An Assessment of Water Conservation in Texas
Prepared for the 80th Texas Legislature

Texas Water Development Board

and

Texas State Soil and Water Conservation Board

December
2006

"To provide leadership, planning, financial assistance, information and education for the conservation and responsible development of Water for Texas."

Mission Statement – Texas Water Development Board

"*Working in conjunction with local soil and water conservation districts, to encourage the wise and productive use of natural resources. It is our goal to ensure the availability of those resources for future generations so that all Texans' present and future needs can be met in a manner that promotes a clean, healthy environment and strong economic growth."*

Mission Statement – Texas State Soil and Water Conservation Board

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Executive Summary

Senate Bill 312, enacted into law by the Texas Legislature in 2001 and codified as Section 16.022 of the Texas Water Code, directs the Texas Water Development Board (TWDB) and the Texas State Soil and Water Conservation Board (TSSWCB) to jointly conduct a study of ways to improve or expand water conservation efforts in Texas. In addition, Senate Bill 312 directs the TWDB and TSSWCB to submit the results of the study in a report to the Texas Legislature as part of, or as a supplement to, the State Water Plan. The law specifically requires that the report include the following:

- An assessment of both agricultural and municipal water conservation issues;
- Information on existing conservation efforts by the TWDB and the TSSWCB;
- Information on existing conservation efforts by municipalities receiving funding from the TWDB, as specified in water conservation plans submitted by the municipalities as part of their applications for assistance;
- A discussion of future conservation needs;
- An analysis of programmatic approaches and funding for additional conservation efforts;
- An assessment of existing statutory authority and whether changes are needed to more effectively promote and fund conservation projects; and
- An assessment of the TWDB's agricultural water conservation program.

The Water Conservation Implementation Task Force (Report to the 79th Legislature and Best Management Practices Guide - 2004) and the Senate Bill -1 Regional Water Planning Groups (Regional Water Plans – 2006) provided significant and valuable points of reference on water conservation for the TWDB and TSSWCB to conduct their study. Recommendations put forward in the Water Conservation Implementation Task Force Report continue to be relevant to the discussion of ways to improve or expand water conservation efforts in Texas. The 2006 Regional Water Plans addressed water conservation implementation challenges that must be resolved in order for Texas to realize the full potential of these measures to meet future water supply and demand expectations. To complete this study, the TWDB and TSSWCB drew upon the knowledge and practical experience gained by administrating many of the state's principal municipal and agricultural conservation programs and initiatives.

This report represents the fulfillment of the TWDB and TSSWCB obligation under Section 16.022 of the Texas Water Code to conduct a study of ways to improve or expand water conservation efforts in Texas and to present their findings and associated recommendations in a report to the Texas Legislature. This report also represents a continued strong endorsement for effective and efficient utilization of water conservation measures, actions, and practices that will be critical to meet the future water-supply needs of Texans. The TWDB and TSSWCB respectfully submit the following key findings and recommendations.

Key Findings and Recommendations

The specific TWDB legislative policy recommendation in the 2007 State Water Plan regarding water conservation states, **"The Legislature should review the Water Conservation Implementation Task Force recommendations and implement those that will result in optimal levels of water-use efficiency and water conservation for the citizens of Texas."** The following key findings and recommendations include those of the Water Conservation Implementation Task Force and other recommendations as a resource for policy considerations for water conservation efforts.

Municipal Water Conservation

- **Key Finding**

  The 2007 State Water Plan places a greater emphasis on municipal water conservation measures to meet future water supply needs and provides a strong argument for a continued and/or expanded state role in support of municipal water conservation efforts in Texas.

  Municipal water conservation accounts for almost 30 percent (approximately 617,000 acre-feet per year) of the total water savings attributable to water conservation strategies recommended in the 2007 State Water Plan. These strategies include aggressive plumbing fixture replacement programs, water-efficient landscaping codes, water loss and leak detection programs, education and public awareness programs, rainwater harvesting, and water rate structures that encourage water conservation. Decision-makers at the municipal and state level can readily justify investments in these strategies if they are well-defined and understood, and when adequate tools are available to evaluate the cost-effectiveness of these strategies when compared to other water supply options.

  The TWDB's municipal water conservation program reviews the implementation and status of statutorily-required conservation plans of certain loan recipients. The municipal water conservation program also provides training, workshops and technical assistance on development of statutorily-required water conservation and drought contingency plans and on institutional, commercial and industrial water-use efficiency; provides targeted training and equipment for leak detection and meter testing; provides assistance with and assessment of statutorily-required water audits; and aids with developing and disseminating water conservation educational and promotional material for the *Major Rivers Program* and the *Water IQ: Know Your Water* public awareness effort.

  The 79th Legislature's Appropriation Act did not include general revenue funding for the TWDB municipal water conservation program. The TWDB has utilized other funds to provide a reduced level of activity during fiscal years 06-07. These other funds will not be available during fiscal years 08-09 and the Agricultural Water Conservation Fund cannot be used for municipal water conservation programs. Without restoration of general revenue funding, TWDB's municipal water conservation program cannot be continued.

- **Recommendations**

  The Texas Legislature should consider:

  1) Restoration and maintenance of general revenue funding for the TWDB's municipal water conservation programs.

  2) Implementation of the following Water Conservation Implementation Task Force Recommendations:

  (a) Consider funding a limited program of grants that can be awarded to water purveyors and other entities to implement innovative water conservation programs, including water-reuse programs (Task Force Recommendation #5),

  (b) Consider providing funding for conservation plan development to smaller communities (<20,000 population), to assist water suppliers who depend on revenue to finance capital improvement programs in addressing financial impacts that may result from water conservation programs, and pursuing federal and state funds to assist implementation of water plan conservation strategies such as rebate programs (Task Force Recommendation # 24), and

  (c) Consider providing additional funding and staff to TWDB for additional collection, review, analysis, and dissemination of data on municipal water use in Texas (Task Force Recommendation # 25).

Agricultural Water Conservation

- **Key Finding**

  Agricultural water conservation has emerged as a significant strategy for meeting the state's future water supply needs and for ensuring that the state's agricultural interests can sustain their economic viability into the 21st Century.

  Agricultural water conservation accounts for almost 70 percent (approximately 1.4 million acre-feet per year) of the total water savings attributable to water conservation strategies recommended in the 2007 State Water Plan. The degree to which these projected water savings will be realized will depend upon the individual and collective decisions of a vast number of farmers and ranchers across Texas. Federal and state agricultural water conservation programs and initiatives that provide technical assistance, technology transfer, educational outreach, and financial support are resources that many farmers and ranchers rely upon to decide whether they can benefit financially by incorporating water conservation into their farming and ranching operations.

- **Recommendations**

  The Texas Legislature should consider:

1) Restoration of funding to the TSSWCB for the technical assistance program for soil and water conservation improvement measures authorized under Subchapter H of the Agriculture Code.

2) Appropriation of funding to TWDB to implement an appropriate statewide irrigation water use data collection program.

3) Implementation of the following Water Conservation Implementation Task Force Recommendations:

(a) Funding a TSSWCB cost-share program to implement on-farm water conservation plans based on best management practices (Task Force Recommendation #6),

(b) Funding the State Brush Control Program at current levels and at expanded levels as funds become available (Task Force Recommendation # 7),

(c) Continued funding of Agricultural Water Conservation Grants administered by the TWDB, and other state loans and grants to assist political subdivisions in meeting the cost-share portion of federal projects for agricultural water conservation (Task Force Recommendation #16), and

(d) Continued funding support for the Texas Agricultural Experiment Station, the Texas Cooperative Extension Service, and state universities in their efforts to develop and evaluate water conservation technologies, management practices, and educational programs designed to encourage conservation (Task Force Recommendation # 17).

Statewide Water Conservation Public Awareness Campaign

- **Key Finding**

  The TSSWCB and TWDB regard the Water Conservation Implementation Task Force recommendation that the state create and fund a statewide water conservation public awareness campaign as a high priority for the Texas Legislature to consider to improve and expand water conservation in Texas.

  In its report to the 79th Texas Legislature, the Water Conservation Implementation Task Force stated, "the Task Force firmly believes that no other proposal contained in this report is more important to achieving a goal of integrating water conservation into our Texas way of life than its recommendation that the state create and fund a Statewide Public-Awareness Program for water conservation. Unless the people of Texas can be convinced that everyone needs to routinely practice water conservation, actual conservation success from the other recommendations will be limited. The public-awareness program would have the primary statewide goal of making individual Texans aware of the importance of water conservation to their future as residents of the state and would complement and reinforce other local and regional water conservation public-awareness programs and activities. The Task Force views the statewide public-awareness program as the foundational component for enhancing the ability of the actions and recommendations presented in this report to achieve their greatest overall water savings potential."

- **Recommendation**

  The Texas Legislature should strongly consider creating and funding a statewide water conservation public awareness campaign of the scope and type recommended by the Water Conservation Implementation Task Force in its Report to the 79th Legislature.

Surface Water Resources Conservation

- **Key Finding**

  The 2007 State Water Plan cites reservoir sedimentation as the primary reason for the decline in surface water availability.

  There are nearly 2,000 small watershed flood control structures across the state on private property that are co-sponsored by soil and water conservation districts. These structures, in addition to providing flood control benefits, assist in preventing sediment from reducing the capacity of our major drinking water reservoirs. As an example, Lake Lavon has 82,600 acre-feet of sediment storage. The small flood control structures above Lake Lavon have combined sediment storage of 21,500 acre-feet. The total design sediment storage of these flood control structures on a statewide basis is about 390,000 acre-feet. As local sponsors, soil and water conservation districts in many watersheds are responsible for the operation and maintenance of these structures and work with landowners in the watersheds to prevent erosion so that the structures can provide sediment reduction and flood control benefits.

- **Recommendation**

  The Texas Legislature should consider establishing a funding source to assist soil and water conservation districts with operation, maintenance, and structural repair for small flood control structures.

Statewide Water Conservation Efforts

Texas Water Code, Chapter 16, Subchapter B, Section 16.022 (a) requires that "the Texas Water Development Board and the Texas State Soil and Water Conservation Board shall jointly conduct a study of the ways to improve or expand water conservation efforts and report to the Legislature." Section 16.022 (c) states that "the report shall be issued as part of, or as a supplement to, the State Water Plan." This report was prepared as a supplement to the separate documents containing the 2007 State Water Plan.

The Texas Water Development Board's mission statement *"To provide leadership, planning, financial assistance, information and education for the conservation and responsible development of Water for Texas"* and the Texas State Soil and Water Conservation Board mission statement of "*Working in conjunction with local soil and water conservation districts, to encourage the wise and productive use of natural resources. It is our goal to ensure the availability of those resources for future generations so that all Texans' present and future needs can be met in a manner that promotes a clean, healthy environment and strong economic growth"* demonstrate a strong commitment to statewide water conservation programs, activities and efforts.

With statewide recording-breaking drought conditions and water scarcity impacting communities and agricultural producers over the last year, the need for conservation efforts has never been more apparent. The following report summarizes the current efforts of the Texas Water Development Board, the Texas State Soil and Water Conservation Board, and other cooperating organizations and individuals working to improve and expand water conservation in the State of Texas and provides recommendations for continuing advancement of water conservation to meet the future needs of Texans.

Water Conservation Implementation Task Force

In 2003, the 78th Texas Legislature considered a broad spectrum of issues related to water conservation and established the Water Conservation Implementation Task Force via passage of Senate Bill 1094. The Task Force's charge was to review, evaluate, and recommend optimum levels of water use efficiency and conservation for the state, and develop a best management practices guide for use by planning groups and political subdivisions responsible for water delivery service.

The task force concentrated on issues related to (1) best management practices, (2) implementation of conservation strategies contained in regional water plans, (3) a statewide public-awareness program, (4) state funding of incentive programs, (5) goals and targets for per-capita water use considering climatic and demographic differences, and (6) evaluation of state oversight and support of conservation. The task force developed practical recommendations that would facilitate and encourage the implementation of appropriate water conservation measures by municipalities, industry, and agricultural interests.

The task force produced the *Water Conservation Best Management Practices Guide - TWDB Report 362*, which serves as a template for designing and implementing water conservation practices and programs. The guide consists of 21 municipal, 14 industrial, and 20 agricultural water conservation best management practices. The practices contained in the guide are voluntary efficiency measures that save a quantifiable amount of water, either directly or indirectly, and can be implemented within a specified timeframe. The guide is a valuable planning tool for the Regional Water Planning Groups and water user groups statewide to evaluate the impact, including potential costs and water savings, of implementation of conservation programs. The guide has also been used extensively by planning groups to identify and recommend water conservation strategies in their 2006 Regional Water Plans.

The task force's *Report to the 79th Legislature*, published in November 2004, summarizes their work and findings, and provides specific recommendations for action and draft legislation. The task force made 25 recommendations it believed will greatly enhance the awareness and ability of Texans to implement water conservation strategies to meet their water-supply needs. The task force recommended the following:

1. consider best management practices to be voluntary measures only;
2. create and fund a statewide water conservation public awareness campaign;
3. provide regional water conservation coordinators to planning groups;
4. establish a public recognition program for water conservation efforts;
5. provide grant funding for innovative water conservation programs;
6. provide cost-share funding for on-farm agricultural water conservation best management practices;
7. continue funding the state brush control program;
8. develop a standard methodology to calculate gallons-per-capita-per-day water use;
9. adoption of task force recommended targets and goals for water conservation;
10. consideration of water conservation water management strategies by planning group to meet any identified water supply need;

11. require water conservation as a criteria for state funding and provide for enforcement of entities that fail to adopt a water conservation plan or conduct required reporting on water conservation efforts;
12. create a water conservation advisory council to advise on water conservation matters;
13. develop a database for cataloging and tracking water conservation plans;
14. establish performance standards for toilet retrofits;
15. establish a water management resource library;
16. continue funding state water conservation programs;
17. continue funding for state water conservation research and education programs;
18. endorse land stewardship as a water conservation strategy;
19. study the impacts, if any, of "take-or-pay" contracts on water conservation efforts;
20. expand funding of Texas A&M University's potential evapo-transpiration network;
21. coordinate state requirements for water conservation and distribution system capacities;
22. provide protection from cancellation of water rights due to water conservation efforts;
23. conduct "end-use" studies of residential water demand;
24. provide funding assistance to bridge gaps in water conservation resources; and
25. provide additional funding for water use data.

The 79th Legislature passed House Bill 1224 which implemented task force recommendation 19 by requiring the TWDB to conduct a research study of the impacts of "take-or-pay" contracts on water conservation efforts. House Bill 1225 implements recommendation 22 and allows the Texas Commission on Environmental Quality to exempt a state water right from cancellation for non-use if the non-use resulted from a water conservation measure that is part of a water conservation plan submitted by a water right holder. House Bill 1226 and Senate Bill 3, which were drafted in the 79th Legislative Session and contained statutory provisions that would have implemented more task force recommendations, did not pass into law.

Due to the efforts of individuals and local and regional water providers, limited implementation of recommendation 2 for funding of a water conservation public awareness program has occurred. The logo "WATER IQ - Know your water" was developed and is being utilized by several individual water providers.

The Best Management Practices Guide is available online at:
http://www.twdb.state.tx.us/assistance/conservation/TaskForceDocs/WCITFBMPGuide.pdf

The task force's Report to the 79th Legislature is available online at:
http://www.twdb.state.tx.us/assistance/conservation/TaskForceDocs/WCITF_Leg_Report.pdf

Water Conservation in the Regional Water Plans and the State Water Plan

During the last ten years of regionally-based water planning in Texas, awareness and understanding of water conservation and water use efficiency have continually grown. Figure 1 illustrates the expansion of water conservation as a strategy across the state between 2001 and 2006 as a result of regional water planning. A comparison of the current state water plan to its 2002 predecessor also demonstrates the growing importance of water conservation in the state. For example, in the 2002 water plan, conservation generated 14 percent of the water needed to meet the state's needs in 2050—a total of about 990,000 acre-feet per year. In the current 2007 plan, conservation accounts for nearly 23 percent of required water in 2060—a total of about 2 million acre-feet per year. These figures represent "active conservation" measures usually initiated by water providers, individual businesses, residential water consumers, and agricultural water users to reduce water consumption.

The 2006 Regional Water Plans are available online at:
http://www.twdb.state.tx.us/rwpg/main-docs/2006RWPindex.asp

The 2007 State Water Plan is available online at: **http://www.twdb.state.tx.us/rwpg/planning_page.asp**

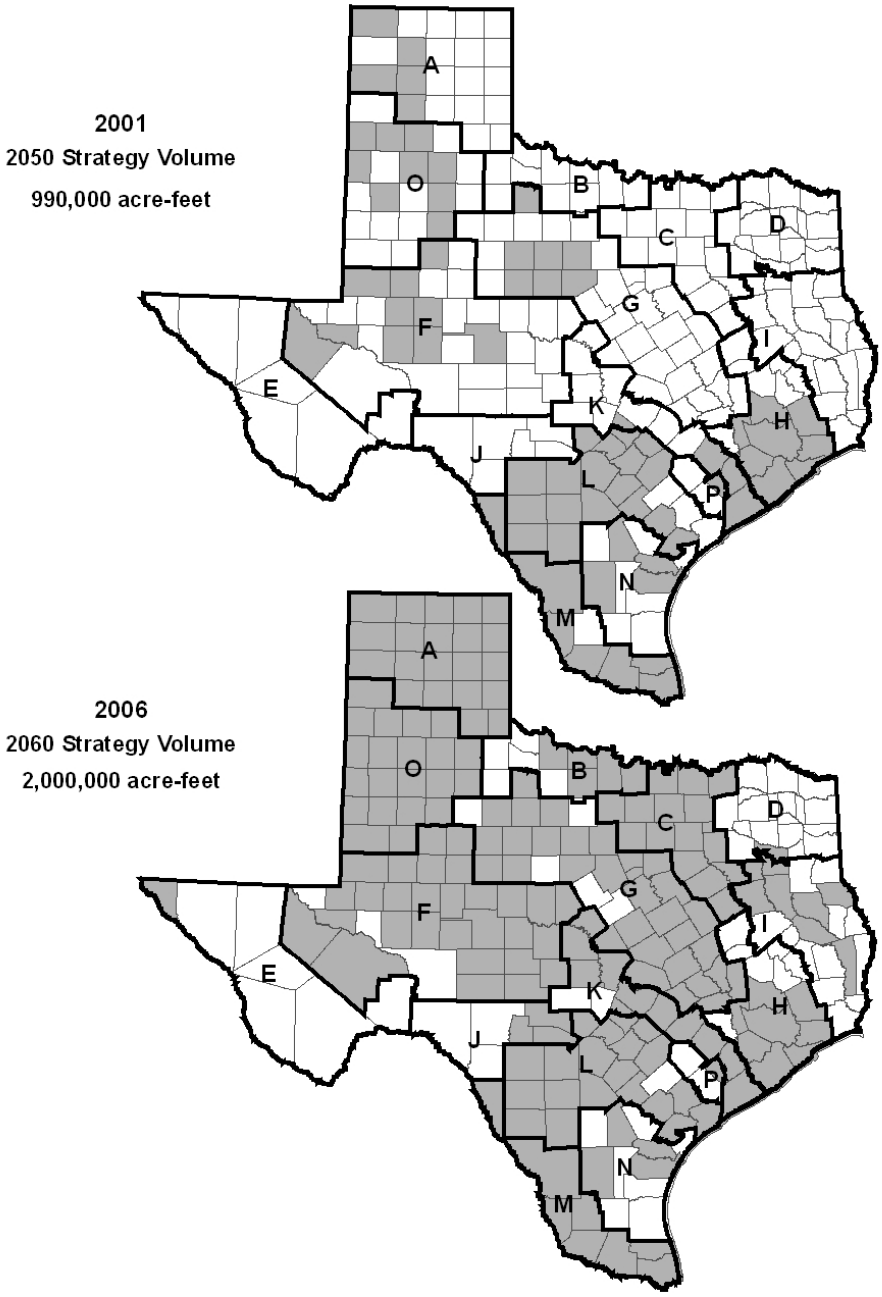

Figure 1. Water conservation strategies adopted in the 2001 and 2006 Regional Water Plans by county within regional water planning areas.

Municipal Water Conservation in Current Regional and State Water Plans

Regional water plans indicate the current water supply will not meet the demand for water over the next 50 years. In total, municipal conservation strategies make up nearly 617,000 acre-feet (6.8 percent) of water generated by all recommend strategies in 2060. The planning groups recommended water conservation be utilized to meet the needs, at least partly at some time during the planning period, of 662 municipal water user groups. Municipal water conservation strategies focus on reducing use through a variety of social or technological approaches. Social approaches include changing water pricing structures to encourage more efficient use, and creating a greater awareness of the importance of conservation through promotional and education campaigns. The 2007 State Water Plan identified strategies for reaching levels of conservation needed to meet water demand including aggressive plumbing fixture replacement programs, water-efficient landscaping codes, water loss and leak detection programs, education and public awareness programs, rainwater harvesting, and water rate structures.

When compared to the total volume of water generated by all strategies, municipal water conservation makes up a substantial share in many of the regions with large metropolitan areas including Region E (17 percent), Region C (11 percent), Region H (8 percent) and Region L (10 percent). Collectively, these regions are home to El Paso (Region E), Dallas-Fort Worth area (Region C), Houston (Region H), and San Antonio (Region L).

These municipal water conservation strategies, or "active water conservation," equal about 617,000 acre-feet, and represents a reduction of 11.9 gallons per capita per day on a statewide basis by 2060. In addition, Texas will also save a significant amount of water through what is known as "passive water conservation." Passive conservation involves water savings that result from state and federal legislation requiring people to install more water efficient plumbing fixtures such as showerheads, faucets, and toilets in homes and businesses. TWDB planners estimate that passive conservation will reduce municipal water demand by 6.6 percent by the year 2060, which equals about 587,000 acre-feet and equals a reduction of 11.5 gallons per capita per day on a statewide basis by 2060.

Many communities throughout the state have taken great strides in developing municipal conservation programs. Austin, Corpus Christi, El Paso, Houston, and San Antonio have active conservation programs in place, and each of these cities uses water conservation for different reasons. The City of Austin wants to lower demand to meet a growing customer base; Corpus Christi hopes to postpone need for additional supply; El Paso has a limited long-term supply; Houston needs to reduce its use of groundwater to reduce subsidence; and San Antonio has limited water availability, especially during drought conditions. Water conservation is not limited to the larger cities. Many small and medium-size systems are committed to increasing water use efficiency. Programs such as plant tours, school programs, and working with local Texas Cooperative Extension offices in educational and outreach activities have proven beneficial. Many smaller systems have partnered with neighboring water systems in public-awareness campaigns to increase coverage, limit confusion, and reduce costs by providing a unified conservation message.

Capital costs needed for implementing municipal water conservation programs are relatively small, amounting to about $9.9 million. Average operating costs per acre-foot of water generated from municipal water conservation strategies range from $863 per acre-foot in Region O to $111 in Region I with a statewide average of $234 per acre-foot.

Summary of recommended municipal water conservation management strategies in 2060

Region	New supplies from all recommended strategies (acre-feet per year)	New supplies from municipal conservation (acre-feet per year)	Percentage of all new supplies from municipal conservation	Estimated capital costs (millions of dollars)	Average annual operating costs per acre-foot of water * (dollars)
A	412,146	4,255	1	0.00	489
B	81,021	1,855	2	0.00	131
C	2,653,248	291,909	11	1.10	421
D	108,742	-	-	-	-
E	137,737	23,437	17	0.00	153
F	239,250	9,727	4	0.00	238
G	736,032	21,406	3	0.00	380
H	1,300,639	100,987	8	0.00	214
I	324,756	1,916	1	0.00	111
J	14,869	55	<1	0.00	419
K	861,930	51,315	6	0.00	209
L	732,779	72,566	10	0.00	442
M	807,587	24,412	3	8.77	141
N	149,496	2,415	2	-	333
O	441,511	10,424	2	0.00	863
P	32,468	-	-	-	-
Texas	9,034,211	616,679	7	9.87	234

*Reported figures are an average of unit costs in the first decade of strategy implementation and unit costs in 2060 weighted by the amount of water produced by a given strategy. A dash indicates that a planning region did not select this type of strategy.

The 2007 State Water Plan contains planning group policy recommendations, including those relating to water conservation. Although the state's sixteen planning groups made over 300 policy recommendations on a variety of topics, a number of common concerns emerged from the planning process. Eight recommendations, in particular, surfaced from geographically and economically diverse regions of the state. Of these, two relate directly to municipal conservation—conservation education, and reuse.

- Conservation Education — Regions D, F, G, J, K, L, O

Recognizing that public information programs can result in water savings, the planning groups encouraged the legislature to fund and implement conservation education programs. The regions specifically mentioned the Water IQ program as one prototype to consider. This suggestion underscores the Water Conservation Implementation Task Force's recommendation to consider public information as a best management practice.

- Water Reuse — Regions A, C, F, G, H, K, L, N

The planning groups identified water reuse as an important water management strategy in the 2007 State Water Plan. Eight regions advocated establishing policies and funds to encourage water reuse throughout the state. As part of their recommendation, the regions also cited the need for safety and environmental guidelines, and a clearly defined permitting process.

Irrigation Water Conservation in Current Regional and State Water Plans

Irrigated agriculture has long been one of Texas's greatest water consumers. For example, irrigation currently accounts for about 60 percent of all water demand in the state, much of which consists of groundwater. By 2060, irrigation water demand will probably decline to about 40 percent of total water demand in the state. Agricultural irrigation conservation programs have been widely promoted in areas of the state with large concentrations of irrigated crop production, such as the Southern High Plains and Lower Rio Grande Valley.

In total, irrigation conservation strategies would generate nearly 1.4 million acre-feet of water in 2060, which equals about 37 percent of all irrigation water needs. When compared to the total volume of water generated by all recommended water management strategies, agricultural water conservation is an important source of water where agriculture is a major economic sector. For example, Region A, Region O, and Region M collectively produce about 80 percent of irrigated crops in the state with an annual economic value of around $1.5 billion dollars. In total, these three regions recommended irrigation conservation strategies that would generate approximately 1 million acre-feet of water by 2060 (76 percent of the total water generated by irrigation conservation strategies in the state). Regions K, H, and J, which also produce substantial amounts of irrigated crops, adopted irrigation conservation strategies generating 222,333 acre-feet by 2060. Estimated capital costs for irrigation conservation are $904 million, and average operating costs per acre-foot of water generated range from $1 per acre-foot in Region K to $216 per acre-foot in Region B.

While many planning groups have adopted agricultural water conservation management strategies as a way to meet agricultural needs, implementing these strategies will be challenging for a variety of reasons. One overarching constraint is economics. The cost per acre-foot for implementation of on-farm water conservation practices, while lower than other water management strategies, is still cost prohibitive for many individual farmers. In Region M, surface water rights and cost structures of irrigation districts may provide disincentives for on-farm conservation. On the other hand, recent increases in energy costs are providing new economic incentives to adopt water conservation practices in areas that rely primarily on groundwater, such as Region A and Region O. However, the effect of energy costs on farm income will limit farmers' abilities to invest in conservation practices that require capital expenditures. Several planning groups have recommended continued and/or increased funding of federal and state financial and technical assistance for agricultural water conservation programs.

The 2007 State Water Plan contains over 300 planning group policy recommendations, including those relating to water conservation and a number of common concerns emerged from the planning process. Eight recommendations related to water conservation surfaced from geographically and economically diverse regions of the state. Of these, one relates directly to agricultural conservation — brush control.

- Brush Control — Regions A, B, E, F, J, K, L, M, O

Much of the western half of the state identified brush control as an important policy for improving water yield and quality. Because salt cedar poses a special problem, the regions requested funds for programs to eradicate it and other nuisance vegetation. They also suggested the legislature consider cost-sharing programs with landowners, financing new technical resources, and funding research to define watersheds that are the best candidates for brush management.

Summary of recommended irrigation conservation water management strategies in 2060

Region	New supplies from all recommended strategies (acre-feet per year)	New supplies from irrigation conservation (acre-feet per year)	Percentage of all new supplies from irrigation conservation	Estimated capital costs (millions of dollars)	Average annual operating costs per acre-foot of water* (dollars)
A	412,146	282,549	69	144.97	6
B	81,021	14,607	18	58.50	216
C	2,653,248	3,121	<1	-	211
D	108,742	-	-	-	-
E	137,737	-	-	-	-
F	239,250	72,247	30	43.15	51
G	736,032	8,027	1	0.00	154
H	1,300,639	77,881	6	0.62	83
I	324,756	-	-	-	-
J	14,869	1,452	10	<0.01	47
K	861,930	143,000	17	2.90	1
L	732,779	7,477	1	0.00	107
M	807,587	438,011	54	325.40	173
N	149,496	342	<1	0.00	171
O	441,511	327,366	74	353.51	65
P	32,468	-	-	-	-
Texas	9,034,211	1,376,080	15	929.06	77

*Reported figures are an average of unit costs in the first decade of strategy implementation and unit costs in 2060 weighted by the amount of water produced by a given strategy. A dash indicates that a planning group did not select this type of water management strategy.

TWDB Municipal Water Conservation Programs

Loan Recipients and Conservation Plans

Since 1984, the TWDB has required applicants for financial assistance greater than $500,000 to develop and submit a conservation plan and implement a conservation program that supports the plan for the life of the loan. The entity receiving financial assistance is required to provide an annual report on the status of their program, including percent of annual water use saved due to conservation efforts, for a minimum of three years or until it is determined that the plan has been successfully implemented. To date, over 480 municipal water providers have developed and implemented conservation plans under this program. Presently there are 131 entities providing annual reports. During fiscal year 2006, TWDB loan recipients reported total water savings of 9.7 percent.

Technical Assistance and Conservation Program Development

TWDB review of reported water use has shown entities with water conservation programs realize a reduction in per capita water use. To support conservation planning and programs for municipal water providers, TWDB provides training, workshops and technical assistance on Water Conservation Plan and Drought Contingency Plan development and on institutional, commercial and industrial water-use efficiency. During fiscal year 2006, TWDB provided technical assistance to 482 different communities across Texas.

Information on TWDB municipal water conservation assistance programs are available online at: **http://www.twdb.state.tx.us/assistance/conservation/Municipal/Munic.asp**

Retail Systems Water Loss

TWDB supports conservation in retail water systems by providing training and equipment for leak detection and meter testing. The 78th Legislature passed House Bill 3338 requiring all Retail Public Water Utilities (approximately 4,200) to submit a water audit report showing the utility system's most recent annual water loss to the TWDB every five years. The water audit report addresses four main points of water loss: loss from distribution lines; inaccuracies in meters; accounting practices; and theft of service. TWDB is providing training, workshops and materials that explain the water audit reporting form and process. The workshops are designed to explain how a system can achieve maximum efficiency by conducting a "top down" water audit and implementing a leak detection program. The first reporting period for the year 2005 has resulted in a 54 percent response rate. The TWDB will provide a report to the 80th Legislature and the sixteen Regional Water Planning Groups providing a detailed analysis of the reported water loss data from the first survey.

Water Conservation Education

TWDB provides educational conservation brochures and guidebooks to water suppliers and individuals, and works closely with associations such as the Texas Nursery and Landscape

Association and the Texas Water Wise Council to develop educational information on efficient water use. Water suppliers can order up to 500 items per year at no cost, and additional materials are available at a minimum cost. This is a valuable service for water suppliers with limited resources and funding, especially those located in rural areas. During fiscal year 2006, the TWDB filled 258 requests for conservation literature, providing 185,696 individual pieces of conservation literature.

The TWDB also provides educational materials to assist Texas schools and communities in educating children about conservation. Major Rivers is a fourth and fifth grade curriculum focusing on Texas water resources, water conservation and non-point source pollution that was developed by the Lower Colorado River Authority. Every year, the TWDB distributes Major Rivers to interested water management entities (river authorities, groundwater conservation districts, etc.) on a cost-reimbursement basis and provides teacher workshops and facilitator training for the curriculum. In fiscal year 2006, TWDB distributed 875 teacher kits and 855 supplemental student material packets to 61 water management entities in Texas.

Working with educational consultants, the TWDB recently developed an award-winning sixth grade level water curriculum with animated web-based visualizations, and hands-on internet-based activities. The "Raising Your Water IQ" curriculum presents concepts such as groundwater and surface water resources, conservation, planning, and water use in Texas. Kids of all ages are learning to care for the State's water resources with this interactive tool. TWDB received 123 new requests for downloadable lesson plans for the Raising Your Water IQ curriculum from teachers and other education or water conservation professionals since the website was introduced in January of 2006.

TWDB water conservation literature and education materials are available online at:
http://www.twdb.state.tx.us/assistance/conservation/Education.asp

Statewide Public Awareness Program for Water Conservation

The Water Conservation Implementation Task Force recognized a need for promoting public awareness of water conservation issues and recommended implementing a program that will focus on delivering a simple, enduring, universal water awareness message. The main goal of the program is to promote the importance and relevance of water conservation to all Texans and to strive to make them aware that their natural water resources are limited and not immune to consequences of individual behavior. In 2004, the TWDB contracted with consultants to conduct research to develop a market strategy and brand for a possible statewide water conservation public awareness program. The project was funded by a voluntary coalition of thirty-six water utilities, municipalities, businesses and conservation groups.

Data from the 2004 study showed only 28 percent of Texans "definitely know" the natural source of their drinking water. The research also showed a strong correlation between knowledge of water sources and willingness to conserve. As part of the study, eleven logo and tagline variations were tested in focus groups in five cities; El Paso, Laredo, Houston, Dallas, and Lubbock. "Water IQ: Know Your Water" rose to the top as an effective brand because "it challenges you to think," and can be tailored with local information and informative tips. "Water IQ" also resonated with Spanish-speaking Texans with the tagline "Conozca Tu Agua."

Four significant regional water providers and one groundwater conservation district have embraced the "Water IQ" campaign concept and are currently implementing pilot projects to establish a "Water IQ" awareness campaign in their service areas. Their efforts will contribute print

ads, public service announcements, and television spots that can be used in developing a statewide program. To date, the North Texas Municipal Water District, the Lower Colorado River Authority, the City of Austin, the City of Lubbock, and the High Plains Underground Water Conservation District have implemented their pilot projects.

More information on Water IQ can be obtained at: **http://www.water-iq.org/**

Rainwater Harvesting

A strong interest in rainwater harvesting has emerged in Texas because of escalating costs of providing water by centralized water systems or by well drilling. The health benefits of rainwater, potential cost savings, and potential for conservation of limited ground and surface water supplies associated with rainwater collection systems have further spurred this interest. The TWDB offers limited technical assistance to communities and individuals interested in rainwater harvesting and participates in educational workshops, seminars, and conferences. The TWDB has published a series of technical guides on rainwater harvesting. The latest version - The Texas Manual on Rainwater Harvesting - was published in 2005.

In 2005, the 79th Texas Legislature established the Rainwater Harvesting Evaluation Committee (HB 2430) and directed the TWDB and three other agencies to formulate recommendations for minimum water quality standards for potable and non-potable indoor use, treatment methods, conjunctive use with existing municipal water systems, and ways in which the state can further promote rainwater harvesting. A TWDB representative served as the Chairperson of this inter-agency committee. The committee provided its report of recommendations to the Legislature in November of 2006.

More information on rainwater harvesting can be obtained at:
http://www.twdb.state.tx.us/iwt/rainwater.asp

Cooperating Agency Programs in Municipal Water Conservation

The **Texas Commission on Environmental Quality** requires entities applying for a new or amended water right to submit a water conservation plan that adopts reasonable conservation measures which are consistent with the applicable regional water plan. The Commission is required to determine whether requested appropriations of state water are reasonable and necessary for the proposed use(s), and whether water right applicants will conserve and avoid wasting water. This determination is made through reviewing the applicant's water conservation plan and is considered in the decision to approve or deny a water right application. In addition to water right applicants, the following entities are required to develop, implement and submit water conservation plans that meet the requirements:

- Municipal, industrial/mining and other non-agricultural water right holders of 1,000 acre-feet of water per year or more
- Agricultural water right holders of 10,000 acre-feet of water per year or more

Water conservation plans must have specific, quantified five and ten year targets for water savings and must be updated every five years to coincide with the regional water planning process. In addition, implementation reports must be submitted that include:

- Dates and descriptions of the conservation measures implemented
- Data about whether or not targets in the plans are being met
- The actual amount of water saved
- If the targets are not being met, an explanation as to why, including any progress on that particular target

Wholesale and retail public water suppliers and irrigation districts are also required to develop drought contingency plans. The Texas Commission on Environmental Quality also oversees the Water-Saving Plumbing Fixture Program that requires manufacturers of plumbing fixtures sold in Texas to comply with the Environmental Performance Standards.

More information can be obtained at:
http://www.tceq.state.tx.us/nav/util_water/conservation.html

The Texas Section of the **American Water Works Association** is a professional trade organization whose mission is to promote public health and welfare, and to assure drinking water of unquestionable quality and sufficient quantity**.** The association is dedicated to advancing the technology, science and governmental policies relative to safe drinking water. Their Conservation and Reuse Division has over 140 active members from municipal utilities, water suppliers, water districts, and consulting firms that work together on advancing conservation efforts in the State through networking, training, and legislative action.

More information can be obtained within the link at: **http://www.tawwa.org/**

The **Water Wise Council of Texas** is a non-profit organization comprised of public and private entities. Its mission is to promote water conservation practices in Texas through a public-private partnership that fosters awareness and implementation of sound water management. The Council is composed of representatives from the nursery, landscape, and irrigation industry, water suppliers and water agencies. They have developed training opportunities for the nursery industry, as well as brochures on sound landscape water use.

More information can be obtained within the link at: **http://www.waterwisetexas.org/**

TWDB Agricultural Water Conservation Programs

Agricultural Water Conservation Financial Assistance

Since 1985 and the passage of House Bill 2, which established the Agricultural Water Conservation Trust Fund and the TWDB water conservation program, the TWDB has been providing

financial assistance to political subdivisions and state agencies for agricultural water conservation projects and programs. With the passage of Senate Bill 1053 in 2003, which terminated the Trust Fund and established an Agricultural Water Conservation Fund, TWDB agricultural water conservation loan and grant programs were expanded to provide additional methods of assistance. Currently the TWDB can:

- Provide agricultural water conservation loans to political subdivisions for improvements on their facilities or as loans to individuals.
- Provide a linked deposit loan program for individuals to access TWDB funds through participating local state depository banks and farm credit institutions.
- Provide grants to state agencies and political subdivisions for agricultural water conservation programs, including demonstration projects, technology transfers and educational programs.

TWDB reports the percent of annual water savings by recipients of financial assistance as a legislative performance measure. This measure demonstrates the amount of water saved due to conservation efforts relative to the amount of water previously used by the grant or loan recipients. During fiscal year 2006, recipients of agricultural water conservation financial assistance reported water savings of 12.7 percent.

Agricultural Water Conservation Loans

Since 1985, the TWDB has been providing low-interest agricultural water conservation loans to political subdivisions, primarily groundwater conservation districts and soil and water conservation districts, for their use as loans to individual irrigators who purchase efficient or water conserving irrigation equipment with the funds. Since 1985, TWDB has provided 85 loans to cooperating districts, totaling $49.2 million in funds. The TWDB has developed internal procedures for handling linked deposit loans, but due to low market interest rates and funds availability, the program has not yet been implemented.

Agricultural Water Conservation Grants

From 1985 to 2003, the TWDB provided small grants to political subdivisions and state agencies for purchase of water conservation and/or water quality testing equipment. During that period, the TWDB provided $1,957,486 to 77 irrigation districts, soil and water conservation districts, and groundwater conservation districts throughout the state. From 2004 to 2006, TWDB has solicited grant proposals for water conservation technical assistance, demonstration, technology transfer, research, education, and metering projects. TWDB has awarded grant funds of up to $600,000 per year for a wide range of projects that are designed to assist in implementation of water conservation strategies in the regional and state water plans. During this period, 25 grants totaling $1,768,270 have been awarded and are in various stages of implementation.

Agricultural Water Conservation Demonstration Initiative Projects

Two large-scale multi-year demonstration projects, one in the Texas High Plains and one in the Lower Rio Grande Valley, have been initiated to address the economic and technical aspects of

implementation of agricultural water conservation. The TWDB awarded grant funds of $6.2 million over eight years to Texas Tech University and $3.8 million over ten years to the Harlingen Irrigation District. A total of $3.6 million in matching funds is currently committed to the projects. The projects represent major collaborative efforts by producers who volunteer their operations and time for the project, water resource and agricultural professionals, researchers, and policy makers to demonstrate cost-effective ways of implementing the conservation strategies in the Regional and State Water Plans. Annual reports for the first project year (2005), containing information on project cooperators, sites, cropping systems, irrigation systems and preliminary water use data, have been approved by TWDB. Both projects are well into the second year of operations.

A third grant award of $250,00 has been made to the Texas A&M Research and Extension Centers in Uvalde and Amarillo for a smaller-scale and shorter-term demonstration project that includes about 10 sites each in the Wintergarden and North High Plains regions of the state. This project emphasizes using potential evapo-transpiration data for the scheduling of various levels of limited irrigation applications and measuring the yield potential and economic viability of limited irrigation approaches.

Information on the demonstration initiatives is available online at:
http://www.twdb.state.tx.us/assistance/conservation/agdemos.asp
http://www.hidcc1.org/node/6
http://www.depts.ttu.edu/tawc/search.htm

Irrigation Water Use Estimates

Accurate estimates of the amount of water used in irrigated agriculture in Texas are critical to regional and state water planning efforts, to development of ground and surface water availability models, and in providing baseline information for measuring the success of conservation strategies. From 1985 to 2000, the Natural Resources Conservation Service collaborated with the TWDB in making annual irrigation water use estimations with county-level irrigation surveys for the entire state.

Since 2000, the U.S. Department of Agriculture-Natural Resources Conservation Service is no longer able to provide this assistance, and TWDB has been calculating annual irrigation water use estimates using an evapo-transpiration based methodology. However, given the wide diversity in irrigation methods, water sources, cropping patterns and climatic conditions throughout the state, estimating irrigation water use for the entire state is a complex process, and TWDB is continually working to develop more accurate methodologies for making these estimates. TWDB has recently completed 2003 and 2004 annual water use estimates utilizing a revised methodology that includes all water diverted for irrigation purposes—previous estimates only accounted for on-farm water use. TWDB is currently working on 2005 estimates and 2006 estimates. TWDB is also working with the U.S. Department of Agriculture-Farm Service Agency to obtain statewide geographic information system based coverage of irrigated farmland and associated data (that will be available in 2007-2008) that will provide for more accurate estimations.

In 2004, TWDB contracted with the Texas Agricultural Experiment Station, Texas Cooperative Extension and the U.S. Department of Agriculture-Agricultural Research Service to develop an appropriate statewide irrigation water use estimating methodology. The report recommended using an evapo-transpiration based model and expanding existing statewide weather station capabilities to include evapo-transpiration related data collection. The development cost of

this expansion was estimated at $950,000, and annual operation and maintenance costs were estimated at $600,000. TWDB has been and continues to evaluate the potential for full implementation of these recommendations.

TWDB irrigation water use data is available online at:
http://www.twdb.state.tx.us/assistance/conservation/IrrigationSurveys.asp

Irrigation Metering Program

The TWDB's Irrigation Metering Program is a joint effort between TWDB and groundwater conservation districts to measure actual irrigation water use to provide data for inclusion in TWDB's groundwater availability models. A side benefit of the program is it provides farmers with a tool to aid with conserving and managing on-farm water use. From 1998 to 2003, eight groundwater conservation districts were provided with meters that were purchased with Senate Bill 1 regional water planning grant funds or agricultural water conservation capital equipment purchase grant funds. Under ten-year agreements with the TWDB, the districts assist by identifying cooperating irrigation farmers, installing the meters on farmers' wells, collecting data from the meters, and providing the data to the TWDB. The TWDB is currently completing a full review of program accomplishments and will publish a technical report on the program in 2007.

For fiscal years 2004 and 2005, TWDB provided cost share funds to groundwater conservation districts and irrigation districts for purchase of flow meters through the Agricultural Water Conservation Grants Program for the purposes of implementing conservation best management practices. Districts in this program enter into five-year contracts to provide estimated water savings and irrigation water use data to TWDB.

Irrigation Training Program

While farmers in Texas have made significant achievements in water application efficiency over the past few decades, for this water application efficiency to equate to actual water savings farmers must be able to effectively manage their irrigation water use. Listening to feedback from farmers, researchers, irrigation specialists and industry experts, the TWDB recognized the need for advancing the understanding of irrigation water management practices statewide. Therefore, the TWDB initiated a Statewide Irrigation Training Program. In June 2006, the TWDB contracted with the Texas Cooperative Extension and the Texas State Soil and Water Conservation Board to develop a statewide, but region-specific, irrigation water management training curriculum and program that will be tailored to local practices and conditions. It is anticipated that this two-year project will provide the framework for a long term program.

Texas State Soil and Water Conservation Board Water Conservation Programs

The Texas State Soil and Water Conservation Board (TSSWCB) has four major programs that address agricultural water conservation issues: the Technical Assistance Grants Program, the Subchapter H Technical Assistance Program, the Water Quality Management Plan Program, and the Brush Control Program. While neither the Technical Assistance Grants Program nor the Water

Quality Management Plan Program are designed specifically or solely for water conservation, each includes water conservation in its implementation. The Subchapter H Technical Assistance program and the Brush Control Program, however, have water conservation as their main objective.

Information on TSSWCB programs is available online at:
http://www.tsswcb.state.tx.us/programs.html
http://www.tsswcb.state.tx.us/reports/2006/1828report200607.pdf

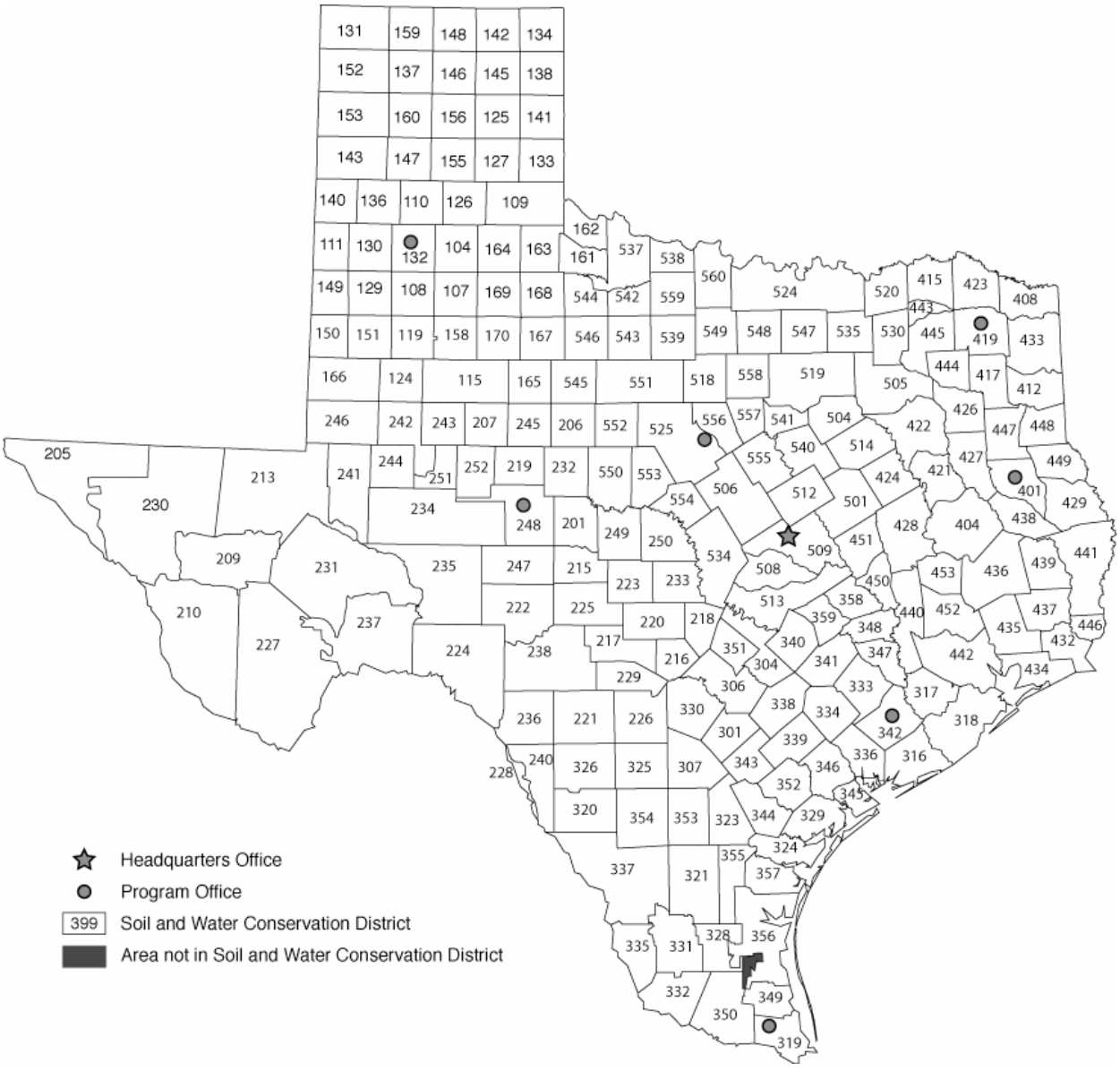

Figure 2. Texas' 217 soil and water conservation districts provide technical and planning assistance to agricultural producers for implementing conservation best management practices on their farms and ranches.

Technical Assistance Grants Program

Since 1984, the Texas Legislature has appropriated funds annually to the TSSWCB to assist soil and water conservation districts in their efforts to provide technical assistance to agricultural producers. These grants may be used to pay employees for performing the duties of a soil and water conservation district conservation technician. A conservation technician works with owners and operators of agricultural or other lands on the installation and maintenance of various conservation practices. Some of these practices are water conservation practices. The TSSWCB provided $1,036,340 to soil and water conservation districts for technical assistance in FY2005 and $1,036,540 in FY2006.

Information on TSSWCB assistance to local soil and water conservation districts can be accessed at: **http://www.tsswcb.state.tx.us/programs/swcdassistance.html**

Subchapter H Technical Assistance Program

Subchapter H funds were appropriated to the TSSWCB from the Agricultural Soil and Water Conservation Account No. 563. Senate Bill 1053 enacted by the 78th Legislature moved the money that funded Account No. 563 to the TWDB. Account No. 563 no longer exists and funding for what was Subchapter H grants now comes from the TWDB in the form of competitive agricultural water conservation grants. The TSSWCB, on behalf of local soil and water conservation districts, applied to the TWDB for grant funding to continue the water conservation program previously supported by the subchapter H program. Soil and water conservation districts provide technical and planning assistance to agricultural producers for implementing conservation best management practices on their farms and ranches.

The TSSWCB received an agricultural water conservation grant of $115,000 from the TWDB for fiscal year 2004. The funds from the grant were allocated to eligible soil and water conservation districts to support technical assistance in planning agricultural water conserving best management practices on farms and ranches. Eligible best management practices were those that directly or indirectly produced water savings and those that reduced erosion, a cause of increased sedimentation of Texas' surface water reservoirs. The grant award of $115,000 supplemented approximately $950,000 in technical assistance funding allocated to local soil and water conservation districts for support of planning and implementing conservation best management practices on farms and ranches.

A total of 197 soil and water conservation districts statewide were eligible and willing to participate in this program. The assistance performed by these soil and water conservation districts has resulted in an estimated 341,729 acre-feet potential water savings for the State or approximately 2.97 ac-ft of water conserved for each agricultural water conservation grant dollar spent.

The TSSWCB received a second grant of $100,000 in fiscal year 2005 under the program. In the second year, 195 soil and water conservation districts participated and achieved over 534,000 acre-feet of potential water savings.

Brush Control

In 1985, Senate Bill 1083, created the Texas Brush Control Program. The goal of this program is to enhance the State's water resources through selective control of brush species. The TSSWCB is designated as the agency responsible for administering the program and is given authority to delegate responsibility for administering certain portions of the program to local soil and water conservation districts. The Water Conservation Implementation Task Force also included brush control as one of the agricultural water conservation best management practices.

The first brush control project began in 1999 when the 76th Legislature initiated the North Concho River Brush Control Project to enhance the amount of water flowing from the North Concho River Watershed into O.C. Fisher Reservoir. In 2002, additional projects were initiated based on favorable results of feasibility studies.

For fiscal year 2004, brush projects were funded from agriculture water conservation bonds and from general revenue appropriated by the 77th Legislature. Fiscal year 2005 funding came from general revenue appropriated by the 78th Legislature. The 79th Legislature approved general revenue funding in the amount of $1,874,176 for fiscal year 2006. The Brush Control Program, in existence since 1999, has treated over 628,000 acres.

Status of brush control projects as of November, 2006

Watershed	Treated area (acres)
North Concho	327,286
Pedernales	60,420
Twin Buttes	232,219
Lake Ballinger	7,340
Oak Creek Lake	16,092
Pecan Creek	11,982
Mountain Creek Lake	1440
Champion Creek	14,909
Spring Creek/Dove Creek	30,571
Pecos (Saltcedar)	7,274
Upper Colorado (Saltcedar)	823
Total Acres Treated	*694,264*

The 78th Legislature provided a $3.1 million budget to continue state brush control projects and initiate a combined effort with the U.S. Department of Agriculture-Natural Resources Conservation Service to continue salt cedar control in the Pecos/Upper Colorado watershed. The TSSWCB is also using state brush control funds along with local match from Mitchell Soil and

Water Conservation District to utilize federal Environmental Protection Agency funds to treat salt cedar along the Upper Colorado River watershed. The Upper Colorado River Authority continues monitoring efforts under contract with the TSSWCB. The Upper Colorado River Authority is working with the Texas Institute for Applied Environmental Research to determine the effects of brush control on the water balance and water yield within the North Concho River watershed.

More information on the TSSWCB brush control program can be accessed at:
http://www.tsswcb.state.tx.us/programs/brush.html

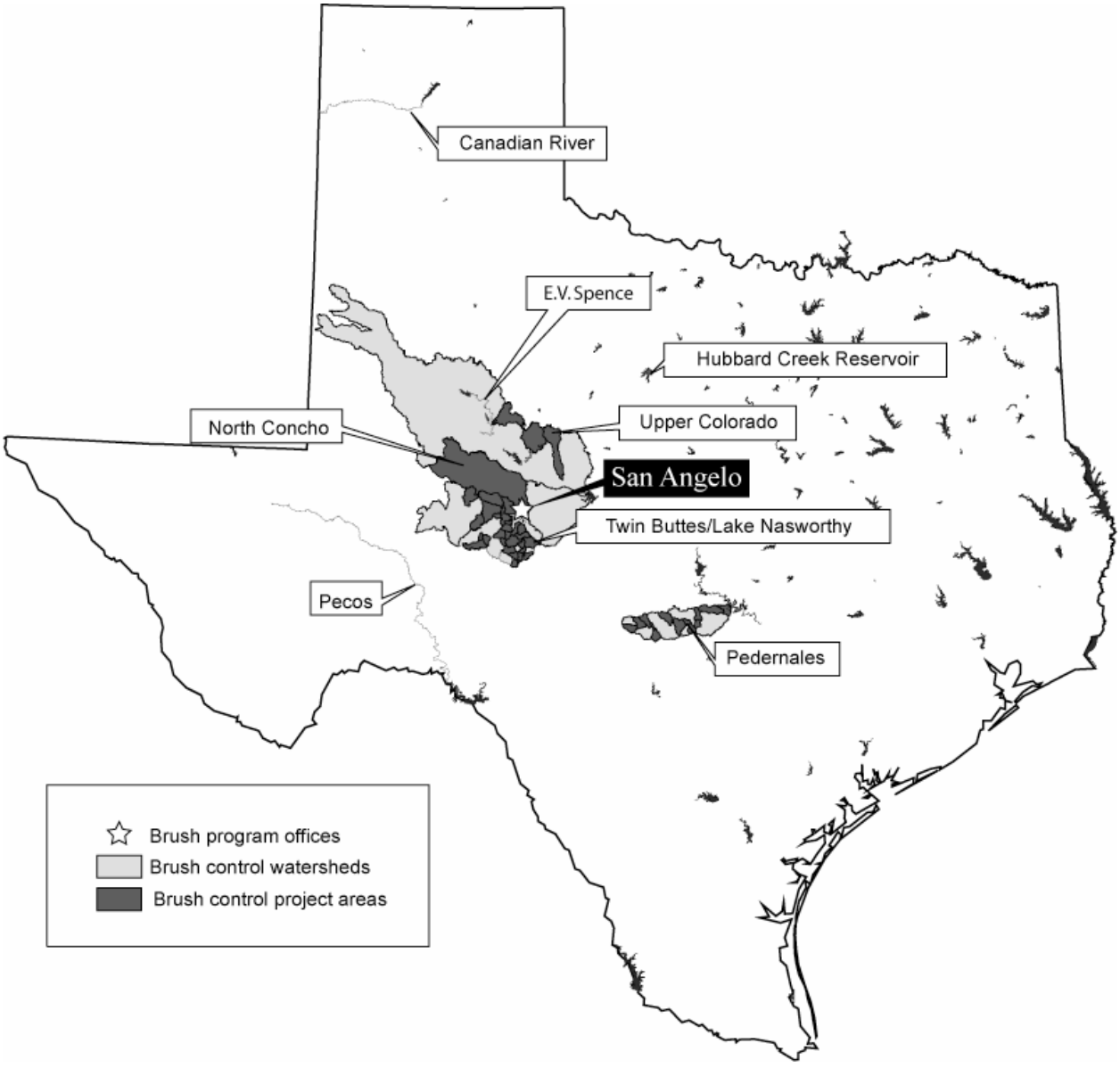

Figure 3. Brush control projects and watersheds

Water Quality Management Plans

The passage of Senate Bill 503 in 1993 directed the TSSWCB to implement water quality management plans in Texas. The TSSWCB has been implementing water quality management plans since and has completed nearly 11,000 plans in Texas. A water quality management plan is a site-specific plan developed through and approved by soil and water conservation districts for agricultural or silvicultural lands. The plan includes appropriate land treatment practices, production practices, management measures and technologies or combinations thereof. The purpose of water quality management plans is to achieve a level of pollution prevention or abatement determined by the TSSWCB, in consultation with local soil and water conservation districts, to be consistent with state water quality standards. While this program is designed for water quality, many of the practices that are included in a water quality management plans are effective at conserving water as well. Water conservation practices include: conversion to more efficient irrigation systems, irrigation land leveling, irrigation tail water recovery, and pond sealing. The Texas Legislature has been appropriating approximately $2.1 million per year to the TSSWCB to use as cost-share to assist agricultural producers with implementing these plans.

Agricultural Water Conservation Best Management Practices Guide

In November, 2004, the Water Conservation Implementation Task Force produced the *Water Conservation Best Management Practice Guide, published as TWDB Report 362*. The agricultural best management practices from this guide were collected and printed as a *Water Conservation Best Management Practices Guide for Agriculture in Texas*, a stand alone publication for use by agricultural and irrigation organizations and agencies. The TSSWCB, the Association of Texas Soil and Water Conservation Districts, the Texas Irrigation Council, and the Harlingen Irrigation District—Lower Rio Grande Valley Agricultural Conservation Demonstration Initiative sponsored the printing and distribution of this document. This report can be accessed at:
http://www.tsswcb.state.tx.us/reports/2005/water_conservation_bmp.pdf

Copies of the guide were distributed to irrigation districts, soil and water conservation districts, TSSWCB regional offices, and other agencies working with implementation of irrigation best management practices. This provides a usable tool for those agencies and entities that provide technical assistance and design services to irrigation farmers who will them implement the appropriate practices. Implementation of conservation practices is the key to reducing water use.

Sediment and Flood Control Dams

There are nearly 2,000 small watershed flood control structures across the State on private property that are cosponsored by soil and water conservation districts. These structures, in addition to providing flood control benefits, assist in preventing sediment from reducing the capacity of our major drinking water reservoirs. As an example, Lake Lavon has 82,600 acre-feet (ac-ft) of sediment storage. The flood control structures above Lake Lavon have combined sediment storage of 21,500 ac-ft. The total design sediment storage of these flood control structures on a state-wide basis is about 390,000 ac ft. As local sponsors, soil and water conservation districts in many watersheds are responsible for the operation and maintenance of these structures and work with landowners in the watersheds to prevent erosion so that the structures can provide sediment reduction and flood control benefits.

Cooperating Agency Programs in Agricultural Water Conservation

The **U.S. Department of Agriculture-Natural Resources Conservation Service** provides significant support for water conservation activities in Texas through grant programs which were authorized under the 2002 Farm Bill and are administered in cooperation with local soil and water conservation districts across the state. Among many important federal programs that contribute to water conservation in Texas, the Environmental Quality Incentive Program has a direct and substantial impact by providing cost-share funds or incentive payments to farmers to implement a broad range of soil and water conservation practices, including practices such as: laser leveling of land, purchase of center pivot or drip irrigation systems, or irrigation water management. The Natural Resources Conservation Service spent over $73 million dollars on this program in Texas in 2005. In addition, in 2005, the Natural Resources Conservation Service launched a conservation planning assistance pilot program to help landowners in creating and adopting realistic conservation plans. Natural Resources Conservation Service reports that in 2005, conservation plans were written for 972,022 acres of cropland in Texas and irrigation efficiency was improved by 68,931 acre-feet.

Information on Natural Resources Conservation Service programs can be accessed at:
http://www.tx.nrcs.usda.gov/

The Texas Agricultural Finance Authority was created in 1987 as a unit of the **Texas Department of Agriculture** to provide financial assistant through lending institutions to producers and providers of goods and services in rural areas. The Linked Deposit Program provides for commercial loans at below-market rates of up to $250,000 for water-conserving equipment or projects.

More information on this program can be accessed at:
http://www.agr.state.tx.us/agr/program_render/0,1987,1848_6057_0_0,00.html?channelId=6057

The **Texas A&M University System** provides a broad range of educational and research programs focused on water conservation through the Texas Water Resource Institute, the Texas Cooperative Extension, and the Texas Agricultural Experiment Stations. The entities work closely together to coordinate water-related research and extension programs. Irrigation efficiency and water conservation research are major activities in these programs.

Texas Cooperative Extension personnel support water conservation by providing education and training materials about groundwater supplies, applicable regulations, and the merits of implementing local groundwater conservation practices in newly formed groundwater management districts. Extension specialists contribute to ongoing seminars for groundwater district personnel as part of a program developed by the Texas Water Resources Institute and the Texas Association of Groundwater Districts. Texas Cooperative Extension also provides brochures and how-to materials for implementing on-farm conservation practices. Texas Agricultural Experiment Station provides research and demonstration of water conserving practices at research centers across the state through field days and educational activities that bring producers in direct contact with the results of research conducted at the stations.

More information on can be accessed at the following links:
http://texasextension.tamu.edu/

http://agresearch.tamu.edu/
http://twri.tamu.edu/

Drought Preparedness and Response

While drought preparedness and response encompass a wide range of activities, drought responses or management strategies typically rely on implementation of conservation measures for mitigation. The Texas Drought Preparedness Council is chaired by the Governor's Division of Emergency Management and is composed of fourteen state agencies that support drought management efforts. The Council emphasizes drought monitoring, assessment, preparedness, mitigation, and assistance.

The TWDB and TSSWCB participate as members of and provide technical assistance to the Council. The Council prepares a monthly Statewide Drought Situation Report which discusses overall state drought conditions, impacted water systems, regional supplies, water flow, as well as agricultural and wildfire concerns. The Council also coordinates with the Regional Water Planning Groups on drought-related issues in the Regional Water Plans.

More information about the Drought Preparedness Council can be accessed at:
http://www.txwin.net/DPC/Index.htm