Water for People and the Environment

3rd Annual Regional Conference for West Texas

October 25, 2003
Midland, Texas

Conference Director: Ken Kramer, Director, Lone Star Chapter Sierra Club
Conference Organizer: Jon Brandt, Lone Star Chapter Sierra Club

Sponsored by the Lone Star Chapter of the Sierra Club, in partnership with:

Christian Life Commission
Clean Water Action
Environmental Defense
League of Women Voters of Midland
League of Women Voters of Texas
National Wildlife Federation
Pro-Tex Network for a Progressive Texas
S.M.A.R.T. (Sensible Management of Aquatic Resources Team)
Texas Committee on Natural Resources
Texas Impact
Texas Wildlife Association

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Some of the speakers at the conference had PowerPoint presentations on some of the topics discussed in these proceedings. For information on obtaining a copy of a particular PowerPoint presentation, contact the Lone Star Chapter of the Sierra Club at lonestar.chapter@sierraclub.org

PROCEEDINGS
Water for the People & the Environment
A Regional Conference for West Texas
Midland, October 25, 2003

Welcome: Ken Kramer, Director, Lone Star Chapter, Sierra Club

Ken Kramer, PhD. is the Director of the Lone Star Chapter of the Sierra Club and has been associated with the Sierra Club in different volunteer and professional capacities since 1978. Dr. Kramer has a B.A. in History from Texas Lutheran University, an M.A. in Political Science from Stephen F. Austin State University, and a Ph.D. in Political Science from Rice University. He has taught at El Paso Community College, Houston Community College, Angelo State University, and Texas A&M University. Dr. Kramer has served on numerous advisory committees to state and local agencies and officials, and he was recently selected by the Texas Water Development Board to serve on the new Water Conservation Implementation Task Force.

Two of the purposes of the Texas Living Waters Project, which started in 2000, are to educate Texas citizens about water issues and to shape government policies that affect these water issues. These issues include water quantity and quality as well as planning for future water supplies for people and the environment. Through these regional water conferences we hope to get more people involved in these water issues. This year the Lone Star Chapter of the Sierra Club has held four regional water conferences – in Houston, Dallas, New Braunfels, and Midland.

This conference is the first regional water conferences that we have held in West Texas. If funding for the project is continued, the plan is to have just one regional conference each fall rotated around to different areas of the state over a three-year period, but we will have some other shorter workshops or forums as well.

As part of the Living Waters Project, the Lone Star Chapter of the Sierra Club has produced a *Facts about Texas Water* booklet as a basic educational publication on water. The booklet will be distributed to over 50,000 students in the Harris, Galveston, and Fort Bend County region, and 20,000 additional copies of the booklet are being distributed elsewhere, including at the regional water conferences. This booklet is available in Spanish as well. Copies of *Facts about Texas Water* are available at the conference, and additional copies may be requested.

Managing Water: Brush Management & Instream Flows

Steve Manning, Leon River Restoration Project
"Brush Management"

The Leon River Restoration Project is a pilot project involving landowners in the Leon River Watershed in Hamilton and Coryell Counties, Texas. Landowners are participating in the project to improve the quality and increase the quantity of water in this watershed. The project accomplishes these goals through the treatment of regrowth Ashe Juniper, while improving wildlife habitat and populations, to include the federally listed Black-capped Vireo and Golden-cheeked Warbler. The project area is in a region of the state that has been adversely impacted by encroachment of regrowth Ashe Juniper. This encroachment has negatively affected both

surface and groundwater yields, wildlife habitats, and agricultural production within the project area.

The greatest obstacle to the successful treatment of this problem has been the perception by both landowners and those in the environmental community that land use practices suitable for agricultural production are in conflict with the type of management needed for the survival of these two endangered songbirds. This project is possible because of the success of two efforts that complement the project. One is a water quality improvement project on the Fort Hood military reservation in Coryell County that has successfully removed regrowth Ashe Juniper while increasing endangered species populations in the project area.

The second project involves a cowbird-trapping program originally located on private property around the perimeter of Fort Hood. The cowbird-trapping program has since been expanded to 40 counties across the range of the Black-capped Vireo including approximately 100 traps in the ongoing project area. The Leon River Restoration Project meets its objectives using the methodology developed in the Fort Hood project and benefits from the continued cowbird-trapping program.

At the present time 75 landowners have enrolled in the project and are currently involved in different phases of the project. Approximately 80 additional landowners in the project area have requested to participate in the project contingent upon additional funding.

The objectives of the Leon River Restoration Project are as follows:

- To increase water quantity and improve water quality in the watershed
- To improve wildlife habitat and increase populations, with special interest being given to the federally listed Black-capped Vireo and Golden-cheeked Warbler
- To incorporate long-term management practices to maintain water and wildlife improvements in the project area
- To provide measurable results of both increased water yields and wildlife populations.

This project has been the coordinating mechanism to bring together a number of diverse non-governmental organizations and federal and state agencies, working with private landowners and land managers. Partners include Texas Wildlife Association, Texas & Southwestern Cattle Raisers Association, Central Texas Cattlemen's Association, Texas Audubon Society, Environmental Defense, Nature Conservancy, Coryell County Commissioners Court, Hamilton County Commissioners court, Hamilton/Coryell Soil & Water Conservation District, Brazos River Authority, and numerous federal and state agencies as well as academic and research institutions.

Norman Johns, Ph.D., National Wildlife Federation
"Maintaining Instream Flows in Texas Streams and Rivers"

Norman Johns, Ph.D. is a Water Resources Scientist for the National Wildlife Federation Gulf States Regional Office in Austin. He has analyzed water resources issues while working in Texas government, university, and private settings for the past 15 years. His topical areas of expertise include hydrology, water supply planning, surface water rights, surface water quality protection, and groundwater hydrology.

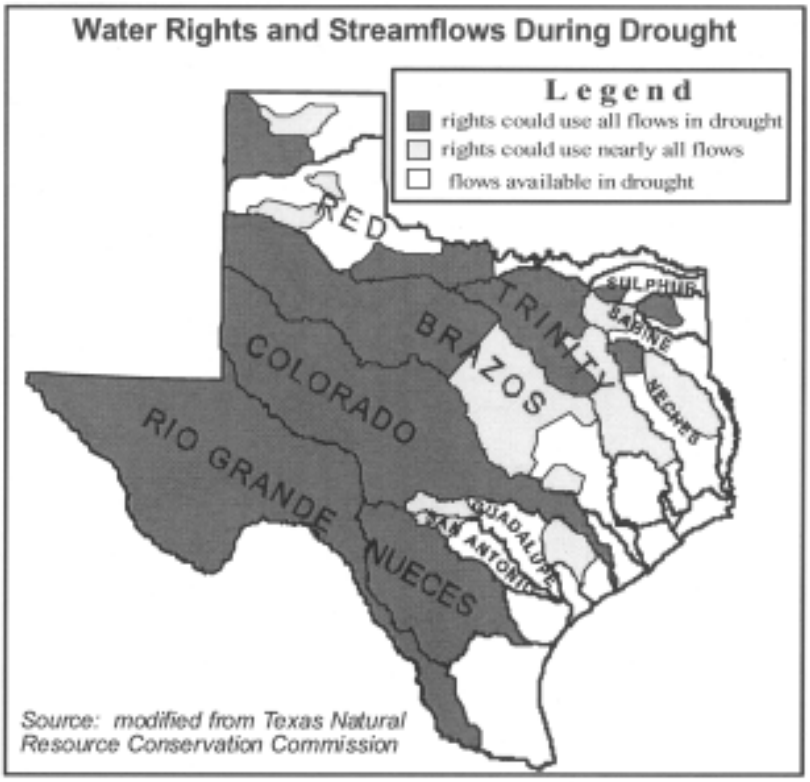
Instream flows are the streamflows necessary to maintain a healthy aquatic community. They are important for the maintenance of habitat (pools and riffles), temperature, and water quality in a stream. The protection of instream flows in Texas streams and rivers involves biology, hydrology, and legal/policy elements.

Relatively few instream flow determinations have been made for Texas streams and rivers thus far. These determinations take 5 to 7 years to complete and involve intensive field data collection and analysis, making them expensive.

The issue of maintaining instream flows is becoming increasingly important in Texas in light of the state's projected population growth over the next 50 years and the increased municipal water use demands projected for that time frame. There are several ways in which those increased demands might be met, including conservation, full use of existing river water rights, reuse of wastewater (which would reduce return flows to the streams), issuance of new water rights for storage and/or diversion, and greater use of aquifers. Full use of existing rights, reuse of wastewater, and new water rights pose threats to the maintenance of instream flows.

Some background on surface water rights is important to understanding why this is the case. Water rights for the use of surface water, which is considered state water held in trust for the people of the state, are issued by the state agency now know as the Texas Commission on Environmental Quality (TCEQ). In times of drought or water shortages a senior water right (issued at an earlier time) on a particular stream takes precedence over a more junior water right (issued at a later time), regardless of whether the senior water right is located upstream or downstream from the more junior one. In other words in the case of surface water rights "older is better."

Most of the current volume of surface water in the state that has been allocated in water rights was allocated prior to 1985. With few exceptions, those water rights were issued without any permit conditions to maintain instream flows. In some basins, therefore, if existing water rights were fully exercised, at least during certain periods there would be no water left flowing in the streams. In West Texas during the current drought we have seen a cessation of flows in the Rio Grande in Big Bend National Park.



What needs to be done to insure instream flow maintenance? Protecting rivers and bays has to be a priority in planning. We also have to ensure that current water is used efficiently so as to avoid unnecessary water development projects that might reduce flows. There is a need for definite, enforceable flow protections. But we must act quickly in order to protect instream flows.

There are several protection options. They include conditions on new water rights permits to maintain flows. The issuance of new water rights permits for the sole purpose of maintaining instream flows is also a possibility, although the Texas Legislature has enacted a new law that at least temporarily takes that option off the table.

Another option would be reservations of water for instream flows – in other words setting aside an amount for flows that would not be subject to appropriation for consumptive uses. Cancellation of existing unused water rights is also a possibility as is the purchase or donation of existing water rights and the conversion of those rights to instream flow maintenance (which is allowed in the law). Finally, there are judicial approaches, such as the possibility of litigation to set aside certain amounts of water in streams for instream flow maintenance under the public trust doctrine.

The best thing that citizens can do to assure maintenance of instream flows is to let decision makers know that they care about this issue. Two of the avenues for doing that are through the Study Commission on Water for Environmental Flows created this year by the Texas Legislature and through the regional water planning groups operating under the SB 1 regional planning process. It is important to do this if we are going to leave a river heritage for future generations of Texans.

Water Conservation in Texas: Progress, Challenges, Prospects
Moderator: Pat Stanley, League of Women Voters of Midland

Pat Stanley is a long-time Midlander (42 years) and a long-time member of the League of Women Voters (45 years). She is presently serving her fourth term as president of the League. Ms. Stanley has taught school, having graduated from SMU and still volunteers at St. Ann's School. Her huband, Herb, is a retired geologist. They spend time traveling to see their four grown children and their 10 grandchildren in California, Colorado, Oklahoma, and Texas. In her free time Pat plays tennis and stays active in the community.

Chris Brown, Chris Brown Consulting (San Antonio)
"Success Stories & Options: Getting the Most Out of Conservation"

Chris Brown is the principal of Chris Brown Consulting, a multifaceted water resource and conservation consultancy. Mr. Brown earned an M.S. in Water Resources Management at the UNLV and a B.A. in Theology at Oberlin College. He is the former Director of the Water Conservation Department, San Antonio Water Systems (SAWS); former researcher for the Center for Urban Water Conservation; and former Executive Director of Citizen Alert, Nevada. The author of numerous water conservation planning documents, Mr. Brown has presented papers on water conservation and drought planning at numerous conferences around the U.S.

Getting to success in water conservation requires an understanding of water conservation's role, the right water pricing structure, learning from others, and personal involvement. Water conservation is a drought tool for short-term relief in dry periods, a planning tool to lessen the gap between demand and available supply, and an economic tool to defer capital facilities for drinking water and wastewater treatment.

Conservation results are obtained from behavioral changes or water efficient equipment. Utility and customer cooperation are important to achieving conservation goals. Those goals may be expressed as percent reduction in water use, per capita reduction, and a positive cost/benefit ratio.

Federal actions on water conservation have included the 1992 law for water efficient plumbing standards, 1992 clothes washer regulations, and the conservation guidelines in the 1996 Safe Drinking Water Act reauthorization. Nationally there are over 15 states with water conservation programs (including Arizona, California, Colorado, Connecticut, Florida, Kansas, New Jersey, Oregon, Texas, and Washington State). There are

also notable city programs in New York City, Boston, Los Angeles, Seattle, San Antonio, El Paso, Austin, and Corpus Christi.

Pricing is a critical factor in successful water conservation programs. Water rates are the best motivator for reducing outdoor and discretionary water use. Inverted blocks, drought surcharges, and water budgets are effective ways of using pricing to affect water use. Inverted block rates entail increasing the unit price of water as water consumption increases. In such a rate structure, basic water consumption is priced low. To be most effective blocks should reflect local usage patterns, and a portion of funds obtained from the use of such rates ought to be dedicated to water conservation programs.

Drought surcharges imposed on water use in times of shortages should involve significant percentage increases in water charges but should only be imposed on the top or excess water users. One of the advantages of drought surcharges is that they can be imposed automatically when the relevant conditions apply. Most importantly, they work!

Water budgets include a baseline historical water use for a water user, such as a residential water customer. A water budget would include water for a landscape area plus an indoor water allotment. A surcharge is then imposed on any amount of water use that exceeds the water budget for the user. Again the price of the excess water should reflect a significant percentage increase over the price for water within the budget. That increase would be even greater during droughts.

Another important element of successful water conservation programs is the use of best management practices (BMPs). BMPs are state of the art conservation programs. Water conservation BMPs have been identified and used by the California Urban Water Conservation Council, the Edwards Aquifer Authority, and the federal energy program. BMPs may include retrofits of less water efficient fixtures, which may be accomplished by the use of rebates or direct purchase and distribution of more water efficient fixtures by the water utility.

Two case histories illustrate the effectiveness of retrofit programs. The City San Antonio operates a toilet rebate program. From June 2000 to June 2001, over 5,908 single-family homes received rebates for the installation of new water efficient toilets. The estimated water savings from these retrofits is 1700 acre feet over 10 years at a cost of $516,000 for the rebates. Thus, the cost of water saved was $303 per acre foot.

A second case history is the showerhead replacement campaign of the City of El Paso. In 2000 the City of El Paso distributed more than 160,000 water efficient showerheads. The cost of each showerhead was $2.31. The potential savings from the distribution of these showerheads is 1734 acre feet per year at a cost per acre foot that ranges from $9 to $65.

A successful water conservation program must also include a public awareness and education campaign. It's essential for the understanding and buy-in of the end-water user. The impact of a public awareness and education campaign is hard to quantify, but it supports all identified water management strategies. There are many good examples of such campaigns, including the H2OUSE program of the California Urban Water Conservation Council.

Finally, city ordinances may be used to affect water use reductions. The City of El Paso has an ordinance that includes landscape watering days, watering times restrictions, restrictions on at-home car washing, prohibitions on water waste, and required leak repairs within 5 days of notification of leaks.

Well-designed water conservation programs work to save water and money. Success in water conservation requires a water resources strategy (including the use of BMPs) and a way to measure success to make sure specific water conservation efforts are working. Above all, public/utility cooperation is essential.

Carole Baker, Harris-Galveston Coastal Subsidence District
"New State Water Conservation Laws and the Water Conservation Task Force"

Carole Baker is the Director of Intergovernmental Affairs at the Harris-Galveston Coastal Subsidence District. She is a Director of the Board of the Texas Water Conservation Association and Chair of the American Water Works Association Legislative Committee. Ms. Baker is a member of the Water Conservation Implementation Task Force mandated by the 78th Texas Legislature. She was a recipient of the Special Service Award for 2001 from the Lone Star Chapter of the Sierra Club.

This presentation is based on the paper "Water Conservation Legislation & Initiatives 2003" included in the conference packet.

A number of new water conservation laws were enacted in the regular session of the 78th Texas Legislature in the spring of 2003. Indeed about 70% of the bills on water conservation that were introduced in the 2003 regular session passed. Following is a brief description of each new law enacted:

HB 645 – relating to the creation or enforcement of certain restrictive covenants that undermine water conservation; a property owners' association may not prohibit or restrict a property owner from:
- implementing measures promoting solid waste composting of vegetation;
- installing rain barrels or a rainwater harvesting system;
- implementing efficient irrigation systems.

HB 3338 – relating to the performance of a water audit by a retail public utility providing potable water; requires water utilities to perform water audits in order to increase water conservation in Texas; every five years a retail public utility providing potable water shall perform and file with the board a water audit computing the utility's most recent annual water system loss.

HB 2660 – relating to the establishment of minimum levels of water conservation in water conservation plans;
- beginning May 1, 2005 all water conservation plans must include specific, quantified 5-year and 10-year targets for water savings;
- the entity preparing the plan shall establish the targets;
- targets must include water loss programs and goals for municipal use in gallons per capita per day.

HB 2663 – relating to the establishment of quantifiable goals for drought contingency plans;
- by May 1, 2005, a drought contingency plan must include specific, quantified targets for water use reductions to be achieved during periods of water shortages and drought;
- TCEQ and TWDB shall identify quantified target goals for drought contingency plans that entities may use as guidelines;
- TCEQ and TWDB shall develop model drought contingency programs for different types of water suppliers.

HB 2661 – relating to the use of graywater;
- graywater is household wastewater from clothes washing machines, showers, bathtubs, handwashing

lavatories, and sinks;
- the use of graywater can produce approximately 100 gallons of excess water per day;
- this bill requires TCEQ to adopt and implement minimum standards for the use of graywater for certain purposes.

SB 1094 – relating to the creation of a task force to evaluate matters regarding water conservation;

HB 1152 – relating to the authority of certain nonprofit water supply corporations and sewer service corporations to establish and enforce customer water conservation matters; amends the Texas Water Code to provide nonprofit water supply corporations the statutory authority to enforce reasonable water conservation practices and prohibit wasteful or excessive water use.

Three important water conservation bills from the 2003 legislative session that did not pass floor action were the following:
- HB 487 – requiring the TCEQ to adopt standards for requiring newly installed or modified irrigation systems to have a rain shut-off device;
- HB 488 – relating to performance standards for toilets sold in the state;
- HB 489 – relating to water and energy saving performance standards for commercial clothes-washing machines.

The Water Conservation Implementation Task Force created under Senate Bill 1094 has the following responsibilities:
- identify, evaluate, and select best management practices for municipal, industrial, and agricultural water uses and evaluate the costs and benefits for the selected best management practices;
- evaluate the implementation of water conservation strategies recommended in regional and state water plans;
- consider the need to establish and maintain a statewide public awareness program for water conservation;
- evaluate the proper role, if any, for state funding of incentive programs that may facilitate the implementation of best management practices and water conservation strategies;
- advise TWDB and TCEQ on a standardized method for reporting and using per capita water use data and establishing per capita water use targets and goals, accounting for such local effects as climate and demographics; and evaluate the appropriate state oversight and support of any conservation initiatives adopted by the Legislature.

As required by SB 1094, the TWDB selected task force members recommended by and representing the following entities and interests: TCEQ, TDA, Parks & Wildlife Department, State Soil & Water Conservation Board, municipalities, groundwater conservation districts, river authorities, environmental groups, irrigation districts, industries, institutional water users, professional organizations focused on water conservation, and higher education.

The Task Force had its first meeting on September 29 and will work at on a fast schedule to complete its assignments.

Ken Kramer, Lone Star Chapter, Sierra Club
"Water Loss in Texas"

Water loss (also called unaccounted-for water) is the difference between the amount of water a utility purchases or produces and the amount of water that it can account for in sales and other known uses for a given period. Simply put, it is the water that a utility cannot account for. It is often attributable to inaccurate or incomplete record keeping, meter error, unmetered uses such as fire-fighting, line flushing, public use and wastewater treatment plants, leaks and water theft.

Comparing water loss in Texas with other states is difficult due to lack of consistent terminology and standards. Lack of standard terminology and measures are at the center of the water loss penumbra.

How much water loss is acceptable in a system? The TWDB recommends immediate action if the unaccounted for water is above 15% for municipal systems and 15-18% for widespread rural systems. The International Water Association recommends looking at water loss in volume.

The water audit is the first step to understanding water loss. In the typical water audit you record the total amount of water produced or purchased, total amount of water sold and a breakdown of where the remaining water is. There is variability in the types of water audits.

There were three sources of information for the Sierra Club water loss research. The Sierra Club survey sent out to 1000 water suppliers in Texas (those serving the largest number of customers). The survey requested information on annual water loss, cost of the lost water, whether water audits are completed on a regular basis, how water loss is addressed by the utility and whether their water conservation plan addresses the issue of water loss. The second piece of information came from the Water and Wastewater Utilities Annual Report. This is required of all investor-owned utilities and filed with the Texs Commission on Environmental Quality. It has a section about annual water loss. The third piece or information came from the survey of ground and surface water use. This is a yearly report required of all governmental water systems and is filed with the TWDB.

Response to the Sierra Club survey was dismal. Only 67 out of 1000 survey were returned. Possible causes of this low rate of return are outdated addresses, lack of information available, lack of desire to answer questions, lack of understanding and lack of one person in charge of the information. From the returned surveys there is a water loss rate of 10.2%.

There were over 12 billion gallons of water lost in just 67 water utilities (these are the ones that returned the Sierra Club survey). There are thousands of water suppliers in Texas. None of the larger water suppliers responded to the survey. The total population served by those who responded is roughly 800,000. Water suppliers in Texas serve over 20 million people.

According to the surveys tuned in to TCEQ, there is a water loss rate of 14.7%. There are 661 investor-owned utilities in the State of Texas. Out of the 4,144 water systems that report to the TWDB, only 399 reported how much water they sold and 1085 reported how much they lost. It is difficult if not impossible to gauge water loss from this data.

The bottom line is that the current data on water loss in Texas is neither accurate nor complete. The State Water Plan proposes to spend billions of dollars to increase the water supply in Texas, but Texans have no idea how much water we waste.

As a result of the research the Sierra Club makes three major recommendations:
-Texans should aggressively monitor water loss.
-The State of Texas should require water providers to reduce water loss.
-Texas should make reduction of water loss a priority for meeting future water demands.

Sam Godfrey, SAMCO Leak Detection
"Leak Detection and Repair"

Sam Godfrey is the owner of SAMCO Leak Detection Services, Inc., located in Austin. He has 20 years of experience locating leaks in water distribution systems. He has worked extensively with sonic leak detection equipment and water conservation procedures. Mr. Godfrey coordinates and performs all aspects of leak detection in Texas water systems ranging in size from municipal utility districts to large rural water systems. Prior to opening SAMCO, he was employed by the Lower Colorado River Authority and served as Leak Detection Program Coordinator for fourteen years. Mr. Godfrey presently serves on the Texas Water Utility Association Education Committee.

One form of conservation is avoiding the loss of already usable water through the distribution system. This requires a total system audit, to identify the unaccounted-for water and its value. Sam reminds us that water is liquid money. Conducting a leak detection audit requires: Accounting for all water that is produced (by metering all water); Testing all large meters; Performing an assessment of customer meters; Auditing accountability records; and Inspecting the system equipment.

Source meters (large utility meters), if inaccurate, are a big revenue drain. Utilities need to have meter change-out programs – the lifespan of the meters is 10 years or about one million gallons.

For a number of reasons, leaks often do not show themselves by surfacing as noticeable surface water. For example, the pipes can be in sandy or porous soil, or under several layers of road surface. The task of actually locating leaks in a water distribution system requires specialized techniques. Sam uses sound. The sound of water escaping from pipes is the basic tool of acoustic leak detection, but making use of that tool requires both quality equipment and a skilled, experienced technician to be able to pinpoint the location of a leak. Exactly locating leaks is necessary because you don't want to be digging lots of holes in order to fix the problem, especially when having to go through asphalt or concrete. The acoustic equipment would be used to listen at all service connections at a meter box, in order to find small leaks (that could become big leaks in time) and even hear leak sounds on plastic pipe material that does not resonate well. Listening at fire hydrants is also necessary, not only to find leak sounds in the system, but also to check for leaks in the hydrants themselves. When the hydrant has a leak sound, it has to be flushed and reseated in order to tell if repairs are necessary.

Finding leaks in rural and remote areas is another matter. Some techniques are: visual inspection of lines (on foot), testing unusual standing water for chlorine or fluoride, investigating indicative vegetation (like cattails or unusually green) near water lines. Leak detection can also identify instances of water theft and, if used preventively, avoid emergency repairs with their associated water loss, damage to property, and lawsuits.

<u>The Right of Capture: Rethinking Groundwater Law</u>
Moderator: Dr. Melanie Barnes, League of Women Voters of Lubbock

Dr. Melanie Barnes has been a member of the League of Women Voters of Lubbock since 1984, serving as President in 1993-94. She has been a research associate in the Department of Geosciences at Texas Tech University since 1989. For eight years Dr. Barnes has been a member and co-chairperson of the

Texas Commission on Environmental Quality's Pollution Prevention Advisory Committee. Dr. Barnes is a two-year member and chair-elect of the Geological Society of America's Public Policy Committee. She earned an M.S. in Geology from the University of Oregon in Eugene, Oregon, and a Ph.D. in Geology from Texas Tech.

Presenter: Ronald Kaiser, Institute of Renewable Resources, Texas A&M University – "Deep Trouble: Aquifer Depletion and Its Impact on Rural Texas"

Ronald (Ron) Kaiser is a professor of water policy and law in the Institute of Renewable Natural Resources and the Department of Recreation, Park and Tourism Sciences at Texas A&M University. He has degrees in natural resource economics, park and recreation management, and law and jurisprudence. Dr. Kaiser is the author of A Handbook of Texas Water Law *published by the Texas Water Resources Institute at Texas A&M University. He has published numerous journal articles on water law and policy. His current research focuses on water rights, water marketing, environmental flows, water conservation and groundwater management. He is especially interested in the social, economic, and environmental impacts of water marketing and the impacts of water management on Texas.*

The greatest threat to rural Texas is the "rule of capture" that governs groundwater in the state.

As of 2002 groundwater, which is governed by the rule of capture, accounted for 57% (9.4 million acre feet) of the water used in Texas. The breakdown of groundwater use was 80% agricultural, 15% municipal, and 5% other uses. Surface water, which is generally allocated by state permits, accounted for 43% (7.1 million acre feet) of water used in Texas. The breakdown of surface water use was 35% agricultural and 65% municipal/industrial.

The amount of water pumped and recharged varied considerably by aquifer.

WATER USE BY AQUIFER

AQUIFER	Estimated Pumping	Estimated Recharge
Ogallala	6,200,000 AF	300,000 AF
Edwards	730,000 AF	1,200,000 AF
Carrizo	500,000 AF	645,000 AF
Trinity	200,000 AF	100,000 AF
Gulf Coast	1,150,000 AF	1,230,000 AF
Bolsum	400,000 AF	430,000 AF
All Others	220,000 AF	200,000 AF
TOTAL	9,400,000 AF	4,100,000 AF

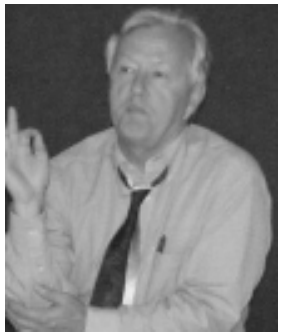
There are a variety of water issues facing Texas today: droughts and how to respond to them, interbasin transfers, proposed reservoirs (cost and consequences), environmental water needs, desalination (where, cost, who pays), and funding, and groundwater issues and the fate of rural Texas. Groundwater issues facing the state include aquifer over-pumping (and consequent interference with other wells, and aquifer mining), aquifer sustainability, groundwater sales & exporting (rural to urban), aquifers as drought hedges, private property rights and the rule of capture, the impact of groundwater management on rural Texas, and now the controversy of proposed leases of water under State-owned lands by the General Land Office (GLO).

The judicial response to groundwater issues has been to keep the rule of capture. This rule, as set forth by the courts, says that Texas landowners can pump unlimited quantities of water from beneath their land, without liability for harm to surrounding landowner wells. There are some judicial and legislative exceptions to this rule: no malice or waste, regulation to control land subsidence from negligent pumping, no slant well drilling, no underflow of a river, and some regulation of groundwater pumping in areas covered by groundwater conservation districts (GCDs).

There are many consequences resulting from the rule of capture, almost all of them negative. The rule of capture provides no protection from well interference (the biggest pump wins), encourages aquifer mining, encourages rural to urban transfers (which is a threat to rural Texas), provides only limited public input into decisions about transfers, provides no incentives to conserve water, does not really protect private property rights, provides no consideration for community impacts of pumping, and fosters political discord and balkanization among regions. Potentially it does provide money to landowners willing to sell or lease their water.

The response of the Legislature to groundwater management issues has been to create groundwater districts: "let the locals figure it out." State action is a last resort, potentially creating GCDs in areas designated as priority groundwater management study areas (PGMAs) if local districts are not created.

There are now over 80 GCDs in the state. Their mandated duties include the preparation and adoption of a groundwater management plan for groundwater sources in the area they cover, keeping records of wells and water use, registering certain wells, and adopting governance rules. At their option they can exempt all wells from registration, set limits on well spacing and pumping, buy and sell water themselves, and/or require permits for transfer of groundwater to locations out of the district.



GCDs have numerous advantages. They provide local control and regulation, modify the rule of capture (there is some disagreement over this), determine the level of regulation they want to adopt for their area (including opting for minimum regulations), provide an avenue for local influence on decisions, encourage citizens to work together, and avoid dreaded state regulation. The Legislature has deemed them to be the preferred method of groundwater management in Texas, and the 80+ GCDs offer widespread coverage of groundwater sources in the state.

There are disadvantages to GCDs as well, however. There is little management and regulatory uniformity. Many districts are over parts of the same aquifer, making unified management difficult. There is limited political will to make hard choices ("don't regulate me, do it to others). GCD decisions can divide communities and groups. GCDs have limited funding. Locals pay regulatory costs to solve state groundwater problems, and locals have to pay litigation expenses if a GCD is taken to

court. Aquifer mining continues in some areas despite GCDs. GCDs cannot prevent water exportation. This last disadvantage is taking on greater importance as proposed groundwater sales, leases, and exports are increasing in number.

Several trends in groundwater management are evident today. There is more pressure on GCDs to regulate groundwater. Political and legal strife over groundwater has increased. Rural to urban water transactions continue to occur. The rural-urban water transfer is happening for several reasons: groundwater is a source of water for cities in times of drought, political power and legislative representation has shifted to the cities as the population became more urban, groundwater is relatively inexpensive water for cities, cities are able to pay money to landowners for their water; the water is good quality, the "junior water rights" provision in state surface water law is seen as limiting surface water transfers, and there is surplus groundwater in some aquifers such as the Gulf Coast and Carrizo-Wilcox aquifers.

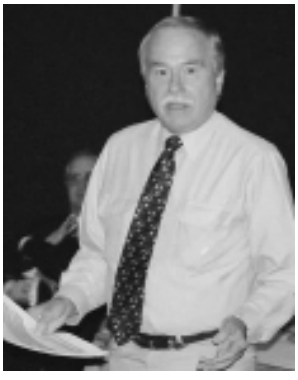
A few points to ponder in thinking about how to advance groundwater management in Texas include the following possible changes:

- State aquifer wide sustainability standards based on safe yield.
- Uniform depletion rates for non-recharging aquifers (i.e., time frame and amount remaining).
- Water exportation based on aquifer safe yield to maintain sustainability.
- Modify the rule of capture for cases involving interference with domestic wells and follow the "reasonable use" or "correlative rights" concepts.
- Regarding leasing of water on GLO lands – require a benefit and impact analysis to be performed for any such lease.

Response Panel:

Tom Beard, Rancher and President, Leoncita Cattle Company

Tom Beard is a sixth generation Texas rancher. He currently serves as Chairman of the Texas Building and Procurement Commission. He is also Chairman of the Far West Texas Planning Group and the Brewster County Groundwater Conservation District. Mr. Beard's business interests include Leoncita Cattle Company, Leoncita Land Company, Rio Grande Broadcasting Company, and Beard & Beard. Mr. Beard has been Chairman of the Federal Reserve Bank of Dallas, El Paso Branch; Presidnet of Texas and Southwestern Cattle Raisers Association, and Chairman of the Executive Committee of the Cattlemen's Beef Promotion and Research Board. He has also been an officer of the National Cattlemen's Association, the National Cattlemen's Beef Association, and the Independent Cattlemen's Association. A graduate of Yale University (B.A.) and the University of Texas at Austin (J.D.), Mr. Beard is also an attorney.



Here's what the "rule of capture" means: "I have the right to take all my damn water and to take all your damn water, and there's not a damn thing you can do about it."

There is no "rule of capture" in our water statutes. It's part of the common law, as stated by the courts. The only part of the Texas Water Code that speaks to ownership of groundwater is Section 36.002. That section says "The ownership and rights of the owners of the land and his lessees and assigns in groundwater are hereby recognized, and nothing in this code shall be construed as depriving or divesting the owners or lessees and assigns of the ownership or rights, except as those rights my be limited or altered by rules promulgated by a district."

Changes need to me made in groundwater law in Texas, but change is difficult and takes time. With the Texas Legislature it's hard to get to conception, much less gestation. A simple change to Section 36.002 would make a big difference, however. Why not add these words to that section: "except in so far that you use so damn much water you're going to harm your neighbor." This is the concept of "correlative rights." All that means is applying the Golden Rule to groundwater rights. If you're concerned that this will be the "Lawyers' Full Employment Act," you can put some limitations on this right.

Mary Kelly, Environmental Defense

Mary Kelly is Senior Attorney and Program Director for U.S./Mexico Border Initiatives at Environmental Defense. Prior to joining Environmental Defense in 2002 she was the Executive Director of the Texas Center for Policy Studies for 12 years. Before that she was an attorney in private practice representing citizen groups, landowners, and local governments in environmental matters. Ms. Kelly has a B.S. in Chemical Engineering and obtained her law degree from the University of Texas. She has researched and published widely on Texas/Mexico water issues.

The right of capture in groundwater management is central to the issue that has arisen in West Texas in the past few weeks as the public has become aware that the Texas General Land Office (GLO), through the School Land Board, is beginning to negotiate leases with private entities for the rights to pump and commercially sell groundwater from state lands. These efforts appear to be particularly advanced in West Texas, but the GLO is considering this prospect in other parts of the state as well.

Environmental Defense and our partner organizations in the Texas Living Waters Project believe such negotiations are extremely premature and should be put on hold until the Texas Legislature has an opportunity to establish a clear framework for water leases for state lands. Such water transactions pose serious public policy issues because pumping water from a state-owned parcel can drain water from adjacent non-state lands and/or affect the entire aquifer upon which other users depend.

The proposed water sales/leases are not similar to oil leases on state lands since oil and gas extraction is a highly regulated activity, with clear limitations to prevent prejudice to adjacent owners' rights. That is not the case for groundwater where the rule of capture applies outside of groundwater districts.

Environmental Defense, National Wildlife Federation, and the Sierra Club have written a letter (included in the conference packet) to the state leadership asking them to prevail upon the GLO to put a moratorium on leasing or selling groundwater rights to private entities for commercial sales until the next regular session of the Legislature can adopt a framework that includes, at a very minimum:

(1) full advance public disclosure of any proposal to lease or sell groundwater from state lands, including advance notice to regional water planning groups and adjacent landowners;

(2) a requirement that major state water sales be consistent with approved regional and state water plans;

(3) clear statutory language requiring that pumping from state lands be subject to the rules of local groundwater districts, including any pumping limits imposed by the district;

(4) if the local groundwater district has not had sufficient funding to determine the sustainable pumping limits for an aquifer, a requirement that prior to approving any leases, GLO fund such a study, by an indepen-

dent consultant, and that the local groundwater district enact a district-wide cap based on the results of the study;

(5) no major sales/leases allowed in areas without groundwater districts;

(6) a requirement that the end customers receiving the water must have implemented the greatest practicable degree of conservation; and

(7) a requirement that the pumping not result in harm to the environment.

The public interest clearly requires that the Legislature closely examine the risks and benefits of leasing or selling groundwater rights from state lands to private entities. It should not be done behind closed doors on a case-by-case basis, as is occurring now, and it is not a policy decision that should rest in the hands of one agency.

Harvey Everheart, Mesa Underground Water Conservation District

Harvey Everheart is General Manager of the Mesa Underground Water Conservation District. A native of Dawson County, Mr. Everheart received a B.S. degree at Tarleton State University in 1965. As the current president of Texas Alliance of Groundwater Districts, member of Region O Planning Group, and a board member of the Texas Water Conservation Association, he has been involved in the work put forth on the omnibus Senate Bill 1 and the most recent Senate Bill 2. Harvey also serves on the State Drought Preparedness Council and the Texas Water Monitoring Council.

The Texas Supreme Court adopted the English "rule of capture" in the case of *Houston & T.C. Railroad Company vs. East* in 1904. The three basic concepts involved in the rule of capture are as follows:

- A person who owns the surface may dig therein.
- Apply all that is found for his own purpose and his free will and pleasure.
- And, if in exercising such right, he intercepts or drains off from underground springs in his adjoining landowner's well, this inconvenience results in an injury without a remedy (damnum absque injuria) - TOUGH LUCK!

The rule of capture is a liability/tort rule. No liability should arise for activities on one's own land. In the two cases that dealt with the rule of capture that went to the Texas Supreme Court (*East* in 1904, and Sipriano in 1999) two things were clear: little guys do not win, and it's the rule of the best lawyer.

In those areas with a groundwater conservation district (GCD), however, what we really have is not the "Rule of Capture" but the "Rule of District." The voters of Texas ratified the "Conservation Amendment" (Section 59, Article XVI) to the Texas Constitution in 1917, granting the Legislature the powers and duties necessary to conserve water and other natural resources. In 1951 the Legislature enabled the establishment of GCDs. These districts now operate primarily under Section 36 of the Texas Water Code. The current language in Sec. 36.101 of the Water Code, dealing with the rulemaking power of GCDs says a GCD "may make and enforce rules limiting groundwater production based on tract size or the spacing of wells…." Several other sections of Chapter 36 further delineate how the district may carry out this power.

Consider, then, the differences between the original "rule of capture" and what we have now in the "rule of district" where GCDs exist:

Rule of Capture **Rule of District**

That the person who owns the surface may dig therein. 36.002. Ownership of Groundwater. The ownership and rights of the owners of the land and his lessees and assigns in groundwater are hereby recognized, and nothing in this code shall be construed as depriving or divesting the owners or lessees and assigns of the ownership or rights, **except as those rights may be limited or altered by** rules promulgated by a district. Apply ALL that is there found to his own purpose at his FREE WILL and PLEASURE! 36.101. Rule making power. 36.113. Permits for wells 36.115. Drilling or Altering Well without a Permit 36.116. Regulation of Spacing and Production 36.122. Transfer of Groundwater out of District 36.123. Right to Enter Land
And if in exercising this RIGHT… 36.015. Purpose In order to provide for the conservation, preservation, protection, recharging, and prevention of waste of groundwater, and of groundwater reservoirs or their subdivisions, and to control subsidence caused by withdrawal of water form those groundwater reservoirs or their subdivisions, consistent with the objectives of Section 59, Article XVI, Texas Constitution, groundwater conservation districts may be created as provided by this chapter. Groundwater conservation districts created as provided by this chapter are the state's preferred method of groundwater management **through rules developed, adopted, and promulgated by a district in accordance with the provisions of this chapter.** He intercepts or drains off the water collected form underground springs in his neighbor's well, this inconvenience to his neighbor falls within the description of "damnum absque injuna" [an injury without remedy], which cannot become the ground of an action. The "Rule of Capture" only applies in the jurisdiction of a GCD whenever the "Rule of District" has been followed. Failure to follow the rules promulgated by the district cause 36.119(c) come into play and the aggrieved party may sue for damages. Sec. 36.119 says that "The aggrieve party may also sue for damages for injuries suffered by reason of the illegal operation and for other relief to which they may be entitled. In a suite for damages, the existence or operation of a well in violation of the rules of the district is prima facie evidence of illegal drainage."

Thus, the existence of a GCD alters the application of the rule of capture.

<u>Hot Groundwater Topics</u>
Moderator: Laura Brock, Environmental Defense

Laura Brock is a Water Analyst for Environmental Defense. Laura's areas of expertise include water policy issues across the state with an emphasis in groundwater management, and growth and development issues as they relate to water availability. She has a technical background in hydrogeology and a policy background from her tenure at the Texas Center for Policy Studies. Laura earned a B.A. in Geological Sciences from the University of Texas at Austin and an M.A. in applied Geography from Southwest Texas State University.

Michael Fahy, El Paso Water Utilities
"Brackish Water Desalination"

Michael (Mike) Fahy is the Strategic Development Manager with El Paso Water Utilities (EPWU) in El Paso. Mr. Fahy earned a B.S. in Geological Engineering from the University of Missouri at Rolla in 1973. He has been with EPWU since 1994. Prior to coming to El Paso he worked for utility companies and consulting firms in Colorado, California, New Mexico, and Kansas – gaining experience in water resource projects in several areas. Mr. Fahy's present responsibilities include forecasting water demands and water rights requirements, managing EPWU's groundwater development functions, including numerical modeling and developing programs to acquire additional surface and groundwater to meet the projected needs of EPWU.

Fort Bliss, a U.S. Army installation located in El Paso, and El Paso Water Utilities (EPWU) are participating in a Joint Desalination Project for the desalination of brackish groundwater. There are a number of common benefits of the Joint Desalination Facilities (JDF) being developed:

- They provide an additional resource for supply management;
- Ft. Bliss and EPWU wells are held in reserve for drought protection emergencies;
- They promote confidence in a reliable water supply;
- They significantly reduce redundant infrastructure facilities and costs.

Several facilities are included in the project. Fifteen groundwater source wells will be rehabilitated, providing 18.5 million gallons daily (MGD). Sixteen new blend wells will be constructed with a capacity to provide 12 MGD. The Project will include a Reverse Osmosis (RO) desalination plant producing 15.5 MGD of treated water, brine disposal facilities, and pipelines for collection, transmission, and brine disposal. Finally, a Water Resources Learning Center (100% EPWU funded) will be established.

Brine disposal will be done through an injection well into deep underground formations. Pending activities for the brine disposal part of the project are the drilling and testing of a pilot hole and preparation and submittal of a TCEQ permit application for the injection. The permit application will go through the TCEQ review process. Once the permit is issued and the plant is operating, full-scale injection will begin.

An Environmental Impact Statement is being prepared for the Joint Project. A notice of intent (NOI) to prepare an EIS was filed in September (2003). A public scooping meeting was held this month (October 2003). A draft EIS is scheduled to be generated by March 2004, with a public comment meeting in either March or April 2004. The final EIS is to be finished by August 2004, and the Record of Decision (ROD) is to be signed in October 2004, with construction to begin around December 2004.

The estimated cost of the Project is $67 million. That includes $12 million for the blend wells, $4.5 million for the supply wells, $14.5 million for the pipelines, $25 million for the desalination plant, and $11 million for brine disposal (by wells).

Robert Mace, Texas Water Development Board
"Groundwater Availability"

Robert Mace, Ph.D., is the leader of the Groundwater Resources Division at the Texas Water Development Board. He has a B.S. in Geophysics and an M.S. in Hydrology from the New Mexico Institute of Mining and Technology and a Ph.D. in Hydrogeology from The University of Texas at Austin. He worked as a staff hydrogeologist at the Bureau of Economic Geology before joining the TWDB. Dr. Mace has been involved with a number of groundwater modeling and water resources studies and currently oversees efforts to collect and disseminate groundwater information on the state's aquifers, assist groundwater conservation districts, and develop groundwater availability models for the major and minor aquifers in Texas.

There are nine major aquifers in Texas: the Ogallalla, Gulf Coast, Edwards, Carrizo-Wilcox, Trinity, Edwards-Trinity (Plateau), Seymour, Hueco-Mesilla Bolson, and Cenozoic Pecos Alluvium. Major aquifers are large, regional aquifers that are capable of producing large amounts of water. In addition there are 21 minor aquifers in the state. Minor aquifers tend to be smaller and produce less water.

The Texas Legislature has given the Texas Water Development Board (TWDB) the responsibility of determining the availability of groundwater in these aquifers. "Like beauty, groundwater availability is in the eye of the beholder." The determination of groundwater availability is mainly a policy question because it involves decisions about how the groundwater is to be managed.

Groundwater Availability Models (GAMs), numerical groundwater models, are being developed by TWDB for the major and minor aquifers. The purpose of the GAMs is to develop tools that can be used to help groundwater conservation districts, regional water planning groups, and others to assess the contribution that groundwater may make to meeting an area's water supply needs and how to manage that resource accordingly.

What is a numerical groundwater model – a GAM? Essentially it's "an aquifer in a computer." The model can be used to predict water levels and flows in response to pumping and drought and the effects of well fields. The data in a GAM includes such items as water in storage, recharge estimates, and hydraulic properties.

A number of GAMs for the major aquifers have been completed. Others are in various stages of development or review. There are some interesting findings in the GAMs that have been completed thus far. For example, in the southern Ogallalla there are some areas where the water levels are going back up or at least will be up by 2050 as a result of declines or anticipated declines in the amount of agricultural irrigation water use.

Additional information about the GAMs and the status of GAMS for different aquifers may be found on the TWDB website at http://www.twdb.state.tx.us/gam.

Stefan Schuster, Freese & Nichols
"Groundwater Transport"

Stefan Schuster has worked for Freese and Nichols, Inc. for a little over a year heading up the Water Resources Planning Group out of Austin. Prior to joining the private sector, he worked as a project manager for TWDB on SB 1 regional water planning and for TCEQ developing the initial criteria for the WAM process. Mr. Schuster also worked for the Barton Springs/Edwards Aquifer Conservation District in Austin and several years as a self-employed consultant working on groundwater issues in Texas. Mr. Schuster has two M.S. degrees (one in Hydrology and one in Community and Regional Planning) and a B.S. in Geophysics, all from the University of Texas at Austin. He was born and raised in Hamburg, Germany and became a U.S. citizen in 1996.

Groundwater transport as the term is used here refers to transfer from a source aquifer to a remote demand. It involves the "export" of local groundwater supplies to another area to meet water demands in that area. There are limited rules controlling the transfer or export of groundwater out of an area, even if that area is in a groundwater conservation district.

In Texas 159 counties depend on groundwater for 40% or more of their water needs. North Central Texas is the one region of the state that does not have any significant reliance on groundwater to meet its needs.

There are a number of existing groundwater transfers in the state, including projects involving the Canadian River Municipal Water Authority, the Colorado River Municipal Water District, and the City of Lubbock.

A number of additional groundwater transfers have been proposed, including transfers from Burleson County and Kinney County and transfers to El Paso. The San Antonio Water System is working on several projects that would involve groundwater transfer, at least in part. These include the Alcoa project, Gonzalez County, the Colorado River Project, and the Guadalupe River Project. Another controversial proposed transfer is the Mesa Water Company in Roberts County – in which Boone Pickens is involved. Several possible end customers for this water have been discussed (as far away as El Paso, Dallas, and San Antonio), but it might ultimately go to a Panhandle city such as Lubbock.

What are the concerns about groundwater transport? The major concerns about groundwater transport include the following:

- equity to the local community;
- economic and social costs;
- transfer of a water resources out a region;
- limitations of groundwater conservation district rules governing exports;
- effect on private property rights (the rights to water of landowners in the region from which the water is being exported); and
- the export of a water supply.

What are the benefits of groundwater transport? The transport may provide needed water supplies to a region. Groundwater transport is often an economical water supply option (compared to other possible supply alternatives such as reservoir construction). Sale or lease of groundwater may provide income for a private property owner. The transport issue is bringing about regulatory changes in groundwater management.

Ken Kramer, Lone Star Chapter, Sierra Club
"Wrap Up"

Everyone is encouraged to take the "Principles for Protecting Texas' Water Resources" found in the conference packet and get endorsements from their local governments and/or community organizations and send those endorsements to the Texas Living Waters Project in order to demonstrate widespread public support for sound water policies. The Sierra Club and the Texas Living Waters Project will endeavor to keep everyone informed about activities on the water issue and inform people of opportunities to provide input on actions to be taken by water decision-makers.