

FILE

U.S. Department of Justice
Environment and Natural Resources Division



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Washington, D.C. 20530

June 15, 1993

90-8-6-219

John D. Neil, Clerk

United States District Court
Western District of Texas

Midland/Odessa Division

316 U.S. Courthouse
200 East Wall St.

Midland, Texas 79701

ATTN: Ms. Sharon Kenderhall

Re: Sierra Club v. Rabbitt (formerly Lujan),
Civil Action No. MO-91-CA-069 (W.D. Tex.)

Dear Mr. Neil and Ms. Kenderhall:

Please file the enclosed original and one copy of the
following documents on behalf of the federal defendants,
Secretary of the Interior Bruce Babbitt, et al.:

1. Notice of Filing of Springfellow Determinations Regarding
Survival and Recovery and Critical Habitat of
Endangered and Threatened Species; and
2. Certificate of Service.

Please let me know if you have any questions.

Very truly yours,

Charles R. Shockey
Charles R. Shockey
(202) 272-4463

Enclosures

cc: Service List (with enclosures)

UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF TEXAS
MIDLAND/ODESSA DIVISION

)
)
) SIERRA CLUB,
) Plaintiff,
) and
) GUADALUPE-BLANCO RIVER AUTHORITY,
) Plaintiff-Intervenor,
) v.
) BRUCE BABBITT, et al.,
) Defendants,
) and
) DANNY MCFADIN, et al.,
) Defendant-Intervenor.
)
)

CIVIL ACTION NO. MO-91-CA-069

NOTICE OF FILING OF SPRINGFLOW DETERMINATIONS REGARDING SURVIVAL
AND RECOVERY AND CRITICAL HABITAT OF ENDANGERED AND THREATENED
SPECIES

As directed by the court's May 26, 1993, Amended Judgment,
Federal defendants file the attached Springflow Determinations.

Respectfully submitted,

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June 15, 1993

SPRINGFLOW DETERMINATIONS REGARDING SURVIVAL AND RECOVERY AND CRITICAL HABITAT OF ENDANGERED AND THREATENED SPECIES

I. Introduction

The amended judgment in the Sixta Club vs. Secretary of the Interior lawsuit on the Edwards Aquifer requires the U.S. Fish and Wildlife Service (Service) to use its best professional judgment to determine:

(1) the minimum springflow required at Comal Springs to avoid appreciable reduction in the likelihood of survival and recovery of the fountain darter in the wild;

(2) the minimum springflow required at San Marcos Springs to avoid appreciable diminution of the value of critical habitat for the survival and recovery of any listed species;

(3) the springflow at San Marcos Springs at which the Texas wild-rice begins to be damaged or destroyed as the springflow drops;

(4) the minimum springflow required at San Marcos Springs to avoid appreciable reduction in the likelihood of survival and recovery of any listed species in the wild; and

(5) the minimum springflows or minimum water levels in the Edwards Aquifer required to avoid appreciable reduction in the likelihood of survival and recovery of the Texas blind salamander in the wild.

These determinations differ from the "take" determinations filed by the Service on April 15, 1993, which provided the Service's best professional judgment on the springflow and aquifer levels required to avoid a taking of only one individual specimen of an endangered or threatened animal species. The determinations in this report look primarily to the survival of each listed animal or plant species as a whole.

In reviewing available information and interviewing various experts, the Service found more data available for basing flow level determinations for some of the listed species than for others. In addition, there are significant gaps in knowledge upon which to base minimum flow level findings for all of the species. Because this evaluation was conducted with much less data than are normally available, this document reflects the Service's best professional judgment for the various flow estimates. Because sufficient data were not available, a conservative approach was taken in developing flow estimates to ensure that irreparable harm would be unlikely to occur to listed species.

"Damage and destruction", "Likelihood of survival", and "diminution of value of critical habitat" thresholds vary from species to species depending on the species' unique requirements, ecology, and life history. The thresholds are also specific to the action under consideration taking into account a myriad of interrelated factors

as the springflow drops. In reference to that statutory provision, the amended judgment requires the Service to determine the springflow at San Marcos Springs at which Texas wild-rice begins to be damaged or destroyed

trespass law. Section 9(a)(2)(B) of the Endangered Species Act provides that it is unlawful to remove and reduce to possession any such species [of endangered plants] from areas under Federal jurisdiction; or remove, cut, dig up, or damage or destroy any such species on any other area in knowing violation of any law or regulation of any State or in the course of any violation of a State criminal trespass law.

In determining whether a specific action will result in the appreciable reduction of the likelihood of survival and recovery of a species in the wild or an appreciable diminution of the value of critical habitat, the Service considers the current status of the species, all factors of the environment affecting the species and its habitat (the environmental baseline), cumulative effects on the listed species and/or critical habitat, and the direct and indirect effects of the action. The environmental baseline for the ecosystems being reviewed under this amended judgment include such factors as water quality and temperature, the presence of exotic species, recreational activities, existing and historic streamflow patterns, and similar interrelated factors.

II. Likelihood of Survival of Endangered or Threatened Species, Diminution of the Value of Critical Habitat, and Damage and Destruction of Endangered Plants

The knowledge upon which to base these determinations can be improved greatly with additional research and data collection. The Service is in the early stages of a multi-year study to collect such data for the coral ecosystem. The Service is also planning to initiate a similar study for the San Marcos ecosystem later this year. Completion of these studies should greatly improve our ability to determine the flow levels where listed species in these ecosystems are first harmed, and to predict what flows are necessary to protect the chances of long-term survival of the listed species and the ecosystems upon which they depend. As more information becomes available, the numbers identified in this document may change to more accurately reflect that best available scientific and commercial information.

A further explanation of the assumptions is provided below. The Service's best professional judgment at this time and are likely to be modified as additional data are collected.

The Service made assumptions using two scenarios. Under the first scenario, the Service assumed that no mechanisms would be in place to manage groundwater withdrawal so that the timing and duration of flow levels could be influenced. The second scenario estimated conditions that could be achieved with an aquifer management plan in place combined with control of certain limiting factors such as exotic species.

Assumptions

As pointed out in the introduction, determinations of springflow levels at which "take" is deemed to occur should be distinguished from the level where appreciable reduction in the likelihood of survival or recovery of the species occurs. "Take" is an event that may involve only one individual specimen of a species, whereas determinations of a "likelihood of survival" involve the status of the species as a whole. Thus, "take" numbers are typically higher than the numbers that represent "likelihood of survival" determinations. Although "take" of a listed species is a violation of Federal law, some "take" may be allowed if an "incidental take" permit is issued by the Service pursuant to Section 10(a) of the Act or an "incidental take" statement is issued under formal Section 7 consultation with a Federal agency.

The following flow determinations (Section III) are based upon the Service's best professional judgment of where damage and destruction would begin to occur for the Texas wild-rice, the water levels needed to prevent the appreciable reduction in the likelihood of survival and recovery of all five listed species that are the subject of the lawsuit, and the water levels needed to prevent an appreciable diminution of the value of critical habitat for the four species that have such designated.

Under the Amended judgment, the Service is required to make determinations on minimum springflow or aquifer levels correlated to "likelihood of survival", "diminution of value of critical habitat", and "damage and destruction" levels in the absence of a specific project or action. Therefore, the Service was required to make several assumptions about duration, timing, extent, and impacts of possible actions.

Including the duration and timing of the action, the extent of impacts, the current environmental baseline and anticipated alterations to that baseline based on project design (such as changes in water quality or temperature).

If exotic species known to be adversely impacting listed species could be very effectively controlled, these springflow level determinations may be lower. This is particularly true in the Comal ecosystem, where control of the giant ramshorn snail is most likely to benefit listed species. It would be

The presence of the giant ramshorn snail (*Maryia cornuarietis*) is of particular concern in the Comal ecosystem. This snail clips aquatic vegetation, resulting in a loss of protective cover and substrate for fountain darter eggs, and a reduction in food availability. The number of snails and corresponding damage appears to increase as flow declines. The snail is also suspected of consuming fountain darter eggs deposited on the plants.

2. Control of exotic species: Both the Comal and San Marcos Rivers contain exotic (non-native) species that have been introduced into these ecosystems. Several of these exotic species adversely affect listed species by modifying the habitat, competing for food and shelter, or preying upon the listed species. For example, Texas wild-rice has been adversely affected by the introduction of nutria (*Myocaster* *copus*) into the San Marcos ecosystem. Nutria have been observed feeding on wild-rice.

The recently enacted Edwards legislation provides an opportunity for local officials to effectively manage the Edwards in a way that ensures protection for federally-listed species in the aquifer ecosystem. In particular, the newly created Edwards Aquifer Authority will be in a position to develop and implement an aquifer management plan that influences the magnitude and duration of springflows at Comal and San Marcos Springs. Such a plan can influence these springflow determination and can form the basis of an effective means to ensure the long-term stability of needed springflow levels.

1. Management of groundwater withdrawals: Springflow levels needed to avoid the appreciable reduction in the likelihood of survival and/or the degradation of critical habitat may be influenced by the duration of flows at certain levels and during certain seasons. For example, low flows are directly associated with increased water temperatures during the summer months and decreased temperatures in the winter months. Both the fountain darter and the San Marcos gambusia are known to be adversely affected by water temperatures above 26 or 27°C. These higher temperatures affect reproductive viability and provide a competitive advantage to other fish species that have a wider tolerance for temperature fluctuations.

very important to carefully evaluate control measures before implementation to ensure that the control measures themselves did not adversely affect the listed species or their ecosystem.

III. Flow Determinations

For the purposes of these flow determinations, we assumed that Comal springflows would be measured at the USGS gaging station near the San Antonio Street bridge. Flows for the San Marcos ecosystem would be estimated based on levels in the index well in San Marcos. Ideally, a gaging station should be installed on the San Marcos River.

Fountain Darter (*Etheostoma fonticola*)

The fountain darter is an endangered fish that occurs in all of the Comal River upstream of the San Antonio Street bridge and all of the San Marcos River upstream of the San Marcos City Wastewater Treatment Plant's outfall. Historically the fountain darter occurred downstream to below the San Marcos River's confluence with the Blanco River. Critical habitat is designated as Spring Lake and its outflow, the San Marcos River, downstream about 0.5 miles below Interstate Highway 35 bridge. No critical habitat is designated for the Comal ecosystem. Primary threats include loss of springflows, habitat alteration, impacts associated with exotic species (e.g. the giant ramshorn snail and several exotic fish species), and degradation of water quality and temperature.

Likelihood of Survival and Recovery

Self-sustaining, viable populations of fountain darters need to be maintained in the wild in both the San Marcos and Comal ecosystems to avoid jeopardizing the species.

For the Comal ecosystem, we believe flows need to be maintained above 150 cfs to avoid appreciable reduction in the likelihood of survival and recovery of the fountain darter under current conditions. However, with very effective ramshorn snail control and the ability to control the timing and duration of low springflows, flow levels could be reduced to 60 cfs for short time periods during certain times of year. Flows below 60 cfs would likely alter temperatures to levels that would be unsuitable for fountain darter reproduction.

For the San Marcos ecosystem, we believe flows need to be maintained above 100 cfs to avoid appreciable reduction in the likelihood of survival and recovery of the fountain darter. These flows are necessary to maintain habitat for the fountain darter and to avoid downstream increases in temperature. With a management plan in place to control duration and timing of low flows, flows possibly could be reduced below 100 cfs for short periods of time.

during certain times of year. Additional studies are needed to determine specific levels and timing requirements.

Diminution of the Value of Critical Habitat

Due to temperature fluctuations, a flow of 100 cfs is needed to avoid appreciable diminution of the value of critical habitat in San Marcos. With a management plan in place to control duration and timing of low flows and possibly control of exotic species, flows could possibly be reduced below 100 cfs for short periods of time without appreciably reducing the value of critical habitat. Additional studies are needed to determine specific levels and timing requirements.

Texas Wild-rice (Zizania texana)

Texas wild-rice is an endangered plant with critical habitat designated as Spring Lake and downstream to the San Marcos River, confluence with the Blanco River. Although historically known throughout its critical habitat, the existing wild population has been reduced to stands occurring in the San Marcos River from just above the Spring Lake dam to an area above the existing San Marcos wastewater treatment plant outfall. Primary threats and reasons for the species decline include diminished springflows and the resulting habitat loss; increased herbivory by nutria and waterfowl, and possibly giant ramshorn snails; potential damage associated with recreational use of the river; and potential competition from exotic plants, such as elephant ears and hydrilla.

Damage and Destruction

Several of the immediate threats to Texas wild-rice, such as herbivory and potential damage from recreation, appear to increase in severity with a decrease in water depths and current velocities. Springflows lower than 100 cfs in the San Marcos ecosystem create conditions of low water depths and potentially decreased velocities in certain relatively shallow reaches of the river where wild-rice occurs. Therefore, springflows below 100 cfs would result in damage and destruction of wild-rice by: limiting the inundated flowing areas of the river, thereby leaving some plants out of water; degrading water quality; and exacerbating herbivory and damage from recreation.

Likelihood of Survival and Recovery

The minimum springflow required in the San Marcos ecosystem to avoid the appreciable reduction in the likelihood of survival and recovery of Texas wild-rice is 100 cfs. Springflows lower than 100 cfs would appreciably reduce the likelihood of survival for the species in the wild by reducing the number of individuals and limiting the distribution of the species. Below this level damage and destruction of individual plants would likely occur. This

San Marcos salamanders are very sensitive to temperature increases and mortality has been shown to occur at temperatures above 25°C. Reductions in springflows that would cause temperatures to exceed 25°C would result in the appreciable reduction of the likelihood of survival and recovery of the species (by causing the elimination of a significant portion of the salamander population) and an appreciable diminution in the value of the critical habitat. Water temperature in Landa Lake in the Comal ecosystem warmed to above 25°C in 1990 when flows at Comal Springs decreased to 60 cfs. Spring Lake contains less water and is deeper than Landa Lake.

Likelihood of Survival and Recovery and Diminution of the Value of Critical Habitat

The San Marcos salamander is a threatened species with critical habitat designated as Spring Lake and downstream about 50 meters from Spring Lake Dam. This species is limited primarily to the areas around spring openings in Spring Lake and to the rocky areas just below the Spring Lake dam. The primary threats to the species include degradation of water quantity and quality, changes in water temperature, and impacts associated with predators in the ecosystem.

San Marcos Salamander (Eurycea nana)

The minimum springflow in the San Marcos ecosystem required to avoid appreciable diminution of the value of critical habitat for Texas wild-rice is 100 cfs. Springflows below this level would result in a direct alteration that would appreciably diminish the value of critical habitat for this species. Levels below 100 cfs would reduce the available inundated habitat for the species in the wild by leaving some portions of the shallow reaches exposed and possibly reducing the water quality. Any reduction in springflows levels below 100 cfs would require additional study and analysis before it could be determined that lower flows would not degrade critical habitat.

Distribution of the Value of Critical Habitat

would be due primarily to low water levels at the stand site resulting in increased exposure of some plants and increased herbivory in shallower, slower water. Because the plant is so limited in number and range, loss of individual plants expected to occur at 100 cfs would jeopardize the species. Short-term reductions in flow levels below 100 cfs might be possible if exotic species could be effectively controlled, an aquifer management plan is implemented to control timing and duration of lower flows, and the status and distribution of the species is improved throughout its historic range in the San Marcos ecosystem. Additional study and analysis would be needed before it could be determined that lower flows would not jeopardize the species.

A minimum flow of 100 cfs is needed to avoid degradation of critical habitat for the San Marcos gambusia due to temperature fluctuations. With an aquifer management plan in place to control duration and timing of low flows, flows can possibly be reduced below 100 cfs for short periods of time without degrading critical

Distribution of the Value of Critical Habitat

levels and timing requirements. Additional studies are needed to determine specific for short periods of time without jeopardizing the San Marcos gambusia. With an aquifer management plan in place to control duration and timing of low flows, flows can possibly be reduced below 100 cfs to the San Marcos gambusia. This could adversely affect San Marcos gambusia growth, feeding behavior, survival, and reproduction. This species' range. Consequently, conditions would be more advantageous for gambusia and may result in thermal stress result in harm to individuals by changing water temperatures in springflow at San Marcos Springs decreases to 100 cfs. Temperature recovery of San Marcos gambusia is estimated to occur when The appreciable reduction in the likelihood of the survival and

Likelihood of Survival and Recovery

would also result in the appreciable reduction in the likelihood of the survival of the species. extremely reduced population numbers, take of even one individual flow determinations were based on the assumption that the San recovery of San Marcos gambusia is estimated to occur when

The San Marcos gambusia is an endangered fish with critical habitat designated as the San Marcos River from the Hopkins Street (Highway 12) bridge downstream to a point about 0.5 miles below the Interstate Highway 35 bridge. This species has not been collected from the San Marcos River since 1983 although several search efforts have been undertaken. It may now be extinct. Primary threats to this species include its extremely low population size and associated problems with hybridization with *Gambusia affinis*, competition with exotic fishes, and habitat degradation due to the occurrence of the exotic elephant ear plant.

San Marcos gambusia (*Gambusia georgei*)

As long as springflows from San Marcos Springs exceed 60 cfs, the recovery of the San Marcos salamander and degradation of its critical habitat will not occur due to flows. Spring Lake's faster exchange rate means lake temperatures will remain constant at lower flows than in the canal system.

habitat for the san Marcos gambusia. Additional studies are needed to determine specific levels and timing requirements.

Texas Blind Salamander (Typhlonectes fatibus?)

This endangered salamander has been collected at several locations including an artesian well on Southwest Texas State University's campus, San Marcos Springs, Honder (Beaver) Cave, Ezell's Cave, and Rattlesnake Cave. It is presently thought that the Texas blind salamander is distributed throughout the Edwards Aquifer in the San Marcos area (in the same range as originally described in 1921). No critical habitat is designated for this species.

The Texas blind salamander is aquatic throughout its life and lives in the water-filled cavernous areas of the Edwards aquifer in the San Marcos Region. Primary threats include degradation in water quality and quantity. One of the characteristics of a cavernous aquifer like the Edwards Aquifer is rapid recharge with little or no filtration of pollutants. Thus, pollution on the surface will make its way into the subsurface rapidly with potentially devastating consequences on subterranean organisms. Movement of the "bad water line" is also a concern. A recent study conducted by the Edwards Underground Water District found that the fresh/saline boundary was much closer to the major springs than previously believed. These results highlight the concern relative to the possibility of saline water movement and the potential deterioration of the salamander's habitat during periods of drought and heavy pumping.

Likelihood of Survival and Recovery

Little is known of the actual extent and health of this subterranean population of salamanders. The Texas blind salamander did survive the drought of record in the mid-1950's when flow levels at San Marcos Springs dropped briefly to 46 cfs. However, there may have been some movement of the bad water line at that time.

Based upon current knowledge, the appreciable reduction in the likelihood of the survival and recovery of the Texas blind salamander (due to reduced flows) can be avoided by maintaining San Marcos springflow levels above 50 cfs. Additional research is needed to provide insight into the relationship between springflow reductions and movement of the bad water line.

A. Summary

The springflow and water level determinations found in this document reflect the Service's best professional judgement based upon data available at this time. Because there is a lack of data to base these determinations on, the Service has taken a

conservative approach to this analysis. As additional data are obtained, the Service plans to modify its recommendations to the court.

The recent enactment of legislation to manage the Edwards Aquifer provides the necessary framework for the state to pursue a section 10(a) permit under the Endangered Species Act. A section 10(a) permit could allow for greater flexibility in managing the Edwards Aquifer by permitting water withdrawals beyond some of the "take" levels filed previously by the Service in District Court.

At its inception, the Edwards Aquifer Authority should work closely with the Service in developing an aquifer management plan that will ensure federally-listed species are protected. The Authority should, at the earliest possible date, initiate development of a habitat conservation plan and other procedural requirements for a section 10(a) permit.

The State of Texas has taken a significant step toward managing one of the State's most unique natural resources. The Service stands ready to assist the State as it continues to move forward in developing and implementing a comprehensive aquifer management plan for the Edwards.

CERTIFICATE OF SERVICE

I certify that, on the 15th day of June, 1993, a true and correct copy of the federal defendants' notice of filing of Springflow Determinations Regarding Survival and Recovery and critical habitat of endangered and threatened species; was served by first class mail, postage prepaid, on the counsel of record as listed below:

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