

FISH COLLECTIONS FROM THE LOWER RIO JEMEZ

U.S. FISH AND WILDLIFE SERVICE
NEW MEXICO FISHERY RESOURCES OFFICE
2105 OSUNA NE
ALBUQUERQUE, NM 87113

Prepared by:

Christopher W. Hoagstrom

December 6, 2000

Submitted to:

Pueblo of Santa Ana

INTRODUCTION

Since July 1998, the U.S. Fish and Wildlife Service, New Mexico Fishery Resources Office (NMFRO) has collected fishes from the Rio Jemez downstream of Jemez Canyon Dam (lower Rio Jemez) on four different occasions. These collections included both backpack electrofisher and seine capture techniques. Collections made prior to November 2000 have been previously discussed by Wiley (1999) and Hoagstrom (2000). This memorandum summarizes all NMFRO Rio Jemez collections and reports results of collections between 20 November and 1 December 2000.

ELECTROFISHING

SUMMARY OF ALL COLLECTIONS

The most consistent and extensive mode of fish collection from Rio Jemez was backpack electrofishing. A Smith-Root Type VII backpack electrofisher was used in 1998 and a Type XII backpack electrofisher was used for subsequent collections. In 1998, a single backpack was used while in 2000, two electrofishers were utilized simultaneously (one on each river bank). Collections were made by progressing upstream. Fishes were netted as they were electrocuted. In 1998, the "shock and block" technique was also used where fish were electrofished from an area of swift water, while a seine was set downstream. Electrocuted fishes which drifted into the block seine were collected. Fish sampling during 1998 was conducted at four specific locations throughout the lower Rio Jemez. Sampling in 2000 included the entire length of the lower Rio Jemez (4.5 km [2.8 mi]).

Twenty species of fish have been collected from the Rio Jemez since 1998 (Table 1; Figure 1 [scientific names are provided in Table 1]). Ten of these species each represented more than one percent of the total catch. Rio Grande silvery minnow were the tenth most abundant species in the lower Rio Jemez, representing 1.2% of all fish collected.

Five fish species (common carp, red shiner, fathead minnow, white sucker, and western mosquitofish) were numerically dominant within electrofishing collections, comprising 75.3% of the catch. Of these, red shiner and fathead minnow were most abundant. All five species were also common in the mainstem Rio Grande (NMFRO data).

Table 1. Summary of fishes collected from Rio Jemez by backpack electrofishing between 28 July 1998 and 21 November 2000.

Abbreviations correspond with those utilized in Figure 1. Number = total individuals collected. Percent = percent of each species within all individuals collected. Rank = species abundance compared to all other species collected. Individuals (Ind.) per minute = total catch-per-unit-effort for each species. Not all collectors identified bullhead (genus *Ameiurus*) to species so these were grouped.

Common Name	Scientific Name	Abbreviation	Number	Percent	Rank	Ind. per Minute
common carp	<i>Cyprinus carpio</i>	cypcar	324	7.4	4	0.30
red shiner	<i>Cyprinella lutrensis</i>	cyplut	442	20.6	1	0.41
Rio Grande silvery minnow	<i>Hybognathus amarus</i>	hybama	26	1.2	10	0.02
fathead minnow	<i>Pimephales promelas</i>	pimpro	385	18.0	2	0.36
flathead chub	<i>Platygobio gracilis gulonella</i>	plagra	49	2.3	9	0.05
longnose dace	<i>Rhinichthys cataractae</i>	rhicat	118	5.5	6	0.11
river carpsucker	<i>Carpionodes carpio elongatus</i>	carcar	8	0.4	12 [^]	0.01
white sucker	<i>Catostomus commersoni</i>	catcom	376	17.6	3	0.35
smallmouth buffalo	<i>Ictiobus bubalus</i>	ictbub	1	0.0	17 [*]	0.00
bullhead	<i>Ameiurus melas</i> & <i>A. natalis</i>	ame...	77	3.6	7	0.07
channel catfish	<i>Ictalurus punctatus</i>	ictpun	10	0.5	11	0.01
brown trout	<i>Salmo trutta</i>	saltru	8	0.4	12 [^]	0.01
western mosquitofish	<i>Gambusia affinis</i>	gamaff	250	11.7	5	0.23
green sunfish	<i>Lepomis cyanellus</i>	lepcya	6	0.3	14	0.01
bluegill	<i>Lepomis macrochirus</i>	lepmac	1	0.0	17 [*]	0.00
spotted bass	<i>Micropterus punctulatus</i>	micpun	1	0.0	17 [*]	0.00
largemouth bass	<i>Micropterus salmoides</i>	micsal	3	0.1	16	0.00
white crappie	<i>Pomoxis annularis</i>	pomann	53	2.5	8	0.05
walleye	<i>Stizostedion vitreum</i>	stivit	4	0.2	15	0.00

[^]two species were tied at 12 (eight individuals each)

^{*}three species were tied at 17 (one individual each)

NOVEMBER 2000 COLLECTIONS

Sixteen fish species were collected by electrofishing in November 2000 (Table 2; Figure 2). Three of these (brown trout, bluegill, walleye) were collected from the lower Rio Jemez for the first time. River carpsucker, smallmouth buffalo, spotted bass, largemouth bass were present in earlier collections, but were absent in November 2000. Seven fish species each represented more than one percent of the November 2000 electrofishing catch. Rio Grande silvery minnow remained the tenth most abundant species but comprised only 0.4% of the sample.

The five numerically dominant fishes (common carp, red shiner, fathead minnow, white sucker, and western mosquitofish) comprised 88.9% of the November 2000 catch. Red shiner and fathead minnow remained most abundant. Red shiner, western mosquitofish, and white crappie were more abundant in November 2000 collections than in those previous (Table 2). In contrast, Common carp, Rio Grande silvery minnow, longnose dace, and white sucker were more abundant in previous collections than in November 2000 (Table 2).

Table 2. Summary of fishes collected from Rio Jemez by backpack electrofishing between 20 and 21 November 2000. Abbreviations correspond with those utilized in Figure 2. Number = total individuals collected. Percent = percent of each species within all individuals collected. Rank = species abundance compared to all other species collected. Individuals (Ind.) per minute = total catch-per-unit-effort

for each species. Percent of Total = the percent of the all individuals collected from the Rio Jemez (Table 1) represented by the November 2000 sample.

Common Name	Abbreviation	Number	Percent	Rank	Ind. per Minute	Percent of Total
common carp	cypcar	85	7.4	5	0.14	26.2
red shiner	cyplut	353	30.6	1	0.57	79.9
Rio Grande silvery minnow	hybama	5	0.4	10	0.01	19.2
fathead minnow	pimpro	237	20.5	2	0.38	61.6
flathead chub	plagra	31	2.7	7	0.05	63.3
longnose dace	rhicat	4	0.3	11	0.01	3.4
river carpsucker	carcar	0	0.0	17^	0.00	0.0
white sucker	catcom	124	10.7	4	0.20	33.0
smallmouth buffalo	ictbub	0	0.0	17^	0.00	0.0
black bullhead	amemel	1	0.1	14*	0.00	?
yellow bullhead	amenat	18	1.6	8	0.03	?
channel catfish	ictpun	1	0.1	14*	0.00	10.0
brown trout	saltru	8	0.7	9	0.01	100.0
western mosquitofish	gamaff	228	19.7	3	0.37	91.2
green sunfish	lepcya	4	0.3	11	0.01	66.7
bluegill	lepmac	1	0.0	14*	0.00	100.0
spotted bass	micpun	0	0.0	17^	0.00	0.0
largemouth bass	micsal	0	0.0	17^	0.00	0.0
white crappie	pomann	51	4.4	6	0.08	96.2
walleye	stivit	4	0.3	13	0.01	100.0

^four species were tied at 17 (zero individuals each)

*three species were tied at 14 (one individual each)

SEINING

Seine collections were made in July 1998 and December 2000. They were not as extensive as electrofishing collections. Much of the lower Rio Jemez is not conducive to seine collections since the rocky substrate provides refugial areas in which fishes can avoid seine capture. Rocky substrate also disrupts the connection between the lead-line and the substrate, allowing fishes to escape underneath. However, downstream of the canyon mouth, the Rio Jemez is ideal for seining. This remains the case all the way to the Rio Grande confluence.

In 1998 a 3 m by 1 m by 3 mm mesh seine with a single lead line was used while in 2000, a 6 m by 2 m by 3 mm mesh seine with single lead was used. Collections were made in a downstream direction. Seine hauls were each conducted within specific habitat types. In 1998, collections were made at four locations, distributed throughout the length of the lower Rio Jemez. At each location, all habitats present were seined. In 2000, seine hauls were made at two locations (the Rio Jemez-Rio Grande confluence area [including the mainstem Rio Grande] and immediately downstream from the Jemez Canyon Mouth). Sample reaches were greater in 2000 than in 1998 and more seine hauls were conducted.

Thirteen fish species were collected from the lower Rio Jemez by seine (Table 3; Figure 3). All but one (gizzard shad [*Dorosoma cepedianum*]) were also collected by electrofishing. Seven fish species each represented more than one percent of the total seine catch. Although flathead chub were not officially documented in 1998, they were noted as present within seine hauls from which fishes were not enumerated (NMFRO data). Therefore, flathead chub were present in both years but were uncommon. Rio Grande silvery minnow were not collected from the lower Rio Jemez by seine.

The five species which numerically dominated electrofishing collections (common carp, red shiner, fathead minnow, white sucker, and western mosquitofish) also dominated seine collections, comprising 86.0%. Common carp, fathead minnow, longnose dace, and white sucker were abundant in 1998 but less abundant in 2000. In contrast, red shiner, western mosquitofish, and white crappie were more abundant in 2000. The great abundance of western mosquitofish in November 2000 seine collections was primarily due to a single seine haul in an isolated pool at the Rio Jemez-Rio Grande confluence (n=466).

Table 3. Summary of fishes collected from Rio Jemez by seine. Abbreviations correspond with those utilized in Figure 3. Number = total individuals collected. Percent = percent of each species within all individuals collected. Individuals per m² = total catch-per-unit-effort for each species.

Common Name	Abbreviation	July 1998	December 2000	Total		
		Number	Number	Number	Individuals per m ²	Percent
gizzard shad	dorcep	0	9	9	0.00	0.6
common carp	cypcar	172	5	177	0.03	11.8
red shiner	cyplut	77	266	343	0.06	22.9
fathead minnow	pimpro	127	7	134	0.24	8.9
flathead chub	plagra	0 [^]	1	1	0.00	0.1
longnose dace	rhicat	134	5	139	0.03	9.3
river carpsucker	carcar	2	3	5	0.00	0.3
white sucker	catcom	61	14	75	0.01	5.0
black bullhead	amemel	2	0	2	0.00	0.1
yellow bullhead	amenat	0	1	1	0.00	0.1
channel catfish	ictpun	0	1	1	0.00	0.1
western mosquitofish	gamaff	74	486	560	0.10	37.4
white crappie	pomann	0	51	51	0.01	3.4

[^]noted as present within un-enumerated seine collections

DISCUSSION

Five fish species (common carp, red shiner, fathead minnow, white sucker, western mosquitofish) dominated all collections. These species are habitat generalists and are resistant to habitat degradation. They are common to abundant in the mainstem Rio Grande. The only abundant mainstem species that was uncommon within lower Rio Jemez was channel catfish (Table 1).

Ten of the species taken from the lower Rio Jemez were also known from Jemez Canyon Reservoir (Wiley, 1999; Hoagstrom, 2000 [NOTE: Hoagstrom (2000) erroneously reported white bass (*Morone chrysops*) as collected from the lower Rio Jemez]). These species are all also known from the mainstem Rio Grande.

The lower Rio Jemez fishery appears to be congruent with the mainstem Rio Grande. It is also likely influenced by the Jemez Canyon Reservoir Fishery. In this regard, uncommon riverine fishes (e.g. Rio Grande silvery minnow, flathead chub) appear to inhabit the lower Rio Jemez in similar abundance to the mainstem Rio Grande.

The role of lower Rio Jemez as a function for Rio Grande silvery minnow conservation can only be determined by routine and intensive monitoring. Such monitoring must determine the distribution and abundance of Rio Grande silvery minnow throughout the year and must also document temporal trends in abundance, differential use between life history stages, and the presence or absence of reproduction. Likewise, only routine fish monitoring can determine whether any other feature of the lower Rio Jemez fishery is independent from the mainstem Rio Grande and/or Jemez Canyon Reservoir.

LITERATURE CITED

- Hoagstrom, C.W. 2000. September Rio Grande silvery minnow surveys in Angostura and Isleta Reaches of the Middle Rio Grande, NM. Memorandum to Richard Fike, U.S. Army Corps of Engineers, Albuquerque Office. Dated 20 October 2000: 12 pp.
- Wiley, B.G. 1999. Fishery survey of Jemez Canyon Reservoir and Jemez River, Santa Ana Pueblo. Report to Santa Ana Pueblo: 26 pp.