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## THE MIDDLE RIO GRANDE CONSERVANCY DISTRICT: SUSTAINING THE MIDDLE VALLEY FOR OVER 70 YEARS

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*“Sustainability: A characteristic of a process or state that can be maintained indefinitely.” From:*

*Caring for the Earth: A Strategy for Sustainable Living IUCN, 1991*

### INTRODUCTION

From the vantage point of the new millennium, it is apparent that the sustainability of New Mexico agriculture has been under severe stress for more than a century, even though the word “sustainability” itself is of recent vintage. The current water war in the middle Rio Grande valley, in which agriculture is pitted against endangered species protection and urban sprawl, was preceded in the early 20<sup>th</sup> century by an equally devastating and complex struggle that threatened the valley’s agricultural economy with extinction.

In this paper, we briefly examine the recent history of some water problems in the middle Rio

Grande valley and describe how the Middle Rio Grande Conservancy District was created to respond to those difficulties. Recent developments in Conservancy District operations, designed specifically to support endangered species, are described in the context of the District’s mission to sustain agriculture in central New Mexico.

Apparently, some of the solutions applied to the water problems of the early twentieth century had unintended consequences, among them the degradation of wildlife habitat in the Rio Grande channel. As a result, farmers who rely on the Rio Grande as their only source of irrigation water are now struggling to maintain a way of life that has roots that extend back to long before the first Europeans appeared in the southwest. Today, the Middle Rio Grande Conservancy District, which was created to restore sustainability to agriculture in 1925,

is in the midst of a new struggle to protect and support the farms that are the only truly sustainable part of New Mexico's modern economy.

## **EARLY HISTORY OF THE CONSERVANCY DISTRICT**

Aldo Leopold, who later developed the ethic of modern-day environmentalism, did not have the word "sustainable" in his vocabulary in 1918 when he wrote that "...agriculture is Albuquerque's one best bet..." As Executive Director of the Albuquerque Chamber of Commerce, he was pleading for help to solve the serious water problem of the day, a problem that threatened to wipe out the economy of his adopted home. In the 1920s, much of the once-irrigable land within the middle Rio Grande valley was saturated and unusable due to aggradation of the river and a corresponding rise in the water table. Irrigation works were in disrepair and needed much work. Moreover, the valley was subjected to periodic flooding, often with devastating effects.

The organizing push from Leopold and others led property owners within the middle Rio Grande valley to seek passage of a state law authorizing formation of conservancy districts. These efforts culminated in passage of the Conservancy Act of 1923, pursuant to which the Middle Rio Grande Conservancy District was formed in 1925 to provide flood control, drainage, and irrigation for the middle Rio Grande valley.<sup>1</sup> Formation of the Conservancy brought together 70 acequias into one unified entity, designed to make lands in the middle valley irrigable.

During the 1940s, the Conservancy was financially unstable. There were inadequate funds to operate and maintain the system and the Conservancy was unable to make regular payments on its bonds. The canals, drains, levees and other works were deteriorating. Consequently, the Conservancy asked the United States Department of the Interior, Bureau of Reclamation, to take over the operation of the District temporarily and retire its outstanding bonds.

In 1951, the Conservancy entered into a 50-year, interest free repayment contract in the amount of \$15,708,567 with the Bureau of Reclamation for the benefit of the District. In addition to retirement of the bonds, that Project included the construction or rehabilitation and improvement of the water storage, diversion and distribution systems to support irri-

gation, drainage and river flood control facilities. In late 1999, the Conservancy paid off the debt to the Bureau of Reclamation. Now that the debt is paid, the Conservancy intends to seek removal of all federal encumbrances on the Conservancy's title to district works and assets, including El Vado Dam and the three diversion dams on the Rio Grande (Angostura, Isleta and San Acacia).

The Conservancy District has been successful in accomplishing its goals of drainage, flood control, and rehabilitation of irrigation works. Because of these efforts, the middle Rio Grande valley and its citizens are now protected from flooding, the once-saturated soils have been drained and restored to a condition suitable for farming, development, and other uses, and the old irrigation works have been rehabilitated or replaced.

One of the key reasons the Conservancy District is able to sustain its works and continue to protect agriculture is that it has a stable source of income to operate and maintain the works of the District: an ad valorem assessment on all real property within the "benefited area" of the District (non-residential property pays a 25% premium); and a \$28.00 per acre water service charge levied only on lands that are served by the District's water delivery system. In 1995, the District revised the assessment structure to eliminate a long-standing controversy over the previous "class A and class B" assessment procedures. The new unitary classification system is simple to administer and helps the District sustain agriculture and promote the open space and green space values of irrigated farmland. To further support agriculture in the middle valley, the Conservancy District also encourages irrigators to take advantage of the greenbelt property tax exemption administered by each county, which reduces the assessed value of irrigated land and thereby lowers the irrigator's property tax as well as the Conservancy District assessment.

## **THE CONSERVANCY DISTRICT TODAY**

The Middle Rio Grande Conservancy District extends from Cochiti Dam south for approximately 150 miles to the Bosque del Apache National Wildlife Refuge (the last irrigator on the last canal in the system). The Conservancy encompasses approximately 278,000 acres in four counties of which 128,787 acres are irrigable lands. At present,

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approximately 70,000 acres were using irrigation water. Within the District's boundaries are thousands of property owners and parts of many towns and villages, six Indian pueblos, and much of the City of Albuquerque. Over one quarter of the population of New Mexico resides within the Conservancy District, much of it in some of the most rapidly urbanizing areas in the state. The Conservancy maintains and manages four diversion dams, 834 miles of canals and ditches, and 404 miles of riverside drains that are capable of delivering water for irrigation and a variety of other purposes.

Since the formation of the Conservancy in the 1920s, land and water use have changed considerably. Flood protection and drainage of saturated lands have helped Albuquerque and the towns and communities of the valley to grow and prosper. Now, land that was once used for agriculture is being developed for residential, industrial, and other purposes at a rapid rate. Thus, water that is no longer needed for irrigation is now needed for a multitude of other uses, including industrial development, residential use, and recreation. Water is also needed for environmental uses such as maintaining riparian habitat and assuring minimum in-stream flows for fish and other water-dependent species, such as the endangered Rio Grande silvery minnow and Southwestern willow flycatcher.

As guardian and advocate of the waters of the middle Rio Grande for its constituency, the Conservancy is adapting its water policies and methodologies to meet changing needs. One way that the Conservancy meets those needs is through the use of a water bank, discussed below; another is the Conservancy's planning efforts for protecting endangered species, also discussed below. First, however, this paper reviews the power and authority of conservancy districts and describes the types of water rights within the Conservancy District.

## **WATER RIGHTS WITHIN THE CONSERVANCY DISTRICT**

Formation of the Middle Rio Grande Conservancy District brought together six pueblos and 70 acequias into one entity that not only began serving existing farmers but also reclaimed large amounts of previously unirrigable lands. Because of the varied history and make up of the Conservancy, seven categories of legally recognized water rights are found within the District boundaries.

### **Individual Pre-1907 Diversionary Water Rights**

Before the creation of the Conservancy District and prior to 1907, when the State Engineer was given jurisdiction over water rights, individuals within the middle valley had perfected surface water rights by diverting and putting water to beneficial use. These pre-1907 water rights are outside the jurisdiction of the State Engineer and are vested in the individual water rights holders who reside within the District. Upon obtaining a State Engineer permit, an individual owner can lease or transfer a pre-1907 water right to a new point of diversion, place or purpose of use.

### **Individual 1907-1927 Water Rights**

A very small number of individuals within the District may hold permits from the State Engineer for water rights established before the creation of the District, but after 1907.

### **District's Permitted Surface Rights**

Shortly after its inception, the Conservancy District applied for water permits from the Office of the State Engineer to effectuate its goals of delivery, conservation, and reclamation of water along the middle Rio Grande valley. In addition to individual vested, pre-1907 surface rights appurtenant to 80,785 acres, the Conservancy has obtained water rights, under its two permits filed with the State Engineer. These additional water rights under permit Nos. 1690 and 0620 represent 42,482 acres of reclaimed lands developed by the works of the Conservancy.

### **Pueblo Reserved Water Rights**

The six Pueblos within the Conservancy acquired surface water rights through assignments by the United States or through reservation under the federal reserved water rights doctrine. Pueblo water rights are senior to all other rights within the Conservancy and irrigate approximately 8,847 acres of Indian land.

### **Pre-1956 and Permitted Groundwater Rights**

Individuals and the Conservancy own water rights based on wells drilled prior to 1956, when New Mexico's State Engineer asserted jurisdiction over the underground waters of the Rio Grande Basin. Groundwater rights based on permits from the State Engineer issued after 1956 are also abundant in the Conservancy.

### **San Juan-Chama Water Rights**

In 1963, the Conservancy contracted with the Bureau of Reclamation for 20,900 acre-feet of water per annum from the San Juan-Chama Project (SJCP). The United States has approved SJCP water for irrigation and other beneficial purposes. In return for the water rights, the Conservancy agreed to pay a portion of the construction, operation and maintenance costs of the project.

### **Storage Rights**

The Conservancy has water storage rights of 198,110 acre-feet at El Vado reservoir pursuant to State Engineer Permit No. 1690. Although the storage right is for reservoir space and not a water right per se, it is a valuable water asset held by the Conservancy.

In total, the amount of consumptive use allowed by State Engineer permits within the boundaries of the Conservancy from surface flows of the Rio Grande is approximately 298,339.4 acre-feet. However, the acreage under permits held by the Conservancy may be greater than land actually irrigated today because the permits have not been fully developed. As outlined below, determining the total perfected amount of the Conservancy right or the "Proof of Beneficial Use" is a complex process, currently under way.

Moreover, as discussed above, water rights held by the Conservancy are not subject to the forfeiture and abandonment statutes enforced by the State Engineer against private water right holders. Section 73-17-21 of New Mexico's Conservancy Act provides the "[t]he rights of the District to the waters of the District, or the use thereof, or the land within the District and property owned by it shall not be lost by the District by prescription or by adverse possession, or for nonuse of the waters." Therefore, the Conservancy has a right to full use of the water under Permit Nos. 1690 and No. 1620. That right is fully vested and water under these permits is deemed to be put to beneficial use as a matter of law.

## **THE CONSERVANCY DISTRICT WATER BANK**

### **Purpose and Functioning of the Water Bank**

In order to meet the changing needs of its constituents, the Conservancy District established a Water Bank on November 13, 1995, when the

District's Board adopted Rule 23, the Water Bank Rule.

The Water Bank is essentially a water management system and a method by which the District manages the distribution of water within the Conservancy by moving water from areas where it is not being used to areas of need. In this way, the District can maximize the beneficial use of water within the Conservancy.

The Water Bank concept is quite simple. Holders of current water rights within the Conservancy who are not using their rights can place the rights in the Water Bank. Persons or entities that need water can "borrow" water from the bank. Thus, water use can be maximized by delivering it to where it can continue to be put to beneficial use. The Water Bank serves the further purpose of providing the District with a mechanism to quantify water rights within the Conservancy and to track the use of water. It also generates revenue for the Conservancy, thereby reducing the tax burden on Conservancy constituents.

Deposits in the Water Bank come from vested Conservancy District water rights and from individual holders of valid pre-1907 rights. It is important to understand that the operation of the Water Bank does not result in a new appropriation of water. The District accepts into the Water Bank only water rights that have been perfected through actual beneficial use. Therefore, in order to determine the total number of water rights available for placement in the Water Bank, the Conservancy is in the process of calculating the number of irrigation rights that are no longer needed on the lands where they were perfected. The District will accomplish this by determining the maximum amount of water historically used by the Conservancy under its permit and then subtracting the amount of water currently being used to determine the "surplus" water that is available for placement in the Water Bank.

Holders of valid pre-1907 water rights within the Conservancy may also deposit all or a portion of their water rights that they are not using into the Bank. When a pre-1907 water right holder presents his or her right to the District for deposit, the holder must verify with the State Engineer that the right is valid and then the Bank will accept the water right for deposit.

At the time that the Conservancy District accepts the deposit of private rights into the Water

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Bank, the right-holder must sign a written agreement that temporarily assigns to the Conservancy all rights to the use of the water for the term of the deposit. Terms of deposit shall not exceed five years. This temporary assignment allows the Water Bank to loan the water to third parties. In return, the right-holder will receive the income when the right is loaned out. All Water Bank transactions are recorded on the bank ledger. The ledger includes the amount of the water right in acre-feet and a property description of the land to which the deposited rights have been appurtenant.

The Conservancy Board of Directors sets the price for water loans when the loan originates from Conservancy water rights. The rate may depend in part on the intended use of the water. Pre-1907 right holders may set their own rate or rely on the rate set by the Conservancy Board. The Conservancy may charge borrowers an additional annual administrative fee to cover the costs in administering the loan. This fee may be charged for District and pre-1907 rights. The Conservancy retains the income that it receives from loaning water rights that belong to the Conservancy. The Conservancy deposits this income into a special Water Bank fund to be used to offset expenses of District operations. Income from pre-1907 rights is paid directly to the right-holder who deposited the rights.

The Water Bank does not affect the rights or responsibilities of owners of individual water rights within the Conservancy. The owner of a pre-1907 right may sell his or her right without going through the Water Bank. However, it might be to the water right holder's benefit to deposit the right into the Water Bank rather than selling it. This is because the right-holder would receive revenue from the lease of the water while still retaining ownership in the event that he or she decides to begin irrigating again. The second important point with respect to individual rights and responsibilities is that placing water rights in the bank will avoid forfeiture for non-use. The Conservancy District's water right is not subject to forfeiture for non-use; however, pre-1907 rights are. Thus, as long as the pre-1907 right is being leased for a beneficial use, it cannot be forfeited.

Any person or entity who needs water for a beneficial use within the District boundaries may apply for a loan from the Water Bank. A key requirement is that the use must be beneficial. Because land use has changed dramatically since the

Conservancy's inception, water that was once beneficially used for irrigation is now being used for other beneficial purposes. A host of uses of Conservancy water could and should be considered a "beneficial use," such as leaving water in the ditches to promote riparian habitat, leasing water for fisheries, or use of water for recreational purposes. The use of water for fish, wildlife and recreational purposes has been recognized in New Mexico as a beneficial use. Also, we need to recognize the role of acequias and agriculture in preserving open space, expanding riparian habitat and recharging the aquifer. The Bureau of Reclamation documented that 50% of the recharge of the Albuquerque aquifer comes from irrigated agriculture.

When a person requests a water loan, the request must be on a standardized form prescribed by the Conservancy. The request must include the amount of water requested, the purpose of the water use, the place of diversion, the place of use, and the duration of use. If the request is approved, the borrower enters into a standard lease agreement with the Conservancy. Loans shall not exceed five years but are renewable for an additional term if water is available. Loans are on a first come, first served basis.

Renewals may receive preference over new borrowers. At the present time, approximately 1,400 acre feet of rights are under lease and have been withdrawn from the Water Bank, all for irrigation.

Potential Water Bank uses include:

**Agriculture** - As the need for water in the Middle Valley for purposes other than agriculture continues, more and more individual water rights holders within the Conservancy sell their pre-1907 rights to third parties. While the Conservancy does not want to interfere with any individual's exercise of a property right, the Conservancy would like to see as much water as possible remain in agriculture. The Water Bank promotes agriculture by: (a) providing an alternative source of water to municipal and industrial users other than permanent severance of pre-1907 rights; and (b) providing a replacement source of agricultural water from Conservancy water to individuals who choose to sever their pre-1907 rights.

**Municipal and Industrial** - The Conservancy already leases some water for municipal and industrial purposes. The Water Bank will document these existing leases and bring them under its

umbrella as well as providing a more efficient clearinghouse for future leases of Conservancy water for these purposes.

**Protection of Endangered Species**— Periods of low river flow since 1996 have been very difficult for water users in the middle valley as a result of the drought conditions and the new water customer with which the conservancy and others must contend—the Rio Grande silvery minnow. As discussed below, more proactive water planning by the federal agencies charged with protecting the minnow, and on the part of the Conservancy as well, will result in the avoidance of future crisis management such as occurred this year. Certainly, the Water Bank provides one clear mechanism for provision of water for the minnow.

## **ENDANGERED SPECIES AND ECOSYSTEM REHABILITATION**

There is some irony in the fact that, as a direct result of the dams and levees that were put into place to solve the problems of Aldo Leopold's day, the Conservancy District today faces new challenges to the sustainability of agriculture. Primarily as a result of the dams, levees, and channel narrowing works installed from the 1930s through the 1960s, much of the habitat for endangered species in the middle Rio Grande has deteriorated. As the human population has grown along with awareness of the environmental consequences of what we consider today essential human infrastructure, the Conservancy District finds itself fighting new assaults on the District's attempts to support and sustain that infrastructure for agriculture in the middle Rio Grande valley. Foremost among the new challenges is the Endangered Species Act, the Federal law that protects and promotes the recovery of the Rio Grande silvery minnow and the Southwestern willow flycatcher.

Not as well known as the silvery minnow, the willow flycatcher is a small migratory bird that spends about half of each year nesting and breeding in the southwestern U.S., and the other half of each year in Central and northern South America. It was listed as endangered in 1995. The flycatcher depends on riparian (i.e., riverside or lakeside) trees and shrubs for nesting and reproduction. Because many riparian areas in the southwest have lost their large

stands of native trees, or seen those stands converted to water-wasting non-native plants like salt cedar, many flycatcher populations seem to be declining. Notable exceptions to this trend are the middle Rio Grande, where numbers of flycatchers have recently increased, and the Gila River in southwestern New Mexico, where the largest population of flycatchers in North America continues to flourish in dense stands of box elder trees above flood-irrigated pastures on a private cattle ranch. The draft official recovery plan for the flycatcher is likely to be published by the end of 2000, after which some measures to enhance flycatcher habitat will probably be incorporated into ongoing ecosystem rehabilitation work on the middle Rio Grande.

The Rio Grande silvery minnow, a small fish that today appears to survive only in the middle Rio Grande between Cochiti Dam and Elephant Butte Reservoir, was listed as an endangered species in 1994. The Conservancy District is working closely with the U.S. Fish and Wildlife Service, the Bureau of Reclamation and other federal and state agencies to protect the minnow and plan for its recovery. In January of this year, the Conservancy entered into a Memorandum of Understanding with other stakeholders to develop a collaborative program for protecting and improving the status of the minnow. That effort will lead to creation of the Middle Rio Grande Endangered Species Act Collaborative Program, a multi-agency, multi-year effort to improve the habitat for the silvery minnow, protect state water law and interstate compacts, and allow legally authorized water use and development to proceed.

Recovery of the silvery minnow is complicated because the biology of the minnow, including its need for water flow in the Rio Grande, is not yet well understood. To date, the Fish and Wildlife Service has insisted upon a continuously flowing Rio Grande to support the minnow, in spite of the historic hydrograph that includes extended dry periods. However, in spite of the provision of some 165,000 acre-feet of leased water in 2000 for no other purpose than support of silvery minnow habitat, the population of that species appears to have declined further. Ongoing mediation in Federal court is intended to resolve disputes about the biology of the fish and management of the Rio Grande that to date have prevented agreement on permanent solutions for recovery the species.

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To improve Rio Grande water management consistent with actions agreed to during a dry period in 1996, the Conservancy in the 1997, 1998, 1999 and 2000 irrigation seasons developed and distributed water operations plans to work cooperatively with the Fish and Wildlife Service, the Bureau of Reclamation, and other entities to demonstrate support for sustainable ecosystem management of the habitat of the silvery minnow and willow flycatcher.

One result of that cooperation is the widespread recognition that the potential for dewatering a segment of silvery minnow habitat in the middle Rio Grande is very high, due to multiple use of the water throughout the river system, conveyance losses that depend largely on weather conditions, and other river conditions outside the control of human water users. These uses and conveyance losses from the Rio Grande occur from its headwaters in Colorado to the Elephant Butte Reservoir.

The Fish and Wildlife Service has recognized that recovery of the silvery minnow is primarily a responsibility of federal agencies including themselves, the Bureau of Reclamation, and the Army Corps of Engineers. As such, the Fish and Wildlife Service has pledged to make good faith efforts to assure that river flows to protect the silvery minnow during the irrigation season will be made available by providing federal water.

During the 2000 irrigation season, most of the 165,000 acre-feet of supplemental water used to support the silvery minnow was provided through Bureau of Reclamation leases of San Juan Chama Project water from the City of Albuquerque. The City in turn provided that water to the Conservancy District for irrigation, thus allowing native Rio Grande flows to remain in the river without diversion. When emergencies arose involving the imminent drying of a portion of the river habitat of the silvery minnow, the Conservancy facilitated, as it has agreed to do within existing physical constraints, the delivery of non-Conservancy water to the appropriate river reaches. When necessary, the Conservancy also provides, consistent with legal and physical constraints, the needed water so long as that water is replaced in a timely manner by federal water.

Once the federal agencies achieve a better understanding of how much water is needed in what reaches of the Rio Grande for the minnow, and that decision is reviewed by affected parties, the

Conservancy and other river users, including the City of Albuquerque, may have to adjust their uses of federal water. That will not be easy.

For example, reduced river flows during the very dry spring of 1996 led water managers to produce a collaborative agreement on future water operations needed to protect the silvery minnow during drought. The *Water Management Strategy for the Middle Rio Grande Valley* (J. Whitney, et al., November 14, 1996, now usually referred to as “the *White Paper*”) is a summary of actions recommended to help ensure adequate flows in the Rio Grande. Representatives of the Fish and Wildlife Service, Bureau of Reclamation, Army Corps of Engineers, New Mexico Interstate Stream Commission, the Conservancy, and the City of Albuquerque joined together to identify a number of measures that could, if undertaken in a timely manner with the necessary legal, financial, and political support, help protect the silvery minnow. To date, some of these measures have been implemented in whole or in part, and the implementation of others awaits action at the federal or state levels and will be addressed pursuant to the recently executed Memorandum of Understanding. The most important of those measures are the following:

**Operational Changes** - Changes in state and federal water operations could increase the capability to store native Rio Grande water in reservoirs upstream from the middle Rio Grande valley, thereby making additional water available for the river during drought. Although the reservoirs upstream of the middle Rio Grande valley were not designed or originally intended to store enough water in wet years to sustain Rio Grande flows through several consecutive dry years, recent changes in operations demonstrate that, under some conditions, Rio Grande flows might be stabilized during dry periods. Some changes in reservoir and river operations to cope with extended drought would require new federal authorizations, while others could be accomplished under current authorities by changing federal water control manuals. As happened in 2000, some San Juan Chama Project water is made available under separate contractual arrangements to supplement native Rio Grande flows for the silvery minnow. However, there is little likelihood that Project water will be anything more than a temporary source for supplemental water, as most municipal contractors will eventually put their water to beneficial use.

Other options for consideration include:

- storing Rio Grande water in Heron Reservoir when space is available;
- transferring water from El Vado to Abiquiu Reservoir;
- increasing the storage capability in Abiquiu and Jemez Canyon Reservoirs; and
- using Cochiti Lake for a re-regulation reservoir during the irrigation season.

These and other modifications of reservoir operations may have significant hydrologic and legal implications that should be evaluated before changes are implemented.

**Supplemental Water and Forbearance** - Acquisition of water from willing sellers could put supplemental water in the River. Two particularly important elements of this strategy would include sustained funding from Congress of water acquisition, and the development of an institutional mechanism to obtain water in a timely manner. If water were to be acquired from current water users, the Conservancy would need to be a party to water acquisition agreements, so that the rights of other water users would be protected while meeting the needs of endangered species. Although forbearance of irrigation water use by farmers is sometimes mentioned as a potential source of water to supplement river flows, at this time there are no practical institutional or physical means to implement agricultural forbearance. The Conservancy has agreed to work with the Bureau to evaluate the feasibility of a pilot district-wide forbearance program for river water management during periods of low river flow.

**Irrigation Efficiency** - Increased efficiency in the delivery and use of Rio Grande water could, under some circumstances, contribute additional water to river flow. Efficiency in water use is always important, but the issue is very complex in the middle valley. For example, studies by the Bureau of Reclamation show that fully half of the water that recharges the crucial aquifer beneath Albuquerque comes from the Conservancy's water conveyance system. Therefore, the lining of irrigation canals, which in other places might seem to be a reasonable efficiency measure, could have negative consequences in the middle Rio Grande valley. Moreover, questions about the disposition of the water "saved" by any increases in efficiency would have to be resolved according to federal and state law, possibly involving agreement by the

Conservancy so that water saving measures can effectively help water managers meet the needs of human water users as well as the silvery minnow.

Another efficiency measure, called "water rotation," is routinely implemented by the Conservancy District in times of water shortage. However, rotation can have some adverse impacts while at the same time conserving irrigation water. For example, under strict water rotation, certain reaches of the Rio Grande may not receive normal return flows, potentially resulting in a dewatering of the river that could have adverse impacts on endangered species. Nonetheless, the Conservancy continues to implement and evaluate this method as a means of increasing efficiency in times of drought.

**Metering of Diversions and Return Flows** - The Conservancy District, with crucial financial and logistical support from the Bureau of Reclamation, the U.S. Geological Survey, and the New Mexico Interstate Stream Commission has made great progress in upgrading the metering of water flows at many points throughout the middle valley, and work on that program continues. The Conservancy anticipates continued support by the federal agencies for the acquisition of additional funds to complete the instrumentation of all return flows from the Conservancy's conveyance system to the Rio Grande.

Metering surface and groundwater irrigation deliveries and return flows to the river helps to clarify existing water uses and needs, quantify the available water supply, and identify water management options. Water rights in the middle Rio Grande valley are not adjudicated and only about half of the irrigation water return flows to the river are currently metered. To respond to calls for better water management, the Conservancy is working hard to improve the measurement of the water flowing through the system. In 1996 the Conservancy began the process of upgrading all of its measuring gauges, and that process continues with the installation of real-time meters on diversions and return flows, as well as ten automated weather stations to provide yet another dimension of data for improved water management. Diversion, return flow, and weather data are available to anyone 24 hours per day on the Bureau of Reclamation website.

## CONCLUSION

The increased urban population of the middle Rio Grande valley has brought with it new demands on our water resources and increased the complexity of water management in the middle Rio Grande valley. To respond to the new physical and regulatory challenges, the Conservancy District is improving operations and increasing its ability to meet those changing demands. As demonstrated by the extensive list of ecosystem rehabilitation projects contemplated for improvement of habitat for endangered species along the middle Rio Grande, the Conservancy District recognizes the need to find balanced solutions to environmental challenges, so that the centuries-old culture of irrigated agriculture can be sustained for our children who will inherit this magnificent valley.

### Endnotes

<sup>1</sup>The original Conservancy Act was enacted in 1923 (1923 N.M. LAWS, ch. 140). However, this act was repealed and replaced with the 1927 Conservancy Act (see *Gutierrez v. Middle Rio Grande Conservancy Dist.*, 34 N.M. 346, 282 P. 1 [1929]).