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Cover photo: An artesian well, belonging to catfish farmer Ronnie Pucek, in the Edwards Aquifer in 1993. © Peter Essick

The Edwards Aquifer Water Wars: The Final Chapter?

Robert L. Gulley^{1,2}, Jenna B. Cantwell^{1,2}

Abstract: On December 28, 2011, the Edwards Aquifer Authority's Board of Directors approved the recommendations of the Edwards Aquifer Recovery Implementation Program with respect to a historic Habitat Conservation Plan. The Habitat Conservation Plan could resolve decades of acrimonious rancor and litigation over the use of the Edwards Aquifer. It provides the protection required by the federal Endangered Species Act for 8 listed species stemming from the use of the Edwards Aquifer and associated Comal and San Marcos springs while recognizing the region's ever-growing need for water. The plan was developed by a diverse group of stakeholders through a consensus-based process and submitted to the U.S. Fish and Wildlife Service on January 5, 2012, in support of the Edwards Aquifer Recovery Implementation Program's application for an Incidental Take Permit. The U.S. Fish and Wildlife Service noticed the availability of the Draft Environmental Impact Statement for public comment and conducted 7 public meetings to receive public comment. The public comment period closed on October 18, 2012. On February 15, 2013, the U. S. Fish and Wildlife Service issued its Record of Decision approving the issuance of the Incidental Take Permit and the Habitat Conservation Plan. This paper discusses the history of the dispute over the use of the aquifer, previous attempts to resolve the dispute, the strategic plan for protecting the aquifer, and the decision-making process used to develop the plan.

Keywords: Edwards Aquifer, groundwater, Endangered Species Act, Habitat Conservation Plan

¹ The authors are currently employed by the Edwards Aquifer Authority and are involved in the implementation of the Edwards Aquifer Habitat Conservation Plan. This paper was prepared while the authors were employed at Texas A&M Institute of Renewable Natural Resources. The views in this paper are those of the authors and do not reflect the views of the Edwards Aquifer Authority or its Board of Directors.

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Terms used in paper

Short name or acronym	Descriptive name
AMP	Adaptive Management Process
AMFs	Aquifer Management Fees
ASR	Aquifer Storage and Recovery
CPM	Critical Period Management
DEIS	Draft Environmental Impact Statement
EAA	Edwards Aquifer Authority
EARIP	Edwards Aquifer Recovery Implementation Program
ESA	Endangered Species Act
FMA	Funding and Management Agreement
FWS	U.S. Fish and Wildlife Service
GBRA	Guadalupe-Blanco River Authority
HCP	Habitat Conservation Plan
IA	Implementing Agreement
IRP	Initial Regular Permit
ITP	Incidental Take Permit
NMFS	National Marine Fisheries Service
SAWS	San Antonio Water System

“At a time when dysfunction marks the upper levels of American government and politics, the Edwards region found a way to compromise and meet the needs of a hugely diverse set of interests.”
- San Antonio Express-News Editorial Board, “Aquifer Plan a Major Success,” December 29, 2011

INTRODUCTION

For over 2 decades, the Edwards Aquifer region of central Texas has been deeply divided over how to balance the needs of species listed under the federal Endangered Species Act (ESA) that reside in the Comal and San Marcos spring systems with the water needs of the people supplied by the aquifer. In 2006, the U.S. Fish & Wildlife Service (FWS) brought together stakeholders from throughout the region to develop a consensus-based plan to contribute to the recovery of the federally listed species while accommodating the needs of the region for water. Subsequently, the Texas Legislature mandated that the Edwards Aquifer Authority (EAA) and 4 state agencies participate in the stakeholder process.

Entering into the process, the stakeholders had their doubts that this process would succeed where other similar attempts to find a solution had failed.¹ Four years later, the Edwards Aquifer Recovery Implementation Program (EARIP) made it possible for the Edwards Aquifer region to maintain control of this important resource. This article describes the history of the disputes against which the stakeholders had to reach their decisions; the plan they came up with; why the process was successful in overcoming the obstacles; and why this may be the final chapter in the long saga of the Edwards Aquifer’s water wars.

BACKGROUND

Edwards Aquifer system

The Edwards Aquifer is a unique karst aquifer flowing 180 miles through highly porous limestone. It is an artesian aquifer, meaning the water is contained underground under pressure, which forces the water upwards through wells and natural springs.

The aquifer is the primary source of drinking water for more than 2 million people in south central Texas and serves the

¹ Joy Nicolopoulos, currently the FWS Deputy Regional Director for Region 2 and the person responsible for bringing the stakeholders together, subsequently admitted, “Politically, nobody gave this a snowball’s chance.” Colin McDonald, “Lawyer was the bridge over troubled waters,” San Antonio Express-News, January 15, 2012.

domestic, agricultural, industrial, and recreational needs of the area. It is the source of the 2 largest springs remaining in Texas: the Comal and San Marcos springs. These springs are vital to several protected species and feed tributaries to the Guadalupe River that, in turn, provide freshwater inflows to bays and estuaries on the Gulf Coast.

The FWS has listed 8 species that depend directly on water in or discharged from the Edwards Aquifer system. These species include the fountain darter, San Marcos salamander, San Marcos gambusia,² Texas blind salamander, Peck’s cave amphipod, Comal Springs dryopid beetle, Comal Springs riffle beetle, and Texas wild-rice. The primary threat to these species is the intermittent loss of habitat from reduced springflows that is the combined result of naturally fluctuating rainfall patterns, regional intermittent pumping, and temporal draw-down of the aquifer. Other threats include invasive non-native species, recreational activities, predation, habitat destruction or modification by humans, and factors that decrease water quality.

The drought of record in the Edwards region occurred between 1947 and 1957. The minimum rainfall during this period was 11.22 inches in 1956.³ This was well below the historical mean rainfall in the region. On June 13, 1956, measured spring discharge at Comal Springs ceased for 144 consecutive days.⁴ Due largely to this cessation of flows, the fountain darter population in the Comal Springs system was extirpated.⁵ The San Marcos Springs never completely stopped flowing, allowing for fountain darters to be successfully reintroduced into the Comal River from the San Marcos River in the mid-1970s.⁶

Texas Water Law

In Texas, the administration of water rights depends on the type of water in question—surface water or groundwater. Texas’ water law is a legacy of having been ruled by 6 different legal codes since Spain first claimed the territory in 1519. While the existence and movements of surface water were straightforward, groundwater was mysterious. As a result,

² The San Marcos gambusia has not been seen since 1982 and may be extinct.

³ Edwards Aquifer Recovery Implementation Program, “Habitat Conservation Program,” December 2011 (HCP) at 3-16. <http://www.eahcp.org/files/uploads/Final20HCP.pdf>

⁴ Todd Votteler, “Water from a Stone: The limits of the sustainable development of the Texas Edwards Aquifer” Southwest Texas State University, February 2000.

⁵ John R. Schenk and B.G. Whiteside, “Distribution, habitat preference, and population size estimate of *Etheostoma fonticola*,” 76(4) *Coepia*, 697, 700 (1976).

⁶ *Id.*

divergent regulatory schemes developed for the 2.

Surface water is governed by the “prior appropriation doctrine,” which is common in most western states. Under this doctrine, the State of Texas owns all surface water in trust for the benefit of its people, subject to a state-granted right to use. Ronald A. Kaiser, Texas Water Research Institute, “*Handbook of Texas Water Law: Problems and Needs*,” (1987) at 19. The State grants permission through an administrative process to beneficially use the water on a seniority basis. *Id.* at 22.

Under Texas common law, groundwater is governed by the “rule of capture.” Under this doctrine, a landowner may drill a well to seek groundwater, withdraw any groundwater that may be encountered, and place the water to beneficial use without significant limitation as to amount, place, or purpose. Kaiser at 32. Moreover, this common law privilege may generally be exercised without regard for any negative impacts to adjacent landowners or springflows. *Id.*

In February 2012, the Texas Supreme Court, in a long-awaited ruling, held that landowners own the groundwater beneath their property and that this property right is constitutionally protected. *Edwards Aquifer Authority v. Day* (slip op., No. 0964) (Feb. 14, 2012) at 1. The Court found that the use of groundwater can be regulated but that regulation is subject to compensation if the right is “taken.” *Id.* at 27.

As coexisting legal frameworks, the prior appropriation doctrine and rule of capture do not encourage conjunctive use of groundwater and surface water. See Todd H. Votteler, “Raiders of the Lost Aquifer? Or the Beginning of the End of Fifty Years of Conflict over the Texas Edwards Aquifer,” 15 *Tulane Environmental Law Journal*, 257, 267 (2002). In fact, since the 1950s, the aquifer users and downstream surface water users have been at odds over the need to regulate the use of the aquifer to protect downstream surface flows. As discussed below, in *Sierra Club v. Babbitt*, the ESA was used to obtain limitations on pumping to benefit surface water users.

The Endangered Species Act

The ESA provides the federal government authority to protect threatened and endangered species from both federal and non-federal actions. Endangered Species Act, Pub. L. No. 93-205, 87 Stat. 884 (1973), codified at 16 U.S.C. §§ 1531-1544. The U.S. Secretary of the Interior, through the FWS or the Secretary of Commerce, through the National Marine Fisheries Service (NMFS), administers and enforces the ESA. 16 U.S.C. § 1533; 50 C.F.R. § 222.101 and 50 C.F.R. § 17.01.⁷ For purposes of this article, the pertinent provisions are found in sections 9 and 10 of the ESA.

⁷ The species at the Comal and San Marcos springs are regulated by FWS, which is within the Department of the Interior. Thus, the use of the term “Secretary” herein refers to the Secretary of the Interior.

Section 9 of the ESA

Section 9 of the ESA prohibits the “take” of listed endangered fish and wildlife. 16 U.S.C. § 1538(a)(1). “Take” is defined as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or to attempt to engage in any such conduct.” 16 U.S.C. § 1532(19). “Harm” includes significant habitat modification that actually kills or injures a listed species through impairing essential behavior such as breeding, feeding, or sheltering. 50 C.F.R. § 17.3; *Babbitt v. Sweet Home Chapter of Communities for a Greater Or*, 515 U.S. 687 (1995). Listed plants are not subject to the “take” prohibition in Section 9. However, under Section 9, plants listed as endangered may not be imported into or exported from the United States, removed from, or damaged on federal property, used in commercial activities, or removed or damaged from any area in knowing violation of any state law or regulation.⁸ 16 U.S.C. § 1538(a)(2).

Enforcement of fish and wildlife violations under Section 9 may come in the form of civil penalties. U.S.C. § 1540. Knowing violations may trigger criminal fines and imprisonment of less than 1 year, and injunctions. 16 U.S.C. § 1540(b). Citizen suits to enjoin violation or compel action of the Secretary are also allowed. 16 U.S.C. § 1540(g).

Courts have found that a regulatory agency’s actions or failures to act may violate the ESA. For example, the First Circuit found that Massachusetts’s fishing regulations caused a “take” of the endangered Northern Right whales.⁹ *Strahan v. Coxe*, 127 F.3d 155, 166 (1st Cir. 1997). The state had authorized gillnet and lobster pot fishing in the whales’ critical habitat, but the NMFS had issued a final interim rule proposing to modify those fishing practices as entanglement with fishing gear was a leading cause of depletion of the whales. *Id.* at 159. The court found that the ESA not only prohibits the acts of the person causing a take but also bans the acts of a third party that bring about the taking, *i.e.*, vicarious liability. *Id.* at 163 citing 16 U.S.C. § 1538(a)(1)(B). The court concluded “a governmental third party pursuant to whose authority an actor directly exacts a taking of an endangered species may be deemed to have violated the provisions of the ESA.” *Id.*

⁸ See *infra* at n. 37.

⁹ See *Palila v. Hawaii Department of Land and Natural Resources*, 639 F.2d 495 (9th Cir. 1981) (Hawaii Department of Land and Natural Resources liable for “take” of Palila bird by failing to manage herds of feral sheep and goats); *Loggerhead Turtle v. County Council of Volusia County*, 148 F.3d 123, 1251 (11th Cir. 1998) (Volusia County may be liable for take resulting from its regulatory actions); see also *Sierra Club v. Yeutter*, 926 F.2d 429 (5th Cir. 1991) (U.S. Forest Service’s even-aged management practices violated section 9 of the ESA); *Defenders of Wildlife v. Administrator, EPA*, 882 F.2d 1294 (8th Cir. 1989) (Environmental Protection Agency liable for take of the endangered black-footed ferret due to its pesticide registration program).

Section 10(a) of the ESA

Section 10(a) of the ESA provides relief under certain circumstances from federal or citizen suits alleging violations of Section 9. For example, permits may be issued that allow a taking if such taking is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. 16 U.S.C. § 1539(a)(1)(B). These permits are referred to as incidental take permits (ITPs).

An ITP must have an approved conservation plan, commonly known as a Habitat Conservation Plan (HCP). *Id.* The HCP must specify the likely impact of the taking; the steps the applicant will take to minimize and mitigate such impacts and the funding available for the steps; the alternative actions considered and the reason why such alternatives are not being used; and such other measures the Secretary may require as necessary or appropriate. 16 U.S.C. § 1539(a)(2)(A)(i)-(iv); 50 C.F.R. § 17.22(b)(iii). An ITP will be issued if the Secretary finds that the taking will be incidental; the applicant, to the maximum extent practicable, will minimize and mitigate the impacts of the taking; the applicant ensures funding for the HCP; the taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild; and the applicant assures the HCP will be implemented. 16 U.S.C. § 10(a)(2)(B); 50 C.F.R. §§ 17.22(b)(2) and 17.32(b)(2).

While the ESA does not prohibit the taking of listed plants on non-federal land, a HCP may need to include conservation measures to protect listed plant species as the ESA requires that the FWS consider, in its Section 7¹⁰ biological opinion regarding its issuance of the permit, impacts to any listed species, including plants. 16 U.S.C. § 1536(c). Once an incidental take permit has been issued, so long as the permittee complies with the terms of the permit, the FWS may not require the commitment of additional funding or resources from the permit holder for changed or unforeseen circumstances. 50 C.F.R. §§ 17.32(b)(5)(iii)(B). This is often referred to as the “no surprises” rule.

The use of the ESA to protect surface water rights from groundwater pumping was put to the test when the Sierra Club sued the FWS for failing to protect the endangered species located in the San Marcos and Comal springs. *See infra* at n. 12.

Section 7 of the ESA

Section 7(a)(2) requires all federal agencies, in consultation with the FWS, to ensure that any action “authorized, funded, or carried out” by an agency is “not likely to jeopardize the continued existence of any endangered or threatened species

or result in the destruction or adverse modification” of designated critical habitat. The issuance of an ITP is a federal action subject to Section 7 of the ESA.

While the ESA does not define “jeopardy,” federal regulations define it as “to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery¹¹ of a listed species in the wild by reducing the reproduction, numbers or distribution of that species.” 50 C.F.R. § 402.02. To determine whether the effects of the incidental take will appreciably reduce the likelihood of the survival and recovery of the listed species, the direct and indirect effects of the action and the cumulative effects are aggregated with the environmental baseline. *Id.* It is important to note that, unlike the Prohibition in Section 9 of the ESA that applies to individual members of a listed species, the Section 7 analysis looks at the effects of the action on the species as a whole.

The ESA describes critical habitat as those areas that contain the “physical or biological features 1) essential to the conservation of the species and 2) which may require special management considerations or protection.” 16 U.S.C. § 1532(5)(A)(i). FWS regulations identify the “constituent elements” of critical habitat to include “those that are essential to the conservation of the species,” such as “roost sites, nesting grounds, spawning sites, feeding sites, seasonal wetland or dryland, water quality or quantity, host species or plant pollinator, geological formation, vegetation type, tide, and specific soil types.” 50 C.F.R. § 424.12.

The results of the Section 7 consultation are documented in biological opinions developed by the FWS. A biological opinion is generally produced near the end of the ESA permitting process to document conclusions regarding the likelihood of jeopardizing the continued existence of, destroying, or adversely modifying designated critical habitat for, any listed species.

SIERRA CLUB V. BABBITT

In 1991, the Sierra Club brought a suit in the U.S. District Court for the Western District of Texas against the FWS, *Sierra Club v. Babbitt* (No. MO-91-CA-069, U.S. Dist. Ct., W.D. Texas). The suit alleged that the FWS had violated the take prohibition in Section 9 of the ESA by failing to protect the federally listed species in the Comal and San Marcos springs.¹² Following a non-jury trial, the court ruled in favor

¹¹ The term “recovery” means “improvement in the status of a listed species to the point at which listing is no longer appropriate.” 50 C.F.R. § 402.02.

¹² The Guadalupe-Blanco River Authority (GBRA) was a plaintiff-intervener in the suit. In an interview, the former GBRA General Manager, John Specht, stated that GBRA’s motivation in *Sierra Club v. Babbitt* was to pro-

¹⁰ *See* Section 7 of the ESA heading.

of the plaintiff. *Sierra Club v. Lujan*, 1993 WL 151353 (W.D. Tex.) (May 26, 1993), *sub nom*, *Sierra Club v. Babbitt*, 995 F.2d 571 (1993).

In his decision, Lucius Bunton, the presiding judge, made it clear that he expected the Texas Legislature, then in session, to act immediately to protect the species. *Sierra Club v. Babbitt*, Amended Findings of Fact and Conclusions of Law, May 26, 1993 (Amended Findings) at 69 (“The next session of the Texas Legislature offers the last chance for adoption of an adequate state plan before the ‘blunt axes’ of Federal intervention have to be dropped.”); *id.* at 56 (“Even the USFWS now agrees that if Texas does not establish adequate pumping controls in the next regular session of the Texas Legislature, which began in January of 1993, the ‘blunt axe’ must fall.”). The Court explained that it would allow plaintiff and plaintiff-interveners to seek appropriate relief immediately after the Legislative session ended “if the State of Texas does not have in effect at such time ... a regulatory system pursuant to which withdrawals from the Edwards Aquifer can and will be limited to whatever extent may be required to avoid unlawful takings of listed species, any appreciable reduction in the likelihood of survival and recovery of listed species in the wild, and any appreciable diminution of the value of critical habitat for the survival and recovery of the species, even in a repeat of the drought of record.” *Sierra Club v. Babbitt*, Amended Judgment at 6 (emphasis in original).

In the Court’s Amended Findings of Fact, the Court repeatedly emphasized the importance of continuous minimum springflows in protecting the listed species.

The endangered or threatened species living either at or downstream of the Comal and San Marcos Springs or in the Edwards rely on adequate and continuous natural flows of fresh water through the Edwards and exiting from the natural spring openings as an environment for their survival.

Sierra Club v. Babbitt, Amended Findings of Fact, May 26, 1993 at 10-11; *see also id.* at 17, 28, 32, 34, 45 and 56. Further, Judge Bunton found that the FWS had not identified the necessary minimum flows to be maintained. *See e.g.*, *Sierra Club v. Babbitt*, Amended Findings at 48. Judge Bunton equated the necessary minimum flows with the jeopardy levels. *See, e.g.*, *id.* at 48 (“At a minimum, the objective requires pumping controls to avoid jeopardy to the species by maintaining aquifer levels which assure a minimum spring flow at Comal Springs.”).

protect the water resources of the Guadalupe River Basin as contrasted with Sierra Club’s interest in protecting the listed species. Votteler, 15 Tulane Env’tl Law J. at 274, n. 70. Simply put, according to Mr. Specht, GBRA realized that, if a court were to order pumping cuts to provide springflows to protect listed species, it would perforce protect a significant contribution to existing surface water rights downstream.

The Court ordered the FWS to make, within 45 days, determinations relative to: 1) the springflow levels at which take of fountain darters and Texas blind salamanders begins at Comal and San Marcos springs, 2) springflows necessary to avoid appreciable diminution of the value of critical habitat of any listed species; 3) the springflow at which Texas wild-rice begins to be damaged or destroyed; 4) the minimum springflow to avoid jeopardy for the fountain darter, San Marcos gambusia, San Marcos salamander and Texas blind salamander; and (5) the springflow levels at which take of San Marcos gambusia and the San Marcos salamander begins at San Marcos Springs. *Sierra Club v. Babbitt*, Amended Judgment at 3-4. The Court established “minimum springflow findings” to serve as interim springflow findings until the FWS made its determinations. *Id.* at 2-3. The Court stated that the FWS “may at any time and from time to time modify any of its minimum springflow or Edwards Aquifer level determinations, based on available information and in the exercise of its best professional judgment.” *Id.* at 4.

The FWS made the determinations required by the Court¹³. These determinations can be seen in Table 1.¹⁴ Although its response was highly qualified, the FWS explained that because its “take” evaluation was conducted with much less data than are normally available, it was forced to base its determination on its “best professional judgment” and that its determinations were conservative. *Sierra Club v. Babbitt*, “Springflow Determinations Regarding ‘Take’ of Endangered and Threatened Species,” April 15, 1993 at 2. It further explained that as more information becomes available, the numbers [it was providing] “may change to more accurately reflect that best available scientific and commercial information.” *Id.*

With respect to jeopardy, the FWS reiterated its concern regarding the “significant gaps in knowledge.” *Sierra Club v. Babbitt*, “Springflow Determinations Regarding Survival and Recovery and Critical Habitat of Endangered and Threatened Species,” June 15, 1993 at 1. It explained that these gaps resulted in a “conservative approach” regarding the flow estimates. *Id.* The FWS found that flow levels at Comal Springs could be reduced to 60 cubic feet per second for short time periods during certain times of the year without jeopardizing the continued existence of the fountain darter if a “very effective” program to control the giant rams-horn snail was in place and if there was the ability to control the timing and duration of low springflows. *Id.* at 4.

The FWS also found that short-term reductions in flow levels below 100 cubic feet per second might avoid jeopard-

¹³ *Sierra Club v. Babbitt*, “Springflow Determinations Regarding ‘Take’ of Endangered and Threatened Species,” April 15, 1993; *Sierra Club v. Babbitt*, “Springflow Determinations Regarding Survival and Recovery and Critical Habitat of Endangered and Threatened Species,” June 15, 1993.

¹⁴ All figures are placed at the end of this paper.

dy for Texas wild-rice if: 1) exotic species (*e.g.*, nutria) could be effectively controlled; 2) an aquifer management plan is implemented to control timing and duration of lower flows; and 3) the distribution of the species is improved throughout its historic range. *Id.* at 7. The FWS, however, did not specify what flow levels might be acceptable if those conditions were satisfied.

SENATE BILL 1477: TEXAS LEGISLATURE'S RESPONSE TO THE JUDGMENT IN *SIERRA CLUB V. BABBITT*

In response to the judgment in *Sierra Club v. Babbitt*, the Legislature enacted Senate Bill 1477¹⁵ that created the EAA. In effect, the Court's ruling supplanted the common law rule of capture for the Edwards Aquifer in favor of regulation of groundwater by statute.

In S.B. 1477, the Legislature directed the EAA to manage withdrawals from the aquifer. EAA Act § 1.15(a). It prohibited, with certain limited exceptions, withdrawing water from the aquifer without a permit from the EAA. *Id.* at § 1.15(b). Further, it established guaranteed statutory minimum amounts that each qualified permittee would receive. *Id.* at § 1.16(e). It also established specific withdrawal caps, *id.* at §§ 1.14(b) and (c), and required measures to be implemented that would ensure "continuous minimum springflows" to protect the listed species, *id.* at 1.14(h). In addition, S.B. 1477 specifically required the EAA to "prepare and coordinate implementation" of a Critical Period Management (CPM) Plan for periods of drought. *Id.* at § 1.26.

Statutory Minimums

S.B. 1477 required the EAA to issue permits with minimum pumping rights based on historic use and guaranteed specific withdrawal rights for qualifying use. EAA Act § 1.16(e). The Legislature set specific "statutory minimums" for permitting purposes.

An existing irrigation user shall receive a permit for not less than two acre-feet a year for each acre of land the user actually irrigated in any one calendar year during the historical period. An existing user who has operated a well for three or more years during the historical period shall receive a permit for at least the average amount of water withdrawn annually during the historical period.

EAA Act § 1.16 (e).

¹⁵ Act of May 30, 1993, 73rd Leg., R.S., ch. 626, 1993, Tex. Gen. Laws 2350, as amended (hereinafter "S.B. 1477" or the "EAA Act").

Withdrawal Caps

S.B. 1477 not only directed the EAA to limit the permitted withdrawals to 450,000 acre-feet per year, but further required the EAA to prepare and implement a plan for reducing the maximum annual volume of water authorized to be withdrawn under regular permits to 400,000 acre-feet per year beginning January 1, 2008. EAA Act §§ 1.14(b) and (c), *id.* at § 1.21(a). The plan had to be enforceable and include water conservation and reuse measures, measures to retire water rights, and other management measures designed to achieve the necessary reduction levels. *Id.* at § 1.21(b). The Legislature directed the EAA to make proportional adjustments to the amount of water authorized for withdrawal under the permits to meet the amount available. *Id.* § 1.16(e). Each existing user, however, would be guaranteed its statutory minimum withdrawal amount. *Id.*

The Texas Legislature required that the cost of reducing withdrawals or permit retirement to get to the 450,000 acre-foot cap was to be borne solely by the pumpers. *Id.* at § 1.29(a)(1). The cost of retiring the water rights to get from 450,000 to 400,000 acre-feet was to be borne equally by aquifer users and downstream water rights holders. *Id.* at § 1.29(a)(2).¹⁶

Continuous Minimum Springflows

With respect to continuous minimum flows, S.B. 1477 directed the EAA, by June 1, 1994, to "implement and enforce

¹⁶ The 450,000 acre-foot and 400,000 acre-foot withdrawal cap requirements do not appear in the Court's Findings or Judgment. In 1992, the Texas Water Commission (TWC) issued a "concept paper" for a comprehensive water management plan based on the J-17 aquifer water elevations. Texas Water Commission, "Avoiding Disaster: An Interim Plan to Manage the Edwards Aquifer," February 18, 1992. In the first 10 years of the plan, when the elevations fell below 666 feet, the total water pumped would be restricted to 450,000 acre-feet. After 10 years, this water use limit would fall to 400,000 acre-feet. 400,000 acre-feet is 80% of the average pumping that occurred between 1934 and 1967 as described in the 1968 State Water Plan. The 1968 Water Plan further explained that 400,000 acre-feet was the necessary amount to maintain a healthy water supply and guarantee the ability of the aquifer to recover following a drought. *See* Votteler "Water from a Stone..." If J-17 fell below 625 feet mean sea level, water use would be reduced to 350,000 acre-feet. *See* Bruce A. McCarl, Wayne Jordan, R. Lynn Williams, Lonnie Jones, and Carl R. Dillion, "Economic and Hydrologic Implications of Proposed Edwards Aquifer Management Plans," March 1993.

The FWS characterized the plan as a "positive step" but criticized the TWC's failure to address the drought of record, noting that Comal Springs would cease to flow for 1 1/2 years. Letter from M.J. Spear, Regional Director, U.S. Fish and Wildlife Service, to John Hall, Chairman, Texas Water Commission, dated March 26, 1992, Attachment, at 1. The FWS explained that once "the Service further refines its opinion on the jeopardy level (*i.e.*, where above 0 cubic feet per second jeopardy occurs), all activities must ensure that the Springs are maintained at or above that level." *Id.* at 2.

water management practices, procedures, and methods to ensure that, by December 31, 2012, the continuous minimum springflows of the Comal Springs and the San Marcos Springs are maintained to protect the endangered and threatened species to the extent required by federal law.” EAA Act § 1.14(h).

EAA’S ATTEMPT TO IMPLEMENT THE WITHDRAWAL CAPS REQUIRED BY S.B. 1477

The EAA began processing applications for Initial Regular Permits (IRPs) in 1996. A series of legal challenges, however, delayed the implementation of S.B. 1477. In 1995, the Medina County Underground Conservation District challenged the constitutionality of S.B. 1477, alleging that the legislation took a vested property right in groundwater under the land. In 1996, the Texas Supreme Court rejected the claim. *Barshop v. Medina County Underground Conservation District*, 925 S.W.2d 618 (Tex. 1996). In addition, a challenge was filed related to whether S.B. 1477 violated the Voting Rights Act, 42 U.S.C. § 1973. The Texas Legislature resolved the disputed voting rights issues in 1995.¹⁷ In 1998, Living Waters Artesian Springs, LTD, filed suit in District Court in Travis County challenging the EAA pumping limits and its regional drought rules and alleging that the rules did not comply with the Administrative Procedures Act.¹⁸ The Court found in favor of the plaintiff and invalidated the permit rules. In *Bragg v. EAA*,¹⁹ the District argued that the EAA violated Texas Private Real Property Rights Preservation Act by failing to prepare a takings impact assessment before issuing its permit rules. The court invalidated the rules.²⁰ The EAA did not appeal the judgment, but instead repealed the rules and proposed and partially adopted new ones.

In 2000, EAA had issued a rule requiring a proportional

¹⁷ Act of May 29, 1995, 75th Leg. R.S. ch 261, Tex. Gen. Laws 2505. A new challenge to how the EAA elects its board was filed in June 2012. *League of United Latin Am. Citizens v. Edwards Aquifer Auth.*, No. 5:12-CV-00620 (W.D. Tex. June 21, 2012).

¹⁸ *Living Water Artesian Springs, LTD. v. Edwards Aquifer Authority*, No. 98-02644 (353rd Dist. Ct. Travis County, Dec. 17, 1998).

¹⁹ *Bragg v. Edwards Aquifer Authority*, No. 98-07-14535CV, 38th State District Court, September 11, 1998. The Court of Appeals vacated in part and reversed and rendered in part. *Bragg v. Edwards Aquifer Authority*, 21 S.W.3d 375 (Tex. App. San Antonio, 2000). The Texas Supreme Court affirmed the court of appeals. *Bragg v. Edwards Aquifer Authority*, 710 S.W.3d 729 (Tex. 2002).

²⁰ In Senate Bill 2, the Texas Legislature repealed the requirement that the EAA’s rulemaking comply with the Administrative Procedures Act. Act of May 28, 2001, 77th Leg., R.S., ch 966, § 6.01, 2001Tex. Gen. Laws 1991, 2075.

adjustment of all permits if the 450,000 acre-foot cap was exceeded and compensation for affected pumpers for the difference between the statutory minimum at the fair market value for the water.²¹ TAC § 711.176(b)(6) (2000). As of November 1, 2003, EAA had approved IRP for 502,517 acre-feet. Hicks & Company, Regulatory Impact Assessment for propose Rules Chapter 711, E (Groundwater Withdrawal Permits), G (Groundwater Available for Permitting: Proportional Adjustment; Equal Percentage Reduction) and K (Additional Groundwater Supplies), December 2003 at 11 (hereinafter “Regulatory Impact Assessment”). Thus, by January 1, 2004,²² the EAA had to implement these rules to limit withdrawals to 450,000 acre-feet annually (with compensation) or come up with an alternative solution.

The cost of the compensation would have been substantial, even in 2004.²³ In 2003, it was estimated that the cost for an initial purchase of 107,000 acre-feet to reduce permitted withdrawals to 450,000 acre-feet would range from \$128,400,000 (if the cost of water was \$1,200 per acre-foot) to \$214,000,000 (if the cost of water was \$2000 per acre-foot). Regulatory Impact Assessment at 35.

Because of the high cost of compensation, the EAA abandoned the compensation rule in December 2003 in favor of an “interruptible/uninterruptible” IRP structure to reduce the permitted withdrawals to 450,000 acre-feet. Resolution and Order No. 12-03-478 attached to the Minutes of the Board of Directors of the Edwards Aquifer Authority (Dec. 16, 2003). Under the rule, the EAA would reduce the total amount of every permitted withdrawal proportionally to bring the authorized amount to 450,000 acre-feet. *Id.* The water rights remaining after the proportional reductions were designated “senior” or “uninterruptible” withdrawal amounts. *Id.* The amount of each permit’s reduction between the statutory minimum and the proportionally reduced amount was designated as “junior rights,” which could not be used if the levels in J-17 and J-27 fell below certain triggers. EAA Rules § 711.164 (2004).

In January 2007, Texas Attorney General Greg Abbott issued an opinion that concluded the EAA did not have the statutory authority to reduce the withdrawal rights of permit holders or issue interruptible “junior” withdrawal rights below the statutory minimum. Letter from Greg Abbott to the Honorable Harvey Hilderbran, Opinion No. GA 0498, dated January 9, 2007.

²¹ Fair market value of the water would be based on the definition of that term in Section 11.0275 of the Texas Water Code. Regulatory Impact Assessment at 31.

²² IRPs issued during a year did not become effective until January 1 of the following year.

²³ In October 2002, the EAA offered all irrigation applicants or permittees \$600/acre-foot for any water rights they wanted to sell or retire. Regulatory Impact Assessment at 34. Interest in the offer was extremely low. *Id.* at 35.

Thus, in 2007, the withdrawal cap issue was unresolved. Meanwhile, the cost of an acre-foot of Edwards' water had risen to over \$5000 per acre-foot. The cost to the pumpers of buying down permits to 450,000 acre-feet and retiring permits to get to 400,000 acre-feet was estimated to be \$725 million. The costs to downstream surface water users responsible for one-half of the cost of retiring permits to get from 450,000 to 400,000 acre-feet was \$125 million.

EAA'S ATTEMPTS TO IMPLEMENT THE CONTINUOUS MINIMUM SPRINGFLOW REQUIREMENT IN S.B. 1477

When the EARIP HCP is approved and in effect, the EAA will have complied with the continuous minimum springflow requirement in S.B. 1477.²⁴ EAA, however, was under pressure in the late 1990s with respect to this requirement. In 1998, EAA received notices of intent to sue regarding alleged violations of Section 9 of the ESA. *See, e.g.*, Letter from Sierra Club to Edwards Aquifer Authority and Department of Interior, "Notice of Violation of Federal Endangered Species Act and Notice of Intent to Sue, dated August 14, 1998 (alleging, among other things, failure to impose meaningful limits on pumping). In 2000, the FWS also threatened to bring a Section 9 action against EAA.

As we have communicated to you previously, your current drought management plan provides reductions in aquifer water use that we believe are not sufficient to adequately protect flows to avoid take or jeopardizing the continued existence of listed species. This inadequate regulation of aquifer pumping has likely resulted in illegal take of listed species. Unless EAA takes further actions to reduce pumping to essential uses, the Service will consider enforcement action against your agency for non-compliance with the ESA.

Letter from David C. Fredrick, Supervisor, to Mr. Greg Ellis, General Manager, EAA, dated September 18, 2000.

To address the continuous minimum springflow requirement, the EAA began preparing a HCP in 1999. After more than 5 years, the EAA completed a draft of the HCP in March 2005. Edwards Aquifer Authority, "Draft Edwards Aquifer Authority Habitat Conservation Plan," March 2005. The plan assumed a withdrawal cap of 450,000 acre-feet. It proposed reducing pumping through a 4-stage Drought Management/

²⁴ As part of the compromise that led to the creation of the EARIP, the Texas Legislature removed the requirement that the EAA implement measures prior to December 31, 2012, by removing the June 1, 1994 date. This amendment, however, would not cure any potential violation of Section 9 of the federal ESA.

CPM program. EAA HCP at 5-4. In Stage IV, pumping would be restricted to 346,400 acre-feet if the worst drought conditions were in effect for an entire calendar year. *Id.*

According to the draft plan, a simulation of the historical record with pumping of 450,000 acre-feet and the CPM program predicted that Comal Springs flows would have no flow (*i.e.*, 0 cubic feet per second) for 1,400 days, about 10 times that which was experienced during the actual drought of record. *Id.* at 4-14. Even excluding the drought of record from the analysis, no flows would occur for approximately 100 days. To ensure survival of the species, the EAA HCP relied on off-site refugia and captive propagation rather than deeper reductions during the CPM. *Id.* at 4-15; *but see* 65 Fed. Reg. 56,916, 56,919 (Sept. 20, 2000) ("Controlled propagation is not a substitute for addressing factors responsible for an endangered or threatened species' decline. Therefore, our first priority is to recover wild populations in their natural habitat wherever possible, without resorting to the use of controlled propagation.")²⁵

The 346,400 acre-foot floor for the CPM in the EAA HCP, however, ignored the continuous minimum flow requirement in S.B. 1477, the subsequent "jeopardy" determinations by the FWS, and the Court's views of what would be required just to maintain continuous springflows.²⁶ *Sierra Club v. Babbitt*, Amended Findings of Fact at 71-2. ("Pumping 350,000 acre-feet per year throughout a repeat of the drought of record of the 1950's will cause the Edwards to drop to levels far below the historic low of 612.51 feet mean sea level, dry up Comal Springs for years and San Marcos Springs for substantial periods of time...").²⁷ Further, it ignored the comments of its own Biological Advisory Team.

Biological goals as stated in the EA/HCP do not comply with the Edwards Authority Act 1.14(h), which states the EAA must ensure "the continuous

²⁵ Unlike the EAA HCP, the EARIP HCP uses the refugia as a safety net in case the assumptions regarding the protectiveness of the measures proved wrong.

²⁶ In August 1992, the FWS suggested that the TWC consider obtaining an incidental take permit. Letter from M.J. Spear, Regional Director, U.S. Fish and Wildlife Service, to John Hall, Chairman, Texas Water Commission, dated August 19, 1992. The FWS stated that to obtain such a permit, direct pumping from the Aquifer must be limited to no more than 450,000 acre-feet per calendar year; within 10 years, the pumping must be reduced to 400,000 acre-feet and a drought management plan must be in place to reduce pumping to 350,000 acre-feet per year at any time the water level in J-17 fell below 625 feet mean sea level. *Id.*

²⁷ *See also Sierra Club v. Babbitt*, Amended Findings of Fact at 70 ("Limiting pumping to an average of roughly 200,000 acre-feet per year during the drought would provide some minimal continuous daily Comal springflows."); *id.* at 71 ("The firm yield of the Edwards, assuming protection of just minimal continuous daily springflows from Comal Springs, is on the order of roughly 200,000 acre-feet per year during a repeat of the drought of record.")

minimum springflows of the Comal Springs and San Marcos Springs are maintained” for the protection of listed species.

Letter to Robert J. Potts, General Manager, EAA, from Dr. Randall E. Moss, Chairman, Biological Advisory Team, dated January 31, 2005.

Although the HCP would not have provided even continuous springflow during severe drought, the EAA, nonetheless, submitted the draft HCP to the FWS. The EAA, however, did not include the Draft Environmental Impact Statement (DEIS) and other required supporting documentation. Letter from Robert Potts, General Manager, EAA, to Mr. Robert Pine, FWS, dated March 11, 2005 (transmitting the draft HCP). The FWS did not take any action on the submittal.

Thus, as 2007 approached, the EAA had not satisfied the withdrawal cap requirements and had not meaningfully addressed the continuous minimum flow requirement of S.B. 1477.

SENATE BILL 3 AND THE CREATION OF THE EARIP

Midst this gathering storm, in late 2006, the FWS brought together stakeholders from throughout the region to participate in a “recovery implementation program”²⁸ to develop a plan to contribute to the recovery of the federally listed species dependent upon the Edwards Aquifer. Meanwhile, the Attorney General’s opinion on interruptible/non-interruptible rights and the reality of the impending cost of a permit buy-down brought the stakeholders to meetings in Austin during the 2007 legislative session to determine if a compromise could be reached.²⁹ In May 2007, the Texas Legislature enacted a compromise generally agreed to by the stakeholders as part of Senate Bill 3 (S.B. 3).³⁰

²⁸ A “recovery implementation program” is a voluntary, multi-stakeholder initiative developed by the FWS that seeks to balance water use and development with the needs of federally listed species. Such programs were developed under then Secretary Bruce Babbitt to blunt efforts in 1995 to substantially amend the ESA. John D. Echeverria, “No Success Like Failure: The Platte River Collaborative Watershed Planning Process,” 25 *Wm & Mary Env’t. L. & Pol’y Rev.* 559, 567 (2001); Joseph L. Sax, “Environmental Law at the Turn of the Century: A Reportorial Fragment of Contemporary History,” 88 *Cal. L. Rev.* 2375, 2381 (2000).

²⁹ Press Release from the Office of State Senator Glenn Hegar, District 18, “Senator Hegar Files Edwards Aquifer Legislation,” dated March 7, 2007; Austin American-Statesman, “San Antonio Seeks More Pumping; Drought-Protection More Limited than Environmentalists Wanted,” May 25, 2007 (discussing the cost of a buy back if the cap was not raised).

³⁰ Act of May 28, 2007, 80th Leg. R. S. ch 1430, §§ 12.01-12.12, 2007 Tex. Gen. Laws 5848, 5901 (Senate Bill 3).

Senate Bill 3

S.B. 3 amended the EAA Act to, among other things, provide that “. . . for the period beginning January 1, 2008, the amount of permitted withdrawals from the aquifer may not exceed or be less than 572,000 acre-feet of water per calendar year . . .” EAA Act 1.14(c). This amount constituted the IRPs already issued and those pending as of January 1, 2005. *Id.* Pumping under this withdrawal cap is subject to the CPM withdrawal reduction in the amounts indicated in Tables 1 and 2 of Section 1.26(b) of the EAA Act, which are included in Tables 2 and 3 of this paper.

If the full amount of the 572,000 acre-foot cap is assumed pumped, even with the critical period changes, simulated springflow ceases at Comal Springs for 38 months during a repeat of the drought of record. Habitat Conservation Plan, § 4.2. Indeed, even assuming a 381,000 acre-foot³¹ level of pumping, simulated springflow still would cease flowing for 36 months during a repeat of the drought of record. *Id.*

Accordingly, the Legislature directed the EAA and 4 state agencies³² to “cooperatively develop a recovery implementation program” through a facilitated, consensus-based stakeholder process.³³ S.B. 3 § 1.26A(a). S.B. 3 further directed the EAA and other state agencies to participate in the EARIP and to jointly prepare, along with other stakeholders, a “program document that may be in the form of a habitat conservation plan used in the issuance of an incidental take permit.”³⁴ S.B. 3 § 1.26A(d). It required that the program document provide, among other things, “recommendations for withdrawal adjustments based on a combination of spring discharge rates of the San Marcos and Comal springs and levels at the J-17 and J-27 index wells during critical periods to ensure that federally listed, threatened, and endangered species associated with the aquifer will be protected at all times, including throughout a repeat of the drought of record.” *Id.* at § 1.26A(d)(1). In addition, S.B. 3 required that the plan take effect by December 31, 2012. *Id.* at § 1.26A(d)(3).

³¹ The average level of withdrawals from 2000 through 2010.

³² Texas Department of Agriculture, Texas Commission on Environmental Quality, Texas Parks and Wildlife Department, and Texas Water Development Board.

³³ Press Release from the Office of State Senator Glenn Hegar, District 18, “Senator Hegar Files Edwards Aquifer Legislation,” dated March 7, 2007 (“I have a lot of concerns over raising the pumping cap without addressing critical management (drought) issues.”).

³⁴ The EARIP stakeholders agreed that the program document would be an HCP in support of an ITP.

The Edwards Aquifer Recovery Implementation Program

S.B. 3 called for the creation of a steering committee to oversee and assist in the development of the EARIP. S.B. 3 § 1.26A(e). The EARIP Steering Committee included 26 members representing environmental, water authority and purveyor, industrial, municipal, public utility, state agency, and agricultural interests related to the Edwards Aquifer. Twenty-one of the members of the Steering Committee were established in S.B. 3. *Id.* The remaining 5 members were added by the Steering Committee to ensure a broad diversity of representation. In early 2008, some 40 stakeholder groups or individuals executed a Memorandum of Agreement with the FWS setting out how the EARIP process would be conducted.³⁵ See *Table 4*.

Approximately 50 to 80 people routinely attended and participated in the EARIP meetings. The stakeholders met at least monthly, often twice a month. Including work group meetings, many stakeholders attended EARIP meetings on a weekly basis.

The EARIP used small work groups and committees to examine and make recommendations regarding specific issues. The use of these groups proved very effective in facilitating resolution of complex or contentious issues in the decision-making process. A list of the various committees and work groups used by the EARIP are set out in Section 1.7.1 of the HCP. See *Table 5*.

S.B. 3 set out specific tasks and deadlines that the EARIP must accomplish.

- Create a steering committee by September 30, 2007
- Hire a program manager by October 31, 2007
- Enter into a Memorandum of Agreement by December 31, 2007
- Appoint an expert Science Subcommittee by December 31, 2007
- The Science Subcommittee must submit to the Steering Committee and stakeholders initial recommendations on issues identified in S.B. 3 by December 31, 2008
- Establish a Recharge Facility Feasibility Subcommittee (no deadline)
- Enter into an implementing agreement to develop a program document by December 31, 2009

Each of these mandates was met within the required timeframe and accomplished in the collaborative spirit the legislature expected. In the summer of 2011, after much debate and compromise, the EARIP agreed on a HCP, the final task mandated by the Legislature.

³⁵ <http://www.eahcp.org/files/uploads/Final20HCP.pdf>.

THE HABITAT CONSERVATION PLAN³⁶

Elements of the HCP

The proposed term of the HCP is 15 years. The implementation of the HCP is divided into 2 phases. In the first phase, habitat protection measures to increase the viability of the species will be implemented immediately at Comal and San Marcos springs. These measures will include habitat restoration and replacement with native vegetation favored by the listed species, maintenance of dissolved oxygen through removal of decaying aquatic vegetation during low flows, sediment removal, predator control, and fountain darter gill parasite control.

The minimization of the impacts of recreation at low flows will be accomplished through the creation of scientific study areas by the Texas Parks and Wildlife Department.³⁷ See TPW Code § 81.501. Access to sensitive habitat, such as areas of Texas wild-rice, will be limited during such periods. Water quality measures will include an incentive program for low impact development, best management practice implementation, support for coal tar sealant bans, and expanded water quality monitoring.

In addition, the first phase will include a package of actions to ensure continuous minimum springflow during a repeat of the drought of record. The flow protection measures will include a voluntary irrigation suspension program during severe drought, a regional municipal conservation program, the use of the San Antonio Water System's (SAWS) Aquifer Storage and Recovery (ASR) facility to store water to offset pumping during severe drought,³⁸ and additional emergency Stage V CPM cutbacks.³⁹

³⁶ The HCP submitted to FWS can be found on the documents page of the EAA website: <http://www.eahcp.org/files/uploads/Final20HCP.pdf>.

³⁷ On March 29, 2012, the Texas Parks and Wildlife Department adopted a rule creating the San Marcos River State Scientific Area. 31 TAC § 57.901. This scientific area is designed to protect Texas wild-rice by restricting recreation in these areas during flow conditions below 120 cubic feet per second. The rule makes it unlawful for any person 1) to move, deface alter, or destroy any sign, buoy, boom or other such marking delineating the boundaries of the area; 2) uproot Texas wild-rice within the area; and 3) enter an area that is marked. The regulations are intended to preserve at least 1,000 m² of Texas wild-rice. The rule went into effect on July 8, 2012.

³⁸ ASR technology is a method of storing water in an aquifer. In the case of the SAWS ASR, water is pumped from the Edwards Aquifer and stored in the Carrizo Aquifer in south Bexar County. See http://www.saws.org/Your_Water/WaterResources/Projects/asr.cfm.

³⁹ The EAA has amended its Critical Period Management program to add, effective on FWS's approval of the HCP, a new emergency Stage V reduction of 44% applicable in both the San Antonio and Uvalde pools. Stage V is designed to be triggered only when other measures have not proven sufficiently effective in maintaining springflow during drought conditions. EAA Rules § 715.221. For the San Antonio Pool, Stage V would be triggered by a

All of the measures will be evaluated through a comprehensive monitoring program and adjustments made through a robust adaptive management process (AMP). The AMP will include an applied research program to test the assumptions underlying the biological goals and objectives. The research will focus on the biological effects of low flows on species and habitat. In addition, the existing MODFLOW model will be improved, and a mechanistic ecological model developed to evaluate all of the impacts on habitat.

In the second phase, the EARIP will implement any additional measures needed to achieve the biological goals. The decision regarding whether any additional measures are needed will be based on the best available science at that time and will rely heavily on information developed in the AMP.

The HCP establishes a presumptive measure for Phase II of the HCP, should it be determined additional measures are needed to achieve the biological goals and no other alternatives can be agreed to. That presumptive measure involves the continuation of the Phase I measures with the expanded use of the SAWS ASR. If expanding the availability of the ASR is unable to fully meet the additional springflow necessary to meet the minimum flow objectives, the balance will be obtained through alterations to the conservation measures, including an increase in Stage V withdrawal reductions.

The HCP also establishes long-term biological goals and objectives for each species. With respect to springflows, the minimum springflow objective is 45 cubic feet per second (monthly average) at Comal Springs and 52 cubic feet per second (monthly average) at San Marcos Springs. HCP § 4.1. These objectives are not to exceed 6 months in duration followed by 80 cubic feet per second (daily average flows) for 3 months. *Id.* Further, the long-term average springflow objective for Comal Springs is 225 cubic feet per second, and for San Marcos Springs, it is 140 cubic feet per second. *Id.* Many of the other objectives are stated in terms of water quality and habitat. *See* HCP, Section 4.2.

The applicants for the incidental take permit include the City of San Marcos, the City of New Braunfels, the EAA, Texas State University, and the City of San Antonio through SAWS. The understandings among the permittees as to how the plan will be managed and implemented are set out in the Funding and Management Agreement (FMA). An Implementing Committee consisting of the applicants will oversee and manage the implementation of the HCP. The Guadalupe-Blanco River Authority will be a non-voting member of that committee. The EAA will have primary responsibility for managing

combination of monthly average J-17 levels below 625 feet or springflows of either 45 cubic feet per second based on a 10-day rolling average at Comal Springs or 40 cubic feet per second based on a 3-day rolling average. The Uvalde Pool would trigger Stage V using the Uvalde County Index Well (J-27) water level of 840 feet-mean sea level.

the day-to-day activities related to the HCP and responsibility for the flow protection measures except for the SAWS ASR facility for which SAWS will have responsibility. The cities of San Marcos and New Braunfels and Texas State University will have primary responsibility for implementing the habitat measures within their respective jurisdictional boundaries.

Approval of the HCP

Starting on October 18, 2011, with the City of San Marcos, the HCP and its supporting documents was presented to the permittees for approval. Approval of the plan was unanimous by the San Marcos City Council and SAWS Board. The City of New Braunfels passed the plan with only one vote in opposition. On October 24, 2011, the administration of Texas State University approved the plan.

At the November 7, 2011 meeting of the EARIP, the Steering Committee recommended to the EAA Board of Directors, for final approval, the HCP and the supporting documents. The recommendation passed with one objection⁴⁰ and one abstention. This vote marked a huge step forward that had long seemed unattainable.

On December 13, 2011, the EAA Board of Directors voted to approve the HCP. It, however, tabled a decision on the related FMA by an 8-7 vote. That decision to table a vote on the FMA resulted from a split in the board regarding whether a rebate program should be applied to the Aquifer Management Fees (AMFs) for the HCP costs.

On December 28, 2011, the EAA Board of Directors approved the FMA by a vote of 15-0. The HCP and supporting documents were submitted to the FWS along with the incidental take permit application on January 5, 2012.

On July 20, 2012, the FWS published a notice of availability in the Federal Register regarding the DEIS under the National Environmental Policy Act and the draft HCP. 77 Fed. Reg. 42,756 (July 20, 2012). The proposed action was the issuance of the ITP. *Id.* at 42,757. The FWS sought public comment on the DEIS. *Id.* at 42,756. The FWS also announced that it would conduct 7 public meetings to receive comments on the proposed action. *Id.* The meetings were held between August 3 and August 15, 2012, in San Marcos, New Braunfels, San Antonio, Uvalde, Kerrville, Corpus Christi, and Victoria. The public comment period remained open until October 18, 2012. *Id.*

On February 15, 2013, the FWS issued its Record of Decision approving the issuance of the Incidental Take Permit and the HCP. 78 Fed. Reg. 11,218 (Feb. 15, 2013). While awaiting this decision, the Implementing Committee developed work plans and budgets for each task in the HCP and put a

⁴⁰ The one stakeholder who objected did not object to the HCP but to the method of paying for its implementation.

management structure in place to oversee the work. The preparatory work for actually implementing the HCP began in January 2013.

Effectiveness of the HCP

The simulated effects of the flow-protection measures on springflow have been modeled over the historical record, including a repeat of the drought of record, to assess whether they are capable of ensuring continuous minimum springflows. The discharge rates can be seen in Tables 6 and 7.

The Phase I package of springflow protection measures provides substantial benefit to the listed species. It ensures minimum continuous springflow even during a repeat of the drought of record. Under current baseline conditions (without the HCP measures in place), modeling predicts that Comal Springs will cease to flow for 38 months during a repeat of drought of record conditions, and the springflows are predicted to be below 30 cubic feet per second (monthly average) for 54 months. At San Marcos Springs, in the simulation of a repeat of the drought of record, the minimum flow will be 2 cubic feet per second, and springflows will be below 52 cubic feet per second (monthly average) for 20 months.

By contrast, with the implementation of the Phase I springflow protection measures, Comal Springs is predicted to have continuous springflow during a repeat of drought of record conditions. As set out in the Table 6, the minimum springflow projected at Comal Springs for Phase I is 27 cubic feet per second (monthly average) and springflow only falls below 30 cubic feet per second on a monthly average for 2 months over a simulated repeat of the drought of record. The long-term average springflows at Comal Springs is projected to decline to 196 cubic feet per second.

At San Marcos Springs, the simulated minimum monthly springflow for Phase I is 50.5 cubic feet per second. Springflow falls below the flow objective of 52 cubic feet per second only twice during a simulated repeat of the drought of record. The long-term average springflows at San Marcos Springs is projected to decline to 155 cubic feet per second.

Hardy (2010)⁴¹ found that these springflows will not appreciably reduce the likelihood of survival and recovery of the listed species over the first 7 years of the HCP, even if a repeat of drought of record conditions were to occur during that time, so long as all recommended measures are implemented to restore and protect the habitat of the listed species. The springflow protection measures ensure continuous springflows at both Comal and San Marcos springs, offering significant

improvements over the environmental baseline. A hydrograph can be found in Figure 1 that shows a simulation of a repeat of the drought of record that compares the effects of the pumping cap and critical period reductions in S.B. 3 with the HCP measures.

Currently available information indicates that, if necessary, the presumptive Phase II measure will provide the necessary additional springflow to meet the minimum flow objectives necessary to attain the biological goals as currently defined. If the presumptive Phase II measure is implemented with an additional 3% Stage V cutback, the minimum monthly average springflow at Comal Springs is 47 cubic feet per second. The minimum monthly average springflow at San Marcos Springs is 52 cubic feet per second.

The AMP will include applied research to evaluate the impact of low flows on the listed species and their habitat. It will also evaluate the long-term average flow requirement and the requirement for 80 cubic feet per second “pulses” during periods at minimum flow levels.

The fact that the springflows do not meet the jeopardy numbers submitted to the Court by the FWS in 1993 does not mean that the proposed actions are not adequately protective.⁴² First, a jeopardy flow number is “specific to the action under consideration; a myriad of interrelated factors including the duration and timing of the action, the extent of impacts, the current environmental baseline, and anticipated alterations to the baseline based on project design...” *Sierra Club v. Babbitt*, “Springflow Determinations Regarding Survival and Recovery and Critical Habitat of Endangered and Threatened Species,” June 15, 1993 at 2-3 (emphasis added). In 1993, to respond to the Court’s Order in the absence of a specific project or action, the FWS was required to make several assumptions about duration, timing, extent, and impacts of possible actions. *Id.* at 3. The HCP sets out a specific action that includes a specific flow regime and minimization and mitigation measures well beyond those assumed by FWS in 1993. Thus, the jeopardy analysis perforce would be different.

Further, the EARIP HCP does not just set 1 minimum flow goal such as was done in 1993. Instead, it establishes a flow regime that includes a minimum flow but also includes limitations on the duration of the minimal flows as well as long-term average flow goals. Collectively, these goals not only ensure the survival of species during a repeat of the drought of record but also ensure that the species retain the potential for recovery following such an event.

⁴¹ Hardy, T.B., K. Kollaus, and K. Tower. 2010. Evaluation of the Proposed Edwards Aquifer Recovery Implementation Program drought of record minimum flow regimes in the Comal and San Marcos River Systems. December 28, 2010. <http://www.eahcp.org/files/admin-records/EARIP-HCP-docs/Hardy,%20Kollaus,%20Tower%202010.pdf>

⁴² See Department of Defense Biological Opinion, Groundwater Withdrawal in Bexar County at Fort Sam Houston, Lackland Air Force Base and Randolph Air Force Base, dated January 11, 2008 (“The Service views on the springflow regime needed to support listed species would be influenced by implementation of an effective aquifer management plan that provides for continuous springflow of adequate magnitude.”).

Finally, FWS's determinations in 1993 were, as the FWS conceded, very conservative to reflect the lack of data available at that time. *Id.* at 2. Subsequently, significant new data have become available including, but certainly not limited to, the instream flow modeling by Dr. Thomas Hardy, a nationally recognized expert on instream flow requirements, and field studies of BIO-WEST on species and their habitat in the spring ecosystems over the last 11 years. The EARIP also sponsored other studies, the most important of which were subjected to independent peer review. *See infra* at 22-23. Thus, it would be expected if some the conservatism in the estimated jeopardy flow number in 1993 would be unnecessary.

The Funding and Management Agreement

The EARIP developed a FMA, which serves to bind the 5 permit applicants to implement the HCP. The FMA establishes the procedures and mutual commitments among the permittees for funding and management of the HCP and the AMP. This agreement will be executed only by the 5 permittees. Key components include:

- A commitment by each permittee to discharge its duties and responsibilities to implement the HCP;
- A process by which the Implementing Committee will develop and amend as necessary a comprehensive work plan and budget to identify the conservation measures, adaptive management activities, and associated costs necessary to implement the HCP;
- A commitment by the EAA to fund the conservation measures and adaptive management activities with special AMFs paid to the EAA by industrial and municipal pumpers from the Edwards Aquifer;
- A process by which the EAA will provide funding to implement conservation measures; and
- The procedural steps and responsibilities of the permittees, the FWS, and other EARIP stakeholders for making AMP decisions and the actions that will be taken because of the decisions.

The Implementing Agreement

In addition to the HCP and FMA, the permittees entered into an Implementing Agreement (IA) with the FWS. The IA is an agreement that, among other things, "defines the obligations, benefits, rights, authorities, liabilities, and privileges of all signatories" to the HCP. FWS, "Habitat Conservation Planning and Incidental Take Permit Process Handbook" (FWS Handbook), Nov. 1996 at 3-37. The decision to develop an IA is within the sole discretion of the FWS's Regional Director. *Id.*

Because of the multiple parties involved and the complexity

of the HCP, it was anticipated that an IA would be necessary for the HCP. Accordingly, the applicants developed a draft IA for their HCP and submitted it along with the program documents. In July 2011, the FWS determined an IA was not necessary but said that if the applicants wanted such an agreement, it would be willing to enter into an agreement that tracked closely with the template document set out in Appendix 4 of the FWS Handbook.

On July 19, 2012, the applicants submitted a draft IA to the FWS that was consistent with the FWS's template. The FWS agreed to the template IA submitted by the applicants with minor changes. The IA has been executed by the applicants and is awaiting execution by the FWS if the permit is approved.

The Cost of the HCP

The annual cost of implementing the HCP is substantial. During the first 7 years, those costs are estimated to average over \$18.6 million per year. *See* Table 8. The municipal and industrial users of the aquifer will bear almost all of the cost of implementing the HCP through increased AMFs.⁴³ AMFs are collected by the EAA, which will then be responsible for distributing the funds for the purposes of fulfilling the obligations of the HCP. Downstream surface water right holders who benefit from the increased springflow from the aquifer will contribute \$736,000 annually towards the cost of implementing the HCP.

The decision regarding how to fund the implementation of the HCP was perhaps the most contentious decision the EARIP faced. Indeed, the use of the AMFs was not the EARIP's first choice because it did not generate any contributions from the irrigators that pump substantial amounts of water from the aquifer.⁴⁴ In early 2011, bills were introduced in the Texas House and Senate on behalf of the EARIP that would have allowed voters in the Edwards region to decide whether to pay for the HCP through revenues from a sales tax. The maximum amount of the tax would have been one-eighth of 1%. The House Bill (H.B. 2760) had a hearing before House Natural Resources Committee. The Senate Bill (S.B. 1595), assigned to Senate Natural Resources Committee, did not get a hearing. Neither bill emerged from their committee. At that point, serious discussions began regarding the use of AMFs and contributions from the downstream interests to pay for the HCP.

The stakeholders will continue to search for alternate fund-

⁴³ *See* EAA Act § 1.29 ("The authority shall assess equitable aquifer management fees ... to finance its administrative expenses and programs ...").

⁴⁴ Irrigators who use about 30% of the water pumped from the aquifer will not share in the costs because their AMFs are capped at \$2 per acre-foot by state law. EAA Act §1.29(e).

ing mechanisms that will more equitably spread the burden across the region, including seeking a vote in the region on a sales tax in subsequent legislative sessions. The stakeholders also will seek funding from Congress and from state and federal grants to help fund the implementation of the HCP.

The decision-making process: How was it possible to reach consensus

In S.B. 3, the Legislature directed the EARIP to develop its plan through a facilitated, consensus-based stakeholder process. In its operating rules, the Steering Committee defined consensus as the absence of opposition to a decision. Although the rules provided for consensus decision making by a supermajority of 75% of the Steering Committee members when opposition occurs, in practice decisions generally were made without opposition and without the need for a vote by Steering Committee members.⁴⁵

The key to consensus decision making for the EARIP was the stakeholders themselves. Throughout the process, the stakeholders evinced a clear understanding that the EARIP offered the last realistic chance for a regional decision rather than one imposed by a federal judge or the Texas Legislature. Furthermore, the final stages of the decision-making process played out against the backdrop of severe drought conditions that sharpened the realization that litigation was a likely alternative if they failed to come up with a plan to protect the species.

The process developed by the stakeholders also aided the decision-making. That the process was required to be an open and transparent process enabled the stakeholders to develop trust for the other stakeholders. Further, early in the process, the stakeholders agreed that no decision was final until all the issues had been resolved. This agreement encouraged the stakeholders to reach important interim decisions without fear that they would be bound by that decision if subsequent issues were not resolved in a manner acceptable to them. Moreover, the deadlines imposed by S.B. 3 kept the stakeholders focused on the issues before them and helped maintain momentum in the process. Frequently, when the stakeholders found themselves unable to reach consensus on an issue, they moved on the other issues with less controversy, returning later to the unresolved issue.

Finally, and most importantly, the stakeholders took ownership of the process. At several points in the process, the EARIP was perilously close to impasse. At each of those points, one of the stakeholders would remind the others that they had come too far to let the process fail—soon thereafter a compromise

was reached. Indeed, the first time that happened was really the defining moment for the EARIP.

IS THE COMPLETION OF THE HCP THE FINAL CHAPTER IN THE EDWARDS AQUIFER WATER WARS?

Perhaps the decades-old war over the use of the aquifer is rapidly drawing to a close. There is now a regional consensus on how to use the aquifer to protect the federally listed species in the spring systems. The solutions incorporated in the HCP protect the listed species while recognizing the region's need for water from the aquifer.

Assuming FWS approval, the requisite measures to ensure continuous minimum springflow levels will be in place. To the extent refinement of these measures is needed because of the new science developed during the adaptive management process, the FMA sets out a process for resolving any disputes that may arise.

With the issuance of the ITP will come protection against suits under the ESA regarding the use of the aquifer. Control of the aquifer will stay in the region rather than with a Federal District Judge.

The completion of the HCP does not mean that all of the issues have been resolved. The region needs a more equitable funding mechanism such as a regional sales tax, or, at least, the region should be allowed to vote on such a tax as an alternative to the AMFs. Moreover, the U.S. Department of Defense's military bases have a Biological Opinion that allows them to withdraw almost 2% of the annual withdrawals from the aquifer; yet they do not pay AMFs. The Defense Department did not participate in the EARIP, but its facilities will be a beneficiary of the EARIP's HCP when the biological opinion regarding its military facilities' use of the aquifer is up for renewal in early 2013. Some contribution to the implementation of the EARIP HCP would certainly be equitable and appropriate.

Some have speculated that the recent decision by the Texas Supreme Court in *EAA v. Day* may have an impact on the HCP. Any such speculation is premature. The obligations of the EAA under the ESA are separate and apart from its obligations of the EAA Act. That the landowners own groundwater in place does not diminish the EAA's obligation under § 9 not to take listed fish and wildlife through their use of the aquifer. The Supreme Court said that the EAA complied with the Act in issuing the permits. The issue is whether the regulation of the use of the aquifer under a very narrow set of facts requires compensation. That is something that may take years to adjudicate. Can future court cases affect the issuance of permits or use of the aquifer in a way that makes it difficult or too costly for the EAA to be able to fulfill its obligations under the Act? Possibly, but any such scenario would only be speculative now.

⁴⁵ <http://www.eahcp.org/files/uploads/05-14-09RevisedPOR.pdf>

The permittees and stakeholders now must implement the HCP and engage in a robust adaptive management process, including a decision in year 7 as to whether additional measures must be implemented. The latter issue has the potential to be contentious. The EARIP, however, has taken steps to facilitate the decision-making process that includes an Adaptive Management Science Committee to advise the Implementing Committee and stakeholders and an independent Scientific Review Panel, which will serve as a formal review body and “provide resolution of major scientific issues.” The Scientific Review Panel also will determine whether the scientific record supports the specific findings regarding the need for additional measures.

In addition, the stakeholder’s experience in the open, transparent EARIP process should foster cohesive, productive conversations during the implementation of the HCP. Such discussions will determine the ultimate success of the HCP and whether the final chapter in this epic saga has indeed been written.

Table 1. FWS 1993 determination of minimum springflows needed to prevent take, jeopardy, or adverse modification of critical habitat (from HCP, Section 4.2)

Species	Take	Jeopardy	Adverse Modification
Fountain darter in Comal	200	100	100
Fountain darter in San Marcos	60	50	150
San Marcos gambusia	100	100	60
San Marcos salamander	50	N/A	100
Texas blind salamander	100	60	N/A
Damage and Destruction			
Texas wild-rice	100	100	100

Note: All flow rates are given in cubic feet per second.

Table 2. Critical period withdrawal reduction stages for the San Antonio Pool (from HCP, Chapter 1)

Critical Period Stage	Comal Springs Flow (cfs)	San Marcos Springs Flow (cfs)	Index Well J-17 Level (MSL)	Withdrawal Reduction - San Antonio Pool
I	<225	<96	<660	20%
II	<200	<80	<650	30%
III	<150	N/A	<640	35%
IV	<100	N/A	<630	40%

cfs = cubic feet per second; MSL = mean sea level

Table 3. Critical period withdrawal reduction stages for the Uvalde Pool (from HCP, Chapter 1)

Critical Period Stage	Index Well J-27 Level (MSL)	Withdrawal Reduction Uvalde Pool
I	N/A	N/A
II	<850	5%
III	<845	20%
IV	<842	35%

MSL = mean sea level; N/A= not applicable

Table 4. Participants in the Edwards Aquifer Recovery Implementation Program

The following 39 stakeholders have executed the 2007 Memorandum of Agreement with the U.S. Fish and Wildlife Service regarding participation in the Edwards Aquifer Recovery Implementation Program:	
Aquifer Guardians in Urban Areas	Guadalupe County Farm Bureau
Alamo Cement Company	John M. Donahue, Ph.D.
Bexar County	Larry Hoffman
Bexar Metropolitan Water District	Mary Q. Kelly
Carol G. Patterson	Nueces River Authority
City of Garden Ridge	New Braunfels Utilities
City of New Braunfels	Preserve Lake Dunlap Association
City of San Marcos	Regional Clean Air and Water Association
City of Victoria	San Antonio River Authority
Comal County	San Antonio Water System
CPS Energy	San Marcos River Foundation
Dan Laroe	South Central Texas Water Advisory Committee
Dow Chemical	South Texas Farm and Ranch Club
East Medina Special Utility District	Texas Bass Federation
Edwards Aquifer Authority	Texas Commission on Environmental Quality
Gilleland Farms	Texas Department of Agriculture
Greater Edwards Aquifer Alliance	Texas Living Waters Project
Greater San Antonio Chamber of Commerce	Texas Parks and Wildlife Department
Guadalupe Basin Coalition	Texas Water Development Board
Guadalupe-Blanco River Authority	Texas Wildlife Association

Table 5. Committees and work groups of EARIP

Subcommittees	Science Subcommittee
	Recharge Feasibility Subcommittee
	Public Outreach Subcommittee
	Ecosystem Restoration Subcommittee
Work Groups	Additional Studies
	Phase I Implementation Work Group
	Voluntary Irrigation Suspension Option Work Group
	Conservation Work Group
	Environmental Restoration and Protection Work Group
	Funding Work Group
	Recreation Work Group
	Refugia Work Group
	Agricultural Water Enhancement Program Work Group
	Covered Species Work Group
	Restoration Work Group
	Low Impact Development Work Group
	Implementing Agreement Drafting Work Group
	SAWS ASR Work Group
	MOA Work Group
Facilitation Work Group	

Table 6. Comal Springs discharge statistics (HCP, Section 4.2)

Springflow statistics (Evaluated for 1947-2000)		Scenario			
		S.B. 3 assuming full pumping of the EAA permits	S.B. 3 assuming pumping of 381,000 ac-ft of EAA permits annually	Phase I	Phase II
Minimum Monthly (cfs)		0	0	27	47
Minimum Rolling 6 month Average (cfs)		0	0	39	54
Long-term Average (cfs)		178	237	196	196
Number of Months below	150 cfs	221	165	185	185
	120 cfs	157	128	127	125
	80 cfs	99	82	53	53
	45 cfs	62	56	7	0
	30 cfs	54	47	2	0
	0 cfs	38	36	0	0

cfs = cubic feet per second

Table 7. San Marcos Springs discharge statistics (from HCP, Section 4.2)

Springflow statistics (Evaluated for 1947-2000)		Scenario			
		S.B. 3 assuming full pumping of the EAA permits	S.B. 3 assuming pumping of 381,000 ac-ft of EAA permits annually	Phase I	Phase II
Minimum Monthly (cfs)		2	5	51	52
Minimum Rolling 6 month Average (cfs)		12	14	53	55
Long-term Average (cfs)		153	160	155	155
Number of Months below	100 cfs	121	113	114	114
	80 cfs	52	51	48	47
	50 cfs	19	17	0	0
	30 cfs	7	6	0	0
	10 cfs	3	2	0	0

cfs = cubic feet per second

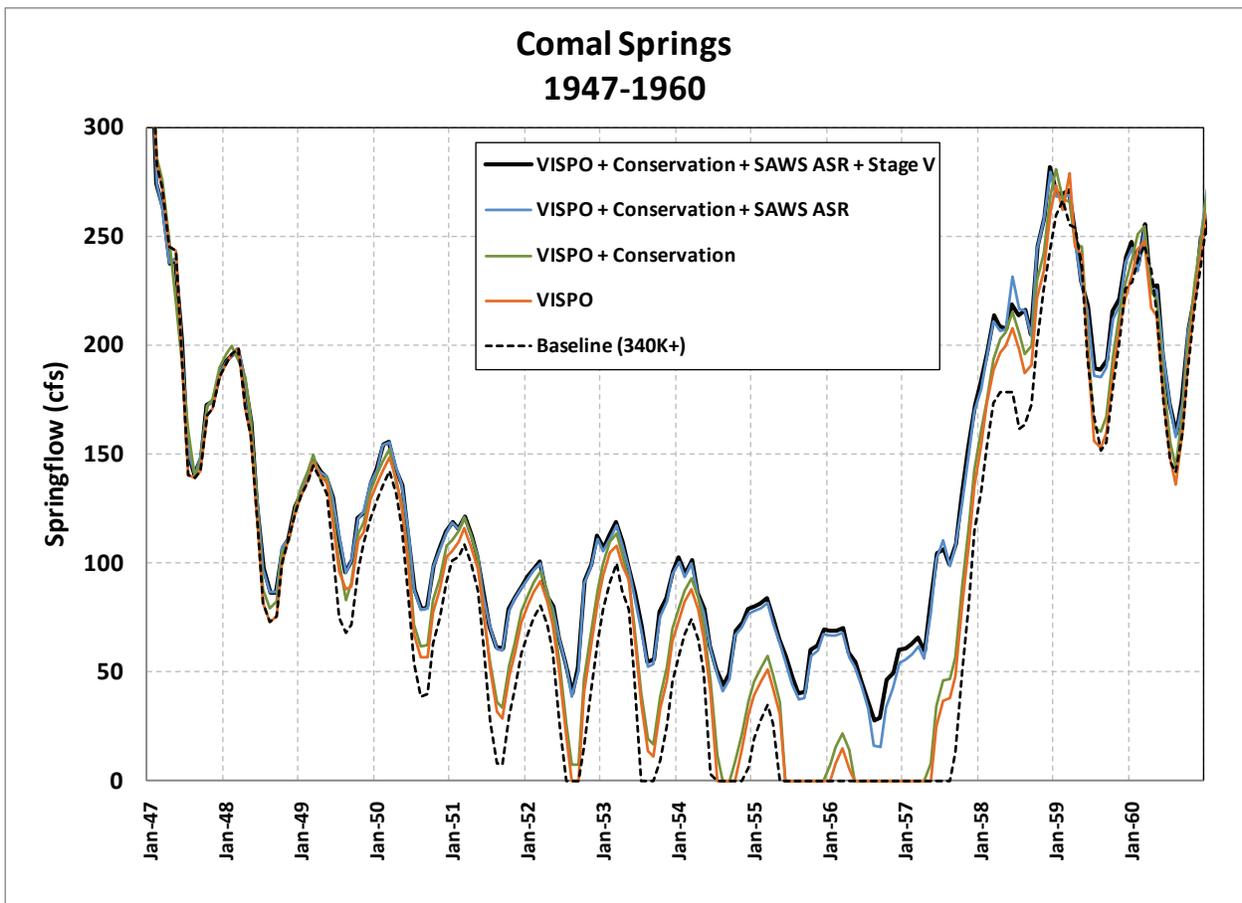


Figure 1. Comal Springs springflow under bottom-up package (from HCP, Section 4.2) cfs = cubic feet per second

Table 8. Annualized implementation costs (years 1–7)

Analyzed Implementation Costs (Years 1–7)		
Flow-related Measures	CPM Stage V	\$0
	Use of SAWS ASR	
	Obtaining Water Leases	\$4,759,000
	Share of SAWS O&M Based on Use	\$2,194,000
	Regional Water Conservation Program	\$1,620,679
	Voluntary Irrigation Suspension Program Option	\$4,172,000
Habitat and Water Quality Measures	Comal Springs	\$1,272,857
	San Marcos Springs	\$1,295,143
Modeling and Research		\$892,857
NFHTC Refugia		\$1,678,597
Project Management		\$750,000
Average Annualized Cost		\$18,635,133