2009, TSSWCB began allocating money to the Bandera SWCD to treat Ashe Juniper. Brush management is increasing the retention of water, thus improving spring and stream flows within Bandera County. Additionally all of the watersheds within Bandera County (Medina River, Verde Creeks, Hondo Creek, Seco Creek, and the Sabinal River) flow south, intersecting the Edwards Aquifer Recharge Zone just below the Bandera County line. All of these watersheds provide direct recharge into the Edwards Aquifer, which is the primary source of water for the San Antonio Metropolitan area. To date, \$508,727.21 has been allocated to the project by TSSWCB and 2,050 acres have been treated.

O.C. FISHER PROJECT

O.C. Fisher Lake is located in west-central Texas on the North Concho River. The lake sits 6.3 miles above the river's confluence with the South Concho River and approximately 65 miles above its confluence with the Colorado River. O.C. Fisher is adjacent to San Angelo in the northwest corner of Tom Green County. The study area includes the majority of the fee-owned government land, above the existing lake level operated by the U.S. Army Corps of Engineers, approximately 15,860 acres.

This project will enhance the water yield from the brush work already completed in the watershed. The recommended plan would restore approximately 3,778 acres of lake habitat, 52 acres of riverine habitat, 10 acres of intermittent riverine, and 250 acres of bottomland hardwoods. In addition, the project would restore 11,759 acres of transitional habitat. The quality of the terrestrial and aquatic habitats within the project area would benefit through the removal and control of exotic/non-native, water-loving plant species. TSSWCB allocated \$140,000 to the O.C. Fisher project to treat Salt Cedar in the lake basin. To date, 2,555 acres have been treated.

BOSQUE COUNTY PROJECT

In September 2011, TSSWCB allocated \$299,850.00 to be used to enhance water flow in Steele Creek which flows directly into Lake Whitney in Northern Bosque County. Currently 1,288 acres have been treated. These funds are utilized for brush control in riparian areas of the creek.

CARRIZO-WILCOX AQUIFER

The Carrizo-Wilcox Aquifer provides drinking water for the citizens of Gonzales, Cibolo, Schertz and Sequin counties which have recently experienced a growth in population. These increases in population will cause an increase demand on the water supply. In September 2009-2011, TSSWCB allocated \$199,261.5 to be

utilized in the Carrizo-Wilcox outcrop areas. To date, 177.1 acres have been treated. Texas Tech University began conducting a feasibility study in Gonzales County to predict water yield.

LOWER GUADALUPE RIVER

Most of the Guadalupe River Watershed was historically part of the Coastal Prairie. Over the past 50 years much of this area has been invaded by woody brush species that use large amount of groundwater. When used in the correct locations, brush control can be an effective tool to aid in enhancing stream flow and aquifer recharge. TSSWCB allocated \$104,646.50 to the Lower Guadalupe Project in September 2011. To date, this allocation has helped to treat 1,000 acres.

Grape Creek

West Fork – 0% Treated Acres



East Fork - 75% Treated Acres



FY2012 IMPLEMENTATION PLAN FOR HOUSE BILL 1808

Organize and Develop a Stakeholder Committee to include the following individuals:

- Dr. Ken Rainwater, Civil Engineer, Texas Tech University
- Clyde Bohlmfalk, Texas Commission on Environmental Quality
- Jason Skaggs, Texas and Southwestern Cattle Raisers Association
- Jule Richmond, Association of Soil and Water Conservation Districts of Texas
- Johnny Oswald, Texas State Soil and Water Conservation Board
- Robert Mace, Texas Water Development Board

The stakeholder committee will identify general program goals such as agricultural irrigation, drinking water, recreation, environmental flow, etc. The committee will also adopt specific goals for water yield consistent with general program goals and develop a standard for determining projected water yield. The establishment of a scientific advisory committee to provide technical expertise will also be needed.

Organize and Develop a Scientific Committee to include the following individuals:

- Dr. Ken Rainwater, Civil Engineer, Texas Tech University
- George Ozuna, U.S. Geological Survey
- John Bumgarner, U.S. Geological Survey

Organize a TSSWCB working group to help review all changes in the Water Supply Enhancement Program that are recommended by the Texas Sunset Commission and are required by HB1808. The committee members include:

- John Foster
- Melissa Grote
- Kendria Ray
- Mel Davis
- Ben Wilde
- Johnny Oswald
- Charlie Upchurch
- Tuffy Wood

- Tony Franklin
- Don Brandenberger

TSSWCB approved a rule relating to the requirements for follow-up treatment on brush control work. This rule is in response to recommendations from the Sunset Commission concerning follow up treatment being subject to funding availability.

The deleted language making follow up work contingent on funding availability and was replaced with *“required follow up work to be carried out as specified in an eligible person’s brush control plan”*.

The amendment to BRUSH FORM 002 deleted language in section (2) *“financial incentive of follow-up treatment is contingent on the availability of funds at the time that follow-up treatment is scheduled”* and was replaced with *“follow-up treatment is to be carried out as specified in an eligible person’s brush control plan and status reviews will be conducted”*.

TSSWCB approved BRUSH FORM 005 - PROPOSAL FOR WATER SUPPLY ENHANCEMENT PROJECT which is required to be filled out by each entity requesting a Water Supply Enhancement Project each application. BRUSH FORM 005 will be ranked in a competitive process.

TSSWCB Water Supply Enhancement Program approved the FY 2012 criteria and accepted project proposals that met the following criteria:

1. Complete a computer model/feasibility study
2. Identify need according to the Region Water Plans
3. Show brush removal as a strategy in the Region Water Plans
4. Meet the following TSSWCB WSEP Priority
 - domestic and municipal uses, including water for sustaining human life and the life of domestic animals
5. Complete an implementation plan by local workgroup

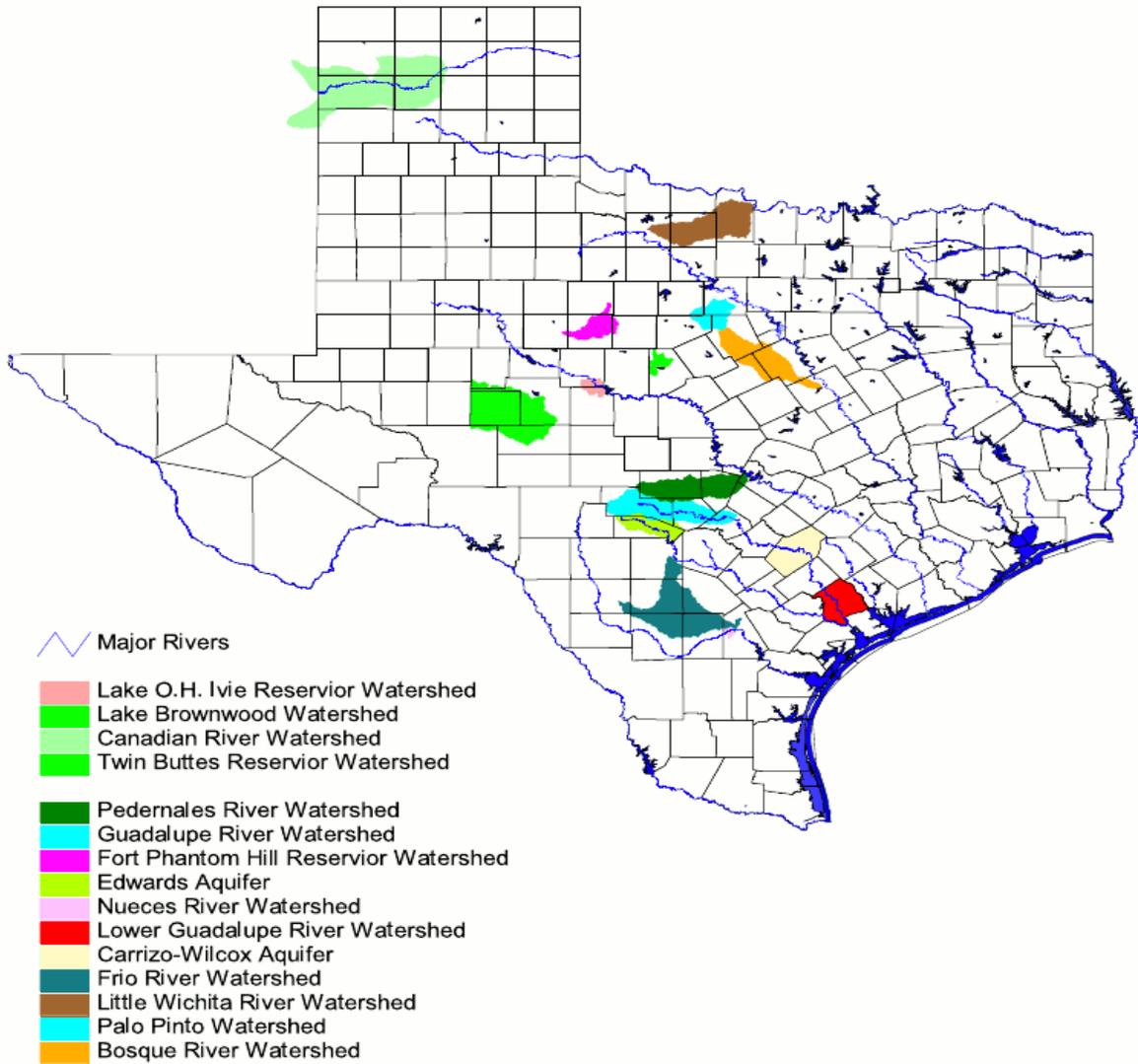
A two year implementation plan must be submitted for each approved project. Funding will be allocated according to the budget and the efficiency of the implementation plan. Project allocations will be contingent on availability of funding at the time of request. After the two year period, the project will resubmit a new implementation plan for future funding.

OTHER ACTIVITIES BY TSSWCB

- Consult with Texas Department of Agriculture (TDA), Texas Parks and Wildlife Department (TPWD), Texas Water Development Board (TWDB), and Legislative Staff on Water Supply Enhancement issues.

- Assist SWCDs with conservation planning and performance certifications for their landowners.
- Evaluate watersheds that meet criteria for water enhancement financial incentive assistance and assess landowner participation.
- Under contract with TSSWCB, the Upper Colorado River Authority (UCRA) continues to monitor efforts of Brush Control on the water balance and water yield within the North Concho River Watershed.
- Consult with the Texas Tech University Water Resources Center and Texas A&M AgriLife Texas Water Resources Institute to develop a mapping system to ensure the TSSWCB is concentrating efforts for both urban water supply and rural benefits.
- Continue partnerships with USGS, USDA-NRCS and Texas Parks and Wildlife on Honey Creek paired watershed study.

Water Supply Enhancement Projects



WATER YIELDED FROM BRUSH CONTROL

Water yield expectations originate from brush control feasibility studies and academic research from a variety of sources.

State Cost-Share Grants 2000 – 2011-----\$38,271,140.00

Landowner Contributions 2000 – 2011-----+ \$19,000,000

Watershed Project	State Cost Per Treated Acre	Treated Acres	Gallons/Acre/Year	Gallons/Year Based on Treated Acres	Total Water Yield for Life of the Project ¹
Lake Ballinger completed	\$45.00	7,799.70	55,354	431,744,593.80	4,317,445,938
Oak Creek Lake completed	\$47.00	16,224	47,225	766,178,400.00	7,661,784,000
Lake Champion completed	\$43.00	14,993.50	31,535	472,820,022.50	4,728,200,225
Mountain Creek completed	\$49.00	1,440	46,389	66,800,160.00	668,001,600
Greenbelt Reservoir completed	\$87.50	571	977,553	558,182,763.00	2,232,731,052
Hubbard Creek completed	\$ 58.75	506	977,553	494,641,818.00	1,978,567,272
Pecos/Upper Colorado completed	\$ 70.78	10,580.12	1,450,037	15,341,564,935.43	61,366,259,742
North Concho River completed	\$45.50	327,000	26,068.08	8,524,262,160.00	85,242,621,600
Lake Brownwood	\$146.34	1,322.8	95,696.25	126,586,999.5	1,265,869,995
Bosque River	\$162.50	1,288	26,068.08	33,575,687.04	335,756,870.4
Wichita River	\$20.92	34,024.3	162,035	5,513,127,450.5	55,131,274,505
Nueces River	\$27.65	17,482.52	73,056	1,277,202,981.12	12,772,029,811.2
Frio River	\$24.22	12,707.1	73,056	928,329,897.6	9,283,298,976
Canadian River	\$92.49	16,850	817,651	13,777,419,350.00	55,109,677,400
Pedernales River	\$72.00	72,242	217,790	15,733,585,180	157,335,851,800
Upper Guadalupe	\$123.71	5,329.75	217,790	1,160,766,252.5	11,607,662,525
Edwards Aquifer	\$155.75	2,050	217,790	446,469,500	4,464,695,000
Twin Buttes	\$68.03	229,739.2	25,028	5,749,912,697.6	57,499,126,976
Fort Phantom Hill Reservoir	\$164.50	860	103,460	88,975,600	889,756,000
Palo Pinto Reservoir	\$139.48	206.2	195,454.5	40,302,717.9	403,027,179
Carrizo- Wilcox Aquifer	\$226.54	177.10			
O.C. Fisher Reservoir	\$104.98	1300	26,068.08	33,888,504	338,885,040
Lower Guadalupe	\$111.69	1,000			
TOTAL		773,341.39 ac.		71,566,337,670.49 gals 219,629 ac./ft.	534,632,523,507 gals 1,640,727 ac./ft.

¹The total water yield is based on the watershed projects having a lifespan of 4 or 10 years depending on the type of brush treated.