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Untying the Gordian Knot: Negotiated Strategies for Protecting Instream Flows in Texas

ABSTRACT

Providing instream river flows is a daunting challenge for Texas. The specter of rivers running dry during drought is a reality in many areas of the state. Only recently has Texas statutorily recognized the importance of instream flows and taken measures to protect these flows. One consequence of this late action is that most of the water in Texas rivers has been allocated to other uses and very little water remains for instream flows. Ultimately, water will have to be reallocated for instream flow needs. Reallocation of water will require the unprecedented stakeholder cooperation between water planners, developers, regulators, suppliers, users and environmental interests. After examining the legal, technical and institutional efficacy of several reallocation strategies, the article explores stakeholder satisfaction with current instream flow practices and outlines, through a preferences and feasibility analysis, those strategies favored by stakeholders. Findings indicate that stakeholders are primarily concerned with the temporal and spatial nature of instream needs, the need to quantify the amount of water needed for instream flows, the importance of equity and fairness in distributing the reallocation burden and the effect of agency recalcitrance in pursuing a number of strategies. The challenge for Texas is to develop negotiated strategies to protect instream flows where the benefits of cooperation exceed the rewards of rivalry.

I. INTRODUCTION

Maintaining a minimum flow of water in Texas rivers to protect biological, recreational and amenity resources is a problem in search of a solution. When rivers run dry due to excessive diversions, drought, or

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reservoir development, adverse environmental, economic and social consequences follow. At a time when it is critical to take steps to protect minimum instream flows,¹ the demands on available water supplies to meet municipal, industrial, and irrigation needs are increasing.² The 1996 Texas drought exacerbated the demands on water and highlighted the need to develop strategies to provide some level of flow protection for rivers.

The multiple benefits of instream flows are widely recognized as an essential factor influencing the biological productivity of rivers, lakes and estuaries.³ Water left to flow freely in rivers can provide significant recreation opportunities; protect fish and wildlife habitat; enhance water quality; promote navigation; provide cultural and aesthetic values; promote general local economic development; enhance groundwater recharge; encourage land preservation; generate hydroelectric power; and protect channel structures in alluvial streams.⁴

1. The term "instream flow" refers to that amount of water flowing in a natural stream channel needed to sustain instream values at some acceptable level. The term "instream values" relates to the uses made of water in the stream channel: it includes maintenance of biological diversity, waste assimilation for water quality purposes, recreation and the maintenance of riparian habitats.

2. Water demands by sectors of the economy are identified in the 1990 State Water Plan. By the year 2010 agricultural, municipal and industrial water needs are projected to be about 15.4 million acre-feet annually. To meet this demand, planners suggest a combination of conservation measures, new reservoir development, water reuse and reallocation measures. See TEXAS WATER DEV. BD., *WATER FOR TEXAS—TODAY & TOMORROW* 3-2 (1990) [hereinafter, 1990 TEXAS WATER PLAN].

3. For an extensive biological bibliography, see TEXAS WATER DEV. BD., *FRESHWATER INFLOWS TO TEXAS BAYS AND ESTUARIES: ECOLOGICAL RELATIONSHIPS AND METHODS FOR DETERMINATION OF NEEDS* 347-386 (1994).

4. For articles discussing these benefits see generally, Richard Ausness, *Water Rights, The Public Trust Doctrine, and the Protection of Instream Uses*, U. ILL. L. REV. 407, 432 (1986); Lynda L. Butler, *Environmental Water Rights: An Evolving Concept of Public Property*, 9 VA. ENVTL. L.J. 323 (1990); Bonnie G. Colby, *Enhancing Instream Flow Benefits in an Era of Water Marketing*, 26 WATER RESOURCES RESEARCH 1113 (1990); John Harbison, *Waist Deep in the Big Muddy: Property Rights, Public Values & Instream Waters*, 26 LAND & WATER L. REV. 535 (1991); Peter N. Davis, *Protecting Waste Assimilation Streamflows by the Law of Water Allocation, Nuisance, and Public Trust, and by Environmental Statutes*, 28 NAT. RESOURCES J. 357 (1988); Margaret Z. Ferguson, Note, *Instream Appropriations and the Dormant Commerce Clause: Conserving Water for the Future*, 75 GEO. L.J. 1701 (1987); Joseph Q. Kaufman, *An Analysis of Developing Instream Water Rights in Oregon*, 28 WILLAMETTE L. REV. 285 (1992); Berton L. Lamb, *Quantifying Instream Flows: Matching Policy and Technology*, in *INSTREAM FLOW PROTECTION IN THE WEST* 7-17 (Lawrence J. MacDonnell & Teresa A. Rice eds., rev. ed. 1993); Berton Lee Lamb, *Criteria for Evaluating State Instream-Flow Programs: Deciding What Works*, 121 J. WATER RESOURCES PLAN. & MGMT. 270 (1995); Alan B. Lilly, *Protecting Streamflows in California*, 8 ECOLOGY L.Q. 697 (1980); Lori Potter, *The Public's Role in the Acquisition and Enforcement of Instream Flows*, 23 LAND & WATER L. REV. 420 (1988); Corinne C. Sherton, Comment, *Preserving Instream Flows in Oregon's Rivers and Streams*, 11 ENVTL. L. 379 (1981); JOSEPH L. SAX ET AL., *LEGAL CONTROL OF WATER RESOURCES* 153 (2d rev. ed. 1991).

In spite of this impressive array of benefits, instream flow recognition and protection under western⁵ and Texas water law⁶ is a tale of too little too late. Today, very little water remains available for allocation to instream flow needs in the West.⁷ This pattern of appropriation has been repeated in Texas. According to data from the Texas Natural Resources Conservation Commission (hereinafter referred to as "TNRCC" or "Commission"), 12 of the 15 major river basins in Texas are fully appropriated.⁸ In river basins that are fully appropriated, the only long term option to providing water for instream needs is to reallocate water from some other preexisting uses.⁹ Forced reallocations through cancellation and condemnation actions will be fraught with political repercussions. Negotiated reallocations have the potential to promote political harmony and minimize legal conflicts.

While there is general consensus among Texas water agencies and stakeholder groups on the need for instream flows, there is little agreement on how much water is needed and what legal tools will be used to provide this water. Competing water interest groups in Texas are struggling to discover that the benefits of cooperation exceed the rewards of rivalry in seeking answers to these two questions. Only recently have the Texas Water Development Board (TWDB), the Texas Parks and Wildlife Department (TPWD) and TNRCC reached any agreement on a method for determining how much water is needed to protect instream flows associated with new reservoir construction or major new diversions.¹⁰ This agreement covers

5. See generally A. Dan Tarlock, *Appropriation for Instream Flow Maintenance: A Progress Report on "New" Public Western Water Rights*, 1978 UTAH L. REV. 211 (1978).

6. In Texas, statutory recognition was extended to protecting estuary inflows in 1985. See generally, TEX. WATER CODE ANN. §§ 11.147, -.150, -.152 (West 1988).

7. Nationally, very little water remains for appropriation. A 1975 assessment of water supplies in the U.S. determined that 86 percent of the nation's average annual streamflows were used and in many western states water use exceeds the average annual renewal supply. See U.S. WATER RESOURCES COUNCIL, *THE NATION'S WATER RESOURCES, 1975-2000: SECOND NATIONAL WATER ASSESSMENT* (1978).

8. There is no water available for new appropriations because rivers are fully appropriated in stretches of the Canadian, Red, Cypress, Sabine, Neches, Trinity, Brazos, Colorado, Guadalupe, San Antonio, Nueces and Rio Grande rivers. See TEXAS NATURAL RESOURCE CONSERVATION COMM'N, *A REGULATORY GUIDANCE DOCUMENT FOR APPLICATIONS TO DIVERT, STORE OR USE STATE WATER* 26 (1995) [hereinafter, TNRCC, *REGULATORY GUIDANCE DOC.*].

9. See NAT'L RESEARCH COUNCIL, *WATER TRANSFERS IN THE WEST - EFFICIENCY, EQUITY AND THE ENVIRONMENT* (1992).

10. This agreement arose from an effort to engage in what has been labeled consensus water planning. Developing ways to provide for instream or environmental flows was part of this planning process. The primary proposal to come out of this inter-agency cooperative effort is the idea of requiring instream flow discharge levels for new water projects. See *Consensus Water Planning*, TEXAS WATER, Summer 1996, at 4.

only new projects and does not extend to the 5,700 reservoirs in the Texas river system.¹¹

In addition to quantifying the amount of instream flow needs, there is the thorny question of selecting the legal tools, or strategies, that will be used to provide this water. This article examines the array of legal strategies available to policy makers and reports on a study of stakeholder preferences for each strategy. Finding and forging a degree of consensus among stakeholders is an important first step in unraveling the gordian knot over instream flow protection for the state. Results from this study indicate that stakeholders are very close to common ground on their strategy preferences. To provide movement toward common ground, the article recommends strategies to protect instream flow in Texas for policy maker consideration.

II. A HISTORY OF INSTREAM FLOW PROTECTION IN TEXAS

Texas water law has been a major barrier to providing for instream flow needs and only recently has become part of the solution. Support for this bold assertion can be gleaned from a brief historical analysis of Texas water law. Since surface water in Texas is allocated under the prior appropriation water law system, water for instream flow protection is based on that system and on the public trust doctrine. The appropriative system provides limited protection for instream flow needs¹² and the public trust doctrine is a nascent legal tool that has yet to be used.¹³ These limitations will be detailed in Section III of this paper.

Basically, instream flow rights under Texas water law have evolved through stages of denial, recognition and finally to reconciliation. Claims to water rights in Texas were based on a conflicting admixture of civil law, common law and prior appropriation rules.¹⁴ This admixture presented few

11. Of these 5,700 reservoirs in the Texas system, there are 188 major reservoirs—massive “holding tanks” that contain more than 5,000 acre-feet of water each. A mere 74 of these major reservoirs contain 98 percent of Texas’ conservation storage, which is the state’s usable surface water supply. See TEXAS WATER DEV. BD., TEXAS WATER FACTS 4 (1991).

12. Instream flows are not specifically recognized as a beneficial use of water in the Texas Water Code and it was not until 1985 that instream flow need assessments were required in the permit process. See TEX. WATER CODE ANN. §§ 11.147, -.150, -.152 (West 1988).

13. For a discussion of the Texas public trust doctrine see Morrison & Dollahite, *The Public Trust Doctrine: Insuring the Needs of Texas Bays and Estuaries*, 37 BAYLOR L. REV. 365 (1985) and Jackie Weaver, *The Public Trust Doctrine and Texas Water Rights Administration: Common Law Protection for Texas’ Bays and Estuaries?*, 15(2) STATE BAR OF TEX. ENVTL. L. J. 1 (1985).

14. For a cogent historical overview of the origins of Texas water law, see Hans Baade, *Historical Background of Texas Water Law – A Tribute to Jack Pope*, 18 ST. MARY’S L.J. 1 (1986).

problems when sufficient water was available, however, the incompatibility of these regimes became manifestly apparent during the drought of the 1950's on the Rio Grande River. Water rights claims based on civil law, riparian law and the prior appropriation system exceeded the amount of water available in the River and the state filed suit to have a court determine the efficacy of these competing water rights claims.¹⁵ The case took more than 13 years to be decided, involved about 3000 parties and generated an estimated \$10 million in court costs and attorneys fees.¹⁶ This case illustrated that 78 years of judicial attempts to reconcile conflicting water law systems was futile and that another approach was needed. Recognizing the need for reconciliation, the Texas legislature statutorily unified the competing systems.

In 1967, the Texas Legislature finally merged these divergent water law regimes through the Water Rights Adjudication Act.¹⁷ This Act required all water users, regardless of the origin of their water right, to file a claim with the Texas Water Commission (TWC).¹⁸ Through an adjudicatory process, all claims were quantified, prioritized and converted to a prior appropriative right. Thus, Texas water rights are governed by a statutory and administrative scheme that provides the exclusive means by which appropriative water rights may be recognized and reconciled with other competing rights.¹⁹ The Act, however, did not specifically address instream flow rights as part of the permit process and it was not until 1985 that the legislature acted to reconcile these rights in the Texas prior appropriation system.

1. Denial of protection for instream flows.

Denial of protection is patently manifested in the Texas version of the riparian rights doctrine and in the prior appropriation doctrine's failure to recognize instream flows as a beneficial use of water.²⁰ Riparian rights would seem for two reasons to be of little or no significance in the assurance

15. *Texas v. Hidalgo County*, WCID No. 18, 443 S.W.2d 728 (Tex. Civ. App. — Corpus Christi 1969, writ *ref'd n.r.e.*).

16. For a review of the case setting see Douglas Caroom & Paul Elliot, *Water Rights Adjudication — Texas Style*, 44 TEXAS BAR J. 1183, 1184 (1981).

17. Act of Apr. 13, 1967, ch. 45, 1967 Tex. Gen. Laws 86, now codified as TEX. WATER CODE ANN. §§ 11.301 to -.341 (West 1988).

18. Now the Texas Natural Resources Conservation Commission.

19. See *In re Adjudication of Water Rights of the Upper Guadalupe Segment*, 642 S.W.2d 438 (Tex. 1982); *In re Adjudication of Water Rights of Brazos III Segment*, 746 S.W.2d 207 (Tex. 1988).

20. While the Texas Water Code recognizes recreation, pleasure and game preserves as a purpose for which state water can be appropriated, it does not explicitly recognize instream flows as a beneficial use of water. See TEX. WATER CODE ANN. § 11.023 (West 1988).

of fresh water inflows. First, riparian rights are generally limited to uses benefiting abutting land and riparians have no legal standing to seek protection of all interest in an entire river or estuary. Second, each riparian is generally entitled to a reasonable share of water in relation to other riparians, and such rights could not provide assurances of a sufficient amount of water to meet flow needs.²¹

Denial was also manifested under the Texas prior appropriation system as instream flows were not specifically recognized as a beneficial use of water, nor was consideration required for flows as part of the permit process.²² While recreation, pleasure and game preserves are listed as purposes for which water can be appropriated, the section of the Code is silent as to instream flows as a beneficial use.²³ The fact that a use is beneficial does not guarantee that available water will be appropriated. The TNRCC is obligated to give preference to applications according to a preference list, a list which ranks all other named uses above recreation and pleasure and is silent as to inflow needs.²⁴

Interestingly, scientific recognition for instream inflows²⁵ preceded legal recognition by some 15 years and reconciliation followed some 17 years after recognition. The following discussion briefly describes the recognition and reconciliation stages in Texas water law.

2. Recognition Through Water Planning Process

In 1957, after damaging floods ended the 1950's drought, the Texas Legislature created the TWDB and directed it to prepare and periodically update a state water plan.²⁶ By 1961, the Board had prepared the first Texas water plan for surface water development. Since that initial report, the Board has revised, updated and released state water plan reports in 1968,

21. See Corwin Johnson, *Legal Assurances of Adequate Flows of Fresh Water into Texas Bays and Estuaries to Maintain Proper Salinity Levels*, 10 HOUS. L. REV. 598, 605 (1973).

22. Instream flow consideration was explicitly mandated as part of the permit process in 1985. See TEX. WATER CODE ANN. § 11.147(c) (West 1988).

23. See TEX. WATER CODE ANN. § 11.023.

24. *Id.* § 11.024.

25. Scientific recognition of the linkage between rainfall, freshwater inflows into Texas bays and estuaries and fish production was first recognized in 1953. See H. Hildebrand & G. Gunter, *Correlation of Rainfall with Texas Catch of White Shrimp, *Penaeus Setiferus**, 82 TRANSACTIONS OF AMERICAN FISHERIES SOCIETY 151-155 (1953).

26. For the statutory planning authority, see TEX. WATER CODE ANN. § 16.051 (West 1988).

1977, 1984 and 1990,²⁷ and is preparing the next plan update that should be released before the end of 1997.

In 1957, Texas voters approved a constitutional amendment authorizing the Board to administer a \$200 million Water Development Fund to help communities construct reliable water supplies.²⁸ Thus began a large-scale state assisted construction program that created impoundments on most state rivers with serious negative consequences for instream flows.²⁹

As early as 1968, the TWDB recognized the adverse impact of reservoir development and excessive water diversions on riverine environments and on the bays and estuaries along the Texas Gulf Coast.³⁰ This interrelationship was acknowledged in the 1968 Texas Water Plan,³¹ and carried forward in the 1977, 1984 and 1990 Texas Water Plans.³² Not surprisingly, each plan recommended further study while the construction of dams and reservoirs continued. There is little evidence, however, to suggest that this state planning process contributed to a solution to the problem.³³ Indeed, drought has been the driver for positive changes in Texas law to protect instream flows.

27. See TEXAS WATER DEV. BD., THE TEXAS WATER PLAN (1968); TEXAS WATER DEV. BD., CONTINUING WATER RESOURCE PLANNING & DEVELOPMENT FOR TEXAS (1977); TEXAS DEP'T OF WATER RESOURCES, WATER FOR TEXAS—A COMPREHENSIVE PLAN FOR THE FUTURE (1984); TEXAS WATER DEV. BD., WATER FOR TEXAS: TODAY AND TOMORROW (1990).

28. TEX. CONST., art. III, § 49-D. The constitution was further amended in 1962, 1966, 1969, 1971, 1976 and 1985 to broaden the Water Development Board's authority to construct reservoirs.

29. In part through this effort, more than 180 reservoirs have been constructed.

30. TEXAS WATER DEV. BD., THE TEXAS WATER PLAN: SUMMARY 33 (1968).

31. The 1968 Plan called for an estimated 2.5 million acre-feet of supplemental freshwater inflows annually to be delivered to Texas estuaries through a coastal canal system. Funding for this system was never approved. See TEXAS WATER DEV. BD., THE TEXAS WATER PLAN, III-14 to -21 (1968).

32. See TEXAS WATER DEV. BD., CONTINUING WATER RESOURCE PLANNING AND DEVELOPMENT FOR TEXAS, II-58 (1977); TEXAS DEPT. OF WATER RESOURCES, WATER FOR TEXAS—A COMPREHENSIVE PLAN FOR THE FUTURE, II-33 (1984); 1990 TEXAS WATER PLAN, *supra* note 2, at 1-10.

33. As part of the new consensus water planning process the Texas Water Development Board (TWDB), the Texas Natural Resource Conservation Commission (TNRCC) and the Texas Parks and Wildlife Department (TPWD) have reached agreement on new reservoir release criteria to quantify the amount of water to be passed through for instream flow needs during times of drought. See *Consensus Water Planning*, *supra* note 10, at 4.

3. Reconciliation within the Water Code

After the drought of the early 1980s highlighted the need for freshwater inflows into Texas bays and estuaries,³⁴ the Texas legislature recognized inflow needs by requiring considerations for such uses in the Water Code. This was accomplished in two ways. First, a specific amount of water was statutorily reserved to fulfill estuary freshwater inflow needs. For reservoirs constructed after 1985 that are within two hundred river miles of the coast, five percent of the annual firm yield of water must be appropriated to the Parks and Wildlife Department to make releases to bays and estuaries and for instream uses.³⁵ The five percent legislative reservation is admirable, but after 11 years, it has yet to be applied to any reservoir.³⁶

The second method for integrating instream flow protection in Texas has been through the water permitting process.³⁷ Since 1985, the TNRCC has been required to assess the effects that the issuance of water use permits would have on instream uses and freshwater inflow needs for bays and estuaries.³⁸ In determining what, if any, conditions should be imposed, the TNRCC considers the following:

34. Ronald Kaiser & Sharon Kelly, *Water Rights for Texas Estuaries*, 18 TEX. TECH L. REV. 1121, 1137 (1987) (Following a 1984 summer drought the Commission ordered the release of 10,000 acre-feet of fresh water from Lake Texana to the Lavaca-Matagorda bay and estuary system to reduce the high salinity levels that were threatening the habitat of white shrimp).

35. TEX. WATER CODE ANN. §§ 15.3041, 16.1331 (West 1988).

36. Telephone interview with Gary Powell, Division Chief, Envtl. Section, Tex. Water Dev. Bd. (Aug. 14, 1996). According to Powell, there are no reservoirs that are operated under this rule. Lake Texana and the Choke Canyon and Lake Corpus Christi water supply systems are both being operated under TNRCC orders developed by the TNRCC, TWDB, and TPWD for environmentally safe operations of the impoundments. These operating rules involve multi-stage operations and in the case of Lake Texana, multi-level outlet works. In both cases, instead of appropriating 5% of the firm yield to the TPWD for use on demand as a freshwater release to the bays and estuaries, the agencies developed "pass-through" rules that result in about the same yield loss but provide substantially more environmental flows and living resource benefits than would have been possible to obtain with a simple 5% appropriation and on-demand release from storage. Future reservoirs that may be affected include: Cibolo Creek, Lindenau, Cuero, Goliad, and the Allens Creek projects.

37. In Texas, the right to divert and beneficially use water is granted through an administrative permit process administered by the TNRCC. Changes in the place, purpose or time of use, point of diversion, rate of diversion or acreage to be irrigated require state approval and the approved changes can be subject to new conditions. Prior to 1985 the Texas Water Code did not specifically require that the Commission consider or impose permit terms to protect instream flows, consequently, terms were seldom attached to storage or diversion permits. See TEX. WATER CODE ANN. §§ 11.025, -.121, -.122 (West 1988 & Supp. 1997).

38. TEX. WATER CODE ANN. §§11.147, -.150, -.152 (West 1988).

- (1) the need for inflows, based on available information;
- (2) the ecology and productivity of the estuary system;
- (3) the expected effects on the public welfare of not including conditions;
- (4) the amount and use of water requested and the needs of those who would be served by the applicant;
- (5) the expected effects on the public welfare of the failure to issue all or part of the permit being considered; and
- (6) the statutory list of water use preferences.³⁹

Under this mandated approach, any new or amended water permit that would adversely impact instream uses and freshwater inflows could be denied, or have limitations attached to it. The TNRCC has interpreted this factor analysis requirement as applying only to new and amended permits, but not to existing permits.⁴⁰

Texas is not unique in seeking to provide instream flow protection for many rivers. Most of the other western states have moved through the denial recognition and reconciliation stages and have adopted some type of strategy for providing instream flow protection. The next section of this paper summarizes some of these strategies and discusses their applicability to Texas.

III. STRATEGIES FOR PROVIDING INSTREAM FLOWS

Given the inherent difficulties of protecting instream flows under the traditional legal rules of the prior appropriation system, many states have gone to creative lengths in seeking to protect these flows. Instream flow strategies identified in the literature and used in other western states, include: (1) reservation of water; (2) appropriation of water; (3) permit restrictions; (4) protecting stream navigability; (5) reservoir releases; (6) condemnation; (7) cancellation; (8) water quality programs; and (9) the public trust doctrine.⁴¹ Additionally, each strategy may have different permutations for protecting instream flows.

A. Reservation of water

Through legislative or administrative action, a state may reserve from future appropriation a base level flow of water in specified streams or

39. TEX. WATER CODE ANN. § 11.147(c) (West 1988).

40. See TNRCC, REGULATORY GUIDANCE DOC., *supra* note 8, at 45.

41. For purposes of this paper, the range of actions, legal techniques, or management options are termed strategies.

stream segments.⁴² This strategy tends to keep state water appropriation statutes intact and may accomplish the same purpose as environmental water right recognition. According to one commentator, reservations may be subject to substantial modification because no vested rights are created for the instream flow.⁴³ This may weaken a reservation strategy as a means of protecting instream flows.⁴⁴

Oregon was the first state to adopt this type of protection.⁴⁵ Since then a number of states have used this technique to protect instream flows. For example, Montana placed a moratorium on further withdrawals from the Yellowstone River in 1974,⁴⁶ and Washington has withdrawn over three hundred waterways from future appropriations.⁴⁷ Colorado and Idaho have also withdrawn certain streams from further appropriations.⁴⁸ More recently, California adopted a modified version of this by allowing water rights holders to dedicate all or a portion of their water rights to instream uses.⁴⁹ Texas has a limited direct reservation system targeted at freshwater inflows into bays and estuaries.⁵⁰ Water for inflows are reserved only from reservoirs constructed after 1985 that are within 200 river miles of the estuary.⁵¹

B. Appropriation of water

Perhaps the simplest way of ensuring instream flows is to directly appropriate water for that purpose. The advantage of direct appropriation over other strategies is that it fits into the existing water rights system, providing all appropriators with the normal safeguards of a long standing

42. Several states use the reservation option including Alaska, ALASKA STAT. § 46.15.145 (Michie 1996); California, CAL. WATER CODE § 1257.5 (West Supp. 1997); Kansas, KAN. STAT. ANN. § 82a-703a (1989); Montana, MONT. CODE ANN. § 85-2-316 (1997); North Dakota, N.D. CENT. CODE § 61-04-31 (1995); Oregon, OR. REV. STAT. § 536.410 (Supp. 1996); South Dakota, S.D. CODIFIED LAWS § 46-5-38 (Michie 1987); Texas, TEX WATER CODE ANN. § 11.147 (West 1988); Utah, UTAH CODE ANN. § 73-6-1 (1989); and Washington, WASH. REV. CODE ANN. § 90.54.050 (West 1992).

43. Tarlock, *supra* note 5, at 8-4.

44. Butler, *supra* note 4, at 349.

45. Richard Wahl, *Acquisition of Water to Maintain Instream Flows*, 1 RIVERS 195, 196 (1990); Kaufman, *supra* note 4, at 304.

46. MONT. CODE ANN. § 85-2-601 (1997).

47. Wahl, *supra* note 45, at 196.

48. COLO. REV. STAT. ANN. § 37-92-102(3) (West 1990 & Supp. 1997); IDAHO CODE § 67-4307 (1995).

49. CAL. WATER CODE § 1707 (West Supp. 1997).

50. TEX. WATER CODE ANN. §§ 11.147, -.150, -.152 (West 1988).

51. TEX. WATER CODE ANN. §§ 15.3041, 16.1331 (West 1988 & Supp. 1997).

system.⁵² The significance of an instream flow water right is that it represents a legally enforceable claim to a certain amount of water for non-consumptive use.⁵³

Two major questions arise in protecting instream flows by appropriation. The first concerns the eligible parties that may hold an instream water right, and the second involves the means available to acquire a right.

1. Water Rights Holders

Even though a state may recognize instream flow rights, this does not mean that any person or entity may hold such a right. The western states vary in their designations of parties who may hold environmental rights. Depending on the jurisdiction, a state agency, the federal government, or a private individual or organization may acquire instream flow water rights.⁵⁴

a. Appropriation by state agencies.

Several western states allow the water resource agency, or the fish and game agency, to appropriate and hold instream flow water rights on behalf of the public. Acting as any other appropriator, the state agency is vested with the authority to acquire instream flows. An important consequence of this approach is that even if state-held inflow appropriations have late priority dates, the state still has standing to challenge transfers or changes of diversion points.⁵⁵

Statutes in Alaska, Arizona, Idaho, Montana, Nebraska, Nevada, Oregon, Utah and Wyoming allow state agencies to appropriate water for instream flows.⁵⁶ Since 1973 the state water agency in Colorado has been

52. For a discussion of the merits of this approach, see Kaiser & Kelly, *supra* note 34; Johnson, *supra* note 21.

53. Kaufman, *supra* note 4, at 297.

54. Federal agencies may apply for and hold instream rights. For example, the Nevada Supreme Court in 1988 held that the federal government could hold instream rights in that state. See *Nevada v. Morros*, 766 P.2d 263 (Nev. 1988). For a discussion of this option see Steven J. Shupe & Lawrence J. MacDonnell, *Recognizing the Value of In-Place Uses of Water in the West: An Introduction to the Laws, Strategies and Issues*, in *INSTREAM FLOW PROTECTION IN THE WEST* 1-13 (Lawrence J. MacDonnell & Teresa A. Rice rev. eds., 1993).

55. Tarlock, *supra* note 5, at 241.

56. ALASKA STAT. § 46.15.145 (Michie 1996); ARIZ. REV. STAT. ANN. § 45-151 (West Supp. 1996); IDAHO CODE § 42-1501 (1990); MONT. CODE ANN. § 85-2-316 (1997); NEB. REV. STAT. § 46-2, 108 (1993); NEV. REV. STAT. ANN. § 533.030 (Michie 1995); OR. REV. STAT. § 537.336 (Supp. 1996); UTAH CODE ANN. § 73-3-3(11)(a) (Supp. 1997); WYO. STAT. ANN. § 41-3-1003(c) (Michie 1997).

able to appropriate unallocated water or directly purchase water rights and reallocate the rights to environmental flows.⁵⁷ Legislation in 1987 allowed the agency to also acquire inflow rights through private sector donations, gifts, bequests, deeds, or other similar means.⁵⁸

In Texas, the obvious agency to appropriate water for instream flows is the Parks and Wildlife Department. It is semi-independent of the appropriation and adjudication system, and it has the expertise to act as an advocate for the environment. It has already been authorized to receive appropriations from certain reservoirs⁵⁹ and is exempted from paying any filing, recording or use fees for appropriations.⁶⁰

b. Private appropriations.

Under the private appropriations approach, individuals or organizations, including environmental groups, are able to appropriate water for beneficial environmental uses. Only Alaska and Arizona explicitly allow private individuals or organizations to hold environmental appropriations.⁶¹ Colorado had a similar approach in the early 1970s, but 1987 legislation gave the state water agency exclusive authority to hold environmental rights, thereby undermining further private efforts.⁶² Although private appropriations are still encouraged, they must be subsequently dedicated to the state.⁶³ Though Oregon does not permit private parties to make new appropriations for instream flows, private parties can purchase, lease, or receive as a gift existing water rights for instream purposes. The state provides incentives and rewards to users initiating conservation or water savings practices. Legislation in 1987 allows appropriators who conserve water to sell or use approximately 75 percent of the salvaged water, while the remaining twenty-five percent reverts to the state for environmental flow needs with the original priority date.⁶⁴

57. COLO. REV. STAT. ANN. § 37-92-102(3) (West 1990 & Supp. 1997).

58. *Id.*

59. TEX. WATER CODE ANN. § 16.1331 (West 1988).

60. *Id.* § 12.112 (West Supp. 1997).

61. ALASKA STAT. § 46.15.145 (Michie 1996); ARIZ. REV. STAT. ANN. § 45-151A (West Supp. 1996).

62. See Potter, *supra* note 4, at 440; Kaufman, *supra* note 4, at 301.

63. COLO. REV. STAT. ANN. § 37-92-102(3) (West 1990 & Supp. 1997).

64. See OR. REV. STAT. §§ 537.348, 537.455, 540.510 (1988 & Supp. 1996). For a discussion of the efficacy of this program see Mark Honhart, *Carrots for Conservation: Oregon's Water Conservation Statute Offers Incentives to Invest in Efficiency*, 66 U. COLO. L. REV. 827 (1995).

Finally, as a result of a Nevada Supreme Court decision, private applications for instream use are possible.⁶⁵

2. Acquisition Methods

Instream flows can be acquired through a new appropriation, the negotiated transfer of an existing senior right, or the condemnation of an existing senior right.⁶⁶ Where water is unappropriated, a new right can be granted for instream flows, although this right will be junior to the more senior diversion rights. The major disadvantage of this approach is that many rivers are fully appropriated, and little water is available for instream uses. Even if water was available for appropriation it would be subject to senior rights.⁶⁷ During times of drought, when instream flows are especially important, there would be little water to satisfy instream needs after senior appropriators had taken their appropriations.

An instream flow right can be obtained by acquiring an existing consumptive right through a negotiated transfer and then converting the right to a nonconsumptive flow right. This process is typically described as water marketing. Water marketing is simply another tool or strategy for establishing and preserving environmental flows. It is an allocative mechanism that encourages voluntary exchanges among interested parties, and it is aptly suited for those jurisdictions where there is little or no unappropriated water. Advocates of this approach suggest that water marketing provides needed flexibility in water allocation to meet changing conditions in a way that minimizes political conflict.⁶⁸ Several specific strategies for acquiring environmental flows through a market-based approach are briefly presented below.

65. See, e.g., *Nevada v. Morros*, 766 P.2d 263 (Nev. 1988) (allowing water to be appropriated for fish and wildlife purposes because Nevada Statutes, NEV. REV. STAT. ANN. § 533.030 (Michie 1995), requires only the application of water to a beneficial use).

66. See condemnation, *infra* notes 116-123.

67. The structural difficulties are illustrated by the Colorado approach of integration. In 1973 Colorado authorized an instream flow program to fit within the guidelines of the prior appropriation system. Thus, instream flow rights became vested rights on par with other rights but they were junior by 70 years to the senior rights on most rivers in the settled regions of the state. See COLO. REV. STAT. ANN. § 37-92-102(3) (West 1990 & Supp. 1997).

68. See Ronald Kaiser, *Texas Water Marketing in the Next Millennium: A Conceptual and Legal Analysis*, 27 TEX. TECH L. REV. 181 (1996); Wahl, *supra* note 45, at 203; Colby, *supra* note 4, at 6-16 to 6-21.

a. Purchases.

Acquiring environmental flow rights in a free market system is typically achieved through purchase of direct flow rights. However, other mechanisms such as purchase of conservation pools or shares in water companies are options as well. A party simply purchases existing water rights and dedicates the rights to an environmental flow.⁶⁹ Problems of funding, determining a fair market price, meeting diversion requirements, and possibly dealing with the reluctance of existing users to have rights dedicated to environmental uses must be overcome for this strategy to be effective.⁷⁰

Montana, Colorado, Utah, and Wyoming appear to be the only western states that specifically authorize the state to purchase existing water rights for environmental flow purposes.⁷¹ Some states allow private individuals and organizations to purchase rights for environmental purposes. Private parties in Oregon and Colorado can purchase existing rights.⁷² In Colorado, however, the rights must subsequently be donated to the state, although the donor is able to contract with the state on how the rights are to be administered.⁷³ Since Alaska and Arizona allow private parties to hold environmental rights, presumably there are no restrictions on purchases for the transfer of existing rights to environmental purposes.

b. Leases, Exchanges and Options.

Where a permanent water right is not available, other acquisition strategies can be used to obtain water for environmental flows. Leases, exchanges and dry-year options can provide water during critical periods or even on a long-term basis.⁷⁴ Lease arrangements have the added advantage of supplying income to and forestalling abandonment proceedings against consumptive users, especially irrigators, who have

69. The Nature Conservancy has been at the forefront in purchasing water rights for dedication to environmental uses. See Bonnie Colby, *Benefits, Costs, and Water Acquisition Strategies: Economic Consideration in Instream Flow Protection*, in *INSTREAM FLOW PROTECTION* IN THE WEST 6-17 to 6-19. (Lawrence J. MacDonnell & Teresa A. Rice eds., rev. ed. 1993).

70. RICHARD DEWSNUP & DALLIN JENSEN, U.S. DEPT OF INTERIOR, *STATE LAWS AND INSTREAM FLOWS* 38-39 (1977).

71. MONT. CODE ANN. § 87-1-209 (1997); COLO. REV. STAT. ANN. § 37-92-102(3) (West 1990 & Supp. 1997); UTAH CODE ANN. § 73-3-3 (Supp. 1997); WYO. STAT. ANN. § 41-3-1007 (Michie 1997).

72. OR. REV. STAT. § 537.348 (1988); COLO. REV. STAT. ANN. § 37-92-102(3) (West 1990 & Supp. 1997).

73. Wahl, *supra* note 45, at 197.

74. DEWSNUP & JENSEN, *supra* note 70, at 40-41.

unused water.⁷⁵ In contrast, at-cost administrative transfers involve leasing water for a rate that covers costs associated with the transfer but does not confer economic gain on the lessor.⁷⁶

Dry-year options arrangements are worthwhile alternatives to purchases and leases. A dry year option is a mechanism to provide water during times of drought. When water users normally have a reliable water supply but are subject to unacceptable shortfalls in dry years, they can acquire an option to lease water from another party during those dry years. Cities have negotiated dry year options with irrigators as a way to provide additional water.⁷⁷ Dry-year options can protect environmental flows during drought years but otherwise do not hinder water use in wetter years.

Wyoming, Montana, and Oregon allow leasing of water for environmental flows. Water conservancy districts in Wyoming are authorized to enter into lease agreements to acquire needed water.⁷⁸ Montana may lease water to augment and maintain streamflows for environmental purposes,⁷⁹ and an innovative state water leasing program was implemented in 1985 to foster conservation and efficient use of the state's water resources.⁸⁰ Lastly, legislation in 1987 authorized agencies in Oregon to acquire water for environmental flow purposes through lease arrangements.⁸¹

3. Acquisition Options In Texas.

One way to overcome the problem of fully appropriated rivers is for a party to acquire and convert an existing water right.⁸² Thus, an environmental group could purchase a senior water right and seek TNRCC approval to change use to streamflow protection. For a change in use or

75. See Christopher H. Meyer, *Integrating New Uses and New Players Into the Prior Appropriation System*, in *INSTREAM FLOW PROTECTION IN THE WEST* 2-12 (Lawrence J. MacDonnell & Teresa A. Rice, eds., rev. ed. 1993).

76. Colby, *supra* note 4, at 1116.

77. For example, a Utah city paid \$25,000 for an option to lease irrigation water in any year that it exercised its option. Over the 25 years that the arrangement was in effect the city used the water a total of three dry seasons. See Edward Clyde, *Legal and Institutional Aspects of Drought Management*, in *DROUGHT MANAGEMENT AND ITS IMPACT ON PUBLIC WATER SYSTEMS* 78, 87 (Nat'l Res. Council ed., 1986).

78. DEWSNUP & JENSEN, *supra* note 70, at 40-41.

79. MONT. CODE ANN. § 87-1-209 (1997).

80. John E. Thorson, *Public Rights at the Headwaters*, J. AM. WATER WORKS ASS'N, Oct. 1986, at 72, 77.

81. See OR. REV. STAT. §§ 537.336, -.348 (1988 & Supp. 1996).

82. For a discussion on buying and selling water rights in Texas, see Ronald Kaiser, *Texas Water Marketing*, *supra* note 68; Mike Willatt, *Buying and Selling Water Rights in Texas*, 59 TEX. BAR J. 628 (1996).

transfer to occur, an amendment to the original water right must be approved by the TNRCC.⁸³ Although it can be argued that instream flows are authorized by the Water Code,⁸⁴ and are a beneficial use of water,⁸⁵ it might be difficult to show that the flows maximize water utilization,⁸⁶ especially in view of low priority given to recreation and other uses on the statutory preference list.⁸⁷ In spite of these ambiguities, instream flow purchases will probably pass legal muster and be sustained by the Commission and the courts.⁸⁸

Another possible contractual source of water for instream flows is the purchase of stored water.⁸⁹ The 1990 Texas Water Plan indicated that about 850,000 acre-feet of storage water is available for purchase.⁹⁰ Instead of acquiring the underlying water right, the purchaser merely buys the water.⁹¹ While the problems of beneficial use and priority are the same as for the purchase of a water right, stored water is more likely to be available, and its purchase would be less likely to result in the impairment of existing rights.

83. An application to change the place or purpose of use, point of diversion, rate of diversion or otherwise alter a water right requires approval of the Commission. See TEX. WATER CODE ANN. § 11.122 (West 1988).

84. Whether a water right for an instream flow is authorized under the Texas Water Code has not been statutorily or judicially resolved. Under the Code, a water right is defined as a right to "impound, divert or use state water," which implies that use is possible without diversion. See TEX. WATER CODE ANN. § 11.002 (5) (West 1988).

85. Rules of the Commission recognize instream uses as a beneficial use of water. See 30 TEX. ADMIN. CODE § 297.1 (West 1988).

86. Although the Commission must give preference to applications which will effectuate the maximum utilization of water and are calculated to present the escape of water without a contribution to a beneficial public service, it seems clear from other parts of the code that inflows relate to public welfare. See TEX. WATER CODE ANN. §§ 11.123, -.1351, -.147, -.152, 15.3041 (West 1988).

87. The Commission is obligated to give preference to applications according to a statutory priority list which ranks all other named uses above recreation and game preserves and does not list inflows protection at all. See TEX. WATER CODE ANN. § 11.023 (West 1988). But see 30 TEX. ADMIN. CODE § 297.1.8 (WESTLAW through Mar. 28, 1997) (rules promulgated by the Commission recognize instream uses as a beneficial use).

88. See Kaiser & Kelly, *supra* note 34, at 1130-34.

89. See TEX. WATER CODE ANN. §§ 11.036, 15.323 (West 1988).

90. 1990 TEXAS WATER PLAN, *supra* note 2, at 1-8. (About half of this 850,000 acre-feet of uncommitted supply is in the Sam Rayburn Reservoir).

91. Sales can only be made if three conditions are satisfied: (1) an applicant has a permit issued by the Commission; (2) the sale is in the public interest; and (3) the sale "is fair, just, reasonable, and in full compliance with the law." See TEX. WATER CODE ANN. § 15.321(a) (West 1988).

Another option for obtaining instream flows is for the Texas Water Bank (Bank) to take a lead role in acquiring instream flows for the state.⁹² The Texas Water Bank is basically an institutional mechanism created to facilitate water transfers. Conceptually, the Bank acts as a brokerage institution where a water right is "deposited" with the Bank by a water rights holder or is purchased or leased by the Bank from a water rights holder. The "deposited" water becomes available for "withdrawal" by a purchaser or lessee subject to certain conditions imposed by the Bank. Unless the Bank purchases or leases a permanent water right, it merely brokers or facilitates the transfer of water between buyers and sellers.

The TWDB is in a position to provide incentive programs to encourage depositors to place water in the Bank to meet instream and environmental water needs.⁹³ Experiences in California and Idaho demonstrate that water for instream flows can be provided through banking activity.⁹⁴ While the Texas Bank does not currently have funding to acquire water rights for environmental purposes, the lack of money should not be viewed as a barrier to all incentive programs. For example, the Bank can offer protection to water rights holders from cancellation of rights.

92. For legislation creating the Bank, see TEX. WATER CODE ANN. §15.700 to -.708 (West Supp. 1997).

93. Legislation creating the Bank directed the TWDB, in coordination with the TNRCC and the TPWD, to study and report on ways to assist in providing flows to meet instream, water quality, fish and wildlife habitat, and bay and estuary inflow needs through the water rights marketing and transfer process. The inter-agency group which completed the report suggested three alternatives to the status quo method of providing and protecting instream uses. First, the legislature should fund the TWDB, or the TPWD, to purchase water rights that will go toward protecting critical aquatic and wildlife habitats. These funds could also be used to compensate rights holders for voluntarily agreeing to environmental (instream) conditions appended to their permits. Second, in order to eliminate the uncertainty in the TNRCC permitting process, the legislature should require a fixed percentage of flow, five percent for example, to be withheld from all new and amended permits. Third, since the state has not dedicated funds for the purchase of water for instream purposes, the legislature should provide funding to the Bank so that TWDB can make these types of purchases. See TEXAS WATER DEV. BD., A REPORT TO THE GOVERNOR AND MEMBERS OF THE TEXAS LEGISLATURE CONCERNING THE TEXAS WATER BANK (1995).

94. Experiences in California and Idaho indicate that banks can transfer a significant amount of water to meet environmental water needs. The 1992 California bank transferred 30 percent of its deposited water for environmental purposes. Data from the local banks in Idaho indicated that a large percentage of the water transferred in 1993 was used for environmental purposes. See Kaiser, *supra* note 68, at 189; LAWRENCE MACDONNELL, ET AL., WATER BANKS IN THE WEST 2-1 to -45 (1994).

C. Permit restrictions

Instream flows can be protected, even in the absence of other strategies, by imposing conditions on water permits that will guarantee a minimum level of stream flow. State constitutions, statutes or administrative rules may require consideration of public interest when approving applications for new permits, transfers or changes in use. Using public interest rubric, state water agencies may incorporate in water permits any condition, restriction, limitation or provision reasonably necessary to insure minimum instream flows.

Except for Colorado and Oklahoma, all of the western states require public interest reviews and consideration for original applications and most also apply the standard to transfers or changes in use.⁹⁵ These statutes vary considerably in outlining the criteria for public interest review and in granting regulatory agencies the discretion in defining the term. Some statutes simply require a public interest review without defining what is meant by the term. New Mexico,⁹⁶ South Dakota,⁹⁷ and Nevada,⁹⁸ allow a regulatory agency to reject a transfer application where the transfer is detrimental to the public interest. The California and Utah statutes specifically require ecological values to be included in public interest determinations.⁹⁹ This perhaps represents an expanding concept of the public interest, which includes greater consideration of environmental values.¹⁰⁰

The TNRCC is required to assess the effects, if any, of the issuance of the permit on bays and estuaries, existing instream uses, fish and wildlife habitat and water quality.¹⁰¹ The Commission has addressed instream flow

95. See ALASKA STAT. § 46.15.080 (Michie 1996); ARIZ. REV. STAT. ANN § 45-153 (West 1994 & Supp. 1997); CAL. WATER CODE, §§ 1255-1258 (West 1971 & Supp. 1998); IDAHO CODE § 42-203A (1990); KAN. STAT. ANN. § 82A-711 (1989); MONT. CODE ANN. § 85-2-311(2) (1997); NEB. REV. STAT. §§ 46-234, -235, 46-2,116 (1993); NEV. REV. STAT. ANN. § 533.370 (Michie 1995); N.M. STAT. ANN. § 72-5-6 (Michie Repl. Pamp. 1997); N.D. CENT. CODE § 61-04-06 (1995); OR. REV. STAT. § 537.170(4), (5) (1988 & Supp. 1996); S.D. CODIFIED LAWS § 46-2A-9 (Michie 1987); TEX. WATER CODE ANN. § 11.147 (West 1988); UTAH CODE ANN. § 73-3-8 (Repl. 1989); WASH. REV. CODE ANN. § 90.03.290 (West 1992 & Supp. 1997); WYO. STAT. ANN. § 41-4-503 (Michie 1997).

96. N.M. STAT. ANN. § 72-5-23 (Michie Repl. Pamp. 1997) (allowing approval of transfers not detrimental to the state).

97. S.D. CODIFIED LAWS § 46-2A-12 (Michie 1987) (allowing for permit changes if not detrimental to public welfare).

98. NEV. REV. STAT. § 533.370 (Michie 1995) (allows for rejection of amendments that prove detrimental to public interest).

99. CAL. WATER CODE § 1253 (West 1971); UTAH CODE ANN. § 73-3-8 (Repl. 1989).

100. Tarlock, *supra* note 5, at 233; Ausness, *supra* note 4, at 431.

101. See TEX. WATER CODE ANN. § 11.147(d), (e) (West 1988).

needs by imposing conditions on new permits and amendments to restrict diversions when flows are at or below certain levels.¹⁰² Since full appropriation of many river basins occurred prior to 1985 without instream flow restrictions, few permits carry these new restrictions. In order to overcome this problem, the Commission would have to determine instream flow needs for each basin and then impose limitations on all water rights holders.¹⁰³ Whether the Commission has the authority, or institutional determination, to sua sponte amend existing rights to protect instream needs is uncertain.

D. Protecting stream navigability

Depending on a state's definition, water may be required to be left in a river or stream to support navigation. Protection or even expansion of state definitions of navigability may indirectly establish and protect environmental values. Although states retain control over the navigable waters within their borders, this power is subsumed to the regulatory authority of the federal government.¹⁰⁴ Based on the federal commerce clause, the federal navigability test rests on whether waters are commercially navigable in fact.¹⁰⁵ If this condition is met and the federal government's authority to regulate commerce is not impaired, then the states are free to adopt their own rules for determining navigability.¹⁰⁶ Some western states have taken advantage of this opportunity on smaller streams, where the beds are privately owned and where streams may support pleasure craft, by classifying them as navigable.¹⁰⁷ Through this mechanism, new or current diversions of water that further deplete a stream thereby impeding navigation can be prohibited.

102. See TNRC, REGULATORY GUIDANCE DOC., *supra* note 8, at 45.

103. Since surface water is held in trust for the public welfare, the state has the general power to place restrictions on water uses to protect instream flow needs. See TEX. WATER CODE ANN. § 11.021 (West 1988).

104. See DEWSNUP & JENSEN, *supra* note 70, at 7-8, 36-37.

105. A threefold test is used to determine navigability: (1) is the river presently being used, or is suitable for use, or, (2) has it been used or was it suitable for use in the past, or (3) could it be made suitable for use in the future by reasonable improvements. See *Rochester Gas & Electric Corp. v. FPC*, 344 F.2d 594, 596 (2d Cir.), *cert. denied*, 382 U.S. 832 (1965); *City of Centralia v. FERC*, 851 F.2d 278 (9th Cir. 1988).

106. Butler, *supra* note 4, at 338.

107. Ausness, *supra* note 4, at 433.

E. Reservoir releases

States can also protect instream flows by increasing the release of water from reservoirs during periods of low flow. It may be more practical to try to develop environmentally safe operating rules for water impoundments based on flow needs under varying conditions rather than appropriating water for inflow needs. By requiring reservoir releases to emulate natural rainfall runoff and stream flows at targeted levels it may be possible to (1) provide more water for the environment than a direct appropriation and (2) preserve the current economic uses of water.¹⁰⁸ As an example of the use of this strategy, Wyoming requires consideration of environmental flow needs in state reservoir or dam projects.¹⁰⁹ Colorado, Montana, and Wyoming statutorily authorize impoundment construction but with protected releases for fish and game.¹¹⁰ The result is the release of sufficient water to protect fish habitats and other environmental values far downstream of the facilities.¹¹¹

Requiring releases of unappropriated water from reservoirs is a limited strategy for protecting instream uses during periods of low flows. The ad hoc nature of this mechanism makes the provision of water for instream flows unpredictable, inconsistent, and uncertain. In some cases, especially for environmental needs, reservoir releases may be too little and too late. Instream uses, like consumptive ones, require a dependable supply of water, and a steady water supply is not provided when decisions are made on a case-by-case basis. A reservoir release is essentially a reaction to a problem, and it may be better to pursue other options which take a proactive stance and offer the predictability, certainty, and consistency that advocates of the prior appropriation system desire.

In Texas, the Commission can place restrictions on reservoir permits that are reasonably necessary for the enforcement and administration of the state water laws, including any public trust obligations.¹¹² Recommendations from the TWDB regarding instream flow

108. For a discussion in Texas see RALPH WURBS ET. AL., *TEXAS WATER RESOURCES INST., RESERVOIR/RIVER SYSTEMS RELIABILITY CONSIDERING WATER RIGHTS AND WATER QUALITY* (1994).

109. See WYO. STAT. ANN. § 41-2-112(a) (Michie 1997).

110. See COLO. REV. STAT. ANN. § 37-92-103(4) (West 1990); MONT. CODE ANN. § 85-2-316(5) (1997); WYO. STAT. ANN. § 41-3-1006 (Michie 1997).

111. See Matthew Reynolds, Comment, *Wyoming's New Instream Flow Act: An Administrative Quagmire*, 21 LAND & WATER L. REV. 455, 456-57 (1986).

112. For example, the permit authorizing the Lake Texana Dam and Reservoir was issued subject to "the release of water for the maintenance of the Lavaca-Matagorda Bay and Estuary System," as determined by the Commission. See TEXAS WATER RIGHTS COMM'N PERMIT NO. 2776 (1972).

criteria for new reservoirs have been accepted by the Commission and the Parks and Wildlife Department.¹¹³

When conditions are critical the TWDB may release unappropriated water stored in a reservoir to relieve emergency conditions related to insufficient instream flows.¹¹⁴ The Commission must first determine the existence of the emergency and request the Board to release the water.¹¹⁵ However, this is a dubious option as very little water is presently available that is not appropriated.

F. Condemnation

If a suitable amount of water is not available to meet instream needs, it is conceivable that the state could use its power of eminent domain to condemn existing rights.¹¹⁶ A water right can be subject to state eminent domain powers because it is an interest in real property. Although water taken for a public use requires compensation to the owner, no compensation is required for proper exercise of a state's police powers that protect values such as public health and safety. For example, water condemned for recreational use will likely require compensation, but water condemned to maintain water quality may pass the compensation test. Commentators note, however, that use of condemnation as a reallocation tool may exact high political costs and may therefore be looked at unfavorably.¹¹⁷ One commentator echoes these sentiments but goes further by suggesting that

113. The conservation storage of new, on-channel water supply reservoirs would be divided into three zones with provisions for varying levels of instream flows downstream of the project. Zone 1 occurs when reservoir levels are greater than 80 percent of storage capacity and inflows will be released up to the monthly medians, calculated with naturalized stream flow estimates. Zone 2 occurs when reservoir levels drop to between 50 and 80 percent of capacity and inflows will be released up to the monthly 25th percentile flows. For zone 3, when reservoir levels drop below 50 percent storage capacity, inflows would be passed up to the established water quality standard for the downstream river segment. See *Consensus Water Planning*, *supra* note 10, at 4.

114. Unappropriated water and other water of the state permitted to the TWDB and stored in any facility under control of the Board may be released without charge to relieve any emergency condition arising from drought or other circumstance. These emergency releases could be used to provide water for instream uses and beneficial inflows for bays and estuaries. The Parks and Wildlife Department may petition the Commission to request such instream flow releases. See TEX. WATER CODE ANN. §§ 15.325, 16.195 (West 1988).

115. See TEX. WATER CODE ANN. § 16.195 (West 1988).

116. See Harbison, *supra* note 4, at 536; John Leshy, *Instream Flow Rights: The Private and Public Rights*, in AMERICAN LAW INST. & AMERICAN BAR ASSOC., WESTERN WATER LAW IN THE AGE OF REALLOCATION 171 (1991).

117. See Sherton, *supra* note 4, at 412-14; Harbison, *supra* note 4, at 570.

the use of this strategy may also be an admission of failure on the part of the prior appropriation doctrine as a system of allocating water resources.¹¹⁸

The state can use its police powers for purposes of condemnation, but this may present political problems as existing users may resist a state's intrusion into "their affairs" and may question the constitutional or regulatory authority of the state's actions.¹¹⁹ The privilege to use the state's waters seems to quickly and ebulliently turn into a right of ownership in those waters.¹²⁰ Since condemnation involves such intense political and emotional responses from water users, the less contentious approach may be for the state to allow water marketing.

Although some states have implicitly denied the use of condemnation to acquire instream flows,¹²¹ Texas statutes authorize state agencies to use condemnation as a means of acquiring water rights.¹²² If water rights for instream flows are not available for purchase, it is theoretically possible for an agency such as the TPWD to condemn such rights.¹²³ While it is legally uncertain whether the agency would have to pay the water rights holders just compensation, the certainty of political furor makes the use of this strategy highly unlikely. Despite the state's public policy of maintaining instream flows, it is unlikely that condemnation would be exercised for this purpose.

G. Cancellation

This strategy is often given short shrift as a tool to provide water for instream flows. Like condemnation it is fraught with adverse political repercussions.¹²⁴ States that have detailed records of water use could make

118. A. Dan Tarlock, *Future Issues in Instream Flow Protection in the West*, in *INSTREAM FLOW PROTECTION IN THE WEST* 8-8 (Lawrence MacDonnell & Teresa Rice, eds., rev. ed. 1993).

119. *Id.* at 8-7 to 8-8.

120. See Tarlock, *supra* note 5, at 211.

121. See, e.g., COLO. REV. STAT. § 37-92-102(3) (1988); WYO. STAT. ANN. § 41-3-1009 (Michie 1997). Wyoming views itself as a market participant rather than a sovereign when using its environmental permits; eminent domain is only permitted for municipal purposes. WYO. STAT. ANN. § 41-3-1013 (Michie 1997). In California, Montana and Oregon condemnation powers have been granted for river protection. OR. REV. STAT. § 390.845 (Supp. 1996); MONT. CODE ANN. § 87-1-209 (1997); CAL. WATER CODE § 11580 (West supp. 1997).

122. See TEX. WATER CODE ANN. § 11.033 (West 1988) (All political subdivisions of the state and constitutional governmental agencies exercising delegated legislative powers have the power of eminent domain to be exercised as provided by law for domestic, municipal, and manufacturing uses and for other purposes authorized by this code, including the irrigation of land for all requirements of agricultural employment).

123. See TEX. WATER CODE ANN. § 11.033 (West 1988).

124. To commence such action, the state agency can initiate forfeiture or abandonment proceedings against the water right holder. Forfeiture involves the loss of rights to use water where an appropriator fails to make beneficial use of the water for a statutorily-defined

better use of this strategy than those which do not. Waters that are not used could be reallocated to environmental uses. Strict enforcement of all uses, not only the most egregious ones, would serve notice to all users that water not put to a beneficial use would be subject to loss. This may be a heavy-handed state action, but it can also be construed as entirely just and equitable in light of public interest concerns.

In Texas a water right is subject to forfeiture and cancellation for nonuse, and the Commission is authorized to initiate cancellation proceedings if its records show that some portion of the water has not been used during the past 10 years.¹²⁵ Although cancellation proceedings do not directly establish and protect instream uses, they can free up water otherwise not used by appropriators for instream uses.

While this strategy is certainly useful, it appears that the Commission is loath to pursue such proceedings.¹²⁶ This strategy could make additional water available for instream flows but it would possibly be with high economic and political costs. Additionally, this strategy is rife with factual difficulty as the Commission lacks accurate and current data to assess the differences between actual use, beneficial use, consumptive use, wasteful use and nonuse for individual rights holder on nearly all river basins.¹²⁷ The Commission recognizes that cancellation of water rights is a

period (e.g. five years). Although similar, abandonment involves an intentional relinquishment or surrender of water rights. The two doctrines, moreover, can serve as protection against speculation. A problem arises with those cases which go beyond administrative hearings and into the courts: not only will the state incur costs associated with litigation, but the courts have been reluctant to take water rights away from those who have not used them. See SAX, ET AL., *supra* note 4, at 271-86.

125. It is the legislature's clear intention that water not put to a beneficial use is to be considered not appropriated. TEX. WATER CODE ANN. § 11.025 (West 1988). The right to use an appropriation of state water can be forfeited, and the water is subject again to appropriation if the appropriation is "willfully abandoned during any three successive years." *Id.* Moreover, a permit may be canceled in whole or part if all or part of the water has not been put to beneficial use during any ten year period. *Id.*, at § 11.173. See also 30 TEX. ADMIN. CODE § 297.73 (WESTLAW through March 28, 1997). In addition, a new permit for appropriation may be canceled in whole or part if no action is taken by the time specified in the permit or a maximum period of two years. TEX. WATER CODE ANN. § 11.146 (West 1988); 30 TEX. ADMIN. CODE § 297.47 (WESTLAW through March 28, 1997).

126. See TNRCC, REGULATORY GUIDANCE DOC., *supra* note 8, at 74-75. The TNRCC should be aware of permit holders who are not putting all or part of their appropriation of state waters to beneficial use. The legislature has explicitly directed the Commission to evaluate outstanding permits and certified filings and cancel those permits which are subject to cancellation. As part of this directive, appropriators are required to submit annual reports to the Commission See TEX. WATER CODE ANN. §§ 11.031, 11.032 (West 1988); see also 30 TEX. ADMIN. CODE § 295.202 (West 1997).

127. See Ronald Kaiser, Texas Water Marketing, *supra* note 68 at 254; OFFICE OF THE STATE AUDITOR OF TEXAS, SAO REPORT NO. 3-081, TEXAS WATER RESOURCES MANAGEMENT: A CRITICAL REVIEW 25 (1993).

viable option but posits that it may not provide sufficient water for instream needs and it views this strategy as procedurally burdensome and time-consuming.¹²⁸

H. Water quality programs

States can make use of water quality control programs to indirectly protect instream flows. Diversions of water can reduce flows below the minimum necessary for natural waste assimilative processes. A stream will not be able to naturally dilute pollutants if water levels are low or if waste discharges into the stream are not abated. States that curtail diversions and diminish pollution discharge into waterways can enhance water quality and a number of other concomitant environmental benefits.¹²⁹

The federal Clean Water Act (CWA)¹³⁰ requires the states to have water quality programs that meet minimum federal standards. Compliance with many of the federal and state water quality standards could be achieved by simply allowing more water to remain in streams.¹³¹ Thus, water quality requirements could be addressed by water quantity measures. If states establish mechanisms that increase flows and protect stream environments based on water quality, then adequate flows for stream flushing, assimilating wastes, and a number of other environmental purposes are possible.¹³²

A state's authority to prevent pollution derives from exercise of its police powers, and compensation to affected parties will not likely be required. The basic tenet here is that no one can acquire a property right to pollute.¹³³ Diversions and discharges can be regulated alike.

I. Public trust doctrine

The public trust doctrine is a collection of common-law principles used to protect the public's interest in property owned by the state in trust for the people.¹³⁴ The doctrine is not new, as its historic roots predate modern water allocation systems. The concept of a public trust was first

128. TNRCC, REGULATORY GUIDANCE DOC., *supra* note 8, at 75.

129. See Davis, *supra* note 4.

130. 33 U.S.C. § 1251 (1997), Pub. L. No. 95-217, 91 Stat. 1567.

131. See Davis, *supra* note 4; Sherton, *supra* note 4, at 399.

132. Leshy, *supra* note 116 at 166.

133. SAX ET AL., *supra* note 4, at 273-86.

134. See Joseph L. Sax, *The Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention*, 68 MICH. L. REV. 473, 478 (1970).

articulated in a series of United States Supreme Court decisions over control of coastal and navigable fresh water resources in the states.¹³⁵

While the modern concept of the public trust doctrine appears to have emanated from an 1892 Illinois case,¹³⁶ the most celebrated public trust case is the Mono Lake decision,¹³⁷ where the California Supreme Court held that "the public trust doctrine imposes a duty of continuing supervision over the taking and use of appropriated water."¹³⁸ The decision grafted the public trust doctrine onto the prior appropriation system¹³⁹ and extended protection to recreational, ecological, and aesthetic values.

Many western states have adopted the public trust theory for water resources. Montana decided two cases in 1984 concerning recreation and stream access.¹⁴⁰ Idaho has used public trust to review existing rights to insure that the doctrine was not violated.¹⁴¹ Utah, Washington, and North Dakota have also invoked or adopted the trust concept in some manner.¹⁴²

The scope of the public trust doctrine is poorly defined in Texas but there is little doubt that the doctrine does exist.¹⁴³ The concept has emerged most often to prevent title to lands submerged under navigable water from being conveyed to private persons without express legislative authorization.¹⁴⁴ Surface water in lakes, rivers, and streams is the property of the state¹⁴⁵ and is held in trust for the "benefit of all of its inhabitants."¹⁴⁶ Although water may be appropriated for consumptive purposes, the public

135. See *Martin v. Waddell*, 41 U.S. (16 Pet.) 367 (1842); *Pollard v. Hagan*, 44 U.S. (3 How.) 212 (1845); *Barney v. City of Keokuk*, 94 U.S. 324 (1876).

136. *Illinois Cent. R.R. v. Illinois*, 146 U.S. 387 (1892).

137. *Nat'l Audobon Soc'y v. Super. Ct. Alpine Cty.*, 658 P.2d 709, *cert. denied*, 464 U.S. 977 (1983).

138. *Id.* at 728-29.

139. *Id.* at 732.

140. See *Montana Coalition for Stream Access v. Hildreth*, 684 P.2d 1088 (Mont. 1984), *overruled on other grounds*; *Montana Coalition for Stream Access v. Curran*, 682 P.2d 163 (Mont. 1984).

141. See *Kootenai Envtl. Alliance, Inc. v. Panhandle Yacht Club, Inc.*, 671 P.2d 1085 (Idaho 1983); *Shokal v. Dunn*, 707 P.2d 441 (Idaho 1985).

142. See *J.J.N.P. Co. v. Utah ex rel. Div. Wildlife Resources*, 655 P.2d 1133 (Utah 1982); *Caminiti v. Boyle*, 732 P.2d 989 (Wash. 1987), *cert. denied* 484 U.S. 1008 (1988); *United Plainsmen Assoc. v. North Dakota State Water Conservation Comm'n*, 247 N.W. 2d 457 (N.D. 1976).

143. See, e.g., *Motl v. Boyd*, 286 S.W. 458 (Tex. 1926); *Diversion Lake Club v. Heath*, 86 S.W.2d 441 (Tex. 1935).

144. See e.g. *Lorino v. Crawford Packaging Co.*, 175 S.W.2d 410 (Tex. 1943); *City of Galveston v. Mann*, 143 S.W. 2d 1028 (Tex. 1940).

145. TEX. WATER CODE ANN. § 11.021 (West 1997).

146. *Butler v. Sadler*, 399 S.W.2d 411, 415 (Tex. Civ. App. — Corpus Christi 1966, writ ref'd n.r.e.).

trust doctrine could be used to reallocate water for an estuary or riverine system.¹⁴⁷

IV. A CASE STUDY OF STAKEHOLDER STRATEGY PREFERENCES

Conflict is endemic in the reallocation of water to satisfy instream needs. While Texas has adopted the U.S. Fish and Wildlife Service model for quantifying instream flow needs,¹⁴⁸ and is working to quantify inflow needs on many stream segments, it is still struggling to determine the appropriate instream flow strategies to provide the water.¹⁴⁹ Many of the strategies discussed in Section III could provide Texas with a comprehensive program, however, choosing the best strategy, or bundle of strategies, is not an easy undertaking. While the three major Texas water agencies and a number of stakeholder groups agree on the need for instream flows, they do not agree on the strategies needed to provide the water. Stakeholder groups want input into strategy selection. An important predicate in strategy consensus building is to identify commonality among stakeholders in their preferences for each strategy. The following section of this paper reports on a study of stakeholder preferences for instream flow strategies in hopes of identifying the commonality.

A. Study methods

Three major riverine stakeholder groups comprised the study population.¹⁵⁰ These stakeholder groups included: (1) state water agencies; (2) water rights holders, and (3) riverine interest or citizen groups. The state water agency group included staff from the Water Development Board (TWDB), the Natural Resource Conservation Commission (TNRCC), and the Parks and Wildlife Department (TPWD). Water rights holders were represented by the Tarrant County Water District; the City of Corpus Christi; the Colorado River and North Texas Municipal Water Districts; and the San Antonio, Brazos, Lower Colorado, Guadalupe-Blanco, and Trinity

147. See *Diversion Lake*, 85 S.W.2d at 448-49.

148. The model is a modified version of the Instream Flow Incremental Methodology (IFIM). See TNRCC, REGULATORY GUIDANCE DOC., *supra* note 8, at 42.

149. *Id.* at 73-78.

150. A nomination process was used to select individual respondents from the target groups. Potential respondents were identified and chosen in part based on participation in the state's consensus water planning meetings. In order to minimize representativeness and data distortions an effort was made to seek nominations from a relatively large and diverse set of target group members.

River Authorities.¹⁵¹ The interest group consisted of representatives from the Nature Conservancy, the Texas Farm Bureau, the Sierra Club, the Audubon Society, the Sportsmen Conservationists of Texas, the Texas Rural Water Association, and the League of Women Voters.

Data for the study was collected through structured personal interviews and by questionnaires.¹⁵² Twenty-eight persons were interviewed and twenty-six responded to the questionnaire.¹⁵³ The purpose for conducting personal interviews was to gain insight into the gestalt of the instream flow issue. The structured format of the interviews enabled the researchers to identify key themes, and patterns in the responses and to gauge stakeholder knowledge of the issues.¹⁵⁴ Questionnaires were used to elicit stakeholders' preferences for selected instream flow strategies and their opinions on the feasibility or viability of implementing these same strategies.¹⁵⁵ This data represents the most up-to-date material from stakeholders involved in instream flow decision-making in Texas.¹⁵⁶ A presentation of this analysis follows.

B. Collateral issues

Stakeholder interviews revealed five issues significant to the development of a comprehensive Texas instream flow program. These included: (1) the temporal and spatial nature of instream needs; (2) the need

151. Although river authorities, water districts, and municipalities are political subdivisions of the state, they control large amounts of water and sell it to smaller appropriators. As such, it was thought that inclusion of the group would accommodate the instream flow strategy preferences of direct consumers of the water resource.

152. All interview and questionnaire data is on file with the authors.

153. For the state agency group, 12 interviews and surveys were completed; 9 interviews were conducted and 7 surveys were returned by water rights holders; and 7 interviews and surveys were completed by the interest groups.

154. While informed minds make informed decisions, the solutions differ. Stakeholders are making informed decisions based on their different interests in the allocation of water among competing interests. Since the stakeholders represent regulatory, managerial and environmental interests, their solutions reflect these interests.

155. Data from the questionnaire comprised the quantitative aspect of the study and was analyzed through descriptive statistical procedures. Descriptive statistics are used to classify and summarize response frequencies. Measures of central tendency and variations among responses can be used to describe the data. The measure of central tendency used in this study was the median. With such a small sample size, the median is the appropriate measure. For a discussion of descriptive statistics see DENNIS E. HINKLE ET AL., *APPLIED STATISTICS FOR THE BEHAVIORAL SCIENCES* 18 (1994).

156. The following study limitations should be recognized. The respondents views are not necessarily the views of the agency or stakeholder group. This study specifically sought the "experts" who would be at the forefront of decisionmaking and policy formulation. It did not seek a representative sample of all possible stakeholders.

to quantify the amount of water required along river segments; (3) the importance of equity in selecting a particular strategy; (4) the effect of agency recalcitrance; and (5) the important but uncertain role for the state water bank. Stakeholders concurred that resolving these issues will be crucial to reaching consensus on the adoption of a particular strategy.

1. The temporal and spatial nature of instream flow needs.

Stakeholders generally view instream flow issues as a statewide problem with "temporal and spatial dimensions." The temporal dimension is illustrated during times of drought when most water users will suffer, though not in the same proportions. The following statement reflects the view held by many state and local water management officials, regarding the temporal nature of instream flows:

It's going to be very difficult to do any management of the environment during a drought, I mean that the system will be stressed naturally and that's the point where man prevails over nature and water will be used to satisfy domestic and municipal needs. Except on a few river basins where flows have been adversely affected by reservoir construction, there is sufficient water for instream needs during normal conditions.¹⁵⁷

While all respondents concur on providing water to meet domestic needs, the respondents diverge over where and when to begin. Environmental interests suggest that some level of resource protection and sustainability should be the first priority, and needs, other than domestic needs, should be satisfied after this concern is addressed. Water supply and regulatory stakeholders did not share this view. They thought that instream flows should be satisfied after municipal, industrial and irrigation needs were met. Whether some level of instream flows and needs should be satisfied prior to satisfaction of other needs remains a problem for stakeholders.

The spatial nature of instream needs is manifested on a regional basis.¹⁵⁸ In east Texas where rainfall is abundant, inadequate instream flow is not a major problem.¹⁵⁹ In south central Texas, springs from the Edwards Aquifer increase the base flow of streams beyond the capacity of surface drainage and produce more uniform flows.¹⁶⁰ The problem is seen as most

157. Confidential interview with a state official in Austin, Tex. (Apr. 16, 1996).

158. All respondents recognized this as a management issue.

159. Except for one respondent who thought that the Trinity River had major instream flow problems, no other stakeholder identified instream flow needs for East Texas Rivers.

160. See Raymond Mathews and Yixing Bao, *The Texas Method of Preliminary Instream Flow Assessment*, 2 RIVERS 295, 300 (1991).

severe in the southern and western semiarid regions of the state where rainfall is highly variable. In these regions the resultant hydrology is stochastic, event based and often intermittent.

The spatial problem is compounded by the fact that many river basins in the southern and semiarid regions of the state are fully appropriated.¹⁶¹ In these basins there is very little protection for instream flows and the environmental amenities are at the mercy of the next drought.¹⁶²

The Guadalupe, San Antonio and Colorado River basins were identified most frequently as problematic basins.¹⁶³ Respondents saw the Colorado River basin, particularly the lower basin, as a problem but many thought that the Lower Colorado River Authority's 1993 Water Management Plan held some promise of providing instream flow protection.

2. Flow quantification.

Stakeholders, especially water rights holders, believe that finding a solution to instream flows is problematic because the amount of water needed to satisfy instream flow needs has yet to be determined on a stream segmented basis. This quantification uncertainty appears to be the primary reason why this group cites the instream flow issue as a problem. Since stakeholders in this group engage in long-term planning, the uncertainty regarding instream flow quantification currently appears to be problematic for these planning efforts.

While the three state agencies have reached consensus on criteria for determining instream flow needs downstream for new on-channel reservoir projects,¹⁶⁴ this consensus is not shared by other non-state agency

161. See TNRCC, REGULATORY GUIDANCE DOC., *supra* note 8, at 26.

162. Confidential interview with an aquatic biologist in Austin, Tex. (Apr. 22, 1996).

163. Other basins or areas mentioned were the Brazos River Basin, the Corpus Christi area, the Sabine River Basin, the Nueces River Basin, and the Blanco River Basin. One respondent said every river that drains into the Gulf of Mexico is problematic, while two respondents did not feel knowledgeable enough to give an informed answer. The Rio Grande River Basin was mentioned by some respondents, and most of these respondents essentially had no hope of instream provision in this basin. *Supra* note 152.

164. The conservation storage of new, on-channel water supply reservoirs would be divided into three categories with provisions for varying levels of instream flows downstream of the projects. Category 1 occurs when reservoir water levels are greater than 80 percent of storage capacity and water for inflows will be discharged at a rate up to the monthly medians, calculated with naturalized daily stream flow estimates. Category 2 occurs as dry conditions drop reservoir levels to between 50 and 80 percent of storage capacity. In this category, water for inflows would be discharged only up to the monthly 25th percentile flow values, calculated with naturalized daily stream flow estimates. In

stakeholders. Waters rights holders and water suppliers suggest that these criteria hamper their long-range planning needs. River authorities and water districts, especially those that have major waterworks, must plan far into the future for initially acquiring and then supplying water. These new criteria may partly or completely change some of these plans.

3. Equity and fairness must guide strategy selection.

All stakeholders stressed that water users should fairly and equitably share in the burden of providing water to meet instream flow needs. While agreeing that this concept should guide agency action, stakeholders did not want to quantify or numerically assess where the burden should fall. They preferred a case-by-case, basin-by-basin process for allocating the burden.

Most stakeholders see the current TNRCC practice of providing instream flow protection through the permit amendment process as inequitable, because the onus of protection is largely placed on those who wish to amend their permits.¹⁶⁵ This practice has the potential to discourage water rights transfers and encourage circumvention of the permitting process. As stated by one respondent:

we don't have the best ideas but we are trying to balance the equity concerns across all water rights holders. A worst case scenario would be if the rules were such that an applicant knew that only they would be at risk if they came in for a new project, they just wouldn't come in for an amendment. They would violate the existing amendment and run the risk of an action by the Commission. Further, I don't think that we can apply instream flow requirements to the next applicant and ask them to meet 100 percent of the instream needs. If we do, there won't be another applicant.¹⁶⁶

category 3, when drought conditions drop reservoir levels below 50 percent storage capacity, water for inflows would be discharged to meet the established water quality standard (7Q2 value published by TNRCC) for the downstream segment. See *Consensus Water Planning*, *supra* note 10.

165. Since 1985 the TNRCC has imposed conditions on new or amended water rights permits to include considerations for instream flows. Most appropriations in Texas were made before instream flow criteria were inserted into the permit process, and the burden of providing instream flow protection will only be borne by a relatively few rights holders. See TEX. WATER CODE ANN. § 11.147 (West 1988).

166. Confidential interview with state water agency administrator in Austin, Tex. (Apr. 16, 1996).

In spite of this concern, the TNRCC continues to apply the instream conditions to new permits and amendments and is reluctant to impose conditions on all water rights holders.¹⁶⁷

Equity concerns were also raised based on the concern that the state would apply the same inflow criteria to all river basins. This "one-size-fits-all" method was seen by many as problematic. The geographic and hydrographic diversity of the state is well recognized but application of a diversity of methods is not. Several respondents in this study advocated regional or basin-by-basin approaches to water management, including instream flows.¹⁶⁸

4. Inflow protection suffers from agency recalcitrance.

The potential political and economic repercussions of reallocating water to instream flows is recognized by stakeholders as contributing to TNRCC recalcitrance in aggressively seeking protection for these flows. There is a strong view among stakeholders outside of the TNRCC that the agency is reluctant to exercise its legally delegated authority. While these respondents recognize the politically onerous repercussion for the TNRCC in exercising this authority, they do not accept this as justification for agency inertia. Stakeholders recognize that there is an institutional culture that may be difficult to change.

5. Uncertain Role for the State Water Bank

The Texas Legislature empowered the Texas Water Bank to facilitate the transfer of water from all sources as necessary to provide an adequate water supply for use within the State of Texas.¹⁶⁹ The TWDB administers the Bank, and the agency has been given significant leeway in creating and operating the Bank.¹⁷⁰ Several key elements of this legislation deserve mentioning. First, the TWDB can facilitate negotiated agreements between buyers, sellers, and depositors; provide registries of buyers and sellers; promote water conservation by allowing conserved water to be deposited in the Bank; purchase or otherwise acquire and sell water and water rights; and establish regional banks. Second, up to 50 percent of a water right, including conserved water, may be deposited. Third, water placed in the Bank is protected from cancellation for ten years. Finally, the

167. See TNRCC, REGULATORY GUIDANCE DOC., *supra* note 8, at 75.

168. Concerns expressed by stakeholders from all groups, even the regulatory group, recognized the need for a basin-specific approach. *Supra* note 152.

169. See TEX. WATER CODE ANN. § 15.701-15.708 (West Supp. 1997).

170. See 31 TEX. ADMIN. CODE §359 (WESTLAW, through March 28, 1997).

Bank is completely voluntary, and transactions may be made outside the Bank.¹⁷¹ Among the western water banks, the Texas Water Bank has the widest legal latitude in the design and operation of its programs.¹⁷²

The general consensus among respondents was that the Bank could be an effective transfer mechanism in the allocation of state water though the respondents were uncertain as to how this would be accomplished. Some interviewees said that it would not work because there is no infrastructure to support it.¹⁷³ The most significant drawback to the Bank was the lack of state funding to acquire water for instream purposes.

C. Crafting instream flow strategies

Developing a set of strategies for instream flow protection requires that a distinction be made between fully appropriated and non-fully appropriated rivers.¹⁷⁴ If unappropriated water is not available in a river and water must be taken away from an existing use and reallocated to instream flows, a different set of strategies is needed than when water is available without reallocation.¹⁷⁵

In order to determine stakeholder acceptance of a particular instream flow strategy, a preference-feasibility analysis was developed based on a four-step process.¹⁷⁶ First, a set of possible instream flow

171. See TEXAS WATER DEV. BD., A REPORT TO THE GOVERNOR AND MEMBERS OF THE TEXAS LEGISLATURE CONCERNING THE TEXAS WATER BANK (1995).

172. See MACDONNELL, *supra* note 94, at 4-79.

173. Other limitations on the Bank include depositor fears about placing their right(s) in the Bank because of uncertainty of how much water they will receive when they withdraw their right (e.g. through partial or full cancellation or a percentage set-aside). Three individuals said, however, that the Bank, as it is structured presently, only appears to prevent cancellation. One person, moreover, mentioned that the restriction of only depositing 50% of one's water right into the Bank is a major hindrance to participation. Finally, one respondent said the Bank will become more active only when water in Texas is exchanged on a market-price basis, rather than a cost of service basis. *Supra* note 152.

174. TEX. WATER CODE ANN. § 11.134(b)(2) (West 1988) provides that the Commission may grant an application for a new or increased appropriation if there is sufficient unappropriated water available in the river. Available water is the amount remaining in the river after taking into account complete satisfaction of all paper and vested water rights valued at their fully authorized levels. See *Lower Colo. River Auth. v. Tex. Dep't of Water Resources*, 689 S.W.2d 873 (Tex. 1984).

175. There is no water available for new appropriations [rivers are fully appropriated] in stretches of the Canadian, Red, Cypress, Sabine, Neches, Trinity, Brazos, Colorado, Guadalupe, San Antonio, Nueces and Rio Grande rivers. See TNRCC, REGULATORY GUIDANCE DOC., *supra* note 8, at 26.

176. This is a variant of importance-performance analysis developed for use in marketing. See James A. Martilla & John C. James, *Importance-Performance Analysis*, 41 J. MARKETING, Jan. 1977, at 77.

strategies were developed from the literature and from the practices of other states.¹⁷⁷ Second, stakeholders were asked to rank their preference for a particular strategy and to rank the feasibility of implementing these strategies on a 5-point Likert scale.¹⁷⁸ Next median preference and feasibility scores were calculated for each strategy (see Tables 1 and 2). Testing indicated that there were no statistically significant differences between the stakeholder groups in the strategies they selected for fully appropriated streams and there were two differences in strategies for the non-fully appropriated streams.¹⁷⁹ Finally, each median score was plotted on a two-dimensional action grid. The action grids depicted in Figures 1 and 2 offer a visual display of the results. Strategies appearing in the right portion of the grid, and in particular the upper right quadrant, are favored by stakeholders, therefore efforts should be focused on these strategies.

1. Fully appropriated rivers.

Figure 1 combines the entire sample's choices for preference and feasibility on strategies for fully appropriated streams. The upper-right quadrant of the graph denotes strategies that the sample as a whole clearly favors and which they feel are feasible to implement.¹⁸⁰ Stakeholders favor strategies that:

- (1) impose instream flow conditions on new permits and on amendments to existing permits;

177. These strategies are outlined in Section III. *Supra* notes 42-147, and accompanying text.

178. For purposes of this study, 'preferences' refers to respondents' ideal choice(s), with all things being equal. 'Feasibility' refers to the viability or possibility of implementing these choices, considering such things as legal, political, economic, and/or social constraints and costs.

179. We used the Kruskal-Wallis nonparametric procedure (the parametric analog is the one-way analysis of variance F test). This test is applicable for three or more samples, and the null hypothesis tested is that the population distributions from which the samples were selected are the same. In analyzing the median "scores" given by the state agency, interest/citizen, and rights holder/water supplier stakeholder groups, it appears that there are no statistically significant differences among the groups in the strategies they selected for fully appropriated streams. For a discussion of this statistic see generally HINKLE ET. AL., *supra* note 155, at 102-24.

180. Respondents were neutral on preference and feasibility for both flow augmentation mechanisms and the public trust doctrine. Reservoir storage releases, while opposed by the sample as a whole, are questionable with respect to feasibility implementation. Conversely, two strategies located in the lower-left quadrant, condemnation and navigability definitions, were opposed and thought to be infeasible for implementation. *Supra* note 152.

- (2) allow for the purchase of instream rights (water marketing) by interested parties;
- (3) require all permit holders to change diversion practice to satisfy state water quality standards (7Q2 standards); and
- (4) require cancellation of unused water rights.¹⁸¹

Except for cancellation(s), stakeholders also thought that these strategies were feasible to implement in the state. Strategies 1 and 3 are status quo positions and do not represent a significant change, while strategies 2 and 4 represent a departure from the status quo.

Although many stakeholders recognized the TNRCC's reluctance to pursue a cancellation program, they believed that this strategy could make water available for instream flows. The argument for this strategy is that if water is not being used beneficially, then the Water Code requires that it be canceled.¹⁸²

2. Non-fully appropriated streams.

As illustrated in Figure 2, strategies favored by stakeholders on non-fully appropriated streams in the state include:

- (1) conditions on new permits;
- (2) reservation of minimum flows;
- (3) purchase of instream rights by interested parties;
- (4) conditions on amended permits; and
- (5) cancellation(s).

Except for the neutral response given to cancellation(s), all of these strategies were also thought to be feasible for implementation. Of these preferred strategies, conditions on new and amended permits represent retention of the status quo.¹⁸³ The other three exemplify a desire for change.

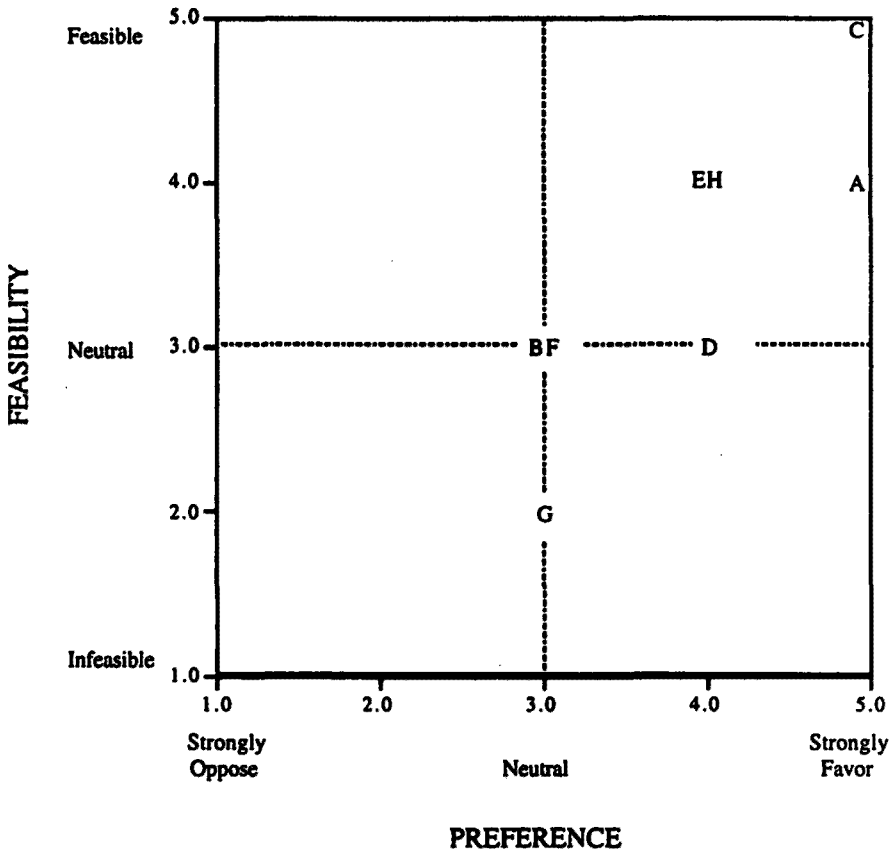
181. Respondents in this study were presented a number of strategies that could be used to establish and preserve instream flows in Texas. Although there are many more strategies which the state can utilize, those presented were thought to be the most feasible in the state.

182. It is the legislature's express intention that water not put to beneficial use is considered not appropriated. See TEX. WATER CODE ANN. § 11.025 (West 1988).

183. The Kruskal-Wallis test detected significant differences, at the $\alpha = .05$ level, among stakeholder group responses for (1) preference for navigability definitions (chi-square 7.657, d.f. 2, sig. .022); and (2) feasibility for reservoir storage releases (chi-square 7.086, d.f. 2, sig. .029). On preference for navigability definitions, the groups that were found to be statistically different were the interest/citizen group and the rights holder/water supplier group (test statistic 9.33, critical value 8.62). Differences regarding the feasibility for reservoir storage releases on non-fully appropriated streams were found between the state agency group and interest/citizen group (test statistic 9.29, critical value 8.59). *Supra* note 152.

Table 1. Stakeholder Median Ratings of Preferences and Feasibilities for Instream Flow Strategies on Fully Appropriated Streams

Strategy	Preferences		Feasibility	
	N	M	N	M
Condemnation	25	2.0	26	2.0
Reservoir storage releases	26	2.0	26	3.0
Conditions on permit amendments	26	4.5	26	4.0
Flow augmentation mechanisms	20	3.0	20	3.0
Purchase of instream rights by interested parties	26	4.0	26	4.0
Public trust doctrine	25	3.0	24	3.0
Navigability definitions	20	2.0	20	2.0
Water quality programs	26	4.0	26	4.0
Cancellation(s)	26	4.0	25	3.0



Aside from the bays and estuaries provision in the Texas Water Code there does not appear to be any other instance where the state has reserved or set-aside water for instream uses. Therefore by definition, there should be water available in non-fully appropriated streams for reservations to meet instream flow needs. Although the number of stream segments with water availability may be limited, stakeholders favor the use of this reservation strategy to preserve available water for instream uses. Canceling unused water rights to free up additional water for instream flows should probably be examined for non-fully appropriated streams as well.

V. CONCLUSIONS

Competition for water in Texas has reached a point where little, if anything, is available for instream flows. The failure to quantify a base level of inflow needs on many Texas rivers and to account for this base level of instream and estuary flow needs during the Texas era of dam building complicates the development of solutions. Ideally, a base level of instream flow needs should have been determined and once that level was satisfied offstream diversions authorized.¹⁸⁴ However, that model was not used and Texas must seek retrofitting solutions.

While regulatory reallocations have successfully secured instream flows in other western states, the political totem of "private property rights" is so entrenched in Texas lore that any compulsory reallocation of water in Texas will meet with heavy political opposition.¹⁸⁵ In this environment, purchasing water rights, placing conditions on existing, new and amended water permits, requiring compliance with water quality standards and reservations of minimum flows on non-fully appropriated rivers may be the best means for maintaining minimum stream flows. These strategies are all authorized in the Water Code but have not been pursued by the TNRCC. If the TNRCC were to add these three strategies to its "arsenal" of instream flow protection strategies, more instream flows could be realized.

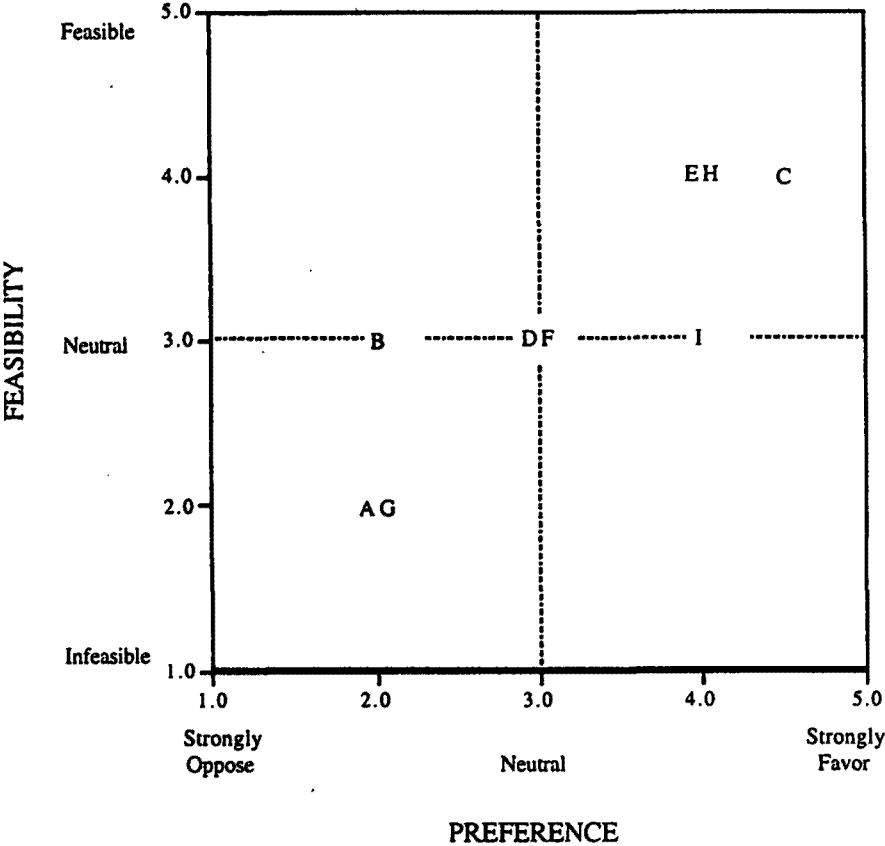
Environmental interests that have historically favored a regulatory approach to natural resource or environmental reallocation, appear to be shifting to a course of consensus-building and negotiated outcomes using

184. The zoned approach for water releases from new reservoirs recently approved by the TNRCC, TWDB and TPWD is a belated attempt to follow this model. See *Consensus Water Planning*, *supra* note 10, at 4.

185. Indeed, one manifestation of this is the TNRCC recalcitrance to institute cancellation proceedings of unused or nonbeneficially used water rights. See TNRCC, REGULATORY GUIDANCE DOC., *supra* note 8, at 75.

Table 2. Stakeholder Median Ratings of Preferences and Feasibilities for Instream Flow Strategies on Non-Fully Appropriated Streams

Strategy	Preferences		Feasibility	
	N	M	n	M
Reservation of minimum flows	25	5.0	26	4.0
Reservoir storage releases	26	3.0	26	3.0
Conditions on new permits	25	5.0	26	5.0
Cancellation(s)	26	4.0	26	3.0
Purchase of instream rights by interested parties	26	4.0	26	4.0
Public trust doctrine	25	3.0	25	3.0
Navigability definitions	20	3.0	18	2.5
Conditions on permit amendments	26	4.0	25	4.0



- LEGEND
- | | |
|--|------------------------------|
| A. Condemnation | F. Public trust doctrine |
| B. Reservoir storage releases | G. Navigability definitions |
| C. Conditions on permit amendments | H. Water quality definitions |
| D. Flow augmentation mechanisms | I. Cancellation(s) |
| E. Purchase of instream rights by interested parties | |

these strategies. As with most government initiatives, change that is the least disruptive is change that will get the least opposition. Merely recognizing or nominally adding these strategies will not provide the desired results. Active implementation of these mechanisms will be necessary for noticeable change to take place. This may mean that a fundamental change in the institutional culture of the TNRCC may be necessary.¹⁸⁶ In order to create a climate that encourages stakeholders to seek negotiated solutions to instream flow problems in Texas, the TNRCC should institute a cancellation program. Until there is some compulsion for the stakeholders to work together, there is only the incentive to plan and not to implement.

Finally, the water shortages resulting from the drought of 1996 illustrate that we have reached a crossroads in the management of Texas water resources. Water demand in the state continues to grow while the opportunity to develop new supplies continues to shrink. Urban growth, industrial and tourism development, environmental needs and recreation uses are creating new demands for water. The challenge for Texas water agencies and water stakeholders is to develop negotiated solutions to protect instream flows where the benefits of cooperation exceed the rewards of rivalry.

186. It would be naive to suggest that political forces do not insert themselves into the policy process. Likewise, it would be carefree to assert that agency personnel are immune to these forces. Perhaps the change that is called for is a political one and must originate in the legislature or the governor's office.