Inventory of the East, Middle and West Forks of the Gila River 2005-2008

New Mexico Department of Game and Fish and Gila National Forest

Submitted to U.S. Bureau of Reclamation and U.S. Fish and Wildlife Service
By: Yvette Paroz, Jerry Monzingo and David Propst
October 2009

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Executive Summary

Surveys were conducted on the East, Middle and West Forks of the Gila River from April 2005 through August 2008 to document fish species occurrence and distribution. Sample sites were spread roughly equidistant throughout the warmwater sections of each fork and were at least 200m in length. Methods were similar to those used to monitor fish populations at Gila-San Francisco drainage permanent sites (Paroz et al. 2006).

East Fork Gila River had the greatest proportion of nonnative predators, smallmouth bass and yellow bullhead. Small-sized fish were rare and small-bodied species were nearly absent. Adult headwater chub, desert sucker, and Sonora sucker were present at most sites.

The Middle and West forks of the Gila contained mostly native species and nonnative salmonids. Headwater chub, of various sizes, were present at most sites. Loach minnow was not collected at any sites, though it was present below the confluence of Middle and West forks and occasionally collected in the vicinity. Spikedace was only collected in the lower portion of the West Fork Gila River. Though there have been several large wildfires and subsequent ash flows in the streams, fish survivied and remain distributed throughout the systems.

Introduction

Among the East, Middle and West forks of the Gila River, warmwater fishes occupy about 150 km of habitat. Composition of the warmwater fish assemblage in each system, however, was poorly documented, particularly relative proportion of native and nonnative fishes and distribution of rare fishes. During the past 10 years, several wildfires burned large portions of the West and Middle forks Gila River drainage, though comparatively little of East Fork was burned. The effect of wildfire associated ash flows on fish assemblages in each river was also unknown. This study was conducted to document the occurrence, distribution, and status of fishes in each fork of the Gila River.

Knowledge of the warmwater fish assemblages of the West, Middle, and East forks of the Gila River is derived mainly from annual sampling permanent sites on each stream. The West and Middle forks sites are located near the downstream terminus of each stream. The East Fork site is located near the confluence of Beaver and Taylor creeks, the origin of the East Fork. Outside of the permanent sites monitoring, several areas in the East fork were inventoried in the 1980s. Spikedace *Meda fulgida* and Loach minnow *Tiargoa cobitis* were collected at several sites during those surveys (Paroz and Propst 2007). Prior to this study, only a few fish collections were made in the West and Middle forks Gila River (Propst et al. 1986, Propst el al. 1988).

Permanent Sites Summary 1988 - 2008

At the East Fork Gila River permanent site, Desert sucker *Catostomus (Pantosteus) clarki* and Sonora sucker *Catostomus insignis* were the only native species collected in all years. Longfin dace *Agosia chrysogaster*, collected each year through 2000, has been found intermittently since 2000. Spikedace *Meda fulgida* has not been collected since 2000, speckled dace *Rhinichthys osculus* since 2002, and loach minnow *Tiaroga cobitis* since 1999. Headwater chub *Gila nigra* was absent in 2002 and 2003, but otherwise present. Smallmouth bass *Micropterus dolemieui*, yellow bullhead *Ameiurus natalis*, Western mosquitofish *Gambusia affinis* and nonnative Chihuahua catfish *Ictalurus sp.*, an undescribed species, were commonly collected. Native fish relative abundance exceeded 80% in most years from 1988 through 1999, steadily declined from 2000 through 2003, and has been generally greater than 50% since then. Large smallmouth bass (>200 mm TL) were collected at the site, particularly from 1998 through 2008 (Propst et al. 2009).

Seven native and eight nonnative fish species were collected at Middle Fork Gila River Trailhead site from 1988 through 1995. All native species were present in all years, except spikedace in 1991 and 1994. From 2003 through 2005, Sonora and desert suckers were the only native species found at Trailhead site. In 2006, Sonora sucker was the only native species collected. In 2007, four native species were collected; both sucker species, longfin dace (last collected in 1997), and headwater chub (last collected in 2002). Additionally, another two native fishes (longfin dace and speckled dace) were found in 2008; loach minnow was the only native species not found in 2008. Sonora sucker was the only native species collected in all years. Nonnative yellow bullhead and smallmouth bass were collected in all years. Native fish relative abundance was generally greater than 75% from 1988 through 1993, but from 1994 through 2006 exceeded 50% only in 1995. In 2007 and 2008, native fish abundance exceeded 80%.

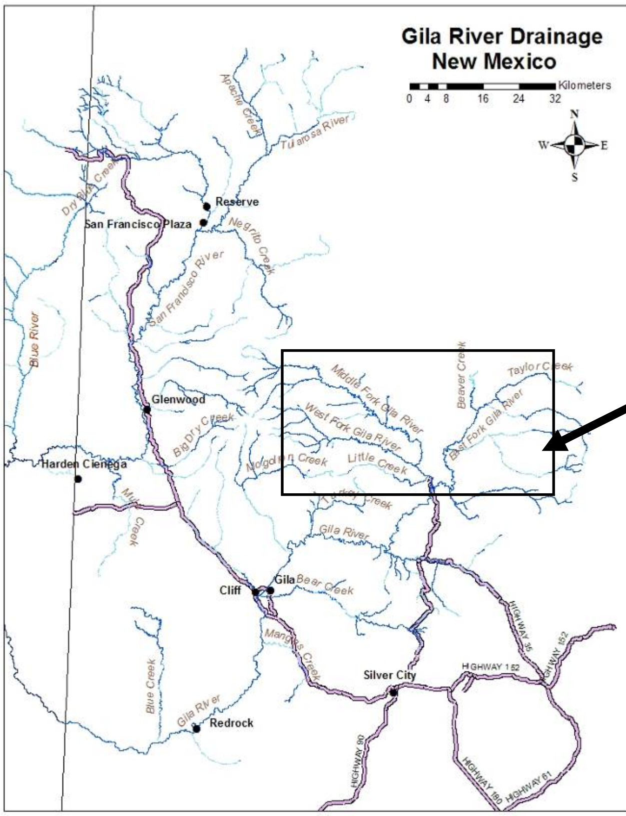
Seven native and five nonnative fish species have been collected at the West Fork site. Among native fishes, only speckled dace and desert sucker were collected in all years. Sonora sucker was absent one year and longfin dace and spikedace were absent two years. Loach minnow was last collected in 2001 and headwater chub was present in about one-half the collections since 1989. Number of fish collected (and density) was greater in 2005 than in any year since 1998, but considerably fewer were collected in 2006 and 2007. Fish abundance was higher in 2008, but still considerably less than in late 1980s-early 1990s. Warmwater nonnative fishes were rarely found at West Fork Gila River Cliff Dwellings site, though salmonids were found in most years.

Study Objectives:

1. Determine the distribution and status of native and non-native fishes in the West, Middle, and East forks (including tributaries of each) of the Gila River.
2. Characterize mesohabitat associations of all native and nonnative warmwater species occupying each fork.
3. Locate potential source populations for individuals to augment depleted populations of rare fishes (i.e., spikedace, loach minnow, and headwater chub).
4. Obtain somatic data (length and mass) from specimens for population size structure characterization and recruitment success evaluation.

Study Area and Methods

The study area included the West, Middle, and East forks of the Gila River in southwestern New Mexico (Figure 1). Almost all of the West and Middle forks were within the Gila Wilderness of the Gila National Forest and a substantial portion of the East Fork lies within the Gila Wilderness and the upper drainage within the Aldo Leopold Wilderness of the Gila National Forest. Portions of East Fork Gila River flowed through private lands, no samples were collected on these private portions.



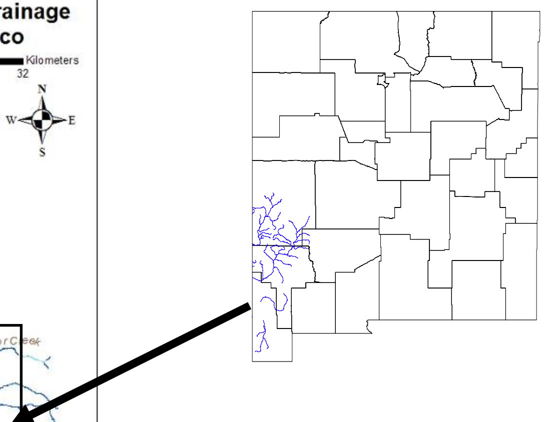


Figure 1. Gila River Forks area in southwestern New Mexico.

The sites on East Fork Gila ranged from 1700 to 1850 meters in elevation. The river is mainly a C-type channel that wanders through meadows (Rosgen 1996). Woody debris and boulders were rare in the system. Streamside vegetation consists mainly of sedges and riparian grasses with sporadic willows (Figure 2). There were several geothermal features (hot springs) near the floodplain in the lower section of the drainage. Substrate was mainly gravel and sand. Since 1996, there have been no high intensity fires that have caused significant ash flow into the system. Wall Lake, a small impoundment was near the confluence of Beaver and Taylor creeks upstream of our sampling sites.

Figure 2. East fork sites at Black Canyon and Trails End Ranch.

Sites on Middle Fork Gila River ranged from 1750 to 2160 meters in elevation. The river was generally a B-type channel in a canyon-bound area (Figure 3). The middle sections contained some large meadows. Boulders and woody debris were common. Streamside vegetation included alder, willow and other hardwood deciduous trees as well as ponderosa pine. There were numerous thermal springs in the drainage from the West Fork confluence upstream through the Meadows section below the confluence of Clear Creek. Substrate ranged from large cobble/boulder areas to silt/sand. The Bear Fire in 2006 burned large portions of the upper watershed and a large flood occurred in January 2008 (Figure 7). Outside of the wilderness section, there was a small reservoir, Snow Lake, on a small tributary in the upper reaches of the Middle Fork where nonnative species are common, including rainbow trout *Oncorhynchus mykiss*, common carp *Cyprinus carpio*, and green sunfish *Lepomis cyanellus*.

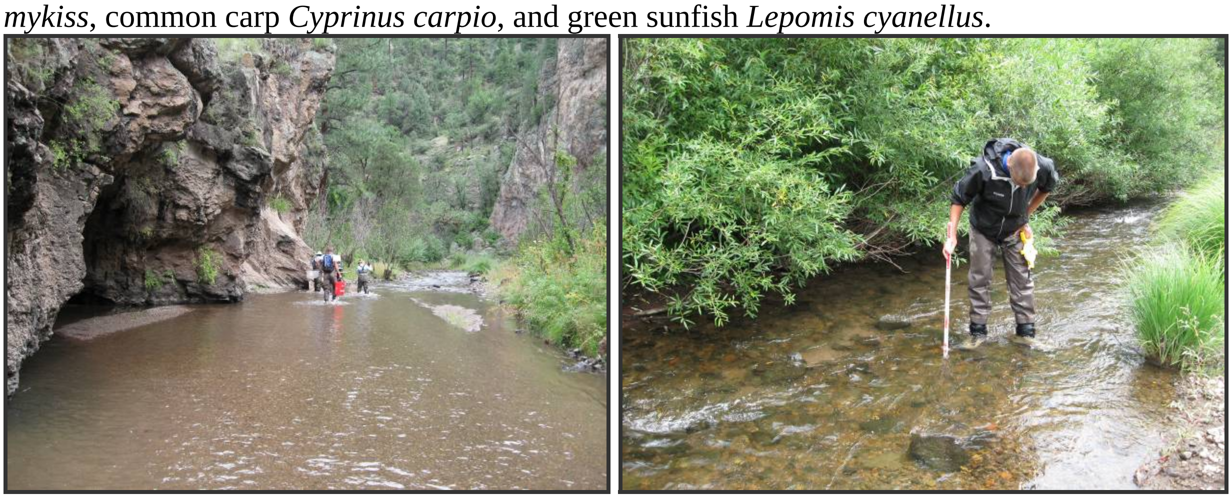


Figure 3. Middle Fork Gila sites near Canyon creek and Loco Mountain trail.

The sites on West Fork Gila River ranged from 1720 to 2010 meters in elevation. The stream was similar to the Middle Fork Gila River; generally a canyon-bound B-type channel, vegetation included alder, willow and other hardwood deciduous trees with large clumps of sedges along stream margins, but with generally larger substrate than the East Fork Gila River (Figure 4). Unlike the other two forks, there was little influence from thermal springs in the West Fork Gila River. Several large fires burned much of the upper watershed in the past decade. The upper portion of the West Fork Gila River was entirely within the Gila Wilderness, there were no impoundments or diversions in the drainage.

Figure 4. West Fork sites at Ring Canyon and Caves below Hells Hole.

Fish were collected from sites roughly equidistantly separate, on each fork. Sites were a minimum of 200 m in length and selected to reflect the diversity of habitats presenting the vicinity. Location (UTM) of the lower end of each site was recorded (Figure 5, Table 1).

All mesohabitats (e.g., pool, pool-run, and riffle) within a site were sampled in rough proportion to their availability within each site. Fish were collected by mesohabitat (e.g., pool, pool-run, and riffle). Each fish collected in a mesohabitat was identified, length and mass determined, released if native and retained if nonnative. Collection data was recorded by mesohabitat. Fish were collected with battery-powered backpack electrofishing gear and seines, methods similar to those used for fish assemblage monitoring at the permanent sites (Paroz et al. 2006). Effort was recorded as CPUE (seconds shocked and area sampled). All data were recorded on standard field forms. For each mesohabitat, type, depth, primary substrata and cover were noted.

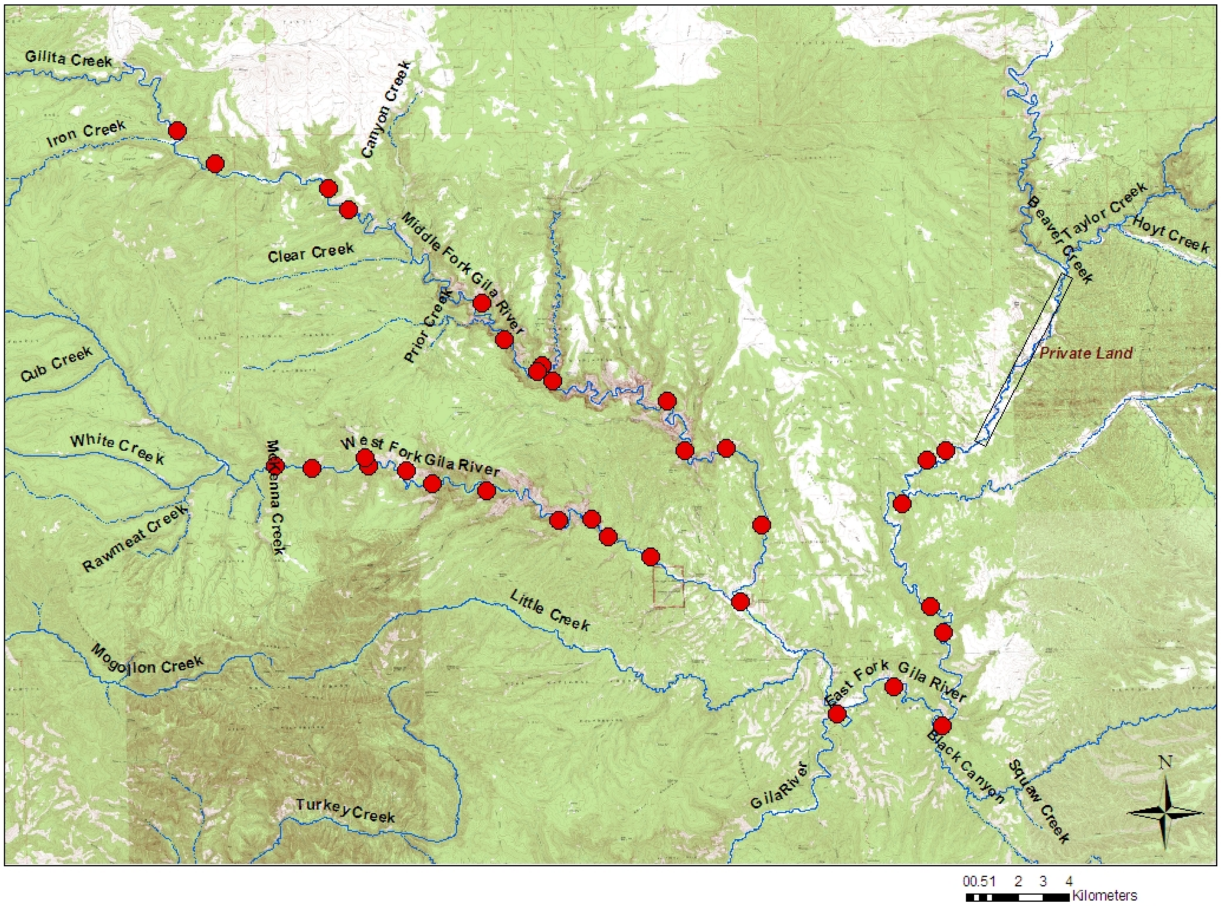


Figure 5. Sampling locations in the East, Middle and West forks of the Gila River, New Mexico, 2005 through 2008.

Table 1. Location (NAD83) and date of sample sites in East, Middle and West forks of the Gila River, New Mexico, 2005 through 2008.

Drainage	Site Number	Date Sampled	UTM-r	UTM-n	UTM-e	Total Area Sampled (m^2)
East Fork Gila	1	11-May-05	12S	760848	3674860	210
	2	26-Apr-07	12S	763025	3675907	244
	3	26-Apr-07	12S	764922	3674404	193
	4	21-Apr-05	12S	764970	3678016	330
	5	21-Apr-05	12S	764463	3679035	452
	6	20-Apr-05	12S	763340	3683060	388
	7	20-Apr-05	12S	764335	3684738	462
	8	25-Apr-07	12S	765057	3685111	236
Middle Fork Gila	1	13-May-08	12S	757870	3682238	227
	2	13-May-08	12S	756508	3685223	320
	3	14-May-08	12S	754876	3685128	108
	4	14-May-08	12S	754206	3687054	358
	5	10-Jul-08	12S	749723	3687834	283
	6	10-Jul-08	12S	749291	3688462	75
	7	10-Jul-08	12S	749114	3688217	259
	8	9-Jul-08	12S	747824	3689464	177
	9	9-Jul-08	12S	746952	3690875	164
	10	27-Aug-08	12S	741735	3694518	291
	11	27-Aug-08	12S	740935	3695343	160
	12	26-Aug-08	12S	736525	3696340	352
	13	26-Aug-08	12S	735053	3697634	306
West Fork Gila	1	24-May-06	12S	757049	3679209	265
	2	23-May-06	12S	753538	3680977	214
	3	23-May-06	12S	751898	3681749	283
	4	22-May-06	12S	751248	3682453	155
	5	22-May-06	12S	749941	3682426	662
	6	24-May-07	12S	747147	3683565	249
	7	24-May-07	12S	745023	3683855	197
	8	25-May-07	12S	744014	3684352	288
	9	22-May-07	12S	742515	3684549	293
	9.5	25-May-07	12S	742394	3684869	Spot Check – Area Not Measured
	10	23-May-07	12S	740288	3684423	233
	11	23-May-07	12S	738880	3684525	185
Grand Total						8619

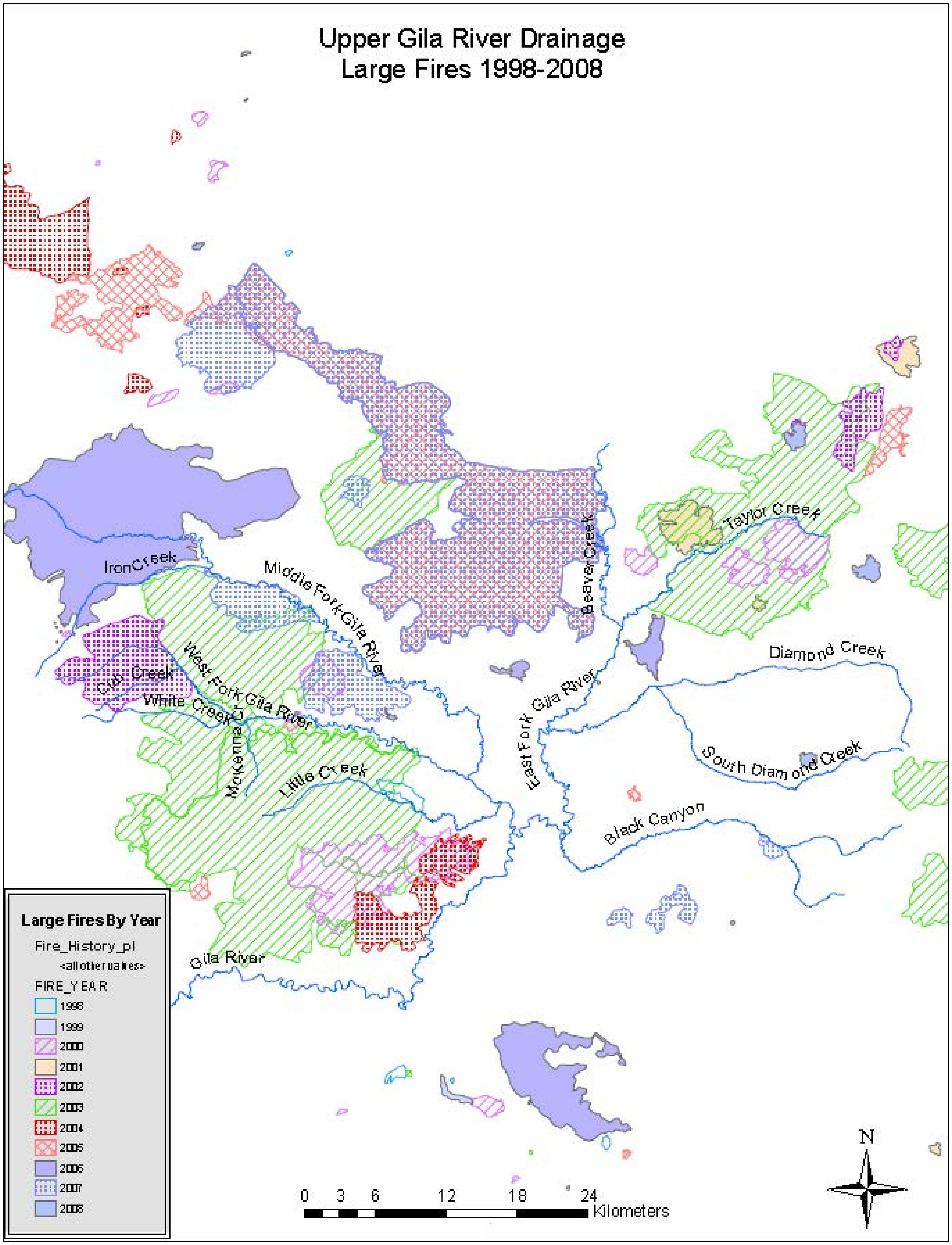


Figure 7. Fire history of upper Gila River drainage, New Mexico, from 1998 through 2008.

Results and Discussion

Thirty two sites were sampled between April 2005 and August 2008. Fifteen species of fish were collected (Table 2). Sonora sucker and desert sucker were the most common large-bodied fish collected in all forks. Speckled dace was abundant in the Middle and West forks Gila River and absent from the East Fork. Longfin dace was only collected in the lower portion of the West Fork Gila River. Three Western mosquitofish specimens were the only small-bodied fish collected in the East Fork. Salmonids were the only nonnative fish that were commonly collected in the Middle and West forks. Smallmouth bass and/or yellow bullhead were collected at all sites on the East Fork.

Juvenile large-bodied fishes were uncommon in the East Fork Gila River. Less than 20 age-0 and age-1 Sonora sucker and desert sucker were collected in the East Fork, but their numbers on the other two forks were in the hundreds for each species (Figures 8 and 9). Populations of adult suckers were similar in all forks.

Table 2 Fishes collected in the East, Middle and West forks Gila River, New Mexico, from 2005 through 2008.

					Number Specimens			
Family	**Common Name**	**Species**	**Status**	**Species Code**	**East Fork Gila**	**Middle Fork Gila**	**West Fork Gila**	**Grand Total**
Cyprinidae	**Longfin dace**	***Agosia chrysogaster***	***Native***	**AGOCHR**	**0**	**0**	**4**	**4**
	Headwater chub	***Gila nigra***	***Native***	**GILNIG**	**12**	**51**	**161**	**224**
	Spikedace	***Meda Fulgida***	***Native***	**MEDFUL**	**0**	**0**	**119**	**119**
	Speckled dace	***Rhinichthys osculus***	***Native***	**RHIOSC**	**0**	**436**	**605**	**1041**
	Fathead minnow	***Pimephales promelas***	***Introduced***	**PIMPRO**	**0**	**0**	**1**	**1**
Catostomidae	**Desert sucker**	***Catostomus (Pantosteus) clarki***	***Native***	**PANCLA**	**72**	**215**	**310**	**597**
	Sonora sucker	***Catostomus insignis***	***Native***	**CATINS**	**186**	**452**	**592**	**1230**
Centrarchidae	**Green sunfish**	***Lepomis cyanellus***	***Introduced***	**LEPCYA**	**4**	**23**	**0**	**27**
	Smallmouth bass	***Micropterus dolomieui***	***Introduced***	**MICDOL**	**39**	**3**	**16**	**58**
Ictaluridae	**Black bullhead**	***Ameiurus melas***	***Introduced***	**AMEMEL**	**0**	**7**	**0**	**7**
	Yellow bullhead	***Ameiurus natalis***	***Introduced***	**AMENAT**	**21**	**11**	**24**	**56**
	Flathead catfish	***Pylodictis olivaris***	***Introduced***	**PYLOLI**	**4**	**0**	**0**	**4**
Poeciliidae	**Western mosquitofish**	***Gambusia affinis***	***Introduced***	**GAMAFF**	**3**	**0**	**0**	**3**
Salmonidae	**Rainbow trout**	***Oncorhynchus mykiss***	***Introduced***	**ONCMYK**	**2**	**85**	**96**	**183**
	Brown trout	***Salmo trutta***	***Introduced***	**SALTRU**	**5**	**46**	**134**	**185**

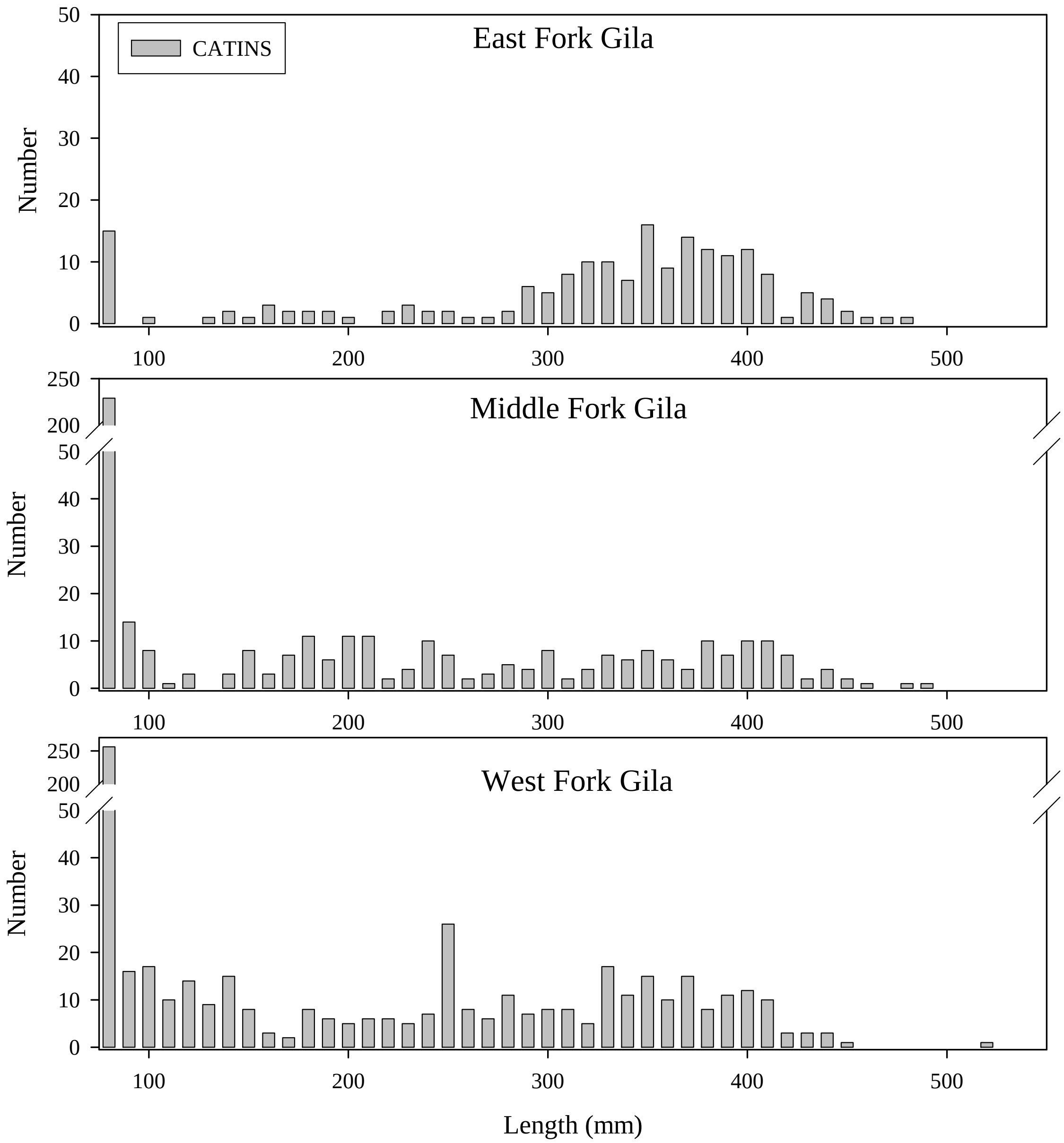


Figure 8. Length-frequency of Sonora sucker collected in the East, Middle, and West forks Gila River, New Mexico, 2005-2008.

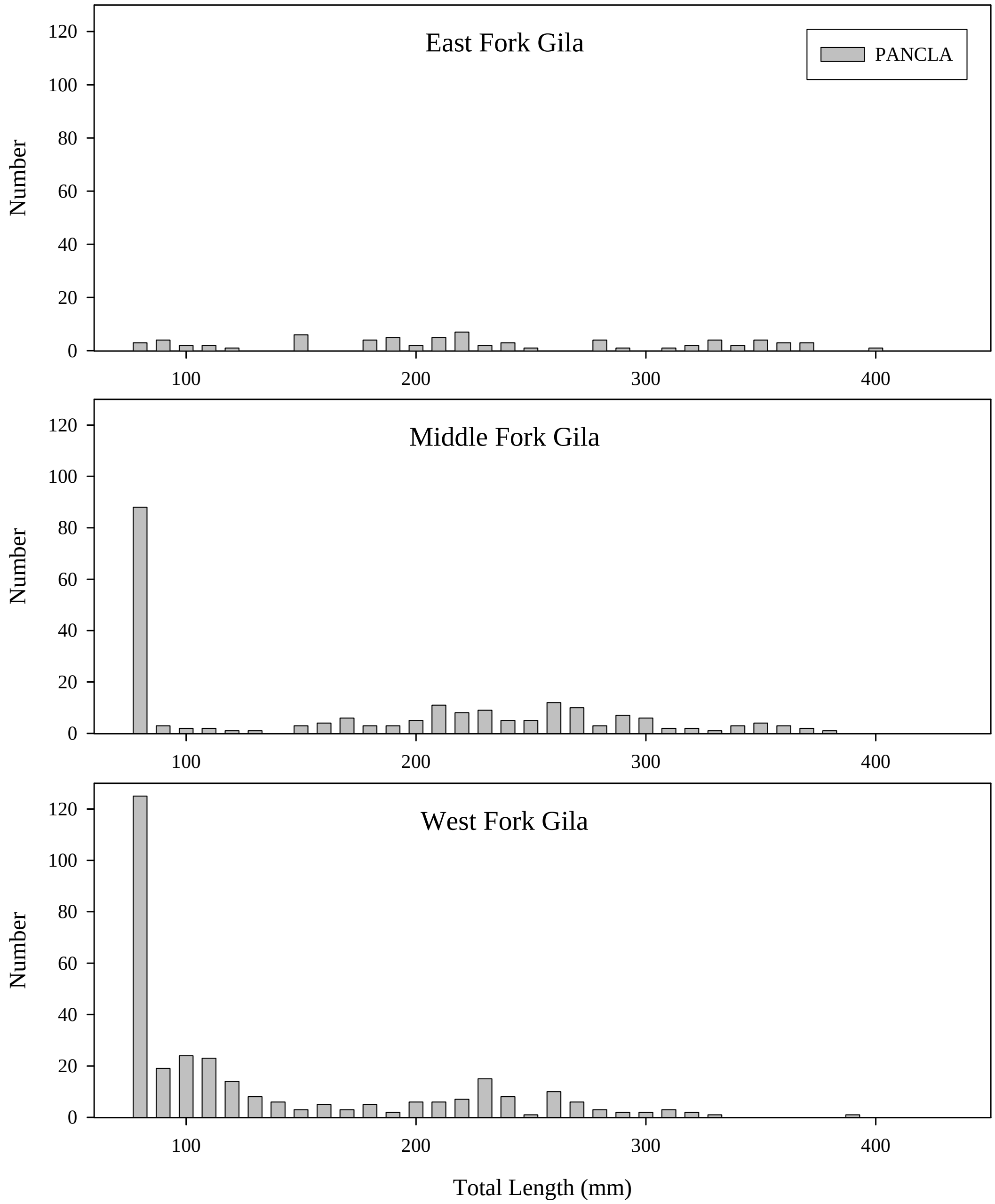


Figure 9. Length-frequency of Desert sucker collected in the East, Middle, and West forks Gila River, New Mexico, 2005-2008.

For all forks, headwater chub was present if pools with cover (debris, root wads or boulders) existed within the site (Figure 10). Several juvenile headwater chub were collected in the Middle and West forks while only a single juvenile was collected in the East Fork at the confluence of the West Fork (Figure 11). Through our observations in this study as well as the concurrent nonnative removal study taking place in the West Fork between the confluence of the Middle and West forks and Little Creek confluence, it is likely that the lower portion of the West Fork is an important nursery area for headwater chub. Among the three forks, West Fork and Middle Fork evidently supported the robust populations of Headwater chub.

Figure 10. Classic Headwater chub habitat, a debris-choked pool in close proximity to rapid velocity water, in West Fork Gila River and an adult Headwater chub.

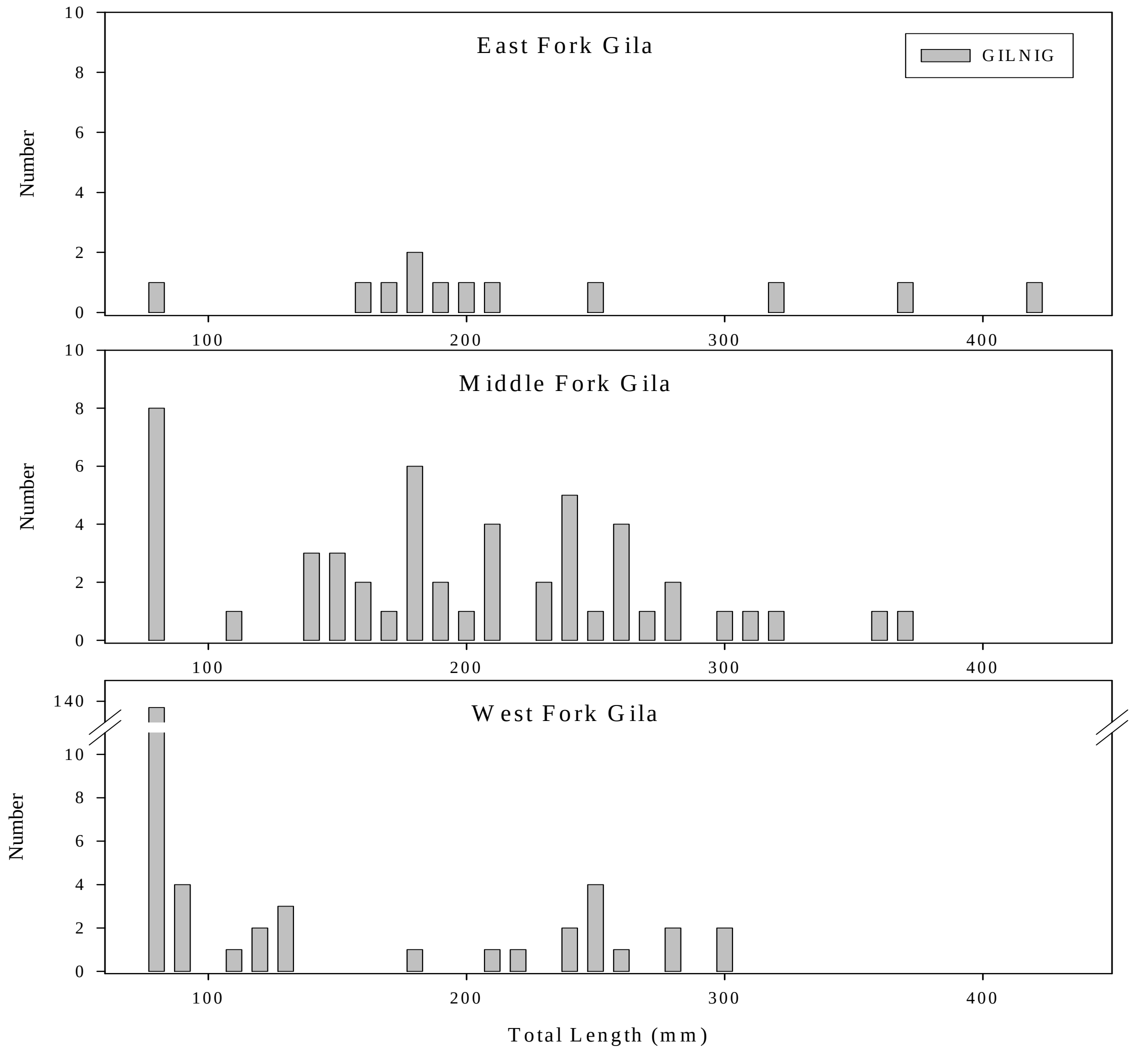


Figure 11. Length frequency for headwater chub collected in the East, Middle, and West Forks of the Gila River 2005-2008.

Yellow bullhead was present at most sites in the East Fork Gila River in several size classes (Figure 12). A few individuals were captured in the lower portion of the Middle and West Forks; however, the majority of yellow bullhead captured in the Middle Fork Gila River were from a single off channel spring system.

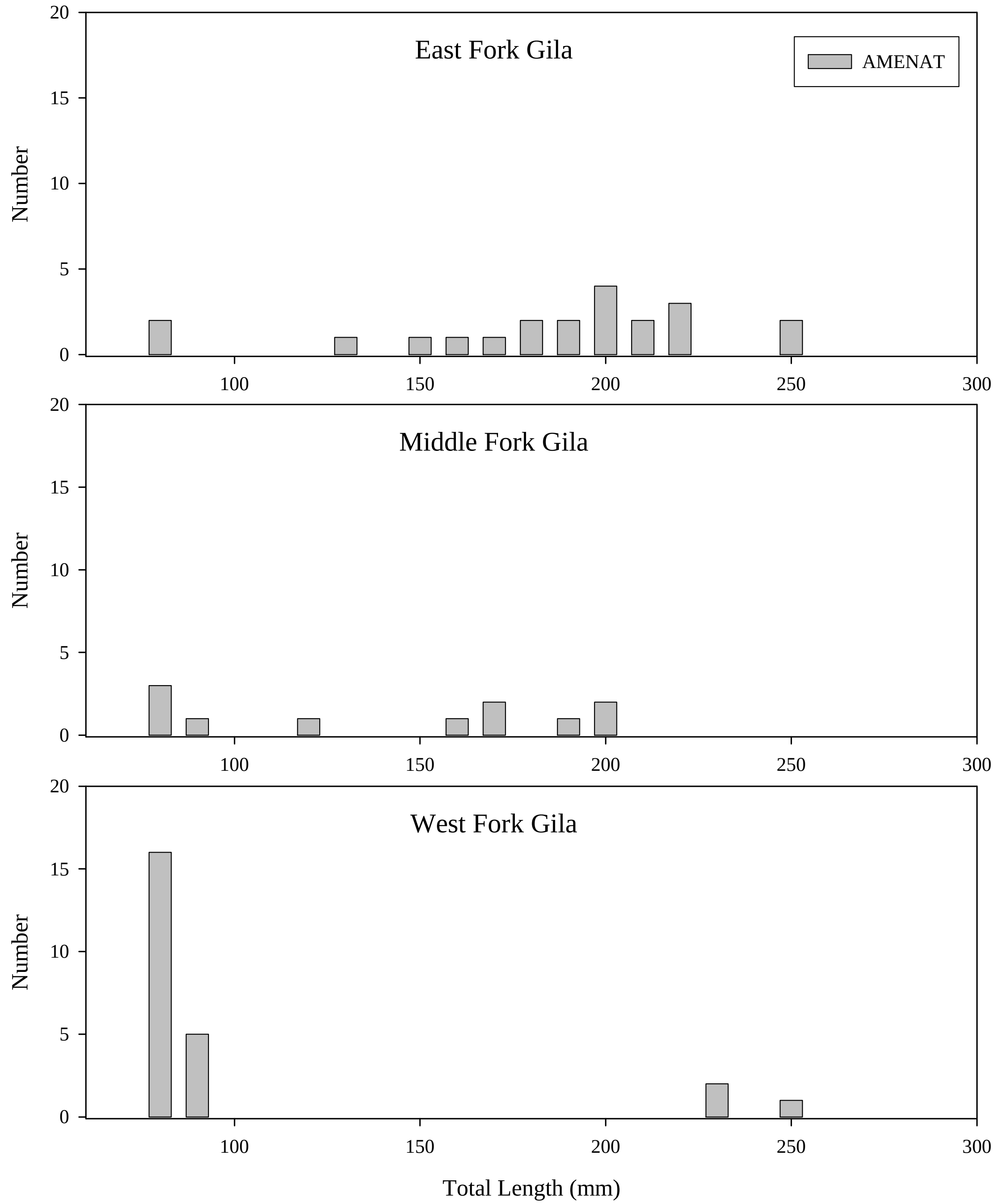


Figure 12. Length-frequency of yellow bullhead collected in the East, Middle, and West forks of the Gila River, New Mexico, 2005-2008.

The East Fork Gila River was the only area where multiple size classes of smallmouth bass were present (Figure 13). Smallmouth bass was captured at all sites on the East Fork, except one. There was a small pocket of age-1 smallmouth in the West Fork Gila River, whereas only three individuals were collected in the Middle Fork Gila River.

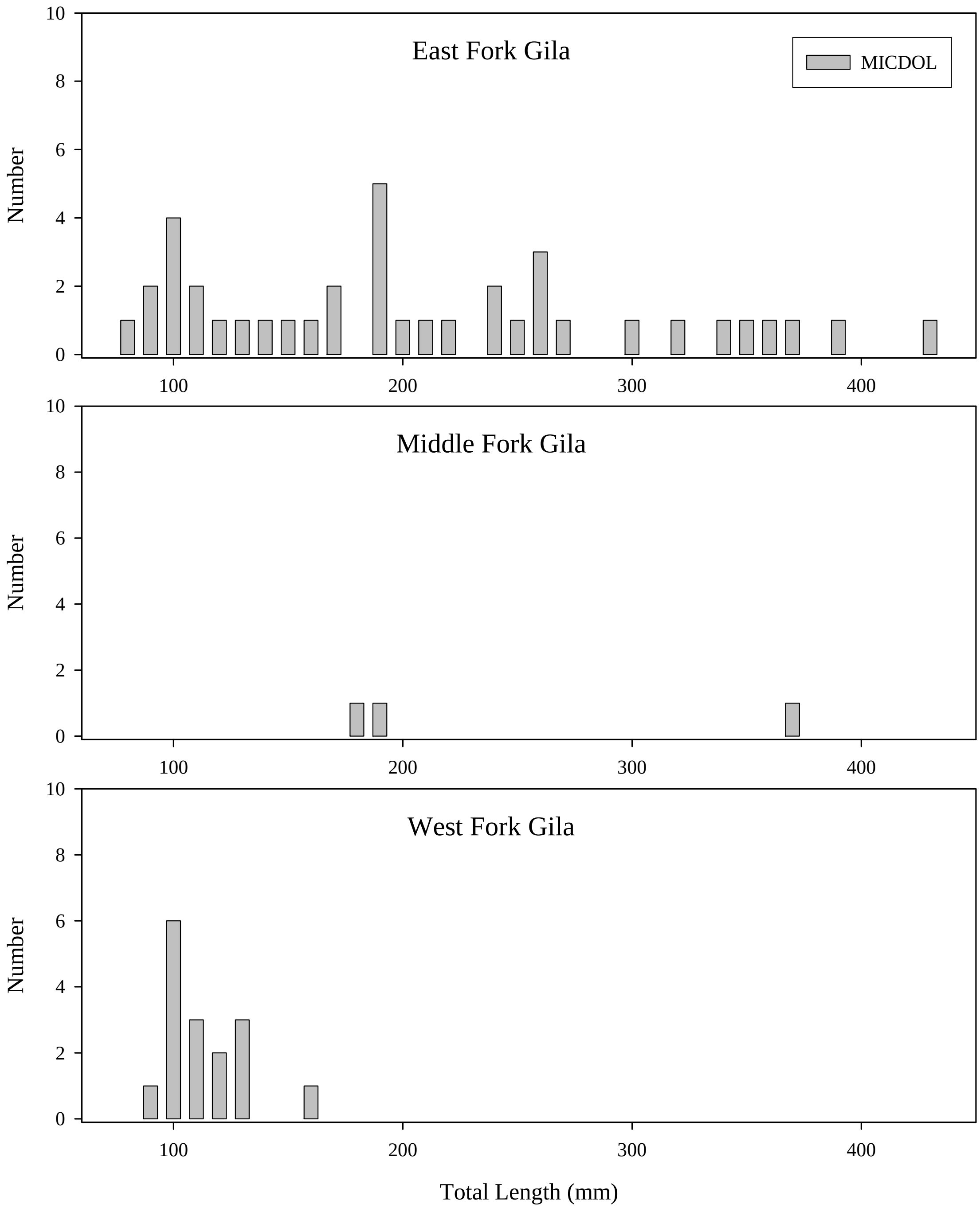


Figure 13. Length-frequency of smallmouth bass collected in the East, Middle, and West forks of the Gila River, New Mexico, 2005-2008.

Multiple size classes of rainbow and brown trout were collected in the Middle and West forks of the Gila (Figure 14). Neither area has been stocked since the early 1990s so these populations have maintained themselves as wild fisheries. Trout were rare in the East Fork Gila River.

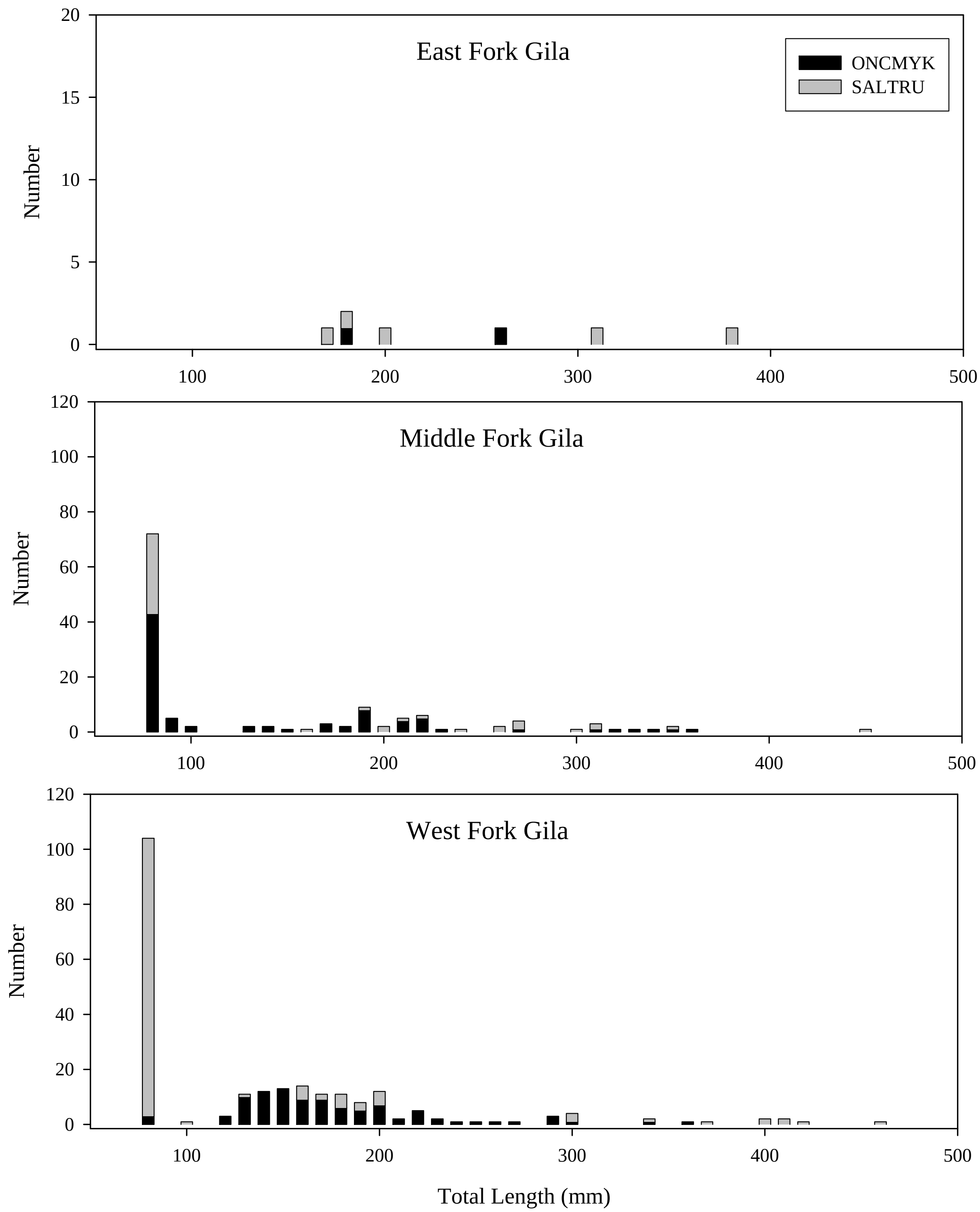


Figure 14. Length-frequency of rainbow and brown trouts collected in the East, Middle, and West forks of the Gila River, New Mexico, 2005-2008.

The East Fork was the only fork where smallmouth bass and yellow bullhead were present in most samples. Smallmouth bass was especially common at the lower sites of the East Fork. Assemblage composition was similar at most sites on the Middle and West Forks, consisting mainly of a native species (Sonora sucker, Desert sucker, Speckled dace, and Headwater chub) and nonnative trout (Rainbow trout and Brown trout). There was an off-channel warm spring sampled in the Middle Fork that was occupied almost entirely by green sunfish and black and yellow bullheads, though those species were not in nearby stream samples. Though recent ash flows had occurred in both the Middle and West Forks, fish were distributed throughout each system and comparatively common (Figure 15).

The East Fork contained a substantial proportion of "classic" spikedace and loachminnow habitats (shoals and riffles, respectively), but neither species was collected during this study in the stream. Loach minnow and spikedace were routinely present in low numbers in the nonnative removal section between the confluence of the Middle and East forks, but were only collected at one upstream site; spikedace was collected just upstream of the Gila Cliff Dwellings on the West Fork in a slow run habitat.

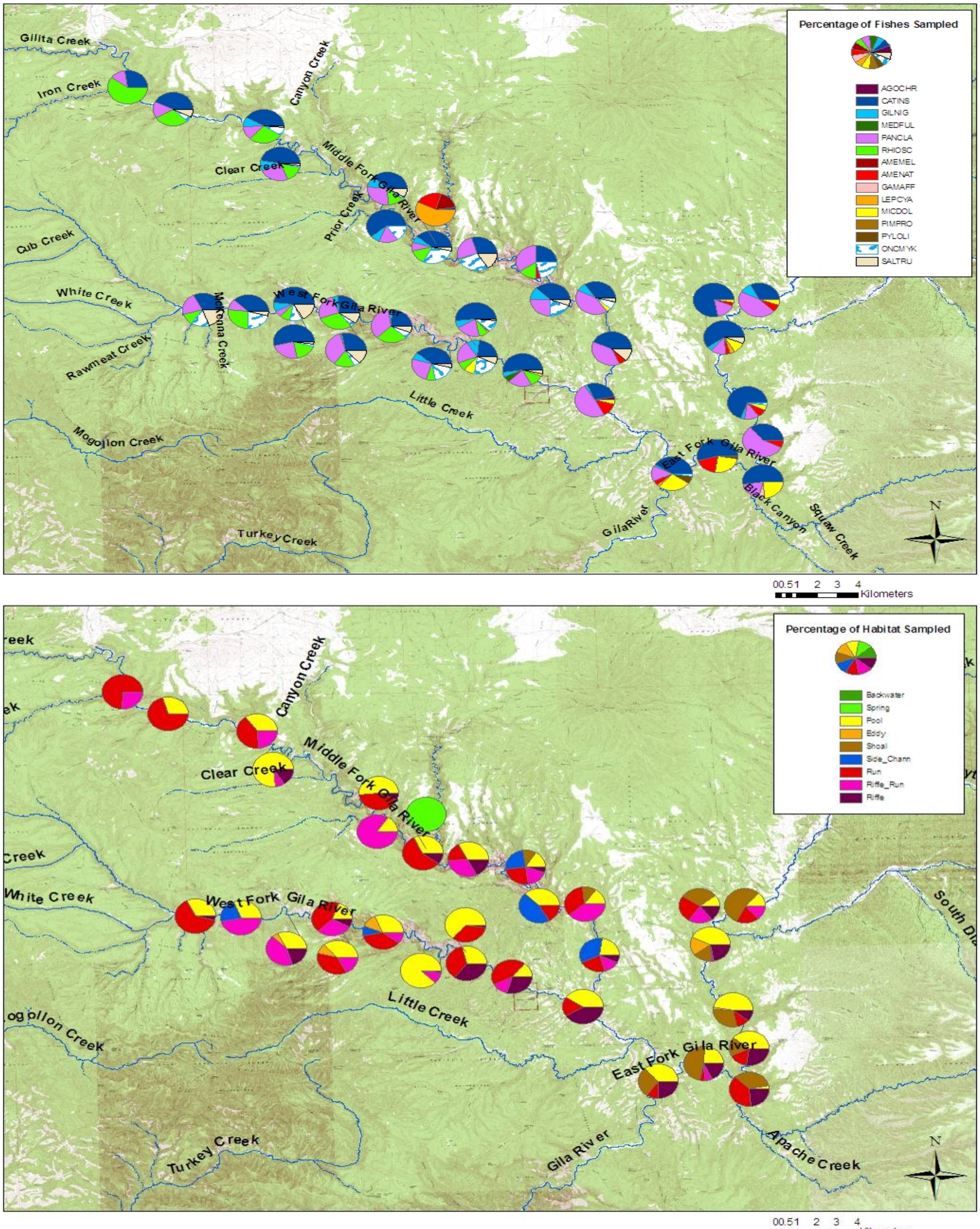


Figure 15. Percent of fishes collected at each site and habitat sampled by area at sites in the East, Middle and West forks of the Gila River, New Mexico, 2005-2008.

Density of native species (e.g., Sonora sucker, Desert sucker, and Headwater chub) in pool habitats were similar among the three forks ($F_{(2, 79)}<0.226$, $p>0.797$), with the exception of speckled dace being absent in the East Fork (Figure 16). Density of smallmouth bass was significantly higher in pools of the East Fork than the Middle and West forks ($F_{(2, 79)}=4.6675$, $p=0.012$-Tukey HSD $p<0.035$). Riffle and riffle-run habitats contained few fish in the East Fork Gila River whereas trout and small native fishes were relatively common in these habitats in the Middle and West forks. Headwater chub was only found in pool habitats in the East Fork, but in the Middle and West forks a few individuals (mainly juveniles) were found in other habitats.

There was no clear longitudinal (downstream to upstream) pattern for the density of native or nonnative fishes (Figure 17 and 18). However, Sonora sucker, speckled dace, rainbow trout, and brown trout density was positively correlated with latitude while yellow bullhead and smallmouth bass were negatively correlated ($r>0.13$, $p<0.03$). Species density of most large-bodied fishes were positively correlated with densities of other fishes ($r>0.16$, $p<0.02$), thus species density was likely more related to the location being sampled than the effect of other fish being present.

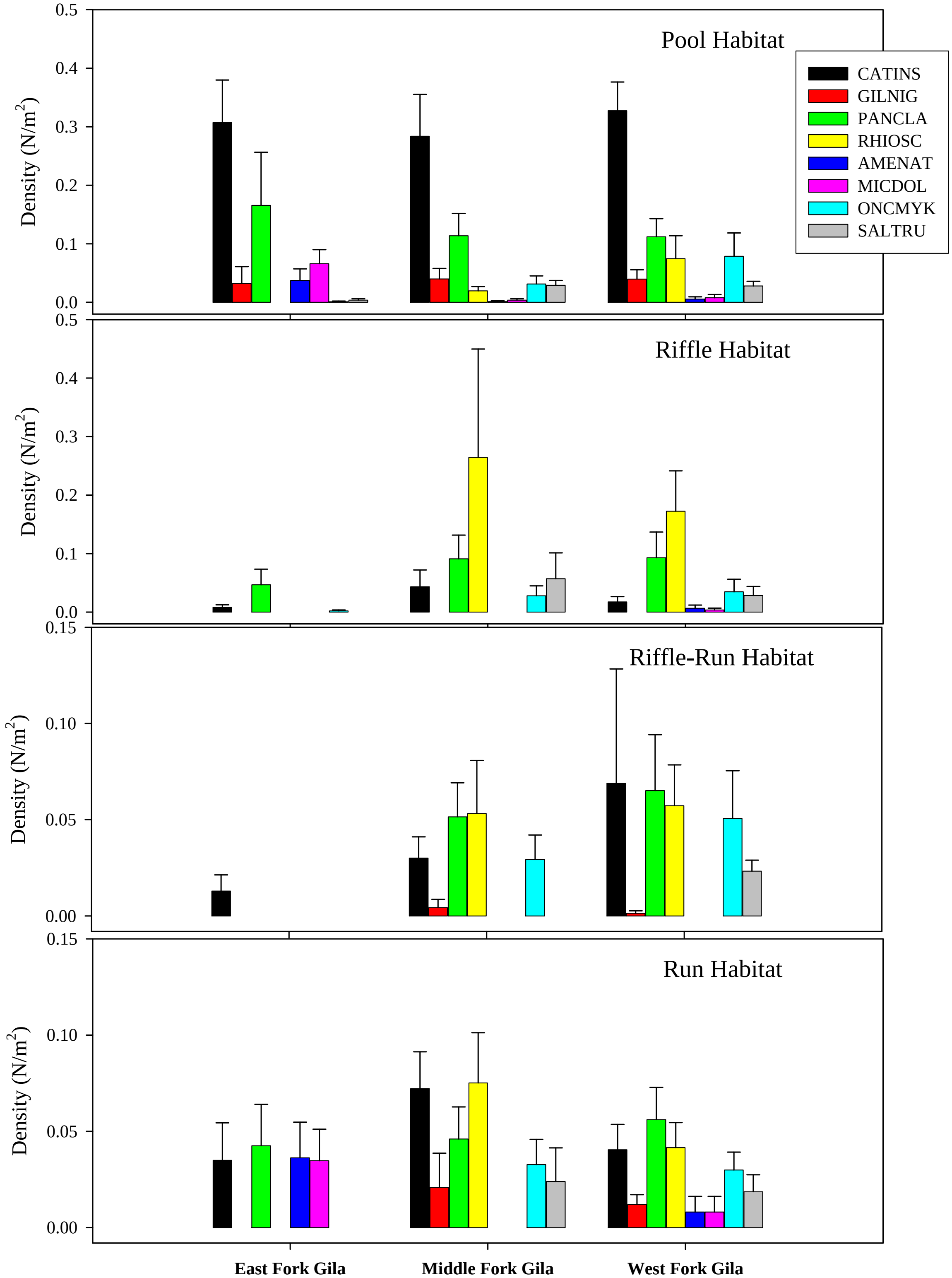


Figure 16. Density (n/m^2) of fishes in various habitats in the East, Middle, and West forks of the Gila River, New Mexico, 2005-2008. Error bars represent one standard error.

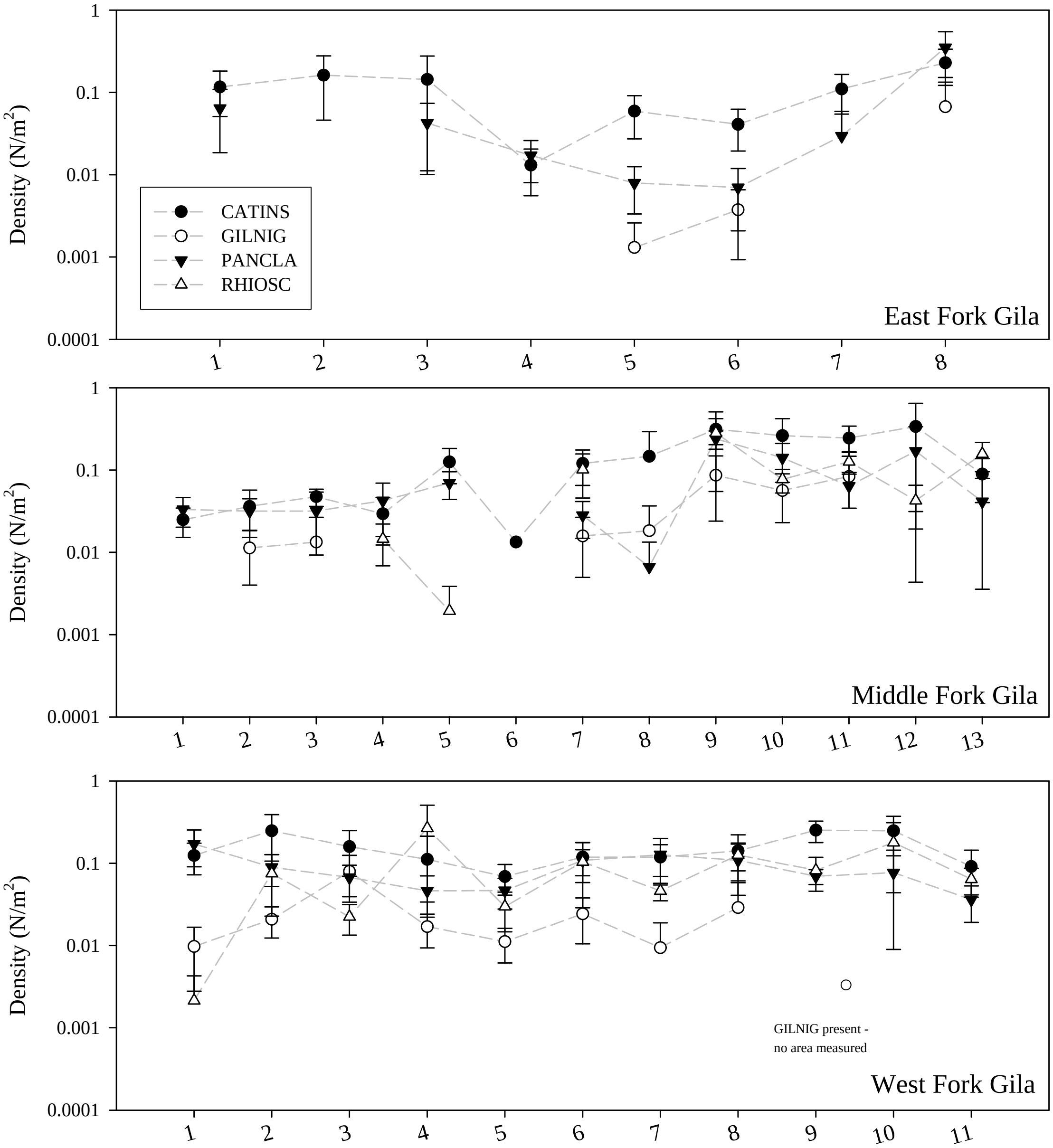


Figure 17. Density (n/m^2) of commonly collected native species from downstream to upstream in the East, Middle and West forks of the Gila River, New Mexico, 2005-2008. Error bars represent one standard error. Note log scale for density.

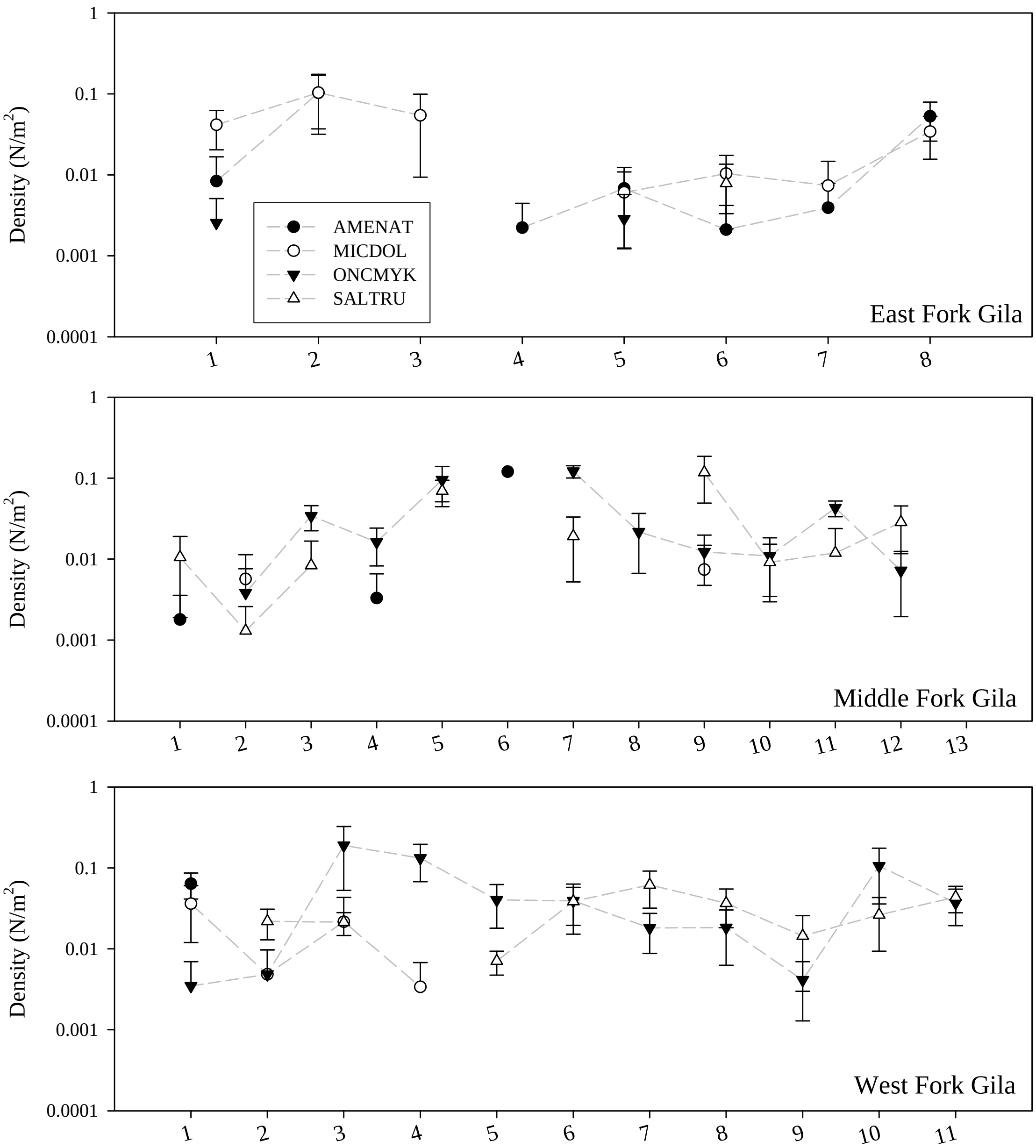


Figure 18. Density (n/m^2) of commonly collected nonnative species from downstream to upstream in the East, Middle and West forks of the Gila River, New Mexico, 2005-2008. Error bars represent one standard error. Note log scale for density.

Opportunistically collected, non-fish aquatic species were noted in the field notes. Of special note was collection of Narrow headed garter snakes *Thamnophis rufipunctatus* at several sites in the Middle Fork Gila River (Figure 19). These records were reported to the state and forest herpetological specialists.

Figure 19. Narrow headed garter snake *Thamnophis rufipunctatus* captured on Middle Fork Gila River, New Mexico, August 2008.

Recommendations

The composition of the fish assemblage in East Fork Gila River has changed in the past 20 years. Small-bodied fish species collected in the 1980s were extremely rare during this study. Habitat conditions in the East Fork have not changed appreciably so it is likely that the nonnative fishes in the system have had a negative impact on the native fish fauna. It also appears that recruitment of native fishes may be low and East Fork populations may be maintained by movement from populations upstream of the survey area. Extensive removal of nonnative fishes in the East Fork Gila may help increase recruitment of native fishes and also allow the reestablishment of small-bodied species. Accessibility to large portions of the East Fork is difficult and effective mechanical removal of nonnative fishes would therefore be challenging. There is some demand for sport-fishing opportunities in this area, which might make removal efforts somewhat controversial.

Prior to our study, few fish collections were made in the Middle and West forks Gila River, thus, we are not certain if species composition in the streams has changed in recent years as a consequence of recent wildfires or if what we found was the historical condition (that of past 75-100 years). Because we do not have historical data for comparison, it is difficult to predict whether nonnative fishes will (re)establish in these two forks or if there is a habitat limitation that has precluded them. Both smallmouth bass and yellow bullhead are present downstream of the confluence of the East and Middle forks, and thus serve as potential colonizers. It may be useful, but difficult, to construct a migration barrier below the confluence of the Middle and

West forks to help protect native fish assemblages in each fork. It appears that recruitment is occurring in both of these forks and populations are self-sustaining.

It may be possible to extend upstream the range of Spikedace and Loach minnow in each fork. Short reaches of suitable habitat were noted in the Middle Fork and West fork for about 10 km from their confluence.

Those reaches of the East Fork that flow through private lands should be sampled. Small populations of Spikedace, Loach minnow, Longfin dace, and Speckled dace historically occurred in these reaches (Propst et al. 1986 and Propst et al. 1988) and may still persist there.

The Forks Area of the Gila is the stronghold for headwater chub in New Mexico; currently it appears that the population is recruiting in the Middle and West forks of the Gila and perhaps persisting in the East Fork. In addition, this area supports one, albeit small, of two Spikedace populations remaining in New Mexico and one (also small) of four surviving New Mexico loach minnow populations. If Spikedace or Loach minnow was eliminated from the Forks Area, it is unlikely either would be restored by colonizers from the East, Middle, or West forks because no fork supports more than a few individuals of either species. Headwater chub was found in much of the sampled portion of the West Fork and Middle Fork and this population likely helps sustain the species in the Forks Area. Continued mechanical removal of nonnative fishes is necessary to aid in maintaining populations of each of these rare species, particularly Spikedace and Loach minnow, in the Gila Forks Area.

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Appendix I

Fishes collected at each sampling location.

Drainage	Location		Date Sampled	UTM-r	UTM-n	UTM-e	Total Area Sampled	AGOCHR	AMEMEL	AMENAT	CATINS	GAMAFF	GILNIG	LEPCYA	MEDFUL	MICDOL	ONCMYK	PANCLA	PIMPRO	PYLOLI	RHIOSC	SALTRU	Grand Total
East Fork Gila	at West Fork Confluence	1	11-May-05	12S	760848	3674860	210.6			2	19		1	1		11	1	6		3			44
	Just Above Lyons Lodge	2	26-Apr-07	12S	763025	3675907	243.9			6	25					8				1			40
	200m Upstream of Black Canyon	3	26-Apr-07	12S	764922	3674404	193.2				11	3				5		4					23
	3 miles downstream from Spring Canyon	4	21-Apr-05	12S	764970	3678016	330			1	5							8					14
	Tom Moore Canyon (downstream of spring canyon)	5	21-Apr-05	12S	764463	3679035	452.35			3	28		1			2	1	5					40
	.5 miles downstream from Diamond Confluence	6	20-Apr-05	12S	763340	3683060	388.4			3	48		3	3		8		10				5	80
	upstream of Main Diamond	7	20-Apr-05	12S	764335	3684738	462.25			1	25					1		5					32
	Below Trails End Ranch On USFS	8	25-Apr-07	12S	765057	3685111	235.62			5	25		7			4		34					75
Middle Fork Gila	2 Miles Upstream From Visitors Center	1	13-May-08	12S	757870	3682238	227.13			1	7							6				2	16
	1 Mile below Little Bear Canyon Trail	2	13-May-08	12S	756508	3685223	320.2				9		2			1	2	11				1	26
	0.5 Miles above Little Bear Canyon	3	14-May-08	12S	754876	3685128	107.5				6		2				3	4				1	16
	Upstream from Jordan Hot springs	4	14-May-08	12S	754206	3687054	358.3			1	8						11	11			89		120
	Below Indian Creek	5	10-Jul-08	12S	749723	3687834	283.2				28						26	24			1	15	94
	Warm Spring Downstream of Meadows	6	10-Jul-08	12S	749291	3688462	75		7	9	1			23									40
	The Meadows	7	10-Jul-08	12S	749114	3688217	258.55				38		7				28	8			14	4	99
	2 Miles upstream of Meadows	8	9-Jul-08	12S	747824	3689464	177.3				8		1				2	2					13
	3.5 Miles upstream from The Meadows	9	9-Jul-08	12S	746952	3690875	164				60		17			2	2	47			21	14	163
	Upstream from Canyon Creek	10	27-Aug-08	12S	741735	3694518	290.6				90		15				2	35			25	3	170
	Below Loco Man Trail	11	27-Aug-08	12S	740935	3695343	160.4				31		7				6	9			21	1	75
	2 Miles Downstream from Iron Creek	12	26-Aug-08	12S	736525	3696340	351.5				42						3	11			41	5	102
	200 meters Upstream of Iron Confluence	13	26-Aug-08	12S	735053	3697634	305.5				124							47			224		395
West Fork Gila	Bridge near heartbar-below MF confluence	1	24-May-06	12S	757049	3679209	264.56	4		24	36		3			5	1	63			1		137
	1 mile upstream from Cliffdwellings	2	23-May-06	12S	753538	3680977	214.3				188		88		119	2	1	39			36	7	480
	1/2 mile upstream from ZigZag trail - 2 miles from Cliffdwellings	3	23-May-06	12S	751898	3681749	282.85				45		23			8	18	31			53	54	232
	4 miles upstream from Gila Cliffdwellings	4	22-May-06	12S	751248	3682453	155.05				63		25			1	10	17	1		35	1	153
	6 miles upstream from Cliffdwellings	5	22-May-06	12S	749941	3682426	662.31				49		10				21	31			126	12	249
	Below Ring Canyon	6	24-May-07	12S	747147	3683565	248.74				22		3				5	35			63	6	134
	Above Phallic Landmark	7	24-May-07	12S	745023	3683855	197.18				17		1				3	21			49	8	99
	Near Caves below Hells Hole	8	25-May-07	12S	744014	3684352	287.51				26		5				4	25			64	11	135
	Hells Hole	9	22-May-07	12S	742515	3684549	293.33				44						2	19			79	2	146
	Hells Hole #2	9.5	25-May-07	12S	742394	3684869	Not Measured				50		3				4	7			53	10	127
	1st Trail Crossing below Pine Flats	10	23-May-07	12S	740288	3684423	232.94				34						19	10			40	9	112
	0.5 Miles below McKenna Creek Confluence	11	23-May-07	12S	738880	3684525	184.6				18						8	12			6	14	58