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Ichthyofauna of the Middle Rio Grande Conservancy District irrigation system:  
Cochiti Dam to Elephant Butte State Park, July-August 1993

Submitted by

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## EXECUTIVE SUMMARY

The Middle Río Grande Conservancy District (MRGCD) consists of four divisions (Cochiti, Albuquerque, Belen, and Socorro) encompassing about 150 river miles from Cochiti Dam to the northern boundary of Bosque del Apache National Wildlife Refuge. The Albuquerque and Belen divisions are bounded at their northern limits by low-head diversion dams, Cochiti Dam and Reservoir head the Cochiti Division, and the technical origin of the Socorro Division was just upstream of San Acacia Diversion Dam. About 834 miles of irrigation channels and 386 miles of interior and riverside drains provide a network of irrigation systems throughout the Middle Río Grande Valley.

The study area encompassed the entire Middle Río Grande Valley from Cochiti Dam to Elephant Butte State Park, including the Low Flow Conveyance Canal (LFCC) and irrigation channels within Bosque del Apache National Wildlife Refuge. We surveyed 74 sites (July-August 1993) in the study area to characterize the distribution and relative abundance of fish species of the MRGCD.

A total of 12,570 specimens representing 6 orders, 9 families, and 27 species was collected from the study area. Nine native species accounted for 63.9% of the study area collection. Two species of native cyprinids, red shiner and fathead minnow, constituted 58.0% of all specimens. Eighteen introduced species, represented by six families, accounted for 36.1% of the study area catch. Non-predator species ( $N=6$ ) represented 70.7% of the introduced catch. Twelve predator species comprised 29.3% of the introduced catch.

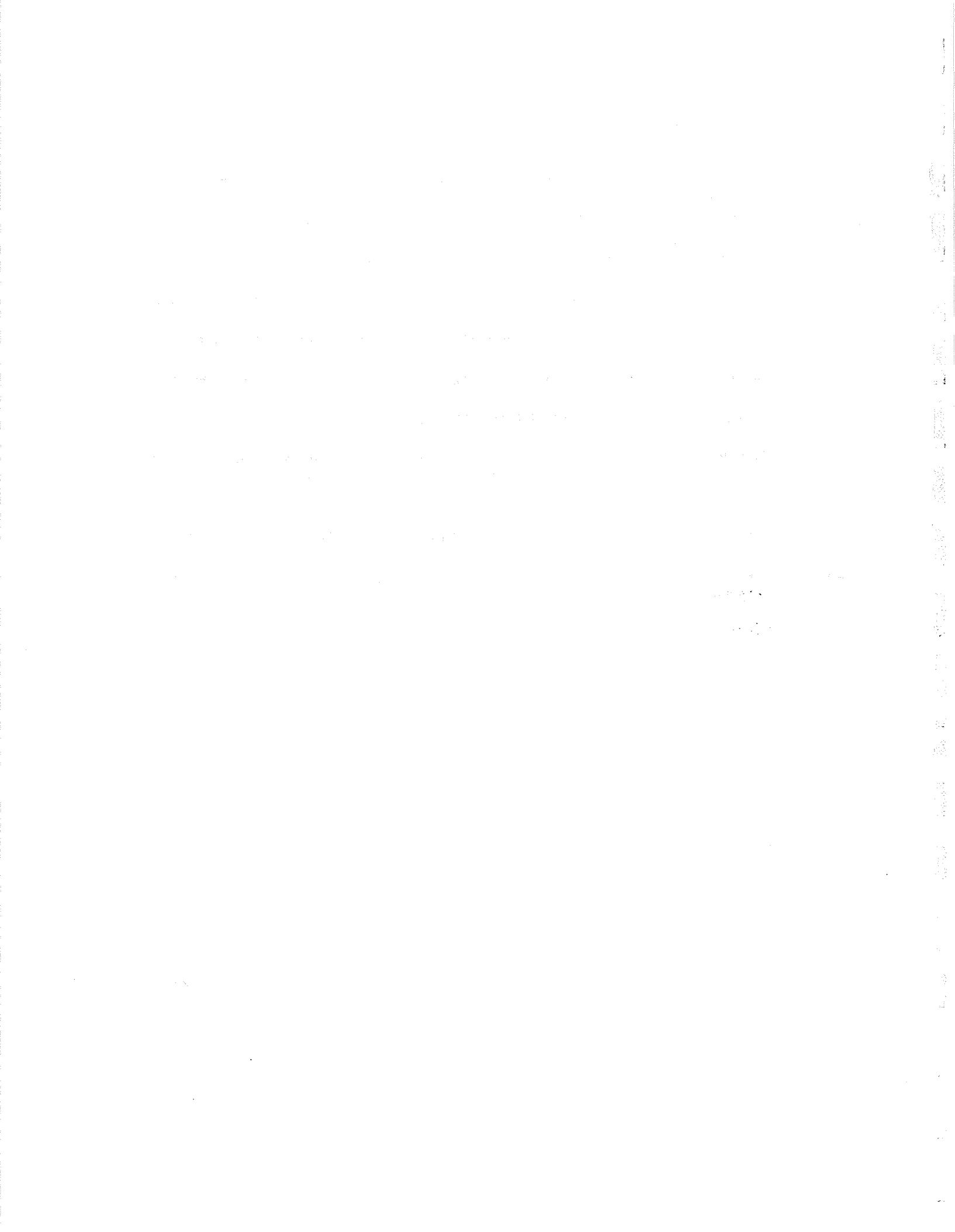
Habitat conditions and species-specific habitat requirements may account for the differences in fish community composition between riverine and non-riverine habitat types of the MRGCD. During low-flow periods, drainage returns may function as "backwater" habitats since little, if any, irrigation

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water is returned to the river. These backwater habitats may provide lentic conditions suitable for reproduction and/or rearing of nest-brooding Centrarchids. Conversely, lotic habitats characteristic of irrigation channels may produce favorable conditions for reproduction and/or rearing of Ictaluridae.

The hydrologic regime of perennial MRGCD irrigation systems may provide more habitat stability than ephemeral irrigation systems. Such habitat stability may account for the greater abundance, higher species richness, and more persistent fish populations characteristic of perennial MRGCD irrigation systems documented by historic collections. However, the inherent value of perennial MRGCD irrigation systems to maintain viable populations of fishes on a long-term basis is questionable.

This study documented a diverse assemblage of native and introduced fishes in the MRGCD relative to other studies in the western United States. The diversity of the MRGCD ichthyofauna may represent repeated reintroductions from mainstem impoundments and sport fishing sources rather than continuous occupation.



## INTRODUCTION

Control of lotic ecosystems in the arid Southwest predated the arrival of European settlers and has continued until present (Halseth 1932, Minckley et al. 1983). As early as 900 years ago, Native American Pueblo populations constructed elaborate irrigation systems in the Middle Río Grande Valley of New Mexico. Spanish colonization, which began about A.D. 1600, brought increased demands for water, primarily for irrigation and flood control. Subsequent development of the Río Grande irrigation system paralleled the growth of urban centers throughout the Middle Rio Grande Valley (Crawford et al. 1993).

Agriculture in the Middle Río Grande Valley encompassed about 125,000 acres by the late 1800s (Crawford et al. 1993). During this period, intensive irrigation practices effectively raised the ground-water level throughout the valley. Concomitantly, the Río Grande riverbed aggraded due to increased sediment loading from overgrazing of riparian vegetation, deforestation in the upper reaches of the watershed, and decreased Río Grande flows (Crawford et al. 1993). This aggradation, in conjunction with irrigation practices, resulted in increased frequency of flooding, prolonged floodplain saturation, increased soil salinity, and decreased water supply for irrigation. Consequently, there was a marked decline in irrigated agriculture in the early 1900s (Crawford et al. 1993).

In response to concern over the decrease in irrigated land in the Middle Río Grande Valley, the 1923 State Conservancy Act provided the administrative and logistical framework for the Middle Rio Grande Conservancy District (MRGCD). The MRGCD's primary charge was to improve the economy of the Middle Río Grande Valley by providing flood protection from the Río Grande, ensuring efficient delivery of irrigation water, and lowering the water table in the valley to allow for industrial, commercial, residential, and agricultural development (Shah 1992).

Beginning in 1928, the MRGCD undertook several major water development projects in the Río Grande and associated riparian corridor. These activities, which included construction of four instream, low-head diversion dams (Cochiti, Angostura, Isleta, and San Acacia); two subterranean Río Grande siphons; and about 800 miles of levees, drains and canals, established the infrastructure for the existing irrigation system of the Middle Río Grande Valley (Shah 1992). Development and improvement of this network has continued, and today the MRGCD provides irrigation opportunities for about 50,000 acres of irrigable lands between Cochiti Dam and the northern boundary of Bosque del Apache National Wildlife Refuge (Shah 1992).

Irrigation systems represent a significant proportion of lotic ecosystems, albeit artificial, of the desert Southwest (Marsh and Minckley 1982). These systems may provide habitats for aquatic biota beyond the constraints that typically limit geographical ranges in desert ecosystems (Minckley et al. 1983). However, little data exists on the aquatic resources of irrigation systems of the Southwest.

Numerous abiotic factors may influence colonization of irrigation systems by fish. The ephemeral hydrologic regime of these ecosystems renders successful colonization tenuous. Irrigation canals are characterized by low habitat diversity. In addition to annual flow manipulations, canal maintenance activities, such as dewatering, canal bank anchoring and stabilization, substrata dredging, and vegetation control, may disturb the aquatic community.

Documentation of the historic ichthyofaunal communities of the MRGCD irrigation system was provided by W.J. Koster, University of New Mexico (UNM) and C.W. Painter and M.D. Hatch of New Mexico Department of Game and Fish (NMGF). Koster's work in the MRGCD consisted of 37 collections taken between 1938-1974. Painter and Hatch surveyed 74 irrigation canal sites in 1977-1978 from southern Sandoval County downstream to northern Sierra County (Elephant Butte State Park). Between 1984-1989, 47 MRGCD irrigation canal sites were surveyed by Museum of Southwestern Biology (MSB), Division of Fish biologists.

In fall 1992, we surveyed 29 MRGCD irrigation sites (Lang and Platania 1993). That work provided baseline data for a more intensive inventory of canal fishes conducted in summer 1993. We report the results of the 1993 study, whose objective was to investigate the relative abundance and distribution of fishes of the MRGCD irrigation system.

### STUDY AREA

The MRGCD consists of four divisions (Cochiti, Albuquerque, Belen, Socorro) encompassing about 150 river miles from Cochiti Dam to the northern boundary of Bosque del Apache National Wildlife Refuge (Figure 1). The study area also included the Low Flow Conveyance Canal (LFCC) and irrigation channels within Bosque del Apache National Wildlife Refuge. Data collected in these two systems (Bosque del Apache National Wildlife Refuge and LFCC) were grouped and analyzed as Socorro Division data. About 834 miles of irrigation canals, laterals, and acequias and 386 miles of interior and riverside drains provide a network of irrigation systems throughout the Middle Río Grande Valley (Shah 1992, Table 1).

Cochiti Division originates directly below Cochiti Dam and extends downstream through Cochiti, Santo Domingo, and San Felipe pueblos, terminating at Angostura Diversion Dam. Irrigation water is transported on both the east and west sides of the Cochiti Division. Human encroachment into the Río Grande riparian corridor is minor relative to downstream divisions. There is only one drainage return in this Division.

Angostura Diversion Dam marks the head of the Albuquerque Division, which includes Santa Ana and Sandia pueblos and continues downstream to Isleta Diversion Dam (IDD), Isleta Pueblo. Numerous municipalities, including Bernalillo, Corrales, and Albuquerque are served by the irrigation system of this division. Flows of the Atrisco Feeder Canal are conveyed from the east to the west riverbank via the Corrales and Atrisco Siphons. There were five drainage returns in this Division.

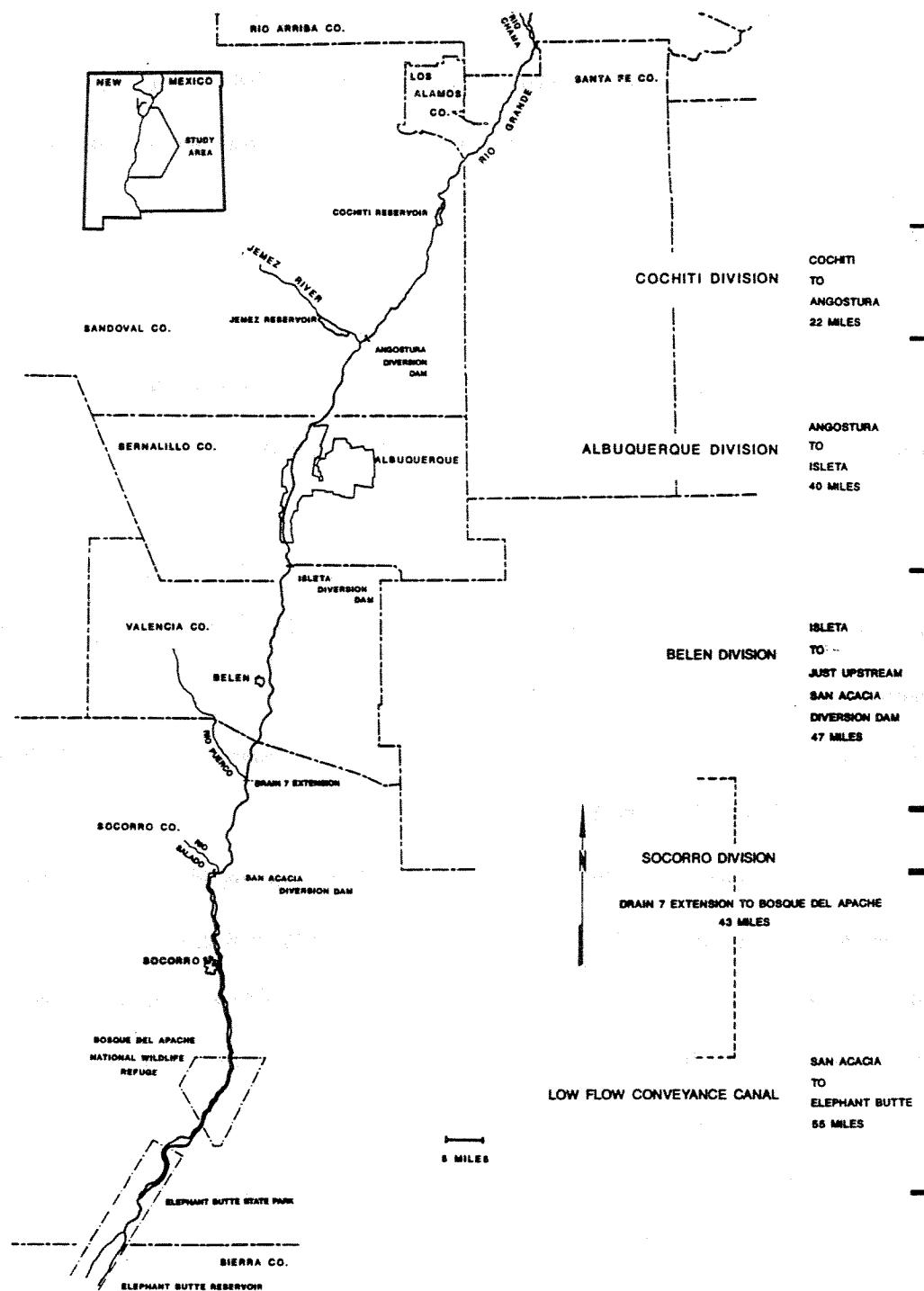


Figure 1. Map of the Middle Rio Grande Conservancy District encompassing about 150 river miles from Cochiti Dam to Elephant Butte State Park.

**Table 1.** Characteristics of the Middle Rio Grande Conservancy District irrigation system (Shah 1992).

Division	Reach Length (river miles)	Canals (miles)	Drains (miles)	Total (miles)
Cochiti	22	125	24	149
Albuquerque	40	256	124	380
Belen	47	346	169	515
Socorro	43	107	69	176
Low Flow Conveyance Canal	55	-	-	-
* TOTAL	152	834	386	1,220

\* Summary totals do not include the LFCC as it is not part of the MRGCD irrigation system.

The development of the MRGCD irrigation system is greatest in the Belen Division. Río Grande mainstem flows are diverted by IDD to irrigation systems that deliver water to irrigable lands stretching about 47 river miles downstream to just upstream of San Acacia Diversion Dam (SADD). Irrigation returns to the Río Grande are most numerous within this division.

Drain Extension 7, which originates just south of the Río Puerco levee at San Francisco, NM, is the northern boundary of the Socorro Division (Shah 1992). About 70% of the Socorro Division's irrigation demand is supplied by Drain 7 Extension, with additional flow provided by water diverted into the Socorro Main Canal at SADD. The LFCC originates at SADD and conveys flow about 55 miles downstream to its Río Grande confluence in Elephant Butte State Park. There are no drainage returns to the Río Grande in this division, as all interior drains discharge into the LFCC.

#### MATERIALS AND METHODS

Fish collections were made with a 10 x 6 foot - 3/16 inch mesh seine and 3 x 3 foot larval seine, July-August 1993. The number of seine hauls varied between sites depending upon habitat heterogeneity and fish density. All aquatic macrohabitats available were sampled. These included pools which formed where turn-out gates, instream weirs, and culvert outfalls scoured the canal substrata. Physicochemical parameters (temperature, pH, conductivity, salinity, and dissolved oxygen) of irrigation waters were recorded with a H<sub>2</sub>O Hydrolab water quality instrument at eight Socorro Main Canal and 15 LFCC sites.

Most fish collected during seining were retained and fixed in 10% formalin. Individuals >10 inches were identified, enumerated, and released at the point of capture. Field collections were returned to the laboratory for segregation by species, enumeration, and measurement. Processed collections were accessioned and catalogued into the Division of Fishes, MSB. A list of site

localities, species, number of specimens per taxon, and MSB catalogue number is appended for each collection (Appendix I). Irrigation system names were taken from division maps provide by the MRGCD.

Scientific and common names followed Robins et al. (1991) (Appendix II). Both scientific and common names are used the first time a taxon was mentioned in the text; thereafter, only common names were used. Determination of resident status followed Lee et al. (1980) and Sublette et al. (1990), with the exception of white sucker (Catostomus commersoni) and western mosquitofish (Gambusia affinis), which we considered introduced. For the purposes of this report, we distinguished between predator and non-predator fish species. Predator species consisted of piscivorous taxa (i.e., Ictaluridae, Salmonidae, Percichthyidae, Centrarchidae, and Percidae); all other trophic groups were designated as non-predators.

Flow in each division is regulated by an upstream dam, which direct mainstem waters into primary channels, also called main canals. Primary channels then convey water to secondary channels (i.e., ditches, laterals, acequias, and interior drains). Interior drains carry irrigation run-off waters to tertiary channels (i.e., feeder canals, riverside drains, and waste ways), which convey these waters downstream as either feeder sources for the next division or as return flow to the Río Grande. The LFCC was considered a tertiary channel.

Primary and secondary irrigation systems are seasonally dewatered (ephemeral) whereas tertiary irrigation systems convey permanent flows (perennial). This hierarchical classification (1°, 2°, 3°) does not correspond to stream order classifications such as that developed by Strahler (1957). Instead primary, secondary, and tertiary classifications were assigned to MRGCD irrigation systems based on function and hydrologic regimes.

We recognized two habitat types in the irrigation system. Drainage returns to the Río Grande were located and fishes were sampled from the nearest upstream control structure (e.g., weir or turn-

out gate) to the confluence with the river. These samples represented a discrete collection from the habitat type designated, for this report, riverine. Localities upstream of the defining control structure were sampled randomly, as determined by site access. These irrigation channel habitats were more channelized and homogeneous than the downstream reaches and were designated non-riverine (Appendices III and IV). Site accessibility for sampling was influenced by MRGCD irrigation flow conditions and property ownership (i.e., sovereign Native American nations or private lands).

This sampling protocol allowed for comparisons of data from distinct habitat types (i.e., riverine versus non-riverine) under various hydrologic regimes (i.e., ephemeral versus perennial).

## RESULTS

A total of 74 fish samples was taken in the study area, July-August 1993. Effort within each division consisted of: Cochiti (4 sites: 1 drainage return and 3 irrigation channel; Figure 2), Albuquerque (13 sites: 5 drainage return and 8 irrigation channel; Figure 2), Belen (34 sites: 10 drainage return and 24 irrigation channel; Figure 3), and Socorro (23 sites: 8 irrigation channel and 15 Low Flow Conveyance Canal; Figures 3 and 4). Of the 21 drainage returns that were located, one was unaccessible and four were non-functional.

### District Summary

A total of 12,570 specimens representing 6 orders, 9 families, and 27 species was collected in the 74 study area samples (Table 2). The nine native species collected represented 33.3% of the species richness, but accounted for 63.9% of the total collection. Native cyprinids represented the greatest percentage of the native catch (94.8%) with two species, red shiner (Cyprinella lutrensis) and fathead minnow (Pimephales promelas) constituting 58.0% of all specimens. River carpsucker (Carpio carpio), flathead chub (Platygobio gracilis), and longnose dace (Rhinichthys cataractae)

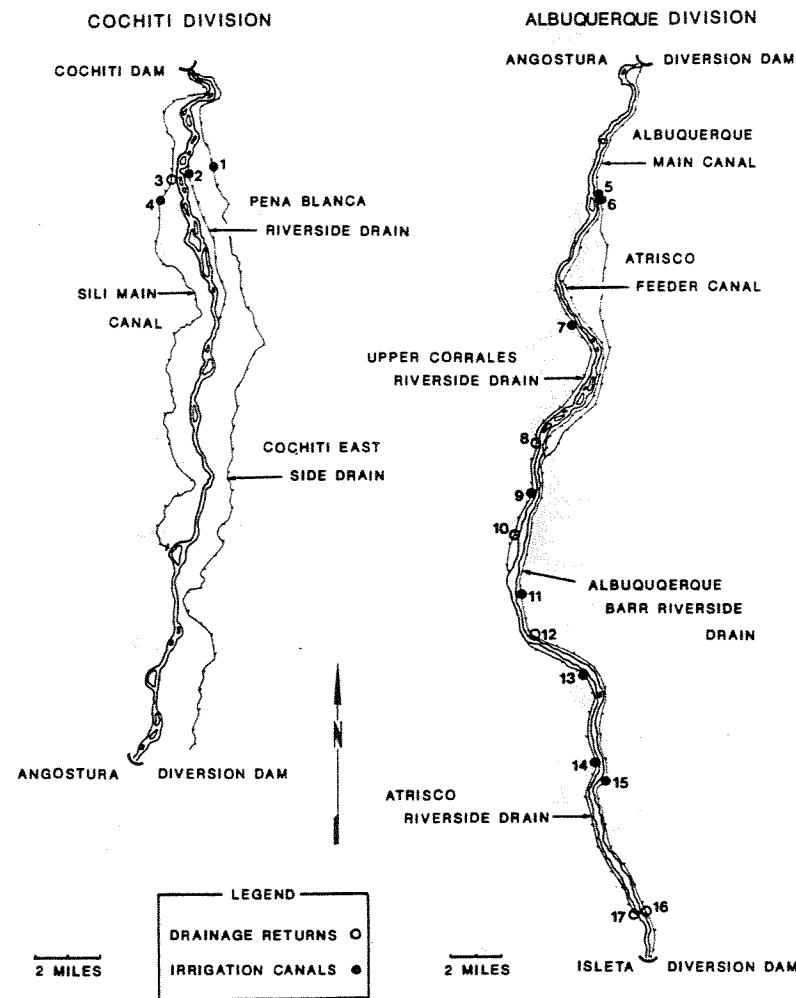


Figure 2. Map of the 1993 sampling localities in the Cochiti and Albuquerque divisions of the Middle Rio Grande Conservancy District irrigation system.

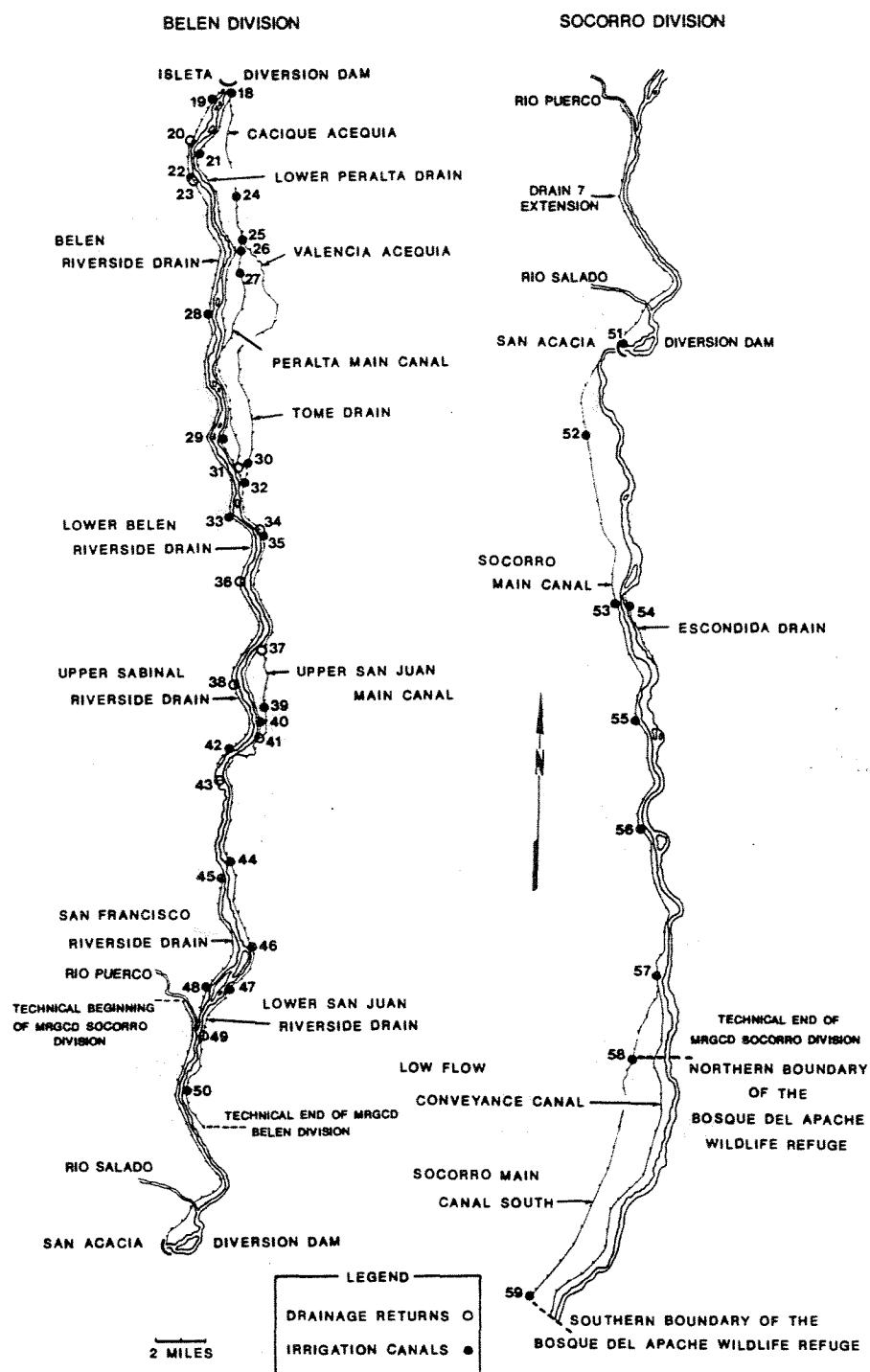


Figure 3. Map of the 1993 sampling localities in the Belen and Socorro divisions of the Middle Rio Grande Conservancy District irrigation system.

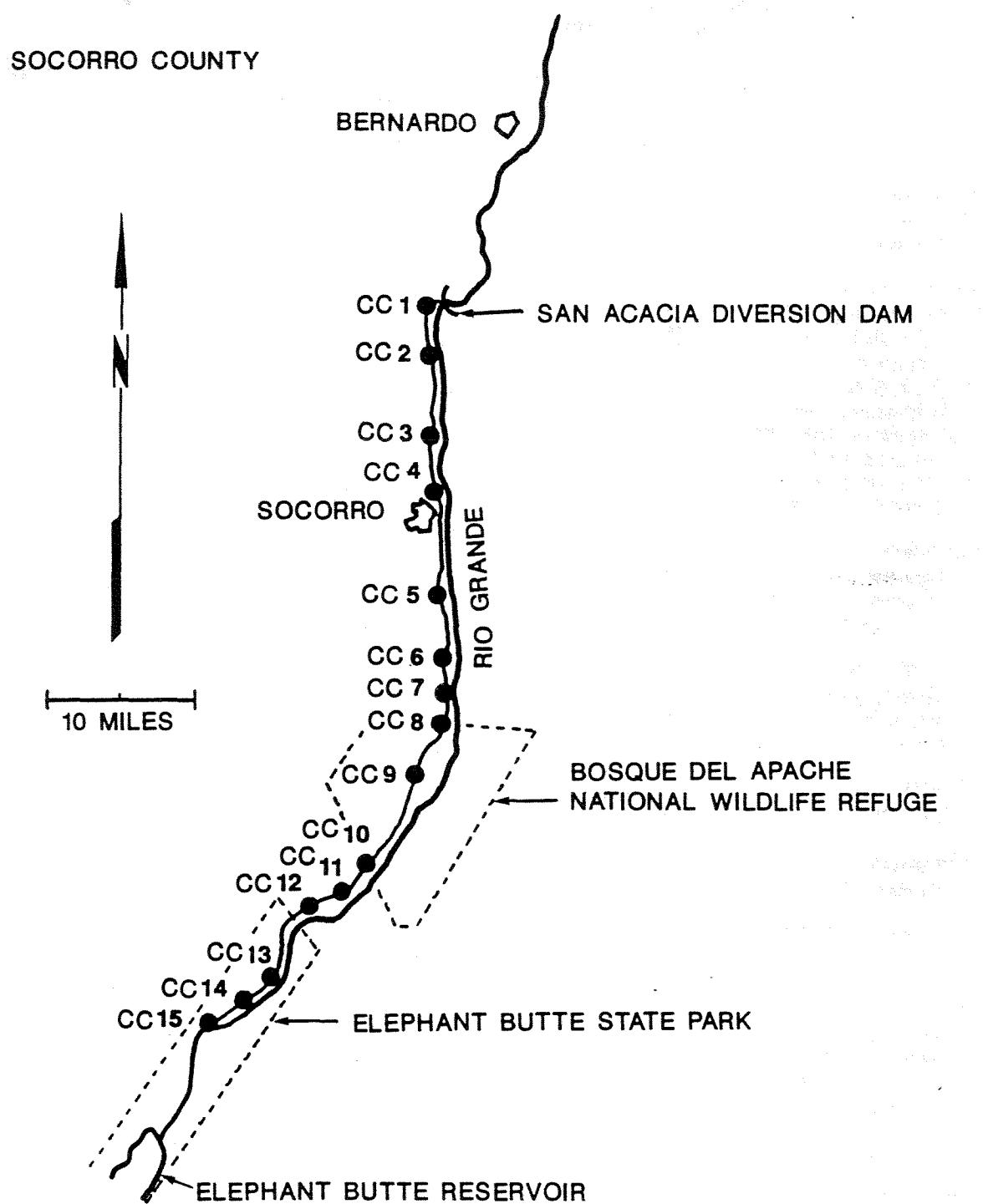


Figure 4. Map of 1993 sampling localities in the Low Flow Conveyance Canal.

**Table 2.** Summary of ichthyofaunal composition of all divisions (Cochiti, Albuquerque, Belen, Socorro) of the Middle Rio Grande Conservancy District irrigation system surveyed July-August 1993 (N=74 sites).

SPECIES	NUMBER OF SPECIMENS	% TOTAL SPECIMENS	RANK ABUNDANCE	FREQUENCY	% FREQUENCY OCCURRENCE
<b>HERRINGS</b>					
N <u>Dorosoma cepedianum</u>	356	2.8	7	3	4.1
I <u>Dorosoma petenense</u>	15	0.1	17	1	1.4
<b>CARPS AND MINNOWS</b>					
I <u>Campostoma anomalum</u>	3	*	23	2	2.7
N <u>Cyprinella lutrensis</u>	5,890	46.8	1	56	75.7
I <u>Cyprinus carpio</u>	377	3.0	6	41	55.4
N <u>Gila pandora</u>	12	0.1	18	3	4.1
N <u>Hybognathus amarus</u>	114	0.9	11	12	16.2
I <u>Notemigonus crysoleucas</u>	2	*	24	2	2.7
N <u>Pimephales promelas</u>	1,405	11.2	3	58	78.4
N <u>Platygobius gracilis</u>	57	0.5	15	15	20.3
N <u>Rhinichthys cataractae</u>	133	1.1	10	24	32.4
<b>SUCKERS</b>					
N <u>Carpoides carpio</u>	63	0.5	13	22	29.7
I <u>Catostomus commersoni</u>	1,480	11.8	2	55	74.3
N <u>Ictiobus bubalus</u>	1	*	25	1	1.4
<b>BULLHEAD CATFISHES</b>					
I <u>Ameiurus melas</u>	347	2.8	9	8	10.8
I <u>Ameiurus natalis</u>	86	0.7	12	26	35.1
I <u>Ictalurus punctatus</u>	417	3.3	5	31	41.9
<b>TROUTS</b>					
I <u>Salmo trutta</u>	10	0.1	19	1	1.4
<b>LIVEBEARERS</b>					
I <u>Gambusia affinis</u>	1,332	10.6	4	59	79.7
<b>TEMPERATE BASSES</b>					
I <u>Morone chrysops</u>	4	*	22	4	5.4
<b>SUNFISHES</b>					
I <u>Lepomis cyanellus</u>	6	*	20	6	8.1
I <u>Lepomis gulosus</u>	2	*	24	2	2.7
I <u>Lepomis macrochirus</u>	38	0.3	16	10	13.5
I <u>Micropterus salmoides</u>	59	0.5	14	20	27.0
I <u>Pomoxis annularis</u>	353	2.8	8	9	12.2
I <u>Pomoxis nigromaculatus</u>	5	*	21	5	6.8
<b>PERCHES</b>					
I <u>Perca flavescens</u>	3	*	23	2	2.7
<b>TOTAL</b>	12,570				

(RESIDENT STATUS: N = native, I = introduced)

\* &lt; 0.1%

occurred consistently, but in low relative abundance compared to other cyprinids and catostomids in all divisions except Cochiti. Gizzard shad (Dorosoma cepedianum) represented 2.8% of the total catch and occurred in three collections from two divisions (Albuquerque and Socorro); 99.0% of these specimens were taken in a single LFCC collection in Elephant Butte State Park.

Eighteen introduced species accounted for 36.1% of the catch. Clupeidae, Cyprinidae, Catostomidae, Ictaluridae, Poeciliidae, and Centrarchidae, accounted for 99.6% of the specimens collected. Non-predator species (N=6) represented 70.7% of the introduced catch. Western mosquitofish and white sucker, numerically the most abundant introduced taxa, were also the most frequently encountered introduced taxa. Predator species (N=12) comprised 29.3% of the introduced catch; of these, ictalurids and centrarchids collectively accounted for 98.7% of the predator catch.

#### Cochiti Division

In the Cochiti Division, catch per unit effort was low because 21 of 37 seining efforts were devoid of fish. Two sites produced only one species while one locality yielded no fish. The Cochiti Division catch represented 2.3% of the total catch (Table 3). Three of the four species found were introduced taxa; white sucker represented 94.3% of all specimens and occurred at three collecting localities. Fathead minnow, represented by nine specimens, was the only native species taken.

#### Albuquerque Division

In the Albuquerque Division, 20 species and 2,043 specimens were collected, which represented 16.3% of the study area catch (Table 4). This Division had the greatest number of species, as well as the largest number of uncommon species. Four of the five most abundant taxa were introduced species and they comprised 74.9% of the Division catch. Conversely, six species were found at one site each in low abundance; these species were gizzard shad, Rio Grande silvery

**Table 3.** Ichthyofaunal composition of the Cochiti Division of the Middle Rio Grande Conservancy District irrigation system surveyed August 1993 (N=4 sites).

SPECIES	NUMBER OF SPECIMENS	% TOTAL SPECIMENS	RANK ABUNDANCE	FREQUENCY	% FREQUENCY OCCURRENCE
<b>CARPS AND MINNOWS</b>					
N <u>Pimephales promelas</u>	9	3.2	2	1	25
<b>SUCKERS</b>					
I <u>Catostomus commersoni</u>	263	94.3	1	3	75
<b>LIVEBEARERS</b>					
I <u>Gambusia affinis</u>	4	1.4	3	1	25
<b>SUNFISHES</b>					
I <u>Micropterus salmoides</u>	3	1.1	4	1	25
<b>TOTAL</b>	<b>279</b>				

(RESIDENT STATUS: N = native, I = introduced)

Table 4. Ichthyofaunal composition of the Albuquerque Division of the Middle Rio Grande Conservancy District irrigation system surveyed July-August 1993 (N=13 sites).

SPECIES	NUMBER OF SPECIMENS	% TOTAL SPECIMENS	RANK ABUNDANCE	FREQUENCY	% FREQUENCY OCCURRENCE
<b>HERRINGS</b>					
N <u>Dorosoma cepedianum</u>	1	*	15	1	7.7
<b>CARPS AND MINNOWS</b>					
I <u>Campostoma anomalum</u>	3	0.1	13	2	15.4
N <u>Cyprinella lutrensis</u>	99	4.8	6	7	53.8
I <u>Cyprinus carpio</u>	144	7.0	4	5	38.5
N <u>Gila pandora</u>	12	0.6	10	3	23.1
N <u>Hybognathus amarus</u>	1	*	15	1	7.7
N <u>Pimephales promelas</u>	220	10.8	3	11	84.6
N <u>Platygobio gracilis</u>	2	*	14	2	15.4
N <u>Rhinichthys cataractae</u>	61	3.0	8	9	69.2
<b>SUCKERS</b>					
N <u>Carpoides carpio</u>	1	*	15	1	7.7
I <u>Catostomus commersoni</u>	906	44.3	1	12	92.3
<b>BULLHEAD CATFISHES</b>					
I <u>Ameiurus melas</u>	76	3.7	7	2	15.4
I <u>Ameiurus natalis</u>	2	*	14	1	7.7
<b>TROUTS</b>					
I <u>Salmo trutta</u>	10	0.5	11	1	7.7
<b>LIVEBEARERS</b>					
I <u>Gambusia affinis</u>	142	7.0	5	10	76.9
<b>SUNFISHES</b>					
I <u>Lepomis macrochirus</u>	16	0.8	9	3	23.1
I <u>Micropterus salmoides</u>	4	0.2	12	3	23.1
I <u>Pomoxis annularis</u>	339	16.6	2	2	15.4
I <u>Pomoxis nigromaculatus</u>	1	*	15	1	7.7
<b>PERCHES</b>					
I <u>Perca flavescens</u>	3	0.1	13	2	15.4
<b>TOTAL</b>	2,043				

(RESIDENT STATUS: N = native, I = introduced)

\* &lt; 0.1%

minnow (Hybognathus amarus), river carpsucker, yellow bullhead (Ameiurus natalis), brown trout (Salmo trutta), and black crappie (Pomoxis nigromaculatus).

Introduced species dominated the Division catch accounting for 80.6% of the specimens taken. Of the introduced catch, non-predators constituted 72.6%. The majority of predators were white crappie (Pomoxis annularis), of which virtually all (99.1%) were taken in one drainage return. The remaining 19.4% of the Division catch was comprised of eight native species. Six of these, red shiner, Rio Grande chub (Gila pandora), Rio Grande silvery minnow, fathead minnow, flathead chub, and longnose dace were 99.5% of the native catch.

Five uncommon species, central stoneroller (Campostoma anomalum), Rio Grande chub, Rio Grande silvery minnow, brown trout, and yellow perch (Perca flavescens), were collected from riverside drains in the Albuquerque Division. Brown trout was taken from a Corrales Riverside Drain site where algal mats, submergent vegetation, and undercut banks with overhanging vegetation provided cover. Numerous trout parr were observed among the protective cover.

The Albuquerque reach of the Atrisco Riverside Drain yielded three specimens of central stoneroller, 11 Rio Grande chub, and one yellow perch. A single Rio Grande silvery minnow and two yellow perch were collected at the confluence of the Albuquerque Barr Riverside Drain and Rio Grande.

#### Belen Division

The 34 Belen Division collections were 65.5% of the total catch (Table 5). Cyprinidae and Poeciliidae numerically dominated the collections and the Catostomidae (4.1%), Ictaluridae (1.9%) Percichthyidae (<0.1%), and Centrarchidae (1.1%) were also present.

Native fish species (N=6) accounted for 83.0% of the Belen Division catch. Red shiner and fathead minnow collectively comprised 96.0% of the Division's native catch. One drainage return

Table 5. Ichthyofaunal composition of the Belen Division of the Middle Rio Grande Conservancy District irrigation system surveyed July-August 1993 (N=34 sites).

SPECIES	NUMBER OF SPECIMENS	% TOTAL SPECIMENS	RANK ABUNDANCE	FREQUENCY	% FREQUENCY OCCURRENCE
<b>CARPS AND MINNOWS</b>					
N <i>Cyprinella lutrensis</i>	5,539	67.3	1	30	88.2
I <i>Cyprinus carpio</i>	161	2.0	5	26	76.5
N <i>Hybognathus amarus</i>	106	1.3	6	8	23.5
I <i>Notemigonus crysoleucas</i>	2	*	17	2	5.9
N <i>Pimephales promelas</i>	1,022	12.4	2	32	94.1
N <i>Platygobio gracilis</i>	52	0.6	11	10	29.4
N <i>Rhinichthys cataractae</i>	55	0.7	10	10	29.4
<b>SUCKERS</b>					
N <i>Carpoides carpio</i>	57	0.7	9	19	55.9
I <i>Catostomus commersoni</i>	284	3.4	4	32	94.1
<b>BULLHEAD CATFISHES</b>					
I <i>Ameiurus melas</i>	34	0.4	13	6	17.6
I <i>Ameiurus natalis</i>	59	0.7	8	17	50.0
I <i>Ictalurus punctatus</i>	64	0.8	7	15	44.1
<b>LIVEBEARERS</b>					
I <i>Gambusia affinis</i>	702	8.5	3	27	79.4
<b>TEMPERATE BASSES</b>					
I <i>Morone chrysops</i>	4	*	16	4	11.8
<b>SUNFISHES</b>					
I <i>Lepomis cyanellus</i>	4	*	16	4	11.8
I <i>Lepomis macrochirus</i>	21	0.3	14	6	17.6
I <i>Micropterus salmoides</i>	51	0.6	12	15	44.1
I <i>Pomoxis annularis</i>	14	0.2	15	7	20.6
I <i>Pomoxis nigromaculatus</i>	4	*	16	4	11.8
<b>TOTAL</b>	<b>8,235</b>				

(RESIDENT STATUS: N = native, I = introduced)

\* &lt; 0.1%

accounted for 30.5% of the red shiner catch. River carpsucker occurred most frequently and in highest abundance in this division relative to other MRGCD divisions.

Rio Grande silvery minnow occurred in 8 of 34 Belen Division collections and was the sixth-most abundant species. The majority of the Rio Grande silvery minnow collected in the Belen Division were young-of-the-year (YOY) individuals.

Introduced species ( $N=13$ ) comprised 17.0% of the Belen Division catch. Golden shiner (Notemigonus crysoleucas), seined from two drainage returns confluencing with the Rio Grande mainstem, was not documented in any other MRGCD division. The other three non-predator species, common carp (Cyprinus carpio), white sucker, and western mosquitofish, collectively accounted for 81.7% of the introduced catch.

Nine predator taxa accounted for 18.2% of the Belen Division introduced species catch. Fifty-one of 59 (86.4%) largemouth bass and all white bass specimens of the study area were taken from the Belen Division.

#### Socorro Division

The Socorro Division catch consisted of eight native and 11 introduced species that accounted for 16.0% of the total catch (Table 6). Three species (gizzard shad, red shiner, and fathead minnow) dominated the native catch and represented 37.8% of the Division catch. Eleven species of introduced fish comprised 60.6% of the Socorro Division catch. Western mosquitofish occurred throughout the Division and numerically dominated the catch. White sucker occurred less frequently and in lower relative abundance in this division compared to upstream MRGCD divisions.

Table 6. Ichthyofaunal composition of the Socorro Division of the Middle Rio Grande Conservancy District irrigation system surveyed August 1993 (N=23 sites: 8 irrigation channel and 15 LFCC).

SPECIES	NUMBER OF SPECIMENS	% TOTAL SPECIMENS	RANK ABUNDANCE	FREQUENCY	% FREQUENCY OCCURRENCE
<b>HERRINGS</b>					
N <u>Dorosoma cepedianum</u>	355	17.6	2	2	8.7
I <u>Dorosoma petenense</u>	15	0.7	11	1	4.3
<b>CARPS AND MINNOWS</b>					
N <u>Cyprinella lutrensis</u>	252	12.5	4	19	82.6
I <u>Cyprinus carpio</u>	72	3.6	7	10	43.5
N <u>Hybognathus amarus</u>	7	0.3	12	3	13.0
N <u>Pimephales promelas</u>	154	7.7	6	14	60.9
N <u>Platygobio gracilis</u>	3	0.1	14	3	13.0
N <u>Rhinichthys cataractae</u>	17	0.8	10	5	21.7
<b>SUCKERS</b>					
N <u>Carpoides carpio</u>	5	0.2	13	2	8.7
I <u>Catostomus commersoni</u>	27	1.3	8	8	34.8
N <u>Ictiobus bubalus</u>	1	*	16	1	4.3
<b>BULLHEAD CATFISHES</b>					
I <u>Ameiurus melas</u>	237	11.8	5	1	4.3
I <u>Ameiurus natalis</u>	25	1.2	9	8	34.8
I <u>Ictalurus punctatus</u>	353	17.5	3	16	69.6
<b>LIVEBEARERS</b>					
I <u>Gambusia affinis</u>	484	24.0	1	21	91.3
<b>SUNFISHES</b>					
I <u>Lepomis cyanellus</u>	2	0.1	15	2	8.7
I <u>Lepomis gulosus</u>	2	0.1	15	2	8.7
I <u>Lepomis macrochirus</u>	1	*	16	1	4.3
I <u>Micropterus salmoides</u>	1	*	16	1	4.3
<b>TOTAL</b>	<b>2,013</b>				

(RESIDENT STATUS: N = native, I = introduced)

\* &lt; 0.1%

Ictaluridae comprised 99.0% of the predator specimens. One LFCC collection yielded 354 of 355 gizzard shad and all black bullhead taken in this division. Young-of-the-year channel catfish were most common in the upper reaches of this Division (i.e., Socorro Main Canal), while channel catfish > 100 mm SL were more abundant in the LFCC.

Smallmouth buffalo (Ictiobus bubalus), threadfin shad (Dorosoma petenense), and warmouth (Lepomis gulosus), species uncommon or previously unrecorded in MRGCD canals, were found at two LFCC sites. The smallmouth buffalo record represented the first documented occurrence of this species in the study area. Specimens of Rio Grande silvery minnow, another uncommon native fish, were seined from two LFCC sites and one Socorro Main Canal Center locality.

#### Drainage returns versus irrigation channels

Twenty species (7 native and 13 introduced) were documented from drainage returns and 25 species (9 native and 16 introduced) from irrigation channel sites (Tables 7 and 8, respectively). About the same numbers of fish were taken in drainage returns and irrigation channels.

Native species (N=7) comprised 69.9% of the drainage return catch, with red shiner and fathead minnow representing 97.2% of the native catch. The nine irrigation channel native species were 57.9% of the total irrigation channel catch. Red shiner and fathead minnow were 48.1% of the catch in non-riverine habitats.

Introduced species were 30.1% of the drainage return catch, compared to 42.1% of the irrigation channel collections. Of the introduced species, white sucker and western mosquitofish accounted for 68.4% and 15.4%, respectively, of the non-predator catch at drainage return sites. Conversely, white sucker and western mosquitofish were 29.7% and 60.7%, respectively, of the irrigation channel catch.

**Table 7.** Ichthyofaunal composition of 16 drainage return sites of the Middle Rio Grande Conservancy District irrigation system surveyed July-August 1993.

SPECIES	NUMBER OF SPECIMENS	% TOTAL SPECIMENS	RANK ABUNDANCE	FREQUENCY	% FREQUENCY OCCURRENCE
<b>HERRINGS</b>					
N <u>Dorosoma cepedianum</u>	1	*	18	1	6.3
<b>CARPS AND MINNOWS</b>					
N <u>Cyprinella lutrensis</u>	3,966	63.1	1	14	87.5
I <u>Cyprinus carpio</u>	218	3.5	5	13	81.3
N <u>Hybognathus amarus</u>	7	0.1	15	2	12.5
I <u>Notemigonus crysoleucas</u>	2	*	17	2	12.5
N <u>Pimephales promelas</u>	302	4.8	4	16	100.0
N <u>Platygobio gracilis</u>	41	0.7	9	8	50.0
N <u>Rhinichthys cataractae</u>	55	0.9	8	8	50.0
<b>SUCKERS</b>					
N <u>Carpoides carpio</u>	20	0.3	12	9	56.3
I <u>Catostomus commersoni</u>	932	14.8	2	16	100.0
<b>BULLHEAD CATFISHES</b>					
I <u>Ameiurus melas</u>	90	1.4	7	3	18.8
I <u>Ameiurus natalis</u>	17	0.3	13	7	43.8
I <u>Ictalurus punctatus</u>	12	0.2	14	4	25.0
<b>LIVEBEARERS</b>					
I <u>Gambusia affinis</u>	210	3.3	6	13	81.3
<b>TEMPERATE BASSES</b>					
I <u>Morone chrysops</u>	1	*	18	1	6.3
<b>SUNFISHES</b>					
I <u>Lepomis macrochirus</u>	24	0.4	11	5	31.3
I <u>Micropterus salmoides</u>	31	0.5	10	9	56.3
I <u>Pomoxis annularis</u>	346	5.5	3	4	25.0
I <u>Pomoxis nigromaculatus</u>	3	*	16	3	18.8
<b>PERCHES</b>					
I <u>Perca flavescens</u>	3	*	16	2	12.5
<b>TOTAL</b>	6,281				

(RESIDENT STATUS: N = native, I = introduced)

\* < 0.1%

**Table 8.** Ichthyofaunal composition of 58 irrigation channel sites surveyed July-August 1993 within all divisions (Cochiti, Albuquerque, Belen, Socorro) of the Middle Rio Grande Conservancy District irrigation system.

SPECIES	NUMBER OF SPECIMENS	% TOTAL SPECIMENS	RANK ABUNDANCE	FREQUENCY	% FREQUENCY OCCURRENCE
<b>HERRINGS</b>					
N <u>Dorosoma cepedianum</u>	355	5.6	6	2	3.4
I <u>Dorosoma petenense</u>	15	0.2	15	1	1.7
<b>CARPS AND MINNOWS</b>					
I <u>Campostoma anomalum</u>	3	*	21	2	3.4
N <u>Cyprinella lutrensis</u>	1,924	30.6	1	42	72.4
I <u>Cyprinus carpio</u>	159	2.5	8	28	48.3
N <u>Gila pandora</u>	12	0.2	17	3	5.2
N <u>Hybognathus amarus</u>	107	1.7	9	10	17.2
N <u>Pimephales promelas</u>	1,103	17.5	3	42	72.4
N <u>Platygobio gracilis</u>	16	0.3	14	7	12.1
N <u>Rhinichthys cataractae</u>	78	1.2	10	16	27.6
<b>SUCKERS</b>					
N <u>Carpioles carpio</u>	43	0.7	12	13	22.4
I <u>Catostomus commersoni</u>	548	8.7	4	39	67.2
N <u>Ictiobus bubalus</u>	1	*	23	1	1.7
<b>BULLHEAD CATFISHES</b>					
I <u>Ameiurus melas</u>	257	4.1	7	5	8.6
I <u>Ameiurus natalis</u>	69	1.1	11	19	32.6
I <u>Ictalurus punctatus</u>	405	6.4	5	27	46.6
<b>TROUTS</b>					
I <u>Salmo trutta</u>	10	0.2	18	1	1.7
<b>LIVEBEARERS</b>					
I <u>Gambusia affinis</u>	1,122	17.8	2	46	79.3
<b>TEMPERATE BASSES</b>					
I <u>Morone chrysops</u>	3	*	21	3	5.2
<b>SUNFISHES</b>					
I <u>Lepomis cyanellus</u>	6	0.1	20	6	10.3
I <u>Lepomis gulosus</u>	2	*	22	2	3.4
I <u>Lepomis macrochirus</u>	14	0.2	16	5	8.6
I <u>Micropterus salmoides</u>	28	0.4	13	11	19.0
I <u>Pomoxis annularis</u>	7	0.1	19	5	8.6
I <u>Pomoxis nigromaculatus</u>	2	*	22	2	3.4
<b>TOTAL</b>	<b>6,289</b>				

(RESIDENT STATUS: N = native, I = introduced)

\* &lt; 0.1%

Drainage return and irrigation channel collections shared three taxa of predator species: ictalurids (22.5% drainage return vs. 91.0% irrigation channel-predator catch), a percichthyid (0.2% drainage return vs. 0.4% irrigation channel-predator catch), and centrarchids (76.7% drainage return vs. 7.3% irrigation channel-predator catch). White crappie was the most abundant predator in the drainage return collections, while channel catfish was the most common predator collected from irrigation channels. Brown trout was only taken in irrigation channel collections, whereas yellow perch only occurred in the drainage return collections.

#### Ephemeral versus perennial irrigation systems

A total of 10,437 specimens representing 27 species was taken from 56 collections in perennial irrigation systems (Table 9). The ephemeral irrigation system catch was 2,133 specimens representing 15 species from 18 sites (Table 10). Native species comprised 62.7% and 69.9% of the perennial and ephemeral channel catch, respectively. Six native species (red shiner, Rio Grande silvery minnow, fathead minnow, flathead chub, longnose dace, and river carpsucker) were common to both ephemeral and perennial irrigation channels. Native species particular to perennial irrigation systems were gizzard shad, Rio Grande chub, and smallmouth buffalo. Collectively, red shiner and fathead minnow, were the most abundant native taxa in both ephemeral and perennial irrigation systems. Rio Grande silvery minnow comprised 6.0% of the ephemeral irrigation system native fish catch compared to 0.4% of the perennial irrigation system catch.

Perennial irrigation systems harbored twice as many species of introduced fishes ( $N=18$ ) as ephemeral irrigation systems. White sucker, western mosquitofish, and common carp comprised 73.5% of the introduced catch of perennial irrigation systems and 50.4% of the introduced species catch from ephemeral irrigation systems. Three species of introduced, non-predator fishes (threadfin shad, central stoneroller, and golden shiner) were taken only in perennial irrigation systems.

Table 9. Ichthyofaunal composition of perennial irrigation channels of the Middle Rio Grande Conservancy District irrigation system surveyed July-August 1993 (N=56 sites).

SPECIES	NUMBER OF SPECIMENS	% TOTAL SPECIMENS	RANK ABUNDANCE	FREQUENCY	% FREQUENCY OCCURRENCE
<b>HERRINGS</b>					
N <i>Dorosoma cepedianum</i>	356	3.4	5	3	5.4
I <i>Dorosoma petenense</i>	15	0.1	17	1	1.8
<b>CARPS AND MINNOWS</b>					
I <i>Campostoma anomalum</i>	3	*	22	2	3.6
N <i>Cyprinella lutrensis</i>	4,713	45.2	1	43	76.8
I <i>Cyprinus carpio</i>	348	3.3	7	30	53.6
N <i>Gila pandora</i>	12	0.1	18	13	23.2
N <i>Hybognathus amarus</i>	25	0.2	16	7	12.5
I <i>Notemigonus crysoleucas</i>	2	*	23	2	3.6
N <i>Pimephales promelas</i>	1,204	11.5	4	47	83.9
N <i>Platygobio gracilis</i>	51	0.5	13	11	19.6
N <i>Rhinichthys cataractae</i>	132	1.3	9	23	41.1
<b>SUCKERS</b>					
N <i>Carpioles carpio</i>	47	0.5	14	18	32.1
I <i>Catostomus commersoni</i>	1,305	12.5	2	44	78.6
N <i>Ictiobus bubalus</i>	1	*	24	1	1.8
<b>BULLHEAD CATFISHES</b>					
I <i>Ameiurus melas</i>	347	3.3	8	8	14.3
I <i>Ameiurus natalis</i>	60	0.6	11	17	30.4
I <i>Ictalurus punctatus</i>	129	1.2	10	20	35.7
<b>TROUTS</b>					
I <i>Salmo trutta</i>	10	0.1	19	1	1.8
<b>LIVEBEARERS</b>					
I <i>Gambusia affinis</i>	1,212	11.6	3	48	85.7
<b>TEMPERATE BASSES</b>					
I <i>Morone chrysops</i>	2	*	23	2	3.6
<b>SUNFISHES</b>					
I <i>Lepomis cyanellus</i>	6	0.1	20	6	10.7
I <i>Lepomis gulosus</i>	2	*	23	2	3.6
I <i>Lepomis macrochirus</i>	38	0.4	15	10	17.9
I <i>Micropterus salmoides</i>	58	0.6	12	19	33.9
I <i>Pomoxis annularis</i>	352	3.4	6	8	14.3
I <i>Pomoxis nigromaculatus</i>	4	*	21	4	7.1
<b>PERCHES</b>					
I <i>Perca flavescens</i>	3	*	22	2	3.6
<b>TOTAL</b>	10,437				

(RESIDENT STATUS: N = native, I = introduced)

\* &lt; 0.1%

Table 10. Ichthyofaunal composition of ephemeral irrigation channels of the Middle Rio Grande Conservancy District irrigation system surveyed July-August 1993 (N=18 sites).

SPECIES	NUMBER OF SPECIMENS	% TOTAL SPECIMENS	RANK ABUNDANCE	FREQUENCY	% FREQUENCY OCCURRENCE
<b>CARPS AND MINNOWS</b>					
N <i>Cyprinella lutrensis</i>	1,177	55.2	1	13	72.2
I <i>Cyprinus carpio</i>	29	1.4	7	11	61.1
N <i>Hybognathus amarus</i>	89	4.1	6	5	27.8
N <i>Pimephales promelas</i>	201	9.4	3	11	61.1
N <i>Platygobio gracilis</i>	6	0.3	10	4	22.2
N <i>Rhinichthys cataractae</i>	1	*	12	1	5.6
<b>SUCKERS</b>					
N <i>Carpoides carpio</i>	16	0.8	9	4	22.2
I <i>Catostomus commersoni</i>	175	8.2	4	11	61.1
<b>BULLHEAD CATFISHES</b>					
I <i>Ameiurus natalis</i>	26	1.2	8	9	50.0
I <i>Ictalurus punctatus</i>	288	13.5	2	11	61.1
<b>LIVEBEARERS</b>					
I <i>Gambusia affinis</i>	120	5.6	5	11	61.1
<b>TEMPERATE BASSES</b>					
I <i>Morone chrysops</i>	2	0.1	11	2	11.1
<b>SUNFISHES</b>					
I <i>Micropterus salmoides</i>	1	*	12	1	5.6
I <i>Pomoxis annularis</i>	1	*	12	1	5.6
I <i>Pomoxis nigromaculatus</i>	1	*	12	1	5.6
<b>TOTAL</b>	<b>2,133</b>				

(RESIDENT STATUS: N = native, I = introduced)

\* &lt; 0.1%

The 12 species of predator fishes were 25.9% of the introduced catch from perennial irrigation systems compared to 49.6% of the introduced catch from ephemeral irrigation systems. Catfishes comprised 98.5% and 53.0% of the ephemeral and perennial irrigation system predator catch, respectively. Largemouth bass, white crappie, and black crappie, and white bass occurred in both ephemeral and perennial irrigation systems; whereas brown trout, Lepomis spp, and yellow perch occurred only in perennial irrigation system collections.

#### Water Quality

Physicochemical parameters were relatively consistent between the eight Socorro Main Canal and 15 LFCC sites (Table 11). Dissolved oxygen was lowest in the Socorro Main Canal and highest in the LFCC. The pH was recorded for six Socorro Main Canal sites only; these values were slightly basic (7.81-7.95). Salinity ranged between 0.3-0.7 ppt, whereas waters temperatures were 17.9-25.3°C. Conductivity of the Socorro Main Canal waters was at least twice as high as several LFCC sites. This limited water quality information precluded interpretation of these data.

Table 11. Water quality parameters measured at 23 sites within the Socorro Division of the Middle Rio Grande Conservancy District irrigation system (August 1993).

SITE	pH	DISSOLVED OXYGEN	SALINITY (ppt)	CONDUCTIVITY ( $\mu\text{v}$ )	TEMPERATURE °C
<b>SOCORRO MAIN CANAL</b>					
52	7.95	7.29	0.3	614	22.5
53	7.80	7.15	0.4	720	21.7
55	7.94	7.45	0.4	693	23.5
56	7.89	7.40	0.4	804	24.0
57	7.90	6.90	0.4	827	25.0
59	7.81	7.09	0.5	1018	22.2
58a	-	7.45	0.6	1000	23.4
58b	-	6.30	0.7	1339	22.4
<b>LOW FLOW CONVEYANCE CANAL</b>					
CC 2	-	7.35	0.5	789	17.9
CC 3	-	7.06	0.4	720	18.9
CC 4	-	7.21	0.4	754	21.9
CC 5	-	7.30	0.3	651	22.5
CC 6	-	7.23	0.3	667	19.6
CC 7	-	7.11	0.3	678	19.3
CC 8	-	7.03	0.3	632	23.8
CC 9	-	7.33	0.3	610	23.1
CC 10	-	7.63	0.3	620	22.2
CC 11	-	7.93	0.5	1245	21.4
CC 12	-	7.28	0.5	987	22.2
CC 13	-	7.26	0.5	1010	22.0
CC 14	-	7.31	0.5	936	22.1
CC 15A	-	6.95	0.4	735	24.3
CC 15B	-	7.45	0.4	866	25.3

a = turbid water of the Socorro Main Canal South

b = clear water of a confluencing acequia

A = isolated pool

B = "backwater" of LFCC

$\mu\text{v}$  = microvolts

ppt = parts per thousand

CC 1 not included - < 6 inches of water

## DISCUSSION

Habitat conditions within the MRGCD irrigation system were conducive for the successful reproduction of the majority of introduced fish species. Young-of-the-year centrarchids were most abundant in the embayments of drainage returns to the Rio Grande whereas YOY ictalurids were more abundant in irrigation channel sites, including the LFCC, than in drainage returns. During low-flow periods, many drainage returns may function as "backwater" habitats since little, if any, irrigation water is returned to the river. These backwater habitats may provide lentic conditions suitable for successful reproduction and/or rearing of nest-brooding centrarchids. Conversely, lotic habitats characteristic of irrigation channels may provide favorable conditions for the successful reproduction of Ictaluridae. Habitat conditions (riverine and non-riverine) of the MRGCD irrigation system may account for the differences in the fish community of drainage returns and irrigation canals in the study area.

Annual dewatering appears to be the primary deterrent for successful establishment of stable fish populations in irrigation systems (Marsh and Minckley 1982, Minckley et al. 1983, Platania 1990). Ephemeral MRGCD irrigation systems produce unstable habitat conditions characterized by seasonal flows and low habitat diversity. These systems are subjected to considerably more human-induced perturbations than perennial irrigation systems (Lang pers. obs.). Annual dewatering throughout the MRGCD commonly results in considerable mortality of fishes in canals. These fish usually became isolated in deep pools typically located at instream control structures or road crossing culverts (Lang pers. obs., Fall 1992 irrigation canal survey, Appendix V).

Conversely, the hydrologic regime of perennial irrigation systems may provides more habitat stability than ephemeral irrigation systems. Such habitat stability may account for the comparatively high abundance, species richness, and persistent fish populations of the MRGCD perennial irrigation systems documented by Koster (1938-1974). In addition to the sympatric occurrence of central

stoneroller, Rio Grande chub, and brown trout, Koster recorded several cyprinids that have been subsequently extirpated from the New Mexico portion of the Rio Grande (roundnose minnow, Dionda episcopa, speckled chub, Macrhybopsis aestivalis, and Rio Grande shiner, Notropis jemezanus) or are extinct (Rio Grande bluntnose shiner, Notropis simus simus). However, despite the apparent habitat stability afforded by perennial MRGCD irrigation systems, their inherent value to maintain viable populations of fishes on a long-term basis is questionable, especially considering the aforementioned extirpations of native fish species.

Historic collections documented the occurrence of Rio Grande silvery minnow in both ephemeral and perennial MRGCD irrigation systems. We did not find evidence of Rio Grande silvery minnow reproduction within any division of the MRGCD, as no eggs, larvae, or gravid individuals were collected at the 74 study area sites. The majority of Rio Grande silvery minnow specimens were YOY individuals (20-37 mm SL) from the Belen Division. Once in the irrigation system, movements of Rio Grande silvery minnow, as most other canal fishes, were influenced primarily by control structures (e.g., instream weirs and turn-out gates), dewatering practices, and dispersal.

Fish enter the MRGCD irrigation system by direct transport of pelagic eggs, drifting larvae, or free-swimming individuals at diversion dam heads or at control structures (i.e., instream weirs or turn-out gates). Quantification of this allochthonous input was beyond the scope of this study. Once in the irrigation system, movement of canal-inhabiting fishes was influenced primarily by instream control structures, dewatering practices, and water dispersal. The Belen Division Rio Grande silvery minnow population was likely the result of in situ development of pelagic eggs (Platania and Altenbach, unpub. data) or larval fish transport into the irrigation system at IDD.

Comparisons between regional canal systems is complicated, not only by the paucity of historic records, but also by differences in physical and structural attributes of distinct irrigation systems. Notwithstanding, this study documented a diverse assemblage of native and introduced

fishes in the MRGCD relative to other studies of the western United States (Marsh and Minckley 1982, Minckley et al. 1983, Platania 1990). The diversity of the MRGCD ichthyofauna may represent repeated reintroductions from mainstem impoundments and sport fishing sources rather than continuous occupation. The MRGCD irrigation system provides, at best, temporary and ephemeral refuge for native fishes. As such, these irrigation systems cannot be viewed as a source of fish to repopulate desiccated reaches of the Río Grande.

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## APPENDIX I

### SUMMARY OF 1993 FISH COLLECTIONS IN MRGCD IRRIGATION CANAL SYSTEM AND THE LOW FLOW CONVEYANCE CANAL (Site numbers correspond to Figures 2-4)

## Site 1

NM: Sandoval Co., Cochiti East Side Main Canal just downstream of the Santa Fe River, Cochiti Pueblo  
 3 August 1993 BKL93-757  
 B.K. Lang, S.P. Platania, and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Catostomus commersoni</u>	9	41-49	14766

## Site 2

NM: Sandoval Co., Peña Blanca Riverside Drain ca. 0.5 miles downstream of the Santa Fe River, Cochiti Pueblo  
 3 August 1993 BKL93-756  
 B.K. Lang, S.P. Platania, and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
NO FISH			

## Site 3

NM: Sandoval Co., Island Lateral return to the Río Grande, Cochiti Pueblo  
 3 August 1993 BKL93-754  
 B.K. Lang, S.P. Platania, and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Pimephales promelas</u>	9	14-57	14761
<u>Catostomus commersoni</u>	236	18-71	14762
<u>Gambusia affinis</u>	4	20-28	14763
<u>Micropterus salmoides</u>	3	44-45	14764

**Site 4**

NM: Sandoval Co., Sili Main Canal at the State Route 22 crossing, Cochiti Pueblo  
 3 August 1993 BKL93-755  
 B.K. Lang, S.P. Platania, and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Catostomus commersoni</u>	18	19-64	14765

**Site 5**

NM: Sandoval Co., Atrisco Feeder Canal just south (downstream) of State Route 44 bridge, Bernalillo  
 27 July 1993 BKL93-737  
 B.K. Lang, C.S. Altenbach, and B.J. Hudenko

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	9	36-52	14747
<u>Pimephales promelas</u>	1	55	14748
<u>Rhinichthys cataractae</u>	2	67,87	14749
<u>Catostomus commersoni</u>	3	42-46	14750
<u>Micropterus salmoides</u>	1	101	14751

**Site 6**

NM: Sandoval Co., Albuquerque Main Canal ca. 0.2 miles downstream of State Route 44 at head of the Sandia Acequia, Bernalillo  
 27 July 1993 BKL93-736  
 B.K. Lang, C.S. Altenbach, and B.J. Hudenko

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	1	32	14744
<u>Pimephales promelas</u>	3	49-53	14745
<u>Catostomus commersoni</u>	68	21-53	14746

## Site 7

NM: Sandoval Co., Upper Corrales Riverside Drain, ca. 0.3 km east of the head of the Corrales Acequia, Corrales  
 12 July 1993 BKL93-687  
 B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Rhinichthys cataractae</u>	8	48-64	14408
<u>Salmo trutta</u>	10	53-79	14410
<u>Gambusia affinis</u>	4	22-33	14409
<u>Lepomis cyanellus</u>	1	58	14411

## Site 8

NM: Bernalillo Co., Corrales Riverside Drain return to the Río Grande, Corrales  
 12 July 1993 BKL93-688  
 B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	1	36	14412
<u>Cyprinus carpio</u>	76	22-64	14413
<u>Pimephales promelas</u>	6	37-50	14414
<u>Catostomus commersoni</u>	335	21-127	14415
<u>Gambusia affinis</u>	4	33-42	14416

## Site 9

NM: Bernalillo Co., Lower Corrales Riverside Drain, ca. 1.3 miles downstream of Paseo del Norte bridge at the return inflow of the Summerford Lateral, Albuquerque  
 12 July 1993 BKL93-690  
 B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Catostomus commersoni</u>	4	42-131	14428
<u>Gambusia affinis</u>	2	30,38	14429

## Site 10

NM: Bernalillo Co., Corrales Main Canal return to Río Grande, ca. 2.0 miles downstream of Paseo del Norte bridge, Albuquerque

12 July 1993

BKL93-689

B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Dorosoma cepedianum</u>	1	19	14417
<u>Cyprinella lutrensis</u>	32	14-57	14418
<u>Cyprinus carpio</u>	19	19-59	14419
<u>Pimephales promelas</u>	121	14-57	14420
<u>Carpoides carpio</u>	1	55	14421
<u>Catostomus commersoni</u>	48	19-118	14422
<u>Ameiurus melas</u>	74	23-205	14423
<u>Gambusia affinis</u>	68	8-49	14427
<u>Lepomis macrochirus</u>	14	18-50	14424
<u>Micropterus salmoides</u>	1	116	14425
<u>Pomoxis annularis</u>	336	17-102	14426

## Site 11

NM: Bernalillo Co., Atrisco Feeder Canal at dead end of Campbell Avenue, Albuquerque

15 July 1993

BKL93-703

B.K. Lang, C.S. Altenbach, and B.J. Hudenko

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Pimephales promelas</u>	5	49-53	14517
<u>Rhinichthys cataractae</u>	1	52	14518
<u>Catostomus commersoni</u>	104	18-37	14519

## Site 12

NM: Bernalillo Co., Atrisco Feeder Canal return to the Río Grande, 0.3 miles upstream of Central Avenue Bridge, Albuquerque

15 July 1993

BKL93-702

B.K. Lang, C.S. Altenbach, and B.J. Hudenko

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	51	27-66	14495
<u>Cyprinus carpio</u>	19	31-71	14496
<u>Pimephales promelas</u>	66	22-57	14497
<u>Platygobio gracilis</u>	1	83	14498
<u>Rhinichthys cataractae</u>	10	28-76	14499
<u>Catostomus commersoni</u>	131	19-143	14500
<u>Ameiurus melas</u>	2	29,30	14501
<u>Gambusia affinis</u>	6	20-29	14502
<u>Perca flavescens</u>	1	32	14503

## Site 13

NM: Bernalillo Co., Atrisco Riverside Drain just downstream of Bridge Avenue, Albuquerque

15 July 1993

BKL93-704

B.K. Lang, C.S. Altenbach, and B.J. Hudenko

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Campostoma anomalum</u>	2	63,63	14504
<u>Gila pandora</u>	8	46-95	14505
<u>Pimephales promelas</u>	1	42	14506
<u>Rhinichthys cataractae</u>	16	47-73	14507
<u>Catostomus commersoni</u>	20	29-158	14508
<u>Gambusia affinis</u>	15	22-39	14509

## Site 14

NM: Bernalillo Co., Atrisco Riverside Drain at the return of the Newborn Lateral, ca. 0.3 km downstream of Río Bravo Blvd., Albuquerque

15 July 1993

BKL93-706

B.K. Lang, C.S. Altenbach, and B.J. Hudenko

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Campostoma anomalum</u>	1	57	14520
<u>Gila pandora</u>	3	53-98	14522
<u>Pimephales promelas</u>	1	45	14521
<u>Rhinichthys cataractae</u>	95	6-73	14523
<u>Catostomus commersoni</u>	62	18-168	14524
<u>Gambusia affinis</u>	3	22-28	14525

## Site 15

NM: Bernalillo Co., Albuquerque Barr Riverside Drain at the outflow under the South Diversion Channel, Albuquerque

15 July 1993

BKL93-705

B.K. Lang, C.S. Altenbach, and B.J. Hudenko

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	1	26	14510
<u>Gila pandora</u>	1	85	14511
<u>Pimephales promelas</u>	5	48-53	14512
<u>Rhinichthys cataractae</u>	12	29-77	14513
<u>Catostomus commersoni</u>	5	33-146	14514
<u>Gambusia affinis</u>	2	37,39	14515
<u>Pomoxis annularis</u>	3	101-170	14516

## Site 16

NM: Bernalillo Co., Albuquerque Barr Riverside Drain return to Río Grande, Isleta Pueblo  
 13 July 1993  
 B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinus carpio</u>	1	63	14474
<u>Hybognathus amarus</u>	1	77	14475
<u>Pimephales promelas</u>	6	23-29	14476
<u>Platygobio gracilis</u>	1	90	14477
<u>Rhinichthys cataractae</u>	1	77	14478
<u>Catostomus commersoni</u>	33	22-174	14479
<u>Ameiurus natalis</u>	2	71,148	14480
<u>Gambusia affinis</u>	15	21-41	14585
<u>Lepomis macrochirus</u>	1	58	14481
<u>Micropterus salmoides</u>	2	159,168	14482
<u>Pomoxis nigromaculatus</u>	1	146	14483
<u>Perca flavescens</u>	2	29,34	14484

## Site 17

NM: Bernalillo Co., Atrisco Riverside Drain return to Río Grande, Isleta Pueblo  
 13 July 1993  
 B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	4	41-55	14468
<u>Cyprinus carpio</u>	29	21-65	14469
<u>Pimephales promelas</u>	5	28-32	14470
<u>Rhinichthys cataractae</u>	2	25,65	14471
<u>Catostomus commersoni</u>	88	18-122	14472
<u>Gambusia affinis</u>	5	20-25	14473

**Site 18**

NM: Bernalillo Co., Cacique Acequia, ca. 0.3 miles downstream of Isleta Diversion Dam, Isleta Pueblo  
 28 July 1993 BKL93-742  
 B.K. Lang, C.S. Altenbach, and B.J. Hudenko

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	9	23-49	14752
<u>Cyprinus carpio</u>	4	61-79	14753
<u>Hybognathus amarus</u>	4	32-37	14754
<u>Pimephales promelas</u>	50	22-60	14755
<u>Rhinichthys cataractae</u>	1	64	14756
<u>Carpioles carpio</u>	4	66-78	14757
<u>Catostomus commersoni</u>	9	25-133	14758
<u>Ictalurus punctatus</u>	1	25	14759
<u>Gambusia affinis</u>	17	22-40	14760

**Site 19**

NM: Bernalillo Co., Isleta Drain where the Belen High Line Crosses the Isleta Drain, Isleta Pueblo  
 13 July 1993 BKL93-695  
 B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	217	33-59	14458
<u>Cyprinus carpio</u>	2	48,51	14459
<u>Pimephales promelas</u>	14	38-53	14460
<u>Platygobio gracilis</u>	7	76-87	14461
<u>Rhinichthys cataractae</u>	2	55,77	14462
<u>Carpioles carpio</u>	2	108,121	14463
<u>Catostomus commersoni</u>	2	34,105	14464
<u>Gambusia affinis</u>	5	21-39	14465
<u>Lepomis cyanellus</u>	1	34	14466
<u>Micropterus salmoides</u>	4	43-78	14467

## Site 20

NM: Bernalillo Co., Isleta Drain return to the Río Grande, Isleta Pueblo  
 13 July 1993 BKL93-694  
 B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	109	28-61	14445
<u>Cyprinus carpio</u>	30	28-77	14446
<u>Pimephales promelas</u>	5	46-56	14447
<u>Platygobio gracilis</u>	3	63-74	14448
<u>Rhinichthys cataractae</u>	1	50	14449
<u>Carpoides carpio</u>	4	85-111	14450
<u>Catostomus commersoni</u>	9	48-111	14451
<u>Ameiurus natalis</u>	2	103,132	14452
<u>Gambusia affinis</u>	5	32-47	14457
<u>Lepomis macrochirus</u>	2	52,57	14456
<u>Micropterus salmoides</u>	5	39-81	14453
<u>Pomoxis annularis</u>	3	164-170	14454
<u>Pomoxis nigromaculatus</u>	1	172	14455

## Site 21

NM: Valencia Co., Upper Peralta Drain at the southern boundary of Isleta Pueblo  
 19 July 1993 BKL93-709  
 B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Pimephales promelas</u>	12	16-23	14536
<u>Catostomus commersoni</u>	4	23-147	14537
<u>Gambusia affinis</u>	3	17-35	14538

## Site 22

NM: Valencia Co., Waste Way No. 2 canal at the head of the Los Lunas Lateral, ca. 100-200 m west of the Río Grande, Isleta Pueblo

13 July 1993

BKL93-693

B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	2	33,41	14436
<u>Cyprinus carpio</u>	6	52-91	14437
<u>Pimephales promelas</u>	8	42-58	14438
<u>Platygobio gracilis</u>	1	93	14439
<u>Carpoides carpio</u>	1	107	14440
<u>Catostomus commersoni</u>	3	110-114	14441
<u>Ameiurus melas</u>	1	100	14442
<u>Ictalurus punctatus</u>	5	74-107	14443
<u>Micropterus salmoides</u>	1	69	14444

## Site 23

NM: Valencia Co., Waste Way No. 2 return to Río Grande, Isleta Pueblo

13 July 1993

BKL93-692

B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	972	28-62	14430
<u>Pimephales promelas</u>	4	45-49	14431
<u>Platygobio gracilis</u>	11	68-113	14432
<u>Rhinichthys cataractae</u>	4	32-83	14433
<u>Carpoides carpio</u>	1	83	14434
<u>Catostomus commersoni</u>	2	42,107	14435

## Site 24

NM: Valencia Co., Peralta Main Canal downstream of South Bosque Loop Road crossing, Bosque Farms  
 22 July 1993 BKL93-734  
 B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	3	45-69	14739
<u>Cyprinus carpio</u>	2	48,67	14740
<u>Catostomus commersoni</u>	6	47-165	14741
<u>Ameiurus natalis</u>	2	109,123	14742
<u>Gambusia affinis</u>	6	25-43	14743

## Site 25

NM: Valencia Co., Valencia Drain, ca. 1.4 miles north of State Road 6, Belen  
 19 July 1993 BKL93-708  
 B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	1	49	14532
<u>Cyprinus carpio</u>	1	61	14533
<u>Pimephales promelas</u>	25	29-54	14534
<u>Catostomus commersoni</u>	5	33-54	14535

**Site 26**

NM: Valencia Co., Upper Peralta Drain at the diversion into the Lower Peralta Drain, Belen

19 July 1993

BKL93-707

B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinus carpio</u>	8	34-58	14526
<u>Pimephales promelas</u>	95	20-68	14527
<u>Rhinichthys cataractae</u>	1	114	14528
<u>Catostomus commersoni</u>	1	164	14529
<u>Ameiurus melas</u>	1	194	15430
<u>Gambusia affinis</u>	103	18-41	14531

**Site 27**

NM: Valencia Co., Peralta Main Canal just south of State Route 263, Belen

19 July 1993

BKL93-710

B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinus carpio</u>	1	94	14539
<u>Pimephales promelas</u>	9	22-36	14540
<u>Catostomus commersoni</u>	2	58,72	14541

**Site 28**

NM: Valencia Co., Upper Belen Riverside Drain ca. 2.0 miles downstream of State Route 6

22 July 1993

BKL93-733

B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	13	38-65	14733
<u>Rhinichthys cataractae</u>	2	35,94	14734
<u>Catostomus commersoni</u>	7	48-69	14735
<u>Ameiurus natalis</u>	1	163	14736
<u>Gambusia affinis</u>	3	21-39	14737
<u>Micropterus salmoides</u>	1	147	14738

**Site 29**

NM: Valencia Co., Lower Peralta Drain, ca. 1.4 mile north (upstream) of the Lower Peralta Drain turnout to the Río Grande

19 July 1993

BKL93-715

B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	1	29	14585
<u>Pimephales promelas</u>	7	37-50	14586
<u>Rhinichthys cataractae</u>	7	25-66	14587
<u>Catostomus commersoni</u>	27	22-140	14588
<u>Gambusia affinis</u>	13	21-43	14589

## Site 30

NM: Valencia Co., Tome Drain at the confluence with Hell Canyon Lateral, Tome  
 20 July 1993  
 B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	758	29-63	14590
<u>Cyprinus carpio</u>	6	52-89	14591
<u>Hybognathus amarus</u>	20	22-33	14592
<u>Pimephales promelas</u>	37	21-57	14593
<u>Carpiodes carpio</u>	1	82	14594
<u>Catostomus commersoni</u>	38	26-158	14595
<u>Ameiurus natalis</u>	1	123	14596
<u>Ictalurus punctatus</u>	5	20-103	14597
<u>Morone chrysops</u>	1	28	14598
<u>Pomoxis nigromaculatus</u>	1	18	14599

## Site 31

NM: Valencia Co., Lower Peralta Drain return to the Rfo Grande, ca. 1.5 miles north of Belen  
 19 July 1993  
 B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	508	32-67	14572
<u>Cyprinus carpio</u>	11	37-79	14573
<u>Hybognathus amarus</u>	6	30-37	14574
<u>Pimephales promelas</u>	8	20-55	14575
<u>Platygobio gracilis</u>	2	56,98	14576
<u>Rhinichthys cataractae</u>	1	28	14577
<u>Carpiodes carpio</u>	1	96	14578
<u>Catostomus commersoni</u>	3	25-43	14579
<u>Ameiurus natalis</u>	3	24-28	14580
<u>Ictalurus punctatus</u>	2	19,98	14581
<u>Gambusia affinis</u>	4	18-43	14582
<u>Morone chrysops</u>	1	109	14583
<u>Micropterus salmoides</u>	2	72,76	14584

## Site 32

NM: Valencia Co., Lower Peralta Drain at the confluence with Tome Drain, Tome  
 19 July 1993 BKL93-711  
 B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	214	25-63	14542
<u>Cyprinus carpio</u>	3	69-117	14543
<u>Hybognathus amarus</u>	61	20-32	14544
<u>Pimephales promelas</u>	37	23-59	14545
<u>Platygobio gracilis</u>	1	33	14546
<u>Carpoides carpio</u>	7	98-121	14547
<u>Catostomus commersoni</u>	7	18-47	14548
<u>Ictalurus punctatus</u>	3	18-20	14549
<u>Gambusia affinis</u>	6	21-45	14550
<u>Morone chrysops</u>	1	30	14553
<u>Micropterus salmoides</u>	1	198	14551
<u>Pomoxis annularis</u>	1	111	14552

## Site 33

NM: Valencia Co., Lower Belen Riverside Drain at the Sausal Drain inflow, ca. 1.2 miles upstream  
 (north) of State Route 6, Belen  
 22 July 1993 BKL93-732  
 B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	47	37-72	14722
<u>Hybognathus amarus</u>	9	23-30	14723
<u>Pimephales promelas</u>	120	18-58	14724
<u>Catostomus commersoni</u>	48	18-70	14725
<u>Ameiurus natalis</u>	7	26-31	14726
<u>Ictalurus punctatus</u>	2	16-19	14727
<u>Gambusia affinis</u>	41	22-44	14728
<u>Morone chrysops</u>	1	35	14729
<u>Lepomis cyanellus</u>	1	75	14730
<u>Lepomis macrochirus</u>	1	21	14731
<u>Pomoxis annularis</u>	1	24	14732

**Site 34**

NM: Valencia Co., Lower Peralta Drain return to Río Grande, Belen  
 19 July 1993 BKL93-712  
 B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	446	26-56	14554
<u>Cyprinus carpio</u>	1	54	14555
<u>Notemigonus crysoleucas</u>	1	42	14556
<u>Pimephales promelas</u>	1	58	14557
<u>Platygobio gracilis</u>	1	68	14558
<u>Carpoides carpio</u>	1	102	14559
<u>Catostomus commersoni</u>	3	28-37	14560
<u>Ameiurus natalis</u>	1	190	14561
<u>Ictalurus punctatus</u>	1	205	14562

**Site 35**

NM: Valencia Co., San Juan Feeder Canal, ca. 0.25 miles upstream (north) of State Route 309, Belen  
 19 July 1993 BKL93-713  
 B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	54	27-55	14563
<u>Cyprinus carpio</u>	8	20-82	14564
<u>Hybognathus amarus</u>	3	22-32	14565
<u>Pimephales promelas</u>	12	23-56	14566
<u>Carpoides carpio</u>	2	93,98	14567
<u>Catostomus commersoni</u>	2	38,52	14568
<u>Ameiurus natalis</u>	4	23-39	14569
<u>Ictalurus punctatus</u>	2	22-101	14570
<u>Gambusia affinis</u>	114	17-41	14571

**Site 36**

NM: Valencia Co., New Belen Waste Way return to Río Grande, ca. 0.3 miles downstream of the Atchison-Topeka and Santa Fe Railroad Bridge, Bacaville

22 July 1993

BKL93-731

B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	50	35-53	14710
<u>Cyprinus carpio</u>	2	45-100	14711
<u>Notemigonus crysoleucas</u>	1	81	14712
<u>Pimephales promelas</u>	5	26-52	14713
<u>Carpoides carpio</u>	2	100,106	14714
<u>Catostomus commersoni</u>	25	21-139	14715
<u>Ameiurus natalis</u>	5	31-37	14716
<u>Ictalurus punctatus</u>	5	21-27	14717
<u>Gambusia affinis</u>	24	19-44	14718
<u>Lepomis macrochirus</u>	6	38-86	14719
<u>Micropterus salmoides</u>	13	30-55	14720
<u>Pomoxis annularis</u>	1	105	14721

**Site 37**

NM: Valencia Co., San Juan Feeder Canal return to the Río Grande, Tome

20 July 1993

BKL93-717

B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	199	38-60	14600
<u>Cyprinus carpio</u>	1	71	14601
<u>Pimephales promelas</u>	1	55	14602
<u>Platygobio gracilis</u>	1	107	14603
<u>Carpoides carpio</u>	3	91-95	14604
<u>Catostomus commersoni</u>	2	100,140	14605
<u>Ameiurus natalis</u>	2	32,40	14608
<u>Gambusia affinis</u>	4	27-32	14606
<u>Pomoxis annularis</u>	1	167	14607

**Site 38**

NM: Valencia Co., Feeder No. 3 return to Río Grande, Bosque  
 22 July 1993 BKL93-730  
 B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	11	34-40	14698
<u>Cyprinus carpio</u>	13	70-102	14699
<u>Pimephales promelas</u>	8	25-55	14700
<u>Catostomus commersoni</u>	1	65	14701
<u>Ameiurus melas</u>	13	71-127	14702
<u>Gambusia affinis</u>	4	23-44	14703
<u>Lepomis macrochirus</u>	1	49	14704
<u>Micropterus salmoides</u>	1	189	14705
<u>Pomoxis nigromaculatus</u>	1	33	14706

**Site 39**

NM: Valencia Co., Upper San Juan Main Canal at the State Route 47 crossing, Tome  
 20 July 1993 BKL93-718  
 B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	109	32-65	14609
<u>Hybognathus amarus</u>	2	21,21	14610
<u>Pimephales promelas</u>	25	23-65	14611
<u>Platygobio gracilis</u>	3	19-31	14612
<u>Catostomus commersoni</u>	4	26-37	14613
<u>Ameiurus natalis</u>	1	30	14614
<u>Ictalurus punctatus</u>	5	22-26	14615
<u>Gambusia affinis</u>	18	22-45	14616

## Site 40

NM: Valencia Co., Upper San Juan Riverside Drain just south of State Route 309, Bosque  
 20 July 1993 BKL93-719  
 B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	1	50	14621
<u>Cyprinus carpio</u>	7	36-65	14617
<u>Pimephales promelas</u>	72	22-58	14618
<u>Catostomus commersoni</u>	4	45-48	14619
<u>Gambusia affinis</u>	9	18-40	14620

## Site 41

NM: Socorro Co., Upper San Juan Riverside Drain return to Río Grande  
 20 July 1993 BKL93-720  
 B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	135	19-57	14622
<u>Cyprinus carpio</u>	1	37	14623
<u>Pimephales promelas</u>	2	27,28	14624
<u>Carpioles carpio</u>	3	100-102	14625
<u>Catostomus commersoni</u>	1	50	14626
<u>Gambusia affinis</u>	65	21-46	14627
<u>Micropterus salmoides</u>	3	56-72	14628

**Site 42**

NM: Valencia Co., Upper Sabinal Riverside Drain at the confluence with the Luna Interior Drain, ca. 1.7 miles downstream (south) of State Route 346

22 July 1993

BKL93-729

B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	13	30-63	14687
<u>Cyprinus carpio</u>	3	57-87	14688
<u>Pimephales promelas</u>	2	20,29	14689
<u>Carpioles carpio</u>	8	78-91	14690
<u>Catostomus commersoni</u>	1	57	14691
<u>Ameiurus natalis</u>	2	78,150	14692
<u>Ictalurus punctatus</u>	6	83-111	14693
<u>Gambusia affinis</u>	6	18-39	14694
<u>Lepomis macrochirus</u>	1	67	14695
<u>Micropterus salmoides</u>	1	37	14696
<u>Pomoxis annularis</u>	1	93	14697

**Site 43**

NM: Valencia Co., Upper Sabinal Riverside Drain return to the Río Grande, ca. 2.9 miles downstream of State Route 346 bridge

22 July 1993

BKL93-728

B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	54	36-59	14681
<u>Pimephales promelas</u>	2	25,38	14682
<u>Rhinichthys cataractae</u>	2	32,34	14683
<u>Carpioles carpio</u>	1	91	14684
<u>Catostomus commersoni</u>	7	26-38	14685
<u>Ameiurus natalis</u>	2	21,43	14686

## Site 44

NM: Socorro Co., Lower San Juan Riverside Drain ca. 3.9 miles north (upstream) of State Route 60  
 20 July 1993 BKL93-721  
 B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Pimephales promelas</u>	3	24-25	14629
<u>Gambusia affinis</u>	2	26,41	14630

## Site 45

NM: Socorro Co., San Francisco Riverside Drain at the Bernardo Heading, Abeytas  
 21 July 1993 BKL93-727  
 B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	12	34-52	14668
<u>Cyprinus carpio</u>	7	49-94	14669
<u>Pimephales promelas</u>	9	19-50	14670
<u>Carpoides carpio</u>	1	128	14680
<u>Catostomus commersoni</u>	1	36	14671
<u>Ameiurus melas</u>	2	150-190	14672
<u>Ameiurus natalis</u>	3	157-162	14673
<u>Gambusia affinis</u>	22	21-40	14674
<u>Lepomis cyanellus</u>	1	61	14675
<u>Lepomis macrochirus</u>	10	47-66	14676
<u>Micropterus salmoides</u>	4	80-104	14677
<u>Pomoxis annularis</u>	1	21	14678
<u>Pomoxis nigromaculatus</u>	1	21	14679

**Site 46**

NM: Socorro Co., Lower San Juan Riverside Drain just south of State Route 60, Bernardo

20 July 1993

BKL93-722

B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	34	39-56	14631
<u>Cyprinus carpio</u>	3	37-81	14632
<u>Pimephales promelas</u>	103	22-58	14633
<u>Catostomus commersoni</u>	6	25-65	14634
<u>Ameiurus natalis</u>	2	115-129	14635
<u>Ictalurus punctatus</u>	9	67-189	14636
<u>Gambusia affinis</u>	18	19-45	14637
<u>Micropterus salmoides</u>	1	113	14638

**Site 47**

NM: Socorro Co., Lower San Juan Riverside Drain ca. 1.6 miles downstream (south) of State Route 60,

Contreras

21 July 1993

BKL93-723

B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	60	20-61	14639
<u>Cyprinus carpio</u>	7	32-59	14640
<u>Hybognathus amarus</u>	1	27	14642
<u>Pimephales promelas</u>	192	22-57	14641
<u>Carpioles carpio</u>	2	90,109	14643
<u>Catostomus commersoni</u>	10	23-58	14644
<u>Ameiurus melas</u>	8	29-39	14645
<u>Ameiurus natalis</u>	7	21-29	14646
<u>Gambusia affinis</u>	145	16-43	14647
<u>Micropterus salmoides</u>	9	48-122	14648

## Site 48

NM: Socorro Co., San Francisco Riverside Drain at the confluence with the Bernardo Drain, San Francisco  
 21 July 1993 BKL93-726  
 B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	14	36-57	14664
<u>Pimephales promelas</u>	7	26-33	14665
<u>Ictalurus punctatus</u>	7	74-102	14666
<u>Gambusia affinis</u>	9	19-37	14667

## Site 49

NM: Socorro Co., Lower San Juan Riverside Drain return to the Río Grande, Ranchitos de La Joya  
 21 July 1993 BKL93-724  
 B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	214	27-56	14649
<u>Cyprinus carpio</u>	5	42-60	14650
<u>Pimephales promelas</u>	53	25-38	14651
<u>Platygobio gracilis</u>	21	28-141	14652
<u>Rhinichthys cataractae</u>	34	31-82	14653
<u>Catostomus commersoni</u>	4	33-58	14654
<u>Ictalurus punctatus</u>	4	21-100	14655
<u>Gambusia affinis</u>	2	20,23	14656

**Site 50**

NM: Socorro Co., La Joya Riverside Drain, La Joya

21 July 1993

B.K. Lang and C.S. Altenbach

BKL93-725

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	27	31-51	14657
<u>Cyprinus carpio</u>	3	50-69	14658
<u>Pimephales promelas</u>	14	21-57	14659
<u>Carpoides carpio</u>	8	13-300	14660
<u>Catostomus commersoni</u>	5	46-73	14661
<u>Ictalurus punctatus</u>	2	65,66	14662
<u>Gambusia affinis</u>	9	19-38	14663

**Site 51**

NM: Socorro Co., Drain 7 extension, ca. 0.5 miles upstream of San Acacia Diversion Dam, San Acacia

14 July 1993

B.K. Lang, C.S. Altenbach, and B.J. Hudenko

BKL93-699

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	72	38-62	14486
<u>Cyprinus carpio</u>	2	38,40	14887
<u>Pimephales promelas</u>	80	18-52	14488
<u>Catostomus commersoni</u>	15	43-82	14489
<u>Ameiurus natalis</u>	5	128-182	14490
<u>Gambusia affinis</u>	45	21-38	14491
<u>Lepomis cyanellus</u>	1	19	14493
<u>Micropterus salmoides</u>	4	37-42	14492

## Site 52

NM: Socorro Co., Socorro Main Canal North at the turn-out for the Lemitar Lateral, Polvadera

5 August 1993

BKL93-765

B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	1	56	14767
<u>Cyprinus carpio</u>	3	56-105	14768
<u>Catostomus commersoni</u>	2	59,83	14769
<u>Ameiurus natalis</u>	1	50	14770
<u>Ictalurus punctatus</u>	72	23-51	14771
<u>Gambusia affinis</u>	1	30	14772

## Site 53

NM: Socorro Co., Socorro Main Canal Center at State Route 408, Escondida

5 August 1993

BKL93-766

B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	30	27-56	14773
<u>Cyprinus carpio</u>	1	98	14774
<u>Hybognathus amarus</u>	2	23,39	14775
<u>Pimephales promelas</u>	3	30-42	14776
<u>Platygobio gracilis</u>	1	46	14777
<u>Carpoides carpio</u>	4	70-106	14778
<u>Ameiurus natalis</u>	5	46-78	14779
<u>Ictalurus punctatus</u>	40	25-140	14780
<u>Gambusia affinis</u>	6	21-36	14781

**Site 54**

NM: Socorro Co., Escondida Drain, ca. 0.25 miles downstream of State Route 408, Pueblito

14 July 1993

BKL93-701

B.K. Lang, C.S. Altenbach, and B.J. Hudenko

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Gambusia affinis</u>	46	21-42	14494

**Site 55**

NM: Socorro Co., Socorro Main Canal Center, ca. 0.5 miles east of the State Route 149 junction with State Route 439, Socorro

5 August 1993

BKL93-767

B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	1	58	14782
<u>Cyprinus carpio</u>	2	68,110	14783
<u>Ameiurus natalis</u>	4	31-49	14784
<u>Ictalurus punctatus</u>	16	22-62	14785
<u>Gambusia affinis</u>	2	35,38	14786

**Site 56**

NM: Socorro Co., Socorro Main Canal South at the San Antonio Acequia turn-out (head), Luis Lopez

5 August 1993

BKL93-768

B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	4	34-39	14787
<u>Cyprinus carpio</u>	2	66,79	14789
<u>Pimephales promelas</u>	1	42	14788
<u>Ameiurus natalis</u>	5	34-60	14790
<u>Ictalurus punctatus</u>	33	23-150	14791

**Site 57**

NM: Socorro Co., Socorro Main Canal South just downstream of U.S. Hwy 380, San Antonio

5 August 1993

BKL93-769

B.K. Lang and C.S. Altenbach

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Ameiurus natalis</u>	4	24-58	14792
<u>Ictalurus punctatus</u>	74	21-48	14793
<u>Gambusia affinis</u>	1	23	14794

**Site 58**

NM: Socorro Co., Socorro Main Canal South at the northern boundary of Bosque del Apache National Wildlife Refuge

6 August 1993

BKL93-771

B.K. Lang and J.P. Larson

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	45	37-56	14799
<u>Pimephales promelas</u>	7	21-44	14800
<u>Platygobio gracilis</u>	1	39	14801
<u>Ameiurus natalis</u>	1	51	14802
<u>Ictalurus punctatus</u>	16	25-47	14803
<u>Gambusia affinis</u>	14	19-37	14804

**Site 59**

NM: Socorro Co., Socorro Main Canal South at the southern boundary of Bosque del Apache National Wildlife Refuge  
 6 August 1993  
 B.K. Lang and J.P. Larson

BKL93-770

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	1	41	14795
<u>Pimephales promelas</u>	4	29-35	14796
<u>Ictalurus punctatus</u>	20	26-101	14797
<u>Gambusia affinis</u>	3	25-28	14798

**Low Flow Conveyance Canal Sites (LFCC)****LFCC Site 1**

NM: Socorro Co., Low Flow Conveyance Canal at San Acacia Diversion Dam, San Acacia  
 17 August 1993  
 B.K. Lang and J.P. Larson

BKL93-772

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Pimephales promelas</u>	2	21,22	14805
<u>Gambusia affinis</u>	2	31,32	14806

**LFCC Site 2**

NM: Socorro Co., Low Flow Conveyance Canal ca. 5.0 miles downstream of San Acacia Diversion Dam, San Acacia  
 17 August 1993  
 B.K. Lang and J.P. Larson

BKL93-773

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	5	42-61	14807
<u>Pimephales promelas</u>	32	36-54	14808
<u>Rhinichthys cataractae</u>	11	39-85	14809
<u>Catostomus commersoni</u>	4	43-60	14810
<u>Gambusia affinis</u>	3	19-40	14811

## LFCC Site 3

NM: Socorro Co., Low Flow Conveyance Canal ca. 8.0 miles downstream of San Acacia Diversion Dam, San Acacia  
 17 August 1993 BKL93-774  
 B.K. Lang and J.P. Larson

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	13	24-50	14812
<u>Cyprinus carpio</u>	2	32,40	14813
<u>Pimephales promelas</u>	76	19-53	14814
<u>Catostomus commersoni</u>	4	32-42	14815
<u>Gambusia affinis</u>	32	17-47	14816

## LFCC Site 4

NM: Socorro Co., Low Flow Conveyance Canal ca. 14.0 miles downstream of San Acacia Diversion Dam, Socorro  
 17 August 1993 BKL93-775  
 B.K. Lang and J.P. Larson

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	4	31-52	14817
<u>Pimephales promelas</u>	2	46,50	14818
<u>Platygobio gracilis</u>	1	112	14819
<u>Rhinichthys cataractae</u>	1	60	14820
<u>Ictalurus punctatus</u>	14	29-144	14821
<u>Gambusia affinis</u>	1	24	14822

## LFCC Site 5

NM: Socorro Co., Low Flow Conveyance Canal ca. 19.0 miles downstream of San Acacia Diversion Dam

17 August 1993

BKL93-776

B.K. Lang and J.P. Larson

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	24	29-53	14823
<u>Cyprinus carpio</u>	2	65,83	14824
<u>Pimephales promelas</u>	12	24-62	14825
<u>Catostomus commersoni</u>	7	30-54	14826
<u>Ictalurus punctatus</u>	37	23-131	14827
<u>Gambusia affinis</u>	4	24-40	14828

## LFCC Site 6

NM: Socorro Co., Low Flow Conveyance Canal ca. 24.0 miles downstream of San Acacia Diversion Dam

18 August 1993

BKL93-777

B.K. Lang and J.P. Larson

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	13	29-44	14829
<u>Cyprinus carpio</u>	1	59	14830
<u>Pimephales promelas</u>	8	44-57	14831
<u>Rhinichthys cataractae</u>	3	26-81	14832
<u>Catostomus commersoni</u>	1	37	14835
<u>Ictalurus punctatus</u>	5	29-108	14833
<u>Gambusia affinis</u>	5	20-41	14834

## LFCC Site 7

NM: Socorro Co., Low Flow Conveyance Canal at U.S. Highway 380 Crossing, San Antonio

18 August 1993

BKL93-778

B.K. Lang and J.P. Larson

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	5	33-48	14836
<u>Pimephales promelas</u>	2	28,54	14837
<u>Rhinichthys cataractae</u>	1	33	14838
<u>Catostomus commersoni</u>	4	43-59	14839
<u>Gambusia affinis</u>	2	28,38	14840

## LFCC Site 8

NM: Socorro Co., Low Flow Conveyance Canal at the northern boundary of the Bosque del Apache National Wildlife Refuge

18 August 1993

BKL93-782

B.K. Lang and J.P. Larson

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	5	33-48	14853
<u>Ictalurus punctatus</u>	1	62	14854
<u>Lepomis cyanellus</u>	1	96	14855

## LFCC Site 9

NM: Socorro Co., Low Flow Conveyance Canal directly east of the Bosque del Apache National Wildlife Refuge Headquarters

18 August 1993

BKL93-781

B.K. Lang and J.P. Larson

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	6	33-57	14849
<u>Rhinichthys cataractae</u>	1	88	14850
<u>Ictalurus punctatus</u>	5	69-107	14851
<u>Gambusia affinis</u>	1	39	14852

## LFCC Site 10

NM: Socorro Co., Low Flow Conveyance Canal at the southern boundary of the Bosque del Apache National Wildlife Refuge

18 August 1993

BKL93-780

B.K. Lang and J.P. Larson

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	4	34-47	14845
<u>Hybognathus amarus</u>	4	40-42	14846
<u>Pimephales promelas</u>	1	41	14847
<u>Gambusia affinis</u>	16	22-40	14848

## LFCC Site 11

NM: Socorro Co., Low Flow Conveyance Canal ca. 2.4 miles downstream of the southern boundary of the Bosque del Apache National Wildlife Refuge

18 August 1993

BKL93-779

B.K. Lang and J.P. Larson

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Catostomus commersoni</u>	1	31	14841
<u>Ameiurus natalis</u>	1	30	14842
<u>Ictalurus punctatus</u>	4	27-51	14843
<u>Gambusia affinis</u>	10	17-39	14844

## LFCC Site 12

NM: Socorro Co., Low Flow Conveyance Canal directly west of the San Marcial Railroad Trestle, San Marcial

19 August 1993

BKL93-787

B.K. Lang and J.P. Larson

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Dorosoma cepedianum</u>	1	75	14879
<u>Cyprinella lutrensis</u>	5	32-44	14880
<u>Pimephales promelas</u>	1	33	14881
<u>Ictalurus punctatus</u>	3	32-83	14882
<u>Gambusia affinis</u>	2	18-30	14883

## LFCC Site 13

NM: Socorro Co., Low Flow Conveyance Canal ca. 4.3 miles upstream of the confluence with the Rio Grande, Elephant Butte State Park

19 August 1993

BKL93-786

B.K. Lang and J.P. Larson

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	34	22-41	14876
<u>Ictalurus punctatus</u>	3	42-81	14877
<u>Gambusia affinis</u>	3	22-31	14878

## LFCC Site 14

NM: Sierra Co., Low Flow Conveyance Canal ca. 3.0 miles upstream of the confluence with the Río Grande, Elephant Butte State Park

19 August 1993

BKL93-785

B.K. Lang and J.P. Larson

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Cyprinella lutrensis</u>	51	19-41	14871
<u>Catostomus commersoni</u>	1	46	14872
<u>Ictalurus punctatus</u>	6	20-133	14873
<u>Gambusia affinis</u>	7	19-35	14874
<u>Lepomis gulosus</u>	1	71	14875

## LFCC Site 15

NM: Sierra Co., Low Flow Conveyance Canal ca. 150 m upstream of the confluence with the Río Grande, Elephant Butte State Park

19 August 1993

BKL93-784

B.K. Lang and J.P. Larson

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB#</u>
<u>Dorosoma cepedianum</u>	354	37-96	14856
<u>Dorosoma petenense</u>	15	18-47	14857
<u>Cyprinella lutrensis</u>	1	22	14858
<u>Cyprinus carpio</u>	55	38-56	14859
<u>Hybognathus amarus</u>	1	28	14860
<u>Pimephales promelas</u>	3	28-33	14861
<u>Carpoides carpio</u>	1	98	14862
<u>Ictiobus bubalus</u>	1	51	14863
<u>Ameiurus melas</u>	237	23-37	14864
<u>Ameiurus natalis</u>	3	38-60	14865
<u>Gambusia affinis</u>	323	15-51	14870
<u>Lepomis cyanellus</u>	1	21	14866
<u>Lepomis gulosus</u>	1	108	14867
<u>Lepomis macrochirus</u>	1	20	14868
<u>Micropterus salmoides</u>	1	44	14869

**Appendix II.** Scientific and common names of fish collected from the Middle Rio Grande Conservancy District irrigation system survey, July-August 1993.

<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>
Order Clupeiformes	
Family Clupeidae	
<u>Dorosoma cepedianum</u>	herrings
<u>Dorosoma petenense</u>	gizzard shad threadfin shad
Order Cypriniformes	
Family Cyprinidae	
<u>Campostoma anomalum</u>	carps and minnows
<u>Cyprinella lutrensis</u>	central stoneroller
<u>Cyprinus carpio</u>	red shiner
<u>Gila pandora</u>	common carp
<u>Hybognathus amarus</u>	Rio Grande chub
<u>Notemigonus crysoleucas</u>	Rio Grande silvery minnow
<u>Pimephales promelas</u>	golden shiner
<u>Platygobio gracilis</u>	fathead minnow
<u>Rhinichthys cataractae</u>	flathead chub longnose dace
Family Catostomidae	suckers
<u>Carpioles carpio</u>	river carpsucker
<u>Catostomus commersoni</u>	white sucker
<u>Ictiobus bubalus</u>	smallmouth buffalo
Order Siluriformes	
Family Ictaluridae	
<u>Ameiurus melas</u>	bullhead catfishes
<u>Ameiurus natalis</u>	black bullhead
<u>Ictalurus punctatus</u>	yellow bullhead channel catfish
Order Salmoniformes	
Family Salmonidae	
<u>Salmo trutta</u>	trouts brown trout
Order Atheriniformes	
Family Poeciliidae	
<u>Gambusia affinis</u>	livebearers mosquitofish

## Appendix II. continued.

## Order Perciformes

Family Percichthyidae	temperate basses
<u>Morone chrysops</u>	white bass
Family Centrarchidae	sunfishes
<u>Lepomis cyanellus</u>	green sunfish
<u>Lepomis gulosus</u>	warmouth
<u>Lepomis macrochirus</u>	bluegill
<u>Micropterus salmoides</u>	largemouth bass
<u>Pomoxis annularis</u>	white crappie
<u>Pomoxis nigromaculatus</u>	black crappie
Family Percidae	perches
<u>Perca flavescens</u>	yellow perch

**Appendix III. Hydrologic order, flow regime, and habitat type of MRGCD irrigation system collecting localities (N=74) sampled July-August 1993.**

Site	MRGCD Name	Hydrologic Order	Flow Regime	Habitat Type
1	Cochiti East Side Main Canal	primary	ephemeral	non-riverine
2	Peña Blanca Riverside Drain	tertiary	perennial	non-riverine
3	Island Lateral (return)	tertiary	perennial	riverine
4	Sili Main Canal	primary	ephemeral	non-riverine
5	Atrisco Feeder Canal	tertiary	perennial	non-riverine
6	Albuquerque Main Canal	primary	ephemeral	non-riverine
7	Upper Corrales Riverside Drain	tertiary	perennial	non-riverine
8	Corrales Riverside Drain (return)	tertiary	perennial	riverine
9	Lower Corrales Riverside Drain	tertiary	perennial	non-riverine
10	Corrales Main Canal (return)	tertiary	perennial	non-riverine
11	Atrisco Feeder Canal	tertiary	perennial	riverine
12	Atrisco Feeder Canal (return)	tertiary	perennial	non-riverine
13	Atrisco Riverside Drain	tertiary	perennial	non-riverine
14	Atrisco Riverside Drain	tertiary	perennial	non-riverine
15	Albuquerque Barr Riverside Drain	tertiary	perennial	non-riverine
16	Albuquerque Barr Riverside Drain (return)	tertiary	perennial	riverine
17	Atrisco Riverside Drain (return)	tertiary	perennial	non-riverine
18	Cacique Acequia (main canal)	primary	ephemeral	non-riverine
19	Isleta Drain	tertiary	perennial	non-riverine
20	Isleta Drain (return)	tertiary	perennial	riverine
21	Upper Peralta Drain	tertiary	perennial	non-riverine
22	Waste Way No. 2	tertiary	perennial	non-riverine
23	Waste Way No. 2 (return)	tertiary	perennial	riverine
24	Peralta Main Canal	primary	ephemeral	non-riverine
25	Valencia Drain	secondary	ephemeral	non-riverine
26	Upper Peralta Drain	tertiary	perennial	non-riverine
27	Peralta Main Canal	primary	ephemeral	non-riverine
28	Upper Belen Riverside Drain	tertiary	perennial	non-riverine
29	Lower Peralta Drain	tertiary	perennial	non-riverine
30	Tome Drain	secondary	ephemeral	non-riverine
31	Lower Peralta Drain (return)	tertiary	perennial	riverine
32	Lower Peralta Main Canal	primary	ephemeral	non-riverine
33	Lower Belen Riverside Drain	tertiary	perennial	non-riverine
34	Lower Peralta Drain (return)	tertiary	perennial	riverine
35	San Juan Feeder Canal	tertiary	perennial	non-riverine
36	New Belen Waste Way (return)	tertiary	perennial	riverine
37	San Juan Feeder Canal (return)	tertiary	perennial	riverine

## Appendix III. (continued)

Site	MRGCD Name	Hydrologic Order	Flow Regime	Habitat Type
38	Feeder No. 3 (return)	tertiary	perennial	riverine
39	Upper San Juan Main Canal	primary	ephemeral	non-riverine
40	Upper San Juan Riverside Drain	tertiary	perennial	non-riverine
41	Upper San Juan Riverside Drain (return)	tertiary	perennial	riverine
42	Upper Sabinal Riverside Drain	tertiary	perennial	non-riverine
43	Upper Sabinal Riverside Drain (return)	tertiary	perennial	riverine
44	Lower San Juan Riverside Drain	tertiary	perennial	non-riverine
45	San Francisco Riverside Drain	tertiary	perennial	non-riverine
46	Lower San Juan Riverside Drain	tertiary	perennial	non-riverine
47	Lower San Juan Riverside Drain	tertiary	perennial	non-riverine
48	San francisco Riverside Drain	tertiary	perennial	non-riverine
49	Lower San Juan Riverside Drain (return)	tertiary	perennial	riverine
50	La Joya Riverside Drain	tertiary	perennial	non-riverine
51	Drain 7 Extension	tertiary	perennial	non-riverine
52	Socorro Main Canal North	primary	ephemeral	non-riverine
53	Socorro Main Canal Center	primary	ephemeral	non-riverine
54	Escondida Drain	primary	ephemeral	non-riverine
55	Socorro Main Canal Center	primary	ephemeral	non-riverine
56	Socorro Main Canal South	primary	ephemeral	non-riverine
57	Socorro Main Canal South	primary	ephemeral	non-riverine
58	Socorro Main Canal South	primary	ephemeral	non-riverine
59	Socorro Main Canal South	primary	ephemeral	non-riverine
CC 1	Low Flow Conveyance Canal	tertiary	perennial	non-riverine
CC 2	Low Flow Conveyance Canal	tertiary	perennial	non-riverine
CC 3	Low Flow Conveyance Canal	tertiary	perennial	non-riverine
CC 4	Low Flow Conveyance Canal	tertiary	perennial	non-riverine
CC 5	Low Flow Conveyance Canal	tertiary	perennial	non-riverine
CC 6	Low Flow Conveyance Canal	tertiary	perennial	non-riverine
CC 7	Low Flow Conveyance Canal	tertiary	perennial	non-riverine
CC 8	Low Flow Conveyance Canal	tertiary	perennial	non-riverine
CC 9	Low Flow Conveyance Canal	tertiary	perennial	non-riverine
CC 10	Low Flow Conveyance Canal	tertiary	perennial	non-riverine
CC 11	Low Flow Conveyance Canal	tertiary	perennial	non-riverine
CC 12	Low Flow Conveyance Canal	tertiary	perennial	non-riverine
CC 13	Low Flow Conveyance Canal	tertiary	perennial	non-riverine
CC 14	Low Flow Conveyance Canal	tertiary	perennial	non-riverine
CC 15	Low Flow Conveyance Canal	tertiary	perennial	non-riverine

**Appendix IV. Hydrologic ordering of the MRGCD irrigation system based on ephemeral (N=18 sites) and perennial (N=56 sites) irrigation channel flow regime.**

Site	MRGCD Name	Hydrologic Order	Flow Regime	Habitat Type
1	Cochiti East Side Main Canal	primary	ephemeral	non-riverine
4	Sili Main Canal	primary	ephemeral	non-riverine
6	Albuquerque Main Canal	primary	ephemeral	non-riverine
18	Cacique Acequia (main canal)	primary	ephemeral	non-riverine
24	Peralta Main Canal	primary	ephemeral	non-riverine
27	Peralta Main Canal	primary	ephemeral	non-riverine
32	Lower Peralta Main Canal	primary	ephemeral	non-riverine
39	Upper San Juan Main Canal	primary	ephemeral	non-riverine
52	Socorro Main Canal North	primary	ephemeral	non-riverine
53	Socorro Main Canal Center	primary	ephemeral	non-riverine
54	Escondida Drain	primary	ephemeral	non-riverine
55	Socorro Main Canal Center	primary	ephemeral	non-riverine
56	Socorro Main Canal South	primary	ephemeral	non-riverine
57	Socorro Main Canal South	primary	ephemeral	non-riverine
58	Socorro Main Canal South	primary	ephemeral	non-riverine
59	Socorro Main Canal South	primary	ephemeral	non-riverine
25	Valencia Drain	secondary	ephemeral	non-riverine
30	Tome Drain	secondary	ephemeral	non-riverine
2	Peña Blanca Riverside Drain	tertiary	perennial	non-riverine
3	Island Lateral (return)	tertiary	perennial	riverine
5	Atrisco Feeder Canal	tertiary	perennial	non-riverine
7	Upper Corrales Riverside Drain	tertiary	perennial	non-riverine
8	Corrales Riverside Drain (return)	tertiary	perennial	riverine
9	Lower Corrales Riverside Drain	tertiary	perennial	non-riverine
10	Corrales Main Canal (return)	tertiary	perennial	riverine
11	Atrisco Feeder Canal	tertiary	perennial	non-riverine
12	Atrisco Feeder Canal (return)	tertiary	perennial	riverine
13	Atrisco Riverside Drain	tertiary	perennial	non-riverine
14	Atrisco Riverside Drain	tertiary	perennial	non-riverine
15	Albuquerque Barr Riverside Drain	tertiary	perennial	non-riverine
16	Albuquerque Barr Riverside Drain (return)	tertiary	perennial	riverine
17	Atrisco Riverside Drain (return)	tertiary	perennial	riverine
19	Isleta Drain	tertiary	perennial	non-riverine
20	Isleta Drain (return)	tertiary	perennial	riverine
21	Upper Peralta Drain	tertiary	perennial	non-riverine
22	Waste Way No. 2	tertiary	perennial	non-riverine

## Appendix IV. (continued)

Site	MRGCD Name	Hydrologic Order	Flow Regime	Habitat Type
23	Waste Way No. 2 (return)	tertiary	perennial	riverine
26	Upper Peralta Drain	tertiary	perennial	non-riverine
28	Upper Belen Riverside Drain	tertiary	perennial	non-riverine
29	Lower Peralta Drain	tertiary	perennial	non-riverine
31	Lower Peralta Drain (return)	tertiary	perennial	riverine
33	Lower Belen Riverside Drain	tertiary	perennial	non-riverine
34	Lower Peralta Drain (return)	tertiary	perennial	riverine
35	San Juan Feeder Canal	tertiary	perennial	non-riverine
36	New Belen Waste Way (return)	tertiary	perennial	riverine
37	San Juan Feeder Canal (return)	tertiary	perennial	riverine
38	Feeder No. 3 (return)	tertiary	perennial	riverine
40	Upper San Juan Riverside Drain	tertiary	perennial	non-riverine
41	Upper San Juan Riverside Drain (return)	tertiary	perennial	riverine
42	Upper Sabinal Riverside Drain	tertiary	perennial	non-riverine
43	Upper Sabinal Riverside Drain (return)	tertiary	perennial	riverine
44	Lower San Juan Riverside Drain	tertiary	perennial	non-riverine
45	San Francisco Riverside Drain	tertiary	perennial	non-riverine
46	Lower San Juan Riverside Drain	tertiary	perennial	non-riverine
47	Lower San Juan Riverside Drain	tertiary	perennial	non-riverine
48	San francisco Riverside Drain	tertiary	perennial	non-riverine
49	Lower San Juan Riverside Drain (return)	tertiary	perennial	riverine
50	La Joya Riverside Drain	tertiary	perennial	non-riverine
51	Drain 7 Extension	tertiary	perennial	non-riverine
CC 1	Low Flow Conveyance Canal	tertiary	perennial	non-riverine
CC 2	Low Flow Conveyance Canal	tertiary	perennial	non-riverine
CC 3	Low Flow Conveyance Canal	tertiary	perennial	non-riverine
CC 4	Low Flow Conveyance Canal	tertiary	perennial	non-riverine
CC 5	Low Flow Conveyance Canal	tertiary	perennial	non-riverine
CC 6	Low Flow Conveyance Canal	tertiary	perennial	non-riverine
CC 7	Low Flow Conveyance Canal	tertiary	perennial	non-riverine
CC 8	Low Flow Conveyance Canal	tertiary	perennial	non-riverine
CC 9	Low Flow Conveyance Canal	tertiary	perennial	non-riverine
CC 10	Low Flow Conveyance Canal	tertiary	perennial	non-riverine
CC 11	Low Flow Conveyance Canal	tertiary	perennial	non-riverine
CC 12	Low Flow Conveyance Canal	tertiary	perennial	non-riverine
CC 13	Low Flow Conveyance Canal	tertiary	perennial	non-riverine
CC 14	Low Flow Conveyance Canal	tertiary	perennial	non-riverine
CC 15	Low Flow Conveyance Canal	tertiary	perennial	non-riverine

## APPENDIX V

### SUMMARY OF 1992 FISH COLLECTIONS IN THE MRGCD IRRIGATION SYSTEM

NM: Valencia Co., Cacique Acequia ca. 100 meters downstream of Isleta Diversion Dam,  
Isleta Pueblo.  
9 November 1992 BKL 575  
B.K.Lang, E.J. Scherff, and R.A. Abell

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB #</u>
<u>Cyprinus carpio</u>	(returned) 10		
<u>Pimephales promelas</u>	15		
<u>Rhinichthys cataractae</u>	2		
<u>Catostomus commersoni</u>	1		

NM: Valencia Co., Peralta Main Canal at Control Gates located 1.9 miles downstream of  
Isleta Diversion Dam, Isleta Pueblo.  
9 November 1992 BKL 576  
B.K.Lang, E.J. Scherff, and R.A. Abell

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB #</u>
<u>Cyprinella lutrensis</u>	2		
<u>Cyprinus carpio</u>	1		
<u>Pimephales promelas</u>	21		
<u>Platygobio gracilis</u>	1		
<u>Rhinichthys cataractae</u>	1		
<u>Gambusia affinis</u>	169		

NM: Valencia Co., Peralta Main Canal ca. 3.9 miles downstream of Isleta Diversion Dam  
(0.9 miles downstream of North Bosque Loop Road), Bosque.  
9 November 1992 BKL 577  
B.K. Lang, E.J. Scherff, and R.A. Abell

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB #</u>
<u>Cyprinella lutrensis</u>	2		
<u>Pimephales promelas</u>	2		
<u>Catostomus commersoni</u>	1		
<u>Gambusia affinis</u>	68		

NM: Valencia Co., Peralta Main Canal ca. 6.4 miles downstream of Isleta Diversion Dam, Valencia.  
 9 November 1992 BKL 578  
 B.K. Lang, E.J. Scherff, and R.A. Abell

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB #</u>
<u>Catostomus commersoni</u>	(2 returned) 3		
<u>Ictalurus punctatus</u>	3		
<u>Gambusia affinis</u>	17		

NM: Valencia Co., Peralta Main Canal ca. 3.7 miles downstream of State Highway 47 crossing, 1.0 miles north of Tome.  
 9 November 1992 BKL 579  
 B.K. Lang, E.J. Scherff, and R.A. Abell

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB #</u>
<u>Cyprinella lutrensis</u>	8		
<u>Pimephales promelas</u>	10		
<u>Rhinichthys cataractae</u>	1		
<u>Catostomus commersoni</u>	(1 returned) 6		
<u>Gambusia affinis</u>	2		

NM: Valencia Co., Lower Peralta Main Canal ca. 3.7 miles downstream of State Highway 47 crossing, 1.0 miles north of Tome  
 9 November 1992 BKL 580  
 B.K. Lang, E.J. Scherff, and R.A. Abell

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB #</u>
<u>Pimephales promelas</u>	12		
<u>Rhinichthys cataractae</u>	8		
<u>Carpio carpio</u>	(returned) 1		
<u>Catostomus commersoni</u>	(1 returned) 5		
<u>Oncorhynchus mykiss</u>	(returned) 1		
<u>Gambusia affinis</u>	1		

NM: Valencia Co., Peralta Main Canal ca. 6.5 miles downstream of State Route 47, Tome.  
 9 November 1992 BKL 581  
 B.K. Lang, E.J. Scherff, and R.A. Abell

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB #</u>
<u>Cyprinella lutrensis</u>	2		
<u>Pimephales promelas</u>	2		
<u>Carpio carpio</u>	2		
<u>Gambusia affinis</u>	4		

NM: Valencia Co., Lower Peralta Main Canal ca. 6.5 miles downstream of State Route 47,  
 Tome.  
 9 November 1992 BKL 582  
 B.K. Lang, E.J. Scherff, and R.A. Abell

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB #</u>
<u>Pimephales promelas</u>	7		
<u>Gambusia affinis</u>	5		

NM: Socorro Co., Drain 7 Extension ca. 100 meters upstream of San Acacia Diversion  
 Dam, San Acacia.  
 10 November 1992 BKL 583  
 B.K. Lang, E.J. Scherff, and R.A. Abell

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB #</u>
<u>Gambusia affinis</u>	2		

NM: Socorro Co., Drain 7 Extension, La Joya State Game Refuge.  
 10 November 1992 BKL 584  
 B.K. Lang, E.J. Scherff, and R.A. Abell

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB #</u>
<u>Cyprinella lutrensis</u>	2		
<u>Pimephales promelas</u>	2		
<u>Ameiurus natalis</u>	4		
<u>Gambusia affinis</u>	383		

NM: Socorro Co., Lower San Juan Riverside Drain immediately downstream of U.S. Highway 60 Bridge Crossing.  
 10 November 1992  
 B.K. Lang, E.J. Scherff, and R.A. Abell

BKL 585

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB #</u>
<u>Cyprinella lutrensis</u>	7		
<u>Cyprinus carpio</u>	(returned) 1		
<u>Pimephales promelas</u>	21		
<u>Gambusia affinis</u>	76		

NM: Socorro Co., Lower San Juan Riverside Drain, 3.0 miles upstream of U.S. Highway 60 Bridge Crossing, Las Nutrias.  
 10 November 1992  
 B.K. Lang, E.J. Scherff, and R.A. Abell

BKL 586

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB #</u>
<u>Cyprinus carpio</u>	(returned) 1		
<u>Platygobio gracilis</u>	1		
<u>Catostomus commersoni</u>	1		
<u>Ameiurus natalis</u>	2		
<u>Gambusia affinis</u>	1		
<u>Micropterus salmoides</u>	1		

NM: Socorro Co., Lower San Juan Riverside Drain at the San Juan Interior Drain, San Juan.  
 10 November 1992  
 B.K. Lang, E.J. Scherff, and R.A. Abell

BKL 587

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB #</u>
<u>Cyprinus carpio</u>	(returned) 4		
<u>Pimephales promelas</u>	5		
<u>Rhinichthys cataractae</u>	1		
<u>Catostomus commersoni</u>	(1 returned) 5		
<u>Ictalurus punctatus</u>	1		
<u>Gambusia affinis</u>	18		
<u>Micropterus salmoides</u>	1		
<u>Perca flavescens</u>	1		

NM: Valencia Co., Upper San Juan Riverside Canal ca. 10.6 miles downstream of the A.T.& S.F. Railroad Crossing at State Highway 304, Turn.  
 10 November 1992 BKL 588  
 B.K. Lang, E.J. Scherff, and R.A. Abell

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB #</u>
<u>Carpioles carpio</u>	1		
<u>Ictalurus punctatus</u>	(returned) 1		

NM: Socorro Co., Socorro Main Canal South ca. 100 meters downstream of U.S. Highway 380 crossing, San Antonio.  
 11 November 1992 BKL 589  
 B.K. Lang, E.J. Scherff, and R.A. Abell

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB #</u>
<u>Dorosoma cepedianum</u>	1		
<u>Cyprinus carpio</u>	(returned) 2		
<u>Gambusia affinis</u>	16		

NM: Socorro Co., Socorro Main Canal South ca. 6.3 miles upstream of U.S. Highway 380 Bridge, Luis Lopez.  
 11 November 1992 BKL 590  
 B.K. Lang, E.J. Scherff, and R.A. Abell

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB #</u>
<u>Cyprinella lutrensis</u>	9		
<u>Cyprinus carpio</u>	(12 returned) 15		
<u>Pimephales promelas</u>	6		
<u>Catostomus commersoni</u>	2		
<u>Ameiurus melas</u>	2		
<u>Gambusia affinis</u>	54		
<u>Lepomis macrochirus</u>	5		

NM: Socorro Co., Socorro Main Canal Center ca. 11.0 miles north of U.S. Highway 380 crossing, Socorro.  
 11 November 1992  
 B.K. Lang, E.J. Scherff, and R.A. Abell

BKL 591

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB #</u>
<u>Cyprinella lutrensis</u>	1		
<u>Platygobio gracilis</u>	1		
<u>Carpio</u>	(returned) 1		
<u>Gambusia affinis</u>	1		

NM: Socorro Co., Socorro Main Canal North at State Highway 408 crossing, Pueblito.  
 11 November 1992  
 B.K. Lang, E.J. Scherff, and R.A. Abell

BKL 592

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB #</u>
<u>Cyprinella lutrensis</u>	42		
<u>Cyprinus carpio</u>	(returned) 1		
<u>Platygobio gracilis</u>	2		
<u>Ictalurus punctatus</u>	2		
<u>Gambusia affinis</u>	1		

NM: Socorro Co., Polvadera Drain ca. 5.0 miles upstream of State Highway 408 Bridge.  
 11 November 1992  
 B.K. Lang, E.J. Scherff, and R.A. Abell

BKL 593

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB #</u>
<u>Cyprinella lutrensis</u>	33		
<u>Cyprinus carpio</u>	(returned) 4		
<u>Platygobio gracilis</u>	2		
<u>Carpio</u>	1		
<u>Catostomus commersoni</u>	1		
<u>Ictalurus punctatus</u>	(1 returned) 6		

NM: Socorro Co., Polvadera Drain, 1.0 miles downstream of San Acacia Diversion Dam,  
San Acacia.  
11 November 1992 BKL 594  
B.K. Lang, E.J. Scherff, and R.A. Abell

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB #</u>
<u>Cyprinella lutrensis</u>	483		
<u>Cyprinus carpio</u>	(returned) 10		
<u>Pimephales promelas</u>	4		
<u>Ameiurus natalis</u>	1		
<u>Gambusia affinis</u>	59		

NM: Sandoval Co., Albuquerque Main Canal ca. 300 meters downstream of Angostura  
Diversion Dam, Algodones.  
13 November 1992 BKL 595  
B.K. Lang and E.J. Scherff

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB #</u>
<u>Cyprinella lutrensis</u>	1		
<u>Gila pandora</u>	19		
<u>Pimephales promelas</u>	8		
<u>Platygobio gracilis</u>	7		
<u>Rhinichthys cataractae</u>	2		
<u>Catostomus commersoni</u>	5		
<u>Gambusia affinis</u>	76		

NM: Sandoval Co., Albuquerque Main Canal at El Valle Serrano Crossing, Bernalillo.  
13 November 1992 BKL 596  
B.K. Lang and E.J. Scherff

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB #</u>
<u>Cyprinus carpio</u>	(returned) 1		
<u>Rhinichthys cataractae</u>	1		
<u>Catostomus commersoni</u>	35		

NM: Sandoval Co., Corrales Main Canal at Head, located ca. 300 meters west of the Rio Grande, Corrales.  
 13 November 1992  
 B.K. Lang and E.J. Scherff

BKL 597

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB #</u>
<u>Pimephales promelas</u>	1		
<u>Rhinichthys cataractae</u>	27		
<u>Catostomus commersoni</u>	13		
<u>Ictalurus punctatus</u>	8		

NM: Bernalillo Co., Lower Corrales Main Canal ca. 300 meters east of the intersection of State Route 448 with Cabezon Road, Corrales/Rio Rancho.  
 13 November 1992  
 B.K. Lang and E.J. Scherff

BKL 598

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB #</u>
<u>Cyprinella lutrensis</u>	821		
<u>Pimephales promelas</u>	65		
<u>Platygobio gracilis</u>	1		
<u>Rhinichthys cataractae</u>	7		
<u>Carpio</u>	1		

NM: Bernalillo Co., Albuquerque Main Canal at the south berm of the North Diversion Canal, Albuquerque.  
 13 November 1992  
 B.K. Lang and E.J. Scherff

BKL 599

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB #</u>
<u>Cyprinella lutrensis</u>	5		
<u>Cyprinus carpio</u>	(returned) 1		
<u>Pimephales promelas</u>	18		
<u>Platygobio gracilis</u>	14		
<u>Rhinichthys cataractae</u>	8		
<u>Carpio</u>	(returned) 1		
<u>Catostomus commersoni</u>	(45 returned) 69		
<u>Ameiurus melas</u>	1		
<u>Ictalurus punctatus</u>	22		
<u>Gambusia affinis</u>	1		

NM: Bernalillo Co., Albuquerque Main Canal ca. 50 meters south of U.S. Highway 423  
 (Paseo del Norte), Albuquerque.  
 13 November 1992 BKL 600  
 B.K. Lang and E.J. Scherff

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB #</u>
<u>Pimephales promelas</u>	25		
<u>Platygobio gracilis</u>	3		
<u>Rhinichthys cataractae</u>	1		
<u>Catostomus commersoni</u>	11		
<u>Ictalurus punctatus</u>	1		
<u>Gambusia affinis</u>	2		
<u>Lepomis cyanellus</u>	1		
<u>Micropterus salmoides</u>	1		

NM: Bernalillo Co., Overlap Drain ca. 1.5 miles upstream of U.S. Highway 40 Bridge,  
 Albuquerque.  
 13 November 1992 BKL 601  
 B.K. Lang and E.J. Scherff

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB #</u>
<u>Pimephales promelas</u>	4		

NM: Bernalillo Co., Overlap Drain ca. 1.0 miles downstream of Central Avenue Bridge,  
 Albuquerque.  
 13 November 1992 BKL 602  
 B.K. Lang and E.J. Scherff

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB #</u>
<u>Gila pandora</u>	1		
<u>Pimephales promelas</u>	12		
<u>Rhinichthys cataractae</u>	2		
<u>Catostomus commersoni</u>	1		
<u>Ameiurus natalis</u>	2		
<u>Gambusia affinis</u>	14		

NM: Bernalillo Co., Albuquerque Barr Riverside Drain ca. 50 meters south of the Rio  
Bravo (State Highway 500) Bridge (east riverbank), Albuquerque.  
13 November 1992 BKL 603  
B.K. Lang and E.J. Scherff

<u>Species</u>	<u># of specimens</u>	<u>Length</u>	<u>MSB #</u>
<u>Rhinichthys cataractae</u>	4		
<u>Catostomus commersoni</u>	(5 returned) 6		
<u>Oncorhynchus mykiss</u>	(returned) 3		
<u>Gambusia affinis</u>	1		
<u>Micropterus salmoides</u>	1		

