12.0 Socioeconomic Impacts

Key Finding **If the State does not ensure that there is enough water to meet projected needs, models project that there will be 7.4 million fewer jobs, 13.8 million fewer people, and 38 percent less income Statewide in 2050.**

If a need for water is not met, there are social and economic impacts to a region and the State. For example, if a city does not have enough water to meet its needs, industry and people are not likely to move to that city. Existing industry may relocate to an area with more resources, taking employees and their dollars with them. If water for irrigation is insufficient, farmers may have to grow less profitable crops or stop farming altogether. These examples have direct impacts (fewer people, less industry, less farming) and indirect impacts (less spending, fewer needed services, fewer farm equipment purchases) on the local, regional, and State economy. Estimating these direct and indirect socioeconomic impacts is important for understanding the cost to the State when there is not enough water to meet needs.

12.1 Estimating Socioeconomic Impacts

The Planning Groups estimated the potential socioeconomic impacts of not meeting water needs in their regions. To do so, they used an analysis developed by the TWDB that estimates direct and indirect socioeconomic impacts of water. The TWDB used economic models to estimate direct and indirect economic benefits of water for residential, commercial, steam-electric power generation, mining, irrigation, livestock, and manufacturing uses for each region. The economic benefit of water was then used to calculate the economic loss when water could not be provided for a future use.

Direct impacts per acre-foot of water were estimated by taking the total economic benefit of a water use and dividing it by the amount of water used to attain that economic benefit. Economic benefit is measured in terms of product sales to final consumption, including exports, but excluding those sales that are used as inputs in the production of a different product in the region. For example, if a farmer sells his crop for $1,000,000 after using 10,000 acre-feet of water to grow that crop, and 75 percent of the region's crop sales go to final consumption, the direct economic benefit is $75 per acre-foot of water ($1,000,000 multiplied by 75 percent divided by 10,000 acre-feet). Direct economic benefit per acre-foot of water for each region was calculated for each water use except manufacturing (Table 12-1). For manufacturing, the direct economic benefit per acre-foot was calculated for different manufacturing uses at a Statewide level (Table 12-2) and then proportioned to each county according to the total manufacturing water use in the county.

The total economic impact of water is the sum of direct and indirect economic impacts. The indirect economic impact is considered in the economic multiplier (Table 12-3). The economic multiplier is the ratio of the direct and indirect economic impacts to the direct economic impact and depends on how much a region imports and exports. The total economic impact can be estimated when the economic multiplier is multiplied by the direct economic impact. For example, if the direct economic impact is $100 per acre-foot of water and the economic multiplier is 2.2, the total economic impact is $220 per acre-foot of water ($100 per acre-foot multiplied by 2.2).

Table 12-1. Direct economic benefit per acre-foot of water for different water uses in the regions (based on 1995 economic benefits and shown in 1999 dollars).

Region	Residential	Commercial	Steam-Electric	Mining	Irrigation	Livestock
A	34,946	122,096	65,348	12,698	298	33,748
B	55,738	160,682	7,650	14,919	338	10,913
C	47,900	148,779	35,012	21,029	467	1,950
D	50,653	176,674	8,867	35,447	111	16,503
E	25,228	218,148	61,636	12,144	161	1,627
F	34,437	193,356	15,459	10,643	187	16,734
G	41,856	240,578	11,358	9,109	317	11,907
H	46,852	246,079	36,670	24,352	115	2,009
I	47,079	162,198	16,407	44,021	116	1,737
J	41,308	141,557	0	9,613	186	13,379
K	41,328	207,736	1,456	8,311	160	1,927
L	39,514	335,305	6,501	5,786	121	13,356
M	28,414	153,365	28,535	3,666	283	8,839
N	51,988	123,361	64,854	10,673	90	1,109
O	34,771	208,509	11,744	18,792	169	31,986
P	54,258	188,221	0	33,665	179	9,268

Table 12-2. Direct economic benefit per acre-foot of water for different manufacturing water uses in the State (based on 1995 economic benefits and shown in 1999 dollars).

Water use	Economic benefit per acre-foot
Paper	13,838
Chemicals	44,154
Petroleum refining	83,692
Primary metals	46,855
Nondurable goods	127,139
Durable goods	397,629

The TWDB also calculated multipliers for income and employment. The income multiplier represents the fraction of the direct impact that ends up as wage and salary income and income to business owners (Table 12-3). The employment multiplier measures the number of jobs in full-time equivalents that result from using the water (Table 12-3). The impact from decreased employment on population was then estimated on the basis of the fundamental assumption of not meeting water needs.

Table 12-3. Economic output, income, and employment multipliers (based on 1995 economic benefits and shown in 1999 dollars).

Water use	Economic output multiplier (per dollar of direct impact)	Income multiplier (per dollar of direct impact)	FTE employment multiplier (per million dollars of output)
Livestock	2.256	0.534	26.990
Irrigation	2.118	0.538	36.688
Mining	1.711	0.416	9.881
Manufacturing	2.365	0.654	17.109
Steam-electric	1.624	0.452	8.692
Commercial	2.194	0.951	30.924
Residential	1.246	0.322	11.528

Economic output multiplier—the ratio of direct and indirect economic impacts to direct economic impacts
Income multiplier—the fraction of direct impact that ends up as wage and salary income and income to business owners
FTE (full-time equivalent) employment multiplier—the number of jobs in full-time equivalents that result from using the water

12.2 Impacts of Not Meeting Water Needs

Total water demand for the State under drought-of-record conditions is projected to increase from 16.9 million acre-feet in 2000 to 20 million acre-feet in 2050. Under the same conditions, water needs will increase from 2.4 million acre-feet in 2000 to 7.5 million acre-feet by 2050. This means that if no new supplies are developed, the State will be able to supply only 62.5 percent of projected water demands in time of drought in 2050. To assess the socioeconomic impacts of not meeting needs, the Planning Groups compared two scenarios: one where all water needs are met and another where water needs are not met.

If the State does not implement plans to ensure that there is enough water, model projections show that there will be 1.9 million fewer jobs in 2010, 4.8 million fewer jobs in 2030, and 7.4 million fewer jobs in 2050. Population growth would be affected by fewer jobs, with 3.8 million fewer people in 2010, 9.1 million fewer people in 2030, and 13.8 million fewer people in 2050. Income to the population is projected to be reduced by about 16 percent ($62 billion) in 2010, about 30 percent ($155 billion) in 2030, and about 38 percent ($238 billion) in 2050.

Agriculture accounts for more than 80 percent of total water needs in 2000 and slightly less than 40 percent in 2050. The economic impact of not meeting agricultural needs is small on the Statewide economy but large for local economies. Municipal needs increase from about 10 percent of total needs in 2000 to about 40 percent in 2050, and account for 60 to 70 percent of the total economic impact to the State.

13.0 Status of Water Availability Modeling

Key Finding **Water availability models of the State's river basins are expected to be completed by December 2001, and groundwater availability models of the State's major aquifers are scheduled for completion in September 2004.**

Texas is developing new, state-of-the-art computer models of surface water and groundwater resources. These new models are important tools for estimating the amount of water available to the citizens of Texas for the next 50 years. In 1997, the Legislature directed the TNRCC to develop water availability models for the major river basins except the Rio Grande Basin. In 1999, the Legislature provided initial funding for development of groundwater availability models for the major aquifers. The 2001 Texas Legislature directed the TWDB to develop groundwater availability models for the minor aquifers and the TNRCC to develop a water availability model for the Rio Grande. The status of these modeling efforts is described below.

13.1 Groundwater Availability Modeling

The TWDB, its contractors and cooperators, the Edwards Aquifer Authority, and the U.S. Geological Survey (USGS) are developing groundwater availability models of the major aquifers of the State. This effort will result in 17 models of the 9 major aquifers (Figure 13-1). Of these, 4 models have been completed, 10 models are currently under construction, and work on 3 models is planned to begin in 2002. Models of the Trinity aquifer in the Hill Country (developed by the TWDB), the north part of the Ogallala aquifer (developed by the Panhandle Planning Group), and the Barton Springs segment of the Edwards aquifer (developed by the Lower Colorado Planning Group) have been completed and are available at the TWDB Web site. The USGS expects to release the model and a final report of the Hueco Bolson aquifer at the end of 2001.

Models currently under development by the TWDB and its contractors include the south part of the Ogallala aquifer; the north, central, and south parts of the Carrizo-Wilcox aquifer; the north, central, and south parts of the Gulf Coast aquifer; the Edwards-Trinity Plateau aquifer; and the north segment of the Edwards aquifer. The model of the north part of the Gulf Coast aquifer is being developed by the USGS in cooperation with the TWDB, the Harris-Galveston and Fort Bend subsidence districts, and the City of Houston. The Edwards Aquifer Authority, in cooperation with the USGS, is developing a new model of the San Antonio segment of the Edwards aquifer. The TWDB plans to begin work on models of the Seymour, Cenozoic Pecos Alluvium, and the north part of the Trinity aquifers in fall 2002. All current and planned modeling of major aquifers are expected to be completed by September 2004.

A critical element of groundwater availability modeling is stakeholder participation. The TWDB assembled a technical advisory group of technical and policy experts to discuss the requirements and standards for modeling. External reviews of proposals and qualifications for contracted models were solicited from Planning Groups, groundwater conservation districts, and other State agencies. Each of the modeling projects has quarterly stakeholder advisory forums for the modeling teams to review progress and receive comments. Stakeholder advisory forums are open to anyone interested in the modeling process.

Planning Groups and groundwater conservation districts will use the models to assess availability of groundwater in the areas or regions. These assessments will be based on the socioeconomic needs of their

areas and may be guided by groundwater management standards that describe the desired future condition of the aquifer, such as the quantity and quality of groundwater and the amount of springflow, baseflow, and subsidence.

Final reports, models, and aquifer information will be posted on the TWDB Web page (www.twdb.state.tx.us/gam).

13.2 Surface Water Availability Modeling

Senate Bill 1 required the TNRCC to develop water availability models for 22 of the 23 river basins in Texas. The TNRCC has hired contractors to develop modeling protocols, as well as the models, which were projected for completion by the end of 2001. These efforts have been coordinated with staff from the TPWD, TDA, and TWDB.

Regions C and North East Texas extracted monthly naturalized and regulated streamflows from the Sulphur River basin model and input the results into the TWDB daily reservoir operation model to calculate firm yields for the Marvin Nichols I proposed reservoir. The South Central Texas Region used the Guadalupe-San Antonio River basin model. The Coastal Bend Region used the Nueces model to calculate surface water availability for part of the region.

The Rio Grande basin was not included in Senate Bill 1 but was included in Senate Bill 76 of the 76th Legislative session, with a designated appropriation in the 77th Legislative session. The TNRCC will produce a model of the Rio Grande basin during the next planning cycle.

The water availability modeling program is used by the TNRCC for surface water rights permitting purposes and by the TWDB, TPWD, and planning groups for water planning purposes. Each water availability model includes basin water rights and hydrological data, GIS watershed graphic programs, a Water Rights Analysis Package (WRAP), and some supplementary programs.

WRAP, part of the water availability model, is a monthly water budget program. It allocates water availability for water rights according to the seniority of the rights. WRAP utilizes “naturalized” historical flow information as a basis for analysis. Naturalized flow means the estimated flow without any human interference. It can be estimated only from recorded river flows coupled with water use and return flow data.

Two major functions of WRAP are the calculation of the firm yield of a water supply reservoir and estimation of the reliability of water rights. Firm yield is defined as the maximum water volume a reservoir can provide each year under a repeat of the most severe historical drought condition. The WRAP tracks usable reservoir storage for the historical period and picks the lowest storage as the firm yield. Therefore, firm yield is more of a measure of water supply capability than a guarantee of availability.

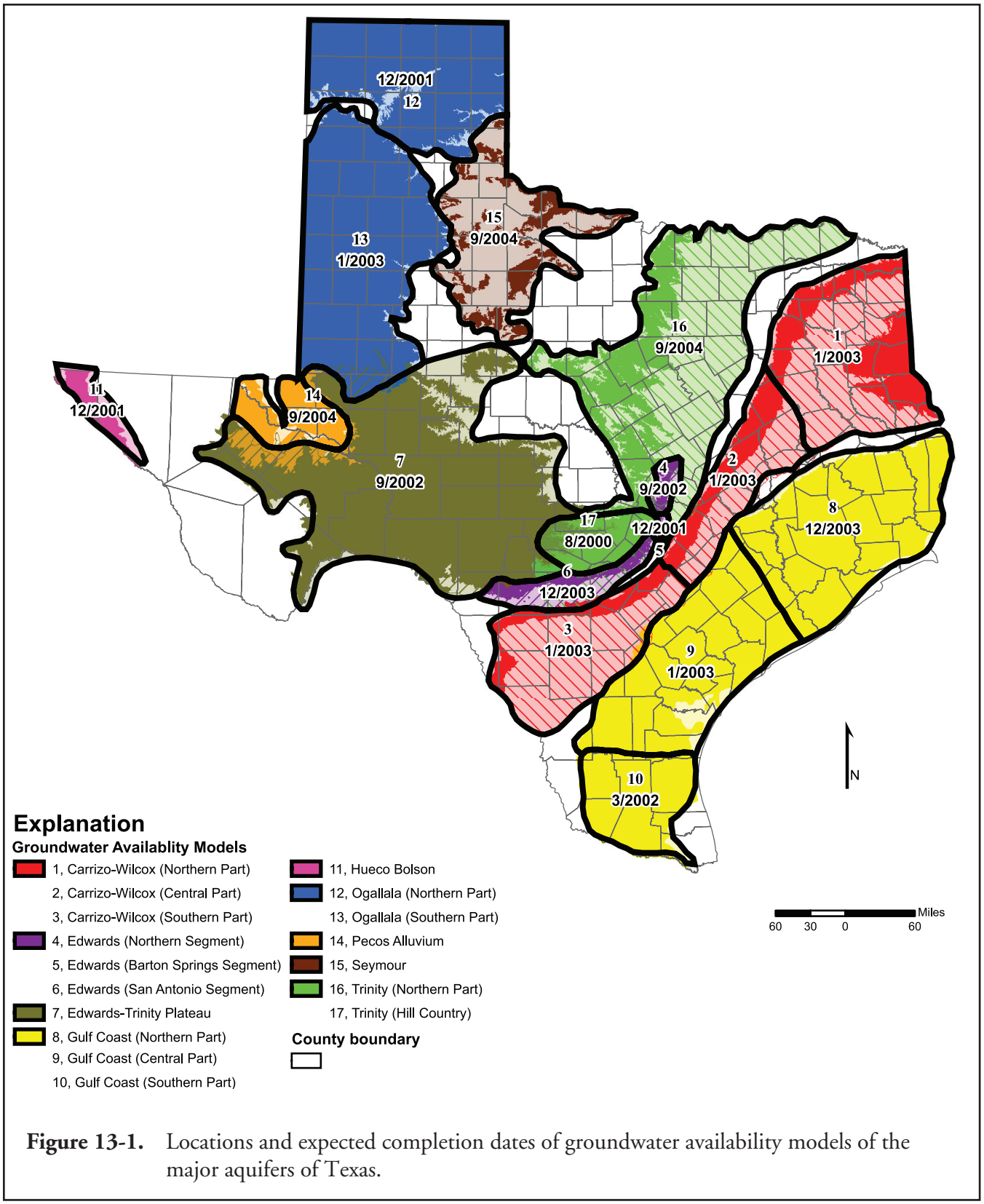

Figure 13-1. Locations and expected completion dates of groundwater availability models of the major aquifers of Texas.

14.0 Policy Recommendations

In Texas, decisions on water resource development, such as preferred water supply options, planning and design, and method of financing, occur at the local level. One goal of the State Water Plan is to bring together often disparate interests to identify policy issues and recommendations that improve the process of managing the State's water resources in order to meet near- and long-term needs.

Policy recommendations included in the 2002 State Water Plan are the result of a two-tiered process beginning in the fall of 2000 and ending in January 2002. The first set of recommendations is one provided by the Planning Groups to the Legislature and the TWDB at the end of the first round of regional water planning.

The second set of recommendations results from a consensus driven, policy development process conducted by the TWDB over a 5-month period by more than 80 stakeholders representing water-related interests throughout the State beginning in May 2001. These policy recommendations represent a collaborative effort to identify policy issues and recommend policy changes. The goal of this policy process was to achieve consensus on the recommendations. In situations where consensus was not reached, levels of agreement and alternative opinions were included in the policy.

14.1 Policy Recommendations from the Planning Groups

Key Finding **The Planning Groups have six common recommendations for the Legislature: (1) to consider allowing the Planning Groups to select alternative water management strategies for water user groups with needs, (2) to continue the planning process, (3) to provide adequate funding for regional water planning, (4) to provide adequate funding for implementing water plan recommendations, (5) to clarify Senate Bill 1 provisions on unique stream segments, and (6)**

Senate Bill 1 allowed the Planning Groups to make policy recommendations to the Legislature about their regional water plans. The recommendations represented regulatory, administrative, or legislative changes that the Planning Groups thought were needed to facilitate the development, management, and conservation of water resources and to prepare for drought.

The TWDB summarized the policy recommendations from the Planning Groups in the *Water for Texas Summary of Regional Water Plans* and presented them to the 2001 Texas Legislature. The common recommendations are again presented here.

Senate Bill 1 required the Planning Groups to develop a regional water plan that had specific provisions for water management strategies for handling a drought-of-record. Many Planning Groups believe that this requirement hampers their ability to make choices and meet the needs of their regions. They also believe that this requirement decreases local control and flexibility. They recommended the Planning Groups be allowed to select alternative water management strategies to meet needs. The TWDB has elected not to revise planning guidelines to address this recommendation. The 77th Texas Legislature also chose not to revise the statutory requirement related to planning in this regard.

The Planning Groups believe that the planning process has been worthwhile and strongly support the grassroots development of water policy for Texas. They believe that it should continue and recommend that the Legislature continue to support the process and the established regions. Continuity is important for the regions as they meet to address changing conditions, serve as communication liaisons with water users, and solve interregional water issues over the long term. The 2001 Texas Legislature, based largely on the broad support of the Planning Groups, continued funding for the regional water planning process.

Adequate funding is key to the success of the regional water planning process. The Planning Groups recommend adequate, continuous funding to improve the collection, monitoring, and dissemination of basic water data. Water data, including groundwater availability information, are critical for regions to accurately identify water needs and appropriate water management strategies. As with the previous recommendation, the 2001 Texas Legislature appropriated funds to make significant progress in addressing this recommendation.

The Planning Groups also recommend that the Legislature provide funds sufficient to implement water management strategies through a loan or grant program or other funding mechanism. During the first planning cycle, the Planning Groups identified a variety of water supply strategies to meet local and regional needs, and they feel that the strategies must now be implemented. Certain water management strategies, such as new reservoir projects, have greater capital costs and environmental challenges than those in the past. This was one of the primary points of focus during deliberations of Senate Bill 2 for the 77th Texas Legislature. Continued funding of the State Participation Program and the approval of a constitutional amendment to increase TWDB funding authorization for water projects in Texas both indicate the Legislature's commitment to addressing this recommendation. However, provisions of Senate Bill 2 require the Planning Groups to provide by 2003 to the Legislature more specific information on the local and regional funding needs and how the local political subdivisions plan to fund these projects.

In Senate Bill 1, the Legislature specifically asked the Planning Groups to consider identifying ecologically unique stream segments for potential designation by the Legislature. The Planning Groups recognize the ecological value of identifying and protecting unique stream segments. However, many found the implications of such a designation unclear. As such, they recommend that the Legislature clarify the definition, implications, and significance of identifying and designating these sites. A few Planning Groups specifically recommend that the Legislature consider the impact of a designation on private property owners and local governmental entities and consider limiting any impact. This issue was clarified in Senate Bill 2 passed by the 77th Texas Legislature.

Many of the Planning Groups believe the State should pay for some of the administrative activities of the regional water planning process, such as reasonable expenses of the Planning Group members, travel expenses of the voluntary Planning Group members, and public-notice requirements. In June of 2001, the TWDB revised funding guidelines to allow for reimbursement of certain administrative costs incurred during the planning efforts.

The Planning Groups provided a total of 340 recommendations on a variety of topics in the regional water plans, including legislative, TWDB rules, and funding suggestions. A detailed summary of the recommendations from the Planning Groups follows. For the complete text of all recommendations from the Planning Groups, see the 16 regional water plans in Volume III.

These recommendations represent the thoughts, needs, and wishes of each Planning Group and address specific legislative and funding recommendations. When grouped by topic, more than 23 different areas of concern were identified on topics ranging from agriculture, conjunctive use, data collection and research, the environment, groundwater availability, interregional water sharing, reuse, specific funding requests, sustainable population growth, and water quality. The listed policy recommendations represent summaries of specific recommendations. Every effort has been made to ensure the accuracy of the information presented here. The authoritative source of information on a specific region is its adopted regional water plan (Volume III).

Agriculture — Regions A, C, F, G, H, I, J, K, L, and M

A, F .....Gather information on water used for irrigating agriculture and watering livestock
A .....Create a water conservation reserve program for managing irrigated acreage
C .....Encourage the Texas Agricultural Statistics Service to include water supply questions on farm and ranch surveys
F .....Provide funding for local supply improvements, such as lining stock tanks
F, M .....Continue funding research on droughts and drought-tolerant crops
G, M .....Expand existing loan and grant programs to assist agriculture in conserving and developing water
H, M .....Fund research on more efficient irrigation practices
I .....Ensure that water is available for agriculture, even in the face of adverse economic conditions or competing demands
J .....Provide funding to landowners for management practices that best conserve water
K.....Study farmland preservation to explain how loss of rural and agricultural lands can affect the quantity and quality of State water supplies
L .....Establish and fund an Irrigation Technology Center as proposed by Texas A&M University
M.....Study the effect of any loss and establish an inventory of agricultural lands
M.....Encourage irrigation districts to review policies to facilitate water transfers among agricultural users

Brush Control and Land Management — Regions A, B, F, G, J, and K

A.....Evaluate legislative barriers to using playa lakes for recharge or other benefits
B .....Study brush management and water yields in the Wichita River watershed
F .....Fund brush control programs
F .....Fund groundwater recharge enhancement structures
G.....Focus programs assisting agricultural producers on intensive brush control
J .....Study the cost of brush removal and recharge benefits
K.....Study brush control projects; provide State and/or Federal funding

Conjunctive Use — Regions J, K, and N

J .....Encourage conjunctive use through tax relief or grants for those that claim riparian rights
K.....Support conjunctive use within Region K to promote conservation and to meet needs
N .....Declare that all water in the State should be managed on a conjunctive use basis

Conservation — Regions A, C, F, H, N, and P

A.....Direct that TNRCC should encourage utilities to monitor for unaccounted losses
C.....Increase State participation in water conservation efforts

F .....Fund implementation of conservation technologies through low-interest loans or incentives
H .....Address and improve water conservation activities in the State
N .....Manage water more efficiently by improving conservation and system operating policies
P .....Support existing efforts by agricultural producers to conserve groundwater and surface water

Data Collection and Research — Regions B, E, J, L, M, N, and O

B .....Fund data collection on agricultural water use and water management/conservation projects
E, M.....Fund data collection in rural areas, including groundwater availability modeling; allow Planning Groups to request funding
J .....Study relationship between groundwater and surface water to determine effects on spring-flows
L .....Provide funding to TWDB and TNRCC to facilitate access to water data
M.....Evaluate effects of groundwater withdrawal on surface water availability and streamflows
N .....Expand research on groundwater conditions and aquifers
N .....Encourage oil and gas drillers to provide information on groundwater formations to facilitate identification of aquifer characteristics
O .....Fund development and maintenance of basic-data network

Desalination — Regions B, H, J, M, N, and P

B .....Maintain the chloride control project on the Wichita River as a regional priority
H .....Fund research and development program for desalination
J .....Conduct a feasibility analysis to evaluate the viability of desalination
M.....Fund research and development of desalination; offer incentives for implementation
N .....Direct TNRCC to review and reclassify concentrate from desalination process
N .....Study environmental impacts of concentrate discharges
N .....Fund State participation program and direct funding to desalination plant construction
P .....Finance full-scale desalination project

Education — Regions C, J, L, N, and O

C.....Provide education to board members of water supply corporations, special utility districts, and municipal utility districts
J .....Develop education programs for public and private sectors
L .....Fund public education programs on water; coordinate with Texas A&M University Extension Service
N .....Fund education programs for citizens on groundwater issues
O .....Fund public education programs about the regional water planning process

Environment — Regions F, H, I, K, and P

F .....Limit releases from Spence and Ivie Reservoirs to inflow levels
H .....Continue State Bays and Estuaries programs; provide for additional monitoring and research
I .....Investigate a regional or Statewide environmental mitigation system
K.....Direct that the Lower Colorado River Authority release water to prevent degradation of water supplies and to protect the environment
P .....Investigate, evaluate, and mitigate impacts to environment from desalination and Palmetto Bend Reservoir Phase II

Groundwater Availability — Regions A, D, H, J, K, and O

A .....Place a high priority on funding groundwater availability modeling projects, including minor aquifers
D .....Support completion of groundwater availability modeling project
H .....Expand funding for groundwater availability modeling
J .....Study Trinity aquifer; develop system of observation wells
J .....Direct Regions J, K, and L to evaluate the Trinity aquifer model
J .....Characterize and delineate groundwater in the Austin Chalk
J .....Assess the ability of the Trinity aquifer to receive and release water
K.....Collect groundwater availability information
O .....Pay for development and maintenance of computer models to quantify aquifer resources

Groundwater Management — Regions A, F, G, H, I, J, K, L, O, and P

A, H, J,
K, O, P .....Support the creation of Groundwater Conservation Districts (GCD's)
A .....Evaluate and clarify authority for reasonable and equitable export fees for GCD's
F, O .....Support current policy that GCD's are the preferred method of managing groundwater
G.....Support coordinated management of groundwater based on resource (aquifer) boundaries
H .....Maintain Rule of Capture in all areas not part of a GCD
I, L.....Support Texas Water Conservation Association's legislative recommendations regarding the management of groundwater
J .....Do not limit a GCD's ability to manage water resources
J .....Establish and enforce uniform well rules in all Trinity aquifer counties
J .....Encourage and enable counties to establish lot sizes and well-spacing regulations
J .....Standardize methodology for groundwater supply evaluation Statewide
K.....Oppose groundwater mining except during extreme drought
K.....Repeal well-permitting exemptions in the Texas Water Code and allow GCD's to adopt own exemptions
K.....Support efforts by Region K GCD's to control or limit groundwater mining
K.....Allow a GCD to charge a transport fee for water produced in the district
L .....Provide additional authority to counties to plan for land use and to regulate development
L .....Require GCD's and Planning Groups to use the same water demand projection data
O .....Support Rule of Capture; modify it to require spacing of wells from property lines
O .....Remove well-permitting and production limitations of water wells within a GCD
O .....Oppose a transport fee for groundwater
O .....Support creation of GCD's in designated priority groundwater or surface water areas
P .....Support Rule of Capture; exercise local control through GCD's
P .....Establish an export fee to help offset the impacts of transferring water out of a region

Interbasin Transfers (IBT) — Regions C, D, E, F, H, I, K, L, N, O, and P

C, H .....Remove barriers to IBT's of surface water
D .....Maintain current law for IBT's of surface water
E .....Study IBT's of surface water to encourage Planning Groups to coordinate
F .....Maintain junior rights provision until water availability modeling is completed
I .....Maintain junior water rights provision until State Water Plan is developed by TWDB

K.....Follow principles established by Region K for transporting water outside of regions
K.....Preserve junior water rights provision
K.....Clarify junior water rights provision so that it applies to water sale contracts and rights transfers
K.....Adjust surcharge on future water sales to users in Williamson County
L .....Clarify that water transferred from bays or the Gulf of Mexico for desalination projects is not part of an IBT
N .....Repeal the junior rights provision and additional application requirements for IBT's for surface water
N .....Exclude water originating from desalination facilities from requirements of IBT permits for surface water
N .....Amend IBT provisions in Senate Bill 1 regarding desalination
O .....Oppose a transport fee for surface water
P .....Maintain junior rights provisions; oppose modification or elimination

Interregional Water Sharing — Regions G, L, and O

G.....Develop guidelines to encourage voluntary redistribution of water
L, O .....Ensure that all Texans know that Planning Group boundaries are not intended to prevent water transport

Public Involvement — Regions A, E, H, and J

A .....Evaluate notification requirements for amending the regional water plans
E .....Amend the Open Records Act to exempt private water information from being released without landowner's consent; prohibit State agencies from sharing data without consent and require them to treat all water data as confidential
E .....Verify and clarify that all Planning Group committees, subcommittees, and subgroups are covered by the Open Meetings Act
H .....Limit notification requirements for amendments to regional water plans
J .....Exempt Planning Group committees and subgroups from the Open Meetings Act

Regional Water Plan Implementation — Regions E, G, M, and N

E .....Clarify that the role of Planning Groups is to monitor implementation of regional water plans
G.....Create incentives for industries to donate water treatment and distribution facilities to governmental water suppliers
M.....Regionalize water and wastewater utility systems
N .....Amend State procurement law in order to give greater flexibility to public agencies to build plants
N .....Encourage a regional approach to water management

Reuse — Regions A, C, G, and N

A .....Evaluate and change rules governing the reuse of wastewater effluent in order to provide incentives to municipalities, industries, and agriculture to use it
C.....Reduce regulatory and legislative obstacles to indirect reuse of treated wastewater

G.....Encourage wastewater reuse as a water management option
N .....Establish State policy to promote reuse

Rio Grande Management — Region M

M.....Create a regional water entity for helping to manage the Rio Grande, developing conservation and supply projects, and monitoring and planning for water quality
M.....Recognize that compliance by Mexico with the terms of the 1944 treaty is essential to the area

Senate Bill 1 — Regions A, B, E, J, M, N, and O

A.....Clarify the relationship between drought-contingency and regional water planning
B .....Clarify the goals of drought-contingency and regional water planning
E .....Lessen focus of Senate Bill 1 on drought-of-record; plans should not be drought-contingency plans
E .....Clarify how existing plans and funding interrelate in Senate Bill 1
J .....Require State agencies involved in the planning process to participate in the Planning Groups
M, N .....Amend Senate Bill 1 to allow State funding for ongoing regional data-collection activities

Specific Funding Requests — Regions A, C, D, F, H, J, K, L, M, and N

A, F, H .....Provide continuing and interim funding to the Planning Groups
A.....Provide funding for utilities to replace or repair aging infrastructure
A.....Fund expansion and integration of the North Plains Potential Evapotranspiration Network
A.....Fund feasibility studies for the Sweetwater Creek Reservoir project
C.....Increase funding for TWDB loans and the State Participation Program
C.....Encourage Federal funding for developing and upgrading Natural Resources Conservation Service small watershed structures
C.....Fund maintenance and construction of stock ponds
D .....Fund assessment of public water systems that have groundwater quality problems
F .....Fund the Railroad Commission of Texas (RRC) programs on drilling and cementing of oil and gas wells that penetrate aquifers
F .....Expand funding of weather modification projects
J .....Fund programs to identify appropriate locations for recharge structures
J .....Fund modernization of water and wastewater systems; educate cities on the need to modernize
J .....Fund weather modification and rainwater harvesting
J .....Fund preliminary study of unique reservoir sites
K.....Fund research on a new high yielding, low water using variety of rice
L .....Provide sufficient funding to TWDB and TNRCC for administering State Water Plan programs
L .....Fund demonstration projects on alternative water supply strategies, such as desalination
L .....Fund a Center for Water Research at The University of Texas at San Antonio
L .....Fund Edwards Aquifer Research and Data Center at Southwest Texas State University
M.....Seek Federal funding for an International Boundary Water Commission (IBWC) study on rechanneling a part of the Rio Grande
N .....Establish a regional resource center for groundwater management in the Coastal Bend area

N .....Establish and fund a Regional Water Resources Information Management System
N .....Fund irrigation efficiency programs and creation of water conservation revenue programs to make it economically feasible for producers to convert from irrigated to dry-land farming

Surface Water Availability — Regions A, F, H, J, and M

A .....Require coordination between Planning Groups and State agencies on development of groundwater and surface water availability modeling projects
F .....Place a high priority on the water availability modeling project
H .....Direct TNRCC to use more realistic assumptions in water availability modeling
J .....Incorporate Medina Lake diversion system in TNRCC's water availability model
M.....Fund development of water availability model for the Rio Grande

Surface Water Rights — Regions C, G, H, J, L, and M

C .....Make certain water rights exempt from cancellation for nonuse
G.....Oppose cancellation of existing water rights as a water management option
H .....Exempt from cancellation water rights that have not been used in 10 years
H .....Exempt from cancellation any water rights secured by a sponsor of a water supply project
J .....Change definitions of "beneficial use" and "waste" in the Texas Water Code to prevent wasteful uses
J .....Devise a survey method to estimate unpermitted riparian water withdrawn from rivers and tributaries
L .....Fund TNRCC to ensure legal and appropriate use of permitted surface water rights
M.....Encourage coordination on urbanization issues between municipalities and irrigation districts

Sustainable Population Growth — Regions K and L

K.....Develop growth-limit projections for Region K
L .....Focus on the consequences of growth; evaluate land use and health of ecosystems to prepare for the future and to support a sustainable quality of life

Water Quality — Regions B, C, D, F, G, K, and L

B .....Allow long-term use of bottled water programs or provide a waiver for small user groups that have no reasonable, cost-effective means of complying with current regulations
C.....Increase State participation in watershed-protection planning
D .....Expedite replacement of methyl tertiary-butyl ether in reformulated gasoline with additives that do not threaten water supplies
F .....Place a moratorium on enforcement of current radionuclide standards; adopt new standards after more research has been done
F .....Provide regulatory guidance for disposal of radionuclide waste products
F .....Allow development and use of water supplies that exceed secondary drinking water standards without mandatory treatment
F .....Increase funding for RRC programs to identify and plug improperly plugged wells
F .....Strengthen RRC rules on abandoned wells
F .....Develop RRC plans to clean up saltwater disposal pits
G.....Assist local entities in implementing sound water quality projects

K.....Request thorough scientific data from the U.S. Environmental Protection Agency to determine health risks present in areas served by Hickory and Marble Falls aquifers
L .....Require consistency between State agencies on Federal permitting processes; articulate requirements in State Water Plan

Other **Regions D and J**

D .....Encourage consistency between TWDB rules for regional water supply planning and TNRCC rules for public drinking water systems regarding minimum requirements for water supply
J……...Establish one State water agency

14.2 Recommendations for Designation of Stream Segments of Unique Ecological Value

Key Finding **Region H was the only region to recommend unique stream segments, and it recommended six segments in its area. The TWDB recommends that the Legislature consider protecting the six segments identified by Region H in its area as unique stream segments.**

Addressing the need for recognizing and protecting some of the unique stream resources of the State, Senate Bill 1 directed the Planning Groups to consider identifying ecologically unique stream segments for potential designation by the Legislature. Under TWDB rules, a Planning Group may recommend that a river or stream segment be considered unique ecologically on the basis of the following criteria:

- **biological function**—stream segments that display significant overall habitat value, including both quantity and quality, according to the degree of biodiversity, age, and uniqueness observed, and including terrestrial, wetland, aquatic, or estuarine habitats;
- **hydrologic function**—stream segments that are fringed by habitats that perform valuable hydrologic functions relating to water quality, flood attenuation, flow stabilization, or groundwater recharge and discharge;
- **riparian conservation areas**—stream segments that are fringed by significant areas in public ownership (including State and Federal refuges for wildlife), management areas, preserves, parks, mitigation areas, or other areas held by governmental organizations for conservation purposes; or the stream segments that are fringed by other areas managed for conservation purposes under a governmentally approved conservation plan;
- **high water quality/exceptional aquatic life/high aesthetic value**—stream segments and spring resources that are significant due to unique or critical habitats and exceptional aquatic life uses that depend on or are associated with high water quality; or
- **threatened or endangered species/unique communities**—sites along streams where water development projects would have significant detrimental effects on State or Federally listed threatened and endangered species; or the sites along a stream that is significant because of the presence of unique, exemplary, or unusually extensive natural communities.

According to State law (as amended by Senate Bill 2), the designation of a river or stream segment of unique ecological value means solely that a State agency or political subdivision of the State may not finance the actual construction of a reservoir in a specific river or stream segment designated by the Legislature.

The TPWD provided a list of candidate stream segments in each of the 16 regions that appeared to fit at least one criterion for being designated as ecologically unique. In many cases, the U.S. Fish and Wildlife Service and other stakeholders provided input to this process.

Only Region H chose to recommend unique stream segments, identifying six (Figure 14-1). Most of the Planning Groups asked the Legislature to clarify this issue and expressed interest in addressing this and other related issues more fully in the next round of planning, when the implications of such a designation may be better understood.

14.3 Recommendations for Unique Reservoir Sites

Key Finding: Five of the Planning Groups found 33 sites uniquely suited for reservoir development.

Senate Bill 1 allows sites to be designated by the Legislature as having unique value for reservoir construction. Once a site is designated, State agencies and political subdivisions are prohibited from obtaining a fee title or easement that would significantly prevent the construction of a reservoir at that site. Although a site may be recognized as having unique value for reservoir construction by a Planning Group or by the TWDB in the State Water Plan, designation must be provided by the Legislature for statutory protection to be provided.

To date, the Legislature has designated two such sites: Allens Creek and Post Reservoirs.

The TWDB directed the Planning Groups to describe the sites, give reasons for the unique designation, and define how the State would benefit from the reservoir. The Planning Group and the TWDB used two criteria to assess whether a site could be considered unique for reservoir construction:

- The site had site-specific reservoir development recommended as a specific water management strategy or it had been included in an alternative, long-term scenario in an adopted regional water plan.
- The location, hydrologic, geologic, topographic, water availability, water quality, environmental, cultural, and current development characteristics (or other pertinent factors) make the site uniquely suited for reservoir development to supply water for the current planning period or reservoir development to meet needs beyond the 50-year planning period.

Five of the Planning Groups recommended 33 sites uniquely suited for reservoir development (Figure 14-2). Region C recommended 4 sites, the North East Texas Region recommended 15 sites, Region H recommended 3 sites, the East Texas Region recommended 13 sites, and the Lavaca Region recommended 1 site. Three of the sites, Marvin Nichols I, Carthage, and Kilgore II, were identified by multiple regions.

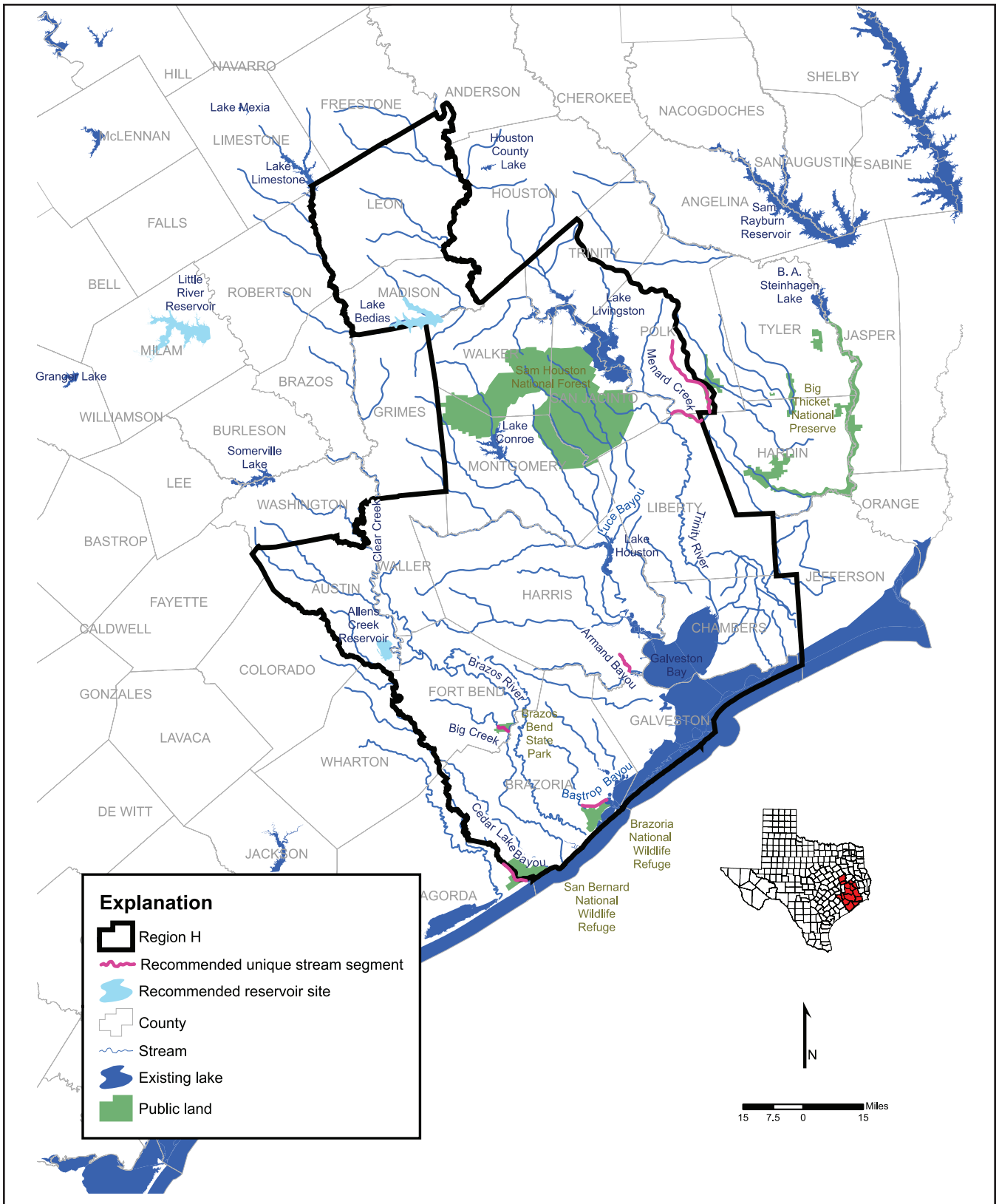

Figure 14-1. Reservoir sites and unique stream segments recommended by Region H.

Key Finding TWDB recommends that the Legislature consider 20 sites identified by the Planning Groups for protection as unique reservoir sites.

The TWDB reviewed the information in the approved regional water plans and recommends the following sites for protection:

- Red River Basin: Lower Bois d'Arc Creek, Big Pine, Pecan Bayou, and Muenster
- Sulphur River Basin: George Parkhouse I, George Parkhouse II, Marvin Nichols I, and Marvin Nichols II
- Cypress Creek Basin: Little Cypress
- Sabine River Basin: Prairie Creek, Big Sandy, Carl Estes, Rabbit Creek, and Carthage
- Neches River Basin: Eastex
- Trinity River Basin: Tehuacana and Bedias
- Brazos River Basin: Little River
- Lavaca River Basin: Palmetto Bend II

The following sites were reviewed but not recommended for designation and protection at this time, although they should remain under consideration as alternative unique reservoir sites.

- Barkman in the North East Texas Region because of lack of information in the regional water plan that justifies designation.
- Liberty Hills in the North East Texas Region because of lack of information in the regional water plan that justifies designation.
- Waters Bluff in the North East Texas Region because of significant wetland bank and conservation easement conflicts.
- Rockland in the East Texas Region because of lack of information in the regional water plan that justifies designation and potential environmental conflicts with a federally protected river reach.
- Big Cow Creek in the East Texas Region because of lack of information in the regional water plan that justifies designation and no identified needs that cannot be met by other sources.
- Bon Weir in the East Texas Region because of lack of information in the regional water plan that justifies designation and its location in the Lower Basin, which has a sufficient existing water supply for the planning period.
- State Highway 322 Stage I in the East Texas Region because of lack of information in the regional water plan that justifies designation and the existing lignite mine in the area conflicts with reservoir development.
- State Highway 322 Stage II in the East Texas Region because of lack of information in the regional water plan that justifies designation and the existing lignite mine in the area conflicts with reservoir development.

- Stateline in the East Texas Region because of lack of information in the regional water plan that justifies designation and no identified needs that cannot be met by other sources.
- Socogee in the East Texas Region because of lack of information in the regional water plan that justifies designation and no identified needs that cannot be met by other sources.
- Fastrill in the East Texas Region because of lack of information in the regional water plan that justifies designation and no identified needs that cannot be met by other sources.
- Ponta in the East Texas Region because of lack of information in the regional water plan that justifies designation and no identified needs that cannot be met by other sources.
- Double Mountain Fork in the Brazos G Region. Late in the planning process, the Brazos G Planning Group became aware of this reservoir site as a potential source of water supply. Currently both local and regional interests are evaluating this site for potential reservoir construction. Because of the severe water shortages that this region has experienced during drought conditions over the past several years, this site may be important in meeting the water supply needs of the region.

Additionally, the TWDB received many comments from concerned residents that construction of some reservoirs would inundate land that has been in their families for multiple generations. The TWDB recognizes that reservoir construction will inevitably create such impacts, which cannot be totally offset by monetary compensation.

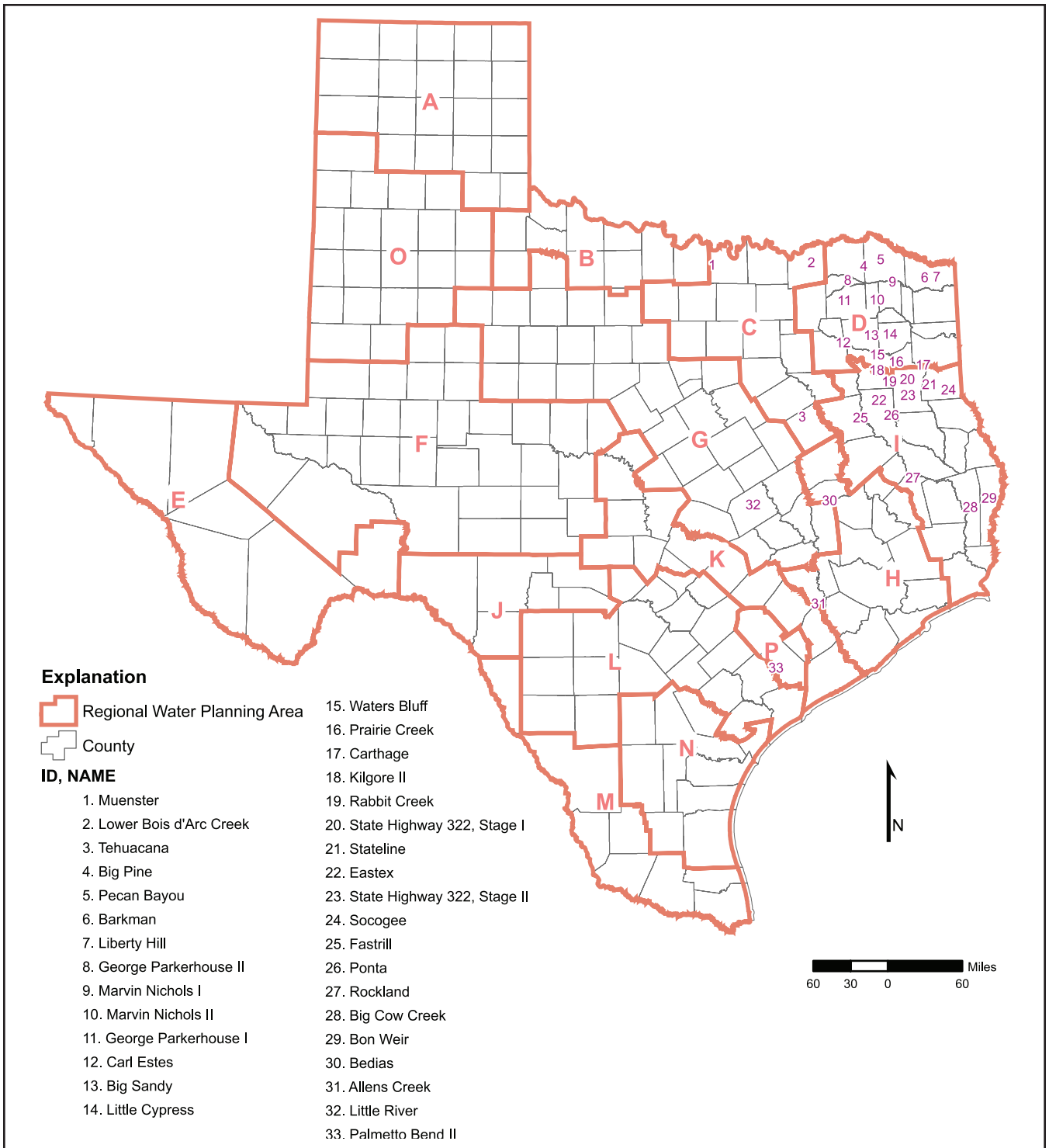

Figure 14-2. Unique reservoir sites proposed by Planning Groups.