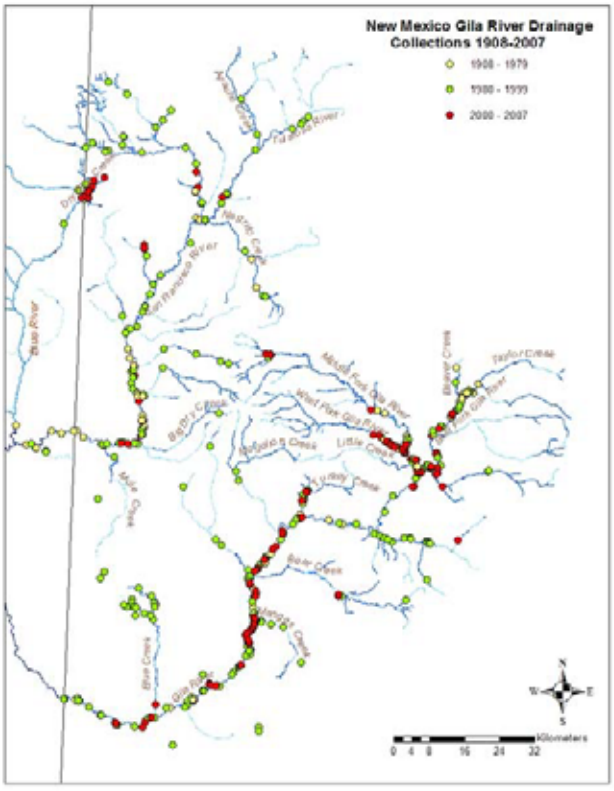
DISTRIBUTION OF SPIKEDACE, LOACH MINNOW, AND CHUB SPECIES IN THE GILA RIVER BASIN, NEW MEXICO 1908 – 2007



Submitted to
U.S. Fish and Wildlife Service and
U. S. Bureau of Reclamation

Yvette M. Paroz and David L. Propst
New Mexico Department of Game and Fish
Conservation Services Division
July 2007

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SUMMARY

Data from Scientific Collecting Permit reports submitted annually to the New Mexico Department of Game and Fish (NMDGF), field notes of NMDGF personnel, agency reports, and museum specimen accession records were compiled to create a database of rare species (Gila chub *Gila intermedia*, headwater chub *Gila nigra*, roundtail chub *Gila robusta*, spikedace *Meda fulgida*, and loach minnow *Tiaroga cobitis*) collection localities in the Gila River drainage in New Mexico. These data were used to create geo-referenced distribution maps for chub species, spikedace, and loach minnow. The period of record was divided into pre-1980, 1980-1999, and 2000-2007 and distribution maps for each period and each species (chubs collectively) were prepared.

Because the three species of chub indigenous to Gila River drainage were only recently recognized (Minckley and DeMarais 2000, Nelson et al. 2004), all chub records were grouped. The range of chub species in the Gila River drainage has declined over the past 100 years. No chub has been collected in the San Francisco River sub-drainage in New Mexico in over 50 years or in the lower mainstem Gila River in almost 15 years. Similarly, spikedace has not been collected in the San Francisco River sub-drainage in New Mexico since the early 1950s. Range of spikedace in the Gila River sub-drainage has also diminished. No spikedace has been captured in the East or Middle forks Gila River since the mid 1990s. Loach minnow persists in both Gila and San Francisco river sub-drainages, but local declines have occurred in each sub-drainage.

INTRODUCTION

Although the Gila River drainage in New Mexico historically supported comparatively few fish species (Table 1), a large proportion of these are endemic (n = 5). Within the Gila and San Francisco rivers and their tributaries, there are three recognized chub species (Minkley and DeMarais 2000, Nelson et al. 2004): roundtail chub *Gila robusta*, Gila chub *Gila intermedia*, and headwater chub *Gila nigra*. Currently, Gila chub is federally listed as 'endangered' (USFWS 2005) and headwater chub is a candidate for federal listing (USFWS 2006). The U.S. Fish and Wildlife Service (USFWS) was petitioned to provide federal protection for roundtail chub, and it determined that federal protection was warranted, but precluded (USFWS 2006). All three chub species are classified as 'endangered' by New Mexico (Propst 1999, Carman 2006). Spikedace *Meda fulgida* is federally protected as threatened (USFWS 1986) and was up-listed to endangered by New Mexico in 2006 (NMDGF 2006). Loach minnow *Tiaroga cobitis* is federally protected as threatened (USFWS 1986) and listed by New Mexico as threatened. Gila topminnow *Poecilia occidentalis* historically occurred in New Mexico, but was extirpated by the early 1960s (Koster 1957, Propst 1999). Though Gila topminnow is federally listed as endangered (USFWS 1967) and is listed as a threatened species by New Mexico, it is not further considered in this document. Gila trout *Oncorhynchus gilae*, federally- (USFWS 2006) and state-listed as threatened (Propst 1999) is also outside the scope of this report.

Table 1. Native fishes of the Gila River drainage in New Mexico.

	Species	Status[1]	Conservation Status[2]
Cyprinidae			
	Longfin dace *Agosia chrysogaster*		common, widespread
	Gila chub *Gila intermedia*	EG	rare, restricted, FWS, NMDGF
	Headwater chub *Gila nigra*	EG	rare, limited, NMDGF
	Roundtail chub *Gila robusta*		rare, extirpated (?), NMDGF
	Spikedace *Meda fulgida*	EG	rare, limited, FWS, NMDGF
	Colorado pikeminnow *Ptychocheilus lucius*	EC	rare, extirpated[3], FWS, NMDGF
	Speckled dace *Rhinichthys osculus*		uncommon, widespread
	Loach minnow *Tiaroga cobitis*	EG	rare, widespread, FWS, NMDGF
Catostomidae			
	Desert sucker *Catostomus clarki*	EC	uncommon, widespread
	Sonora sucker *Catostomus insignis*	EC	uncommon, widespread
	Razorback sucker *Xyrauchen texanus*	EC	rare, restricted[3], FWS
Salmonidae			
	Gila trout *Oncorhynchus gilae*	EG	rare, limited, FWS, NMDGF
Poeciliidae			
	Gila topminnow *Poeciliopsis occidentalis*		rare, restricted, FWS, NMDGF

[1]Status: EG = endemic to Gila River drainage (New Mexico, Arizona, & Sonora) and EC = endemic to Colorado River drainage.
[2]Conservation Status: rare = low abundance in most areas of occurrence, uncommon = low to moderate abundance in most areas of occurrence, common = moderate to high abundance in most areas of occurrence; restricted = ≤10 populations or ≤50 km occupied habitat, limited = 10 to 20 populations or 50 to 100 km occupied habitat, and widespread = ≥20 populations or ≥100 km occupied habitat; FWS = federal protection, NMDGF = state protection. Classification of status and range based on distribution and status in Gila River drainage in New Mexico and protective status based on status in entire range.
[3]Neither Colorado pikeminnow nor razorback sucker was documented in Gila River drainage in New Mexico, but their occurrence just downstream in Arizona indicates both likely entered New Mexico at least seasonally.

There has not been a range-wide, systematic ichthyofaunal inventory of the Gila River drainage since the early 1980s (Propst et al. 1986, Propst et al. 1988). Since then considerable sampling has been conducted in portions of Gila River drainage supporting warmwater fish assemblages in New Mexico, but most is at annually sampled permanent sites. This information provides insight to the status of each species and population trends at these locations, and is likely reflective of trends in the general vicinity of each site. Other than permanent site sampling, information on Gila drainage warmwater fish assemblages has been sporadically collected over past 20 years.

This document is a compilation of collection records from four primary sources: NMDGF Scientific Collecting Permit annual reports, field notes of NMDGF personnel, agency reports, and museum accession records of fishes collected in the Gila River drainage in New Mexico. Data from collections made in coldwater stream reaches (and outside range of target species) were not included in this report. Because it is a compilation of data from existing sources, this report is not a comprehensive assessment of the distributional status of each rare

species. Rather, this document is intended to provide a general overview of current distributional status of each rare species in the Gila River drainage of southwest New Mexico.

METHODS

Fish collection records from warmwater reaches of the Gila River drainage (Figure 1) were compiled from field notes of NMDGF personnel, agency reports, NM Scientific Collection Permit annual reports, and accession records of museums holding Gila River drainage, New Mexico specimens. Information for each record included date, collector(s), location (general, Range-Township-Section, Latitude-Longitude, or UTM), number of specimens of chubs, spikedace, and loach minnow captured or if no rare fish was captured. For information obtained from annual scientific collection reports, no effort was made to evaluate collection effort, methods used, or identification skills of collector(s) Identities of all museum specimens were confirmed by museum personnel, but data on methods and effort to obtain these specimens were not consistently available and thus not used. Museum records were used only if a target species

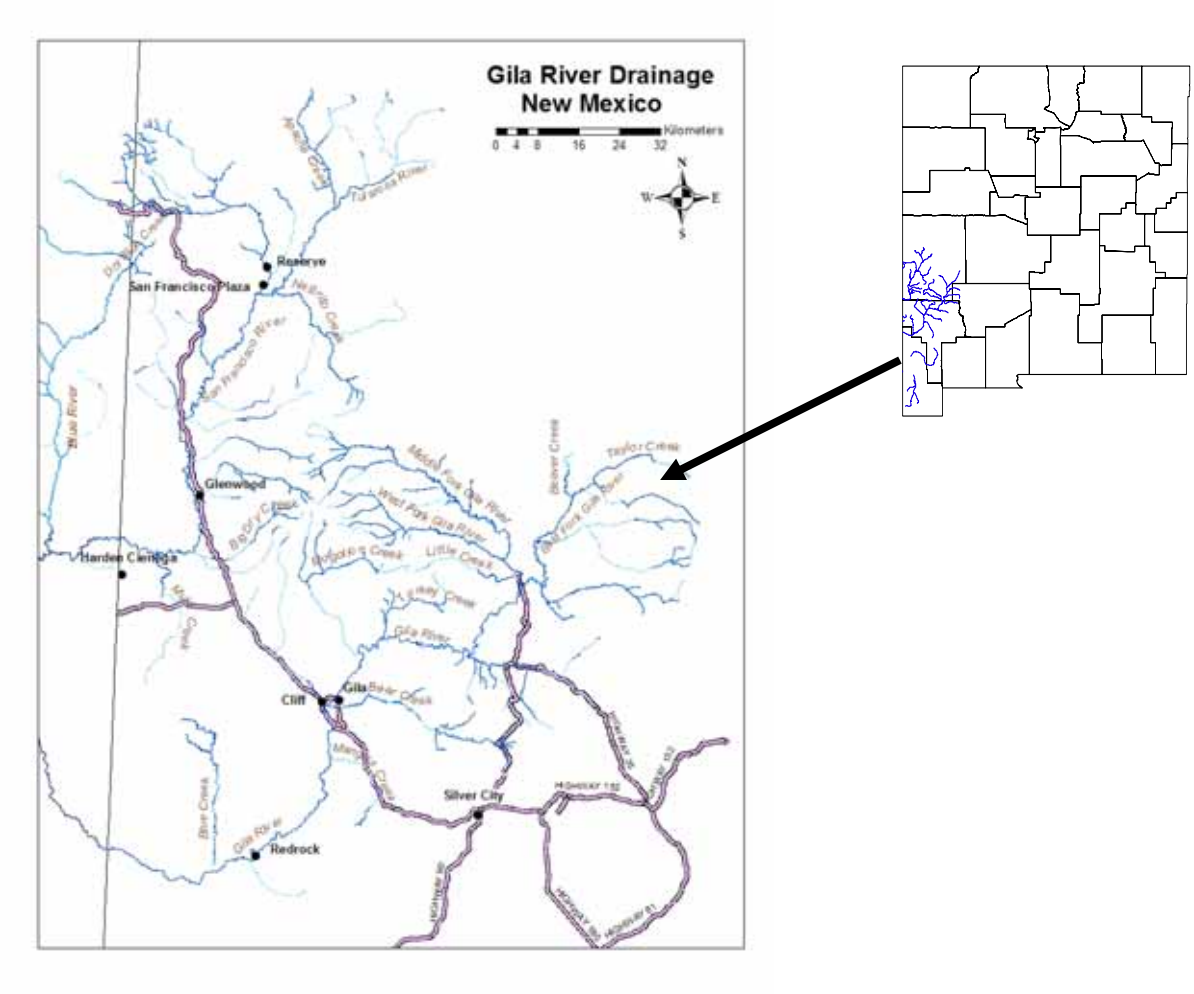


Figure 1. Gila River drainage in New Mexico and adjacent Arizona.

(*Gila sp*., spikedace, or loach minnow) was present, no effort was made to quantify number of sampling occasions where target species were not captured. Museum records were found for the target species at American Museum of Natural History, Arizona State University, Eastern New Mexico University, New Mexico State University, Smithsonian National Museum of Natural History, Tulane University Museum of Natural History, University of Kansas Natural History Museum, University of Michigan Museum of Zoology, and University of New Mexico Museum of Southwest Biology. Records were cross-checked to avoid duplicating collection localities. Most recent (since mid 1990s) collection records were geo-referenced with a GPS reading (UTM or latitude-longitude). For those collections lacking a GPS reference, physical location descriptions were used to locate the collection site, if possible. If the location description was deemed too general (e.g., East Fork Gila or San Francisco River) to enable location within 15 km, collection data were not used to construct maps. Most records are for collections in New Mexico, but data for several collections made by NMDGF personnel in adjacent areas of Arizona were mapped.

The collection record was divided into three periods; pre-1980, 1980-1999, and 2000-2007. Site-specific data were converted into a GIS data layer for mapping of collection locations on a Gila-San Francisco River drainage map. For each period, all collection localities for each species were mapped with incrementally-sized circles. Circle size was based on number of individuals collected on a specific sampling occasion. Mapping thusly provided a rough measure of abundance of each species where collected. Chubs were grouped because the taxonomy of the Gila River drainage chubs (hereinafter 'roundtail chub complex') has changed considerably over past 30 years, and remains somewhat in flux. Localities sampled during a given period but where species of interest was not collected were denoted with 'No Rare Fish' symbol.

The American Fisheries Society did not recognize Gila chub as a species separable from roundtail chub, until 1991 (Robins et al. 1991). Minckley and DeMarais (2000) subsequently split remaining Gila River basin roundtail chub complex members into two species, roundtail and headwater chubs. Thus, specimens reported in 1980s and earlier as roundtail chub instead might be headwater chub or Gila chub (for example, see Bestgen and Propst 1986). Although location of collection provides some indication of species, it is an imprecise approach and therefore not used to reclassify chub specimens collected prior to 2000. Minimally, re-classification of specimens from a location requires examination of each specimen to ensure its correct identification. Many of the reported specimens were released or otherwise not available for examination and thus confirmation of identity was not possible.

RESULTS

Collections and Collectors

A total of 1739 collection records were located and used to develop maps for rare Gila River drainage fishes (Table 2). The first collections used in this report were made in 1908 and the most recent in spring 2007. There were 34 New Mexico records for which the location description was too vague to enable location within 15 km and 19 locations in Arizona that were

outside of the map scope or had no UTM reference. Records used represented 2,509 individuals of *Gila sp*., 34,709 *Meda fulgida*, and 18,755 *Tiaroga cobitus* specimens.

Table 2. Number of collection records containing loach minnow, spikedace, and Gila River chubs during each sampling period in New Mexico.

	Total	Pre 1980	1980-1999	2000-2007
Gila sp.	199	42	116	41
Meda fulgida	519	87	290	142
Tiaroga cobitus	767	112	498	157
No Rare Fish	243	12	176	55

Sampling was fairly evenly distributed over the Gila River drainage during the period of record (Figure 2). The most notable sampling gaps during the pre-1980 period were San Francisco River upstream of Reserve, San Francisco River from near Negrito Creek confluence downstream to US 180 bridge, upper warmwater reaches of West and Middle forks Gila River, middle reach of East Fork Gila River, Gila Wilderness reach of mainstem Gila River, and Gila River downstream of Redrock. During the 1980-1999 period, almost all permanently watered warmwater stream reaches were sampled. Upstream warmwater reaches of West and Middle forks Gila River, however, remained unsampled. Since 2000, sampling has been concentrated in the Gila River forks area, mainstem Gila River in Cliff-Gila Valley, mainstem Gila River near Middle Box mouth, Tularosa River near Reserve, San Francisco River near Glenwood, and Dry Blue Creek.

From the late 1940s through 1960s, considerable sampling in the Gila River drainage was by University of New Mexico professor W.J. Koster and students (K. Rafferty, Jr., K.R. Coburn and G.C. Kobetich). Koster's Fishes of New Mexico (1957) contained the first published general accounting of Gila River drainage fishes. It and Huntington (1955) also provided the first comprehensive accounts of native fishes distribution in the Gila River drainage of New Mexico. Subsequently, LaBounty and Minckley (1972) provided a second drainage-wide characterization of its fish fauna. Most collecting during the 1970s was by P.R. Turner (New Mexico State University) and students (R. M. Anderson and K.D. Britt) and yielded two master theses (Anderson 1978, Britt 1982). Much of the sampling in the 1980s was accomplished by D. L. Propst, K.R. Bestgen, and C.W. Painter. Their work yielded a masters thesis (Bestgen 1985) and several publications (Bestgen et al. 1987, Bestgen and Propst 1989, Propst et al. 1986, Propst et al. 1988, and Propst and Bestgen 1991). Larval fishes collected during the 1980s contributed to development of a key for the identification of Gila River basin larval fishes (Snyder et al. 2005). Rinne (1989, 1991) and Douglas et al. (1994) provided additional information on life history and habitat of loach minnow and spikedace in New Mexico. Since the early 1990s, most sampling in the Gila River drainage has been by NMDGF personnel (D.L. Propst, A.L. Kingsbury, and Y.M. Paroz), U.S. Forest Service (J.A. Monzingo, A.J. Telles, J.A. Stefferud, and J.N. Rinne), and Western New Mexico University (D.M. Miller). Recent publications include Rinne and Miller (2006) and Paroz et al. (2006).

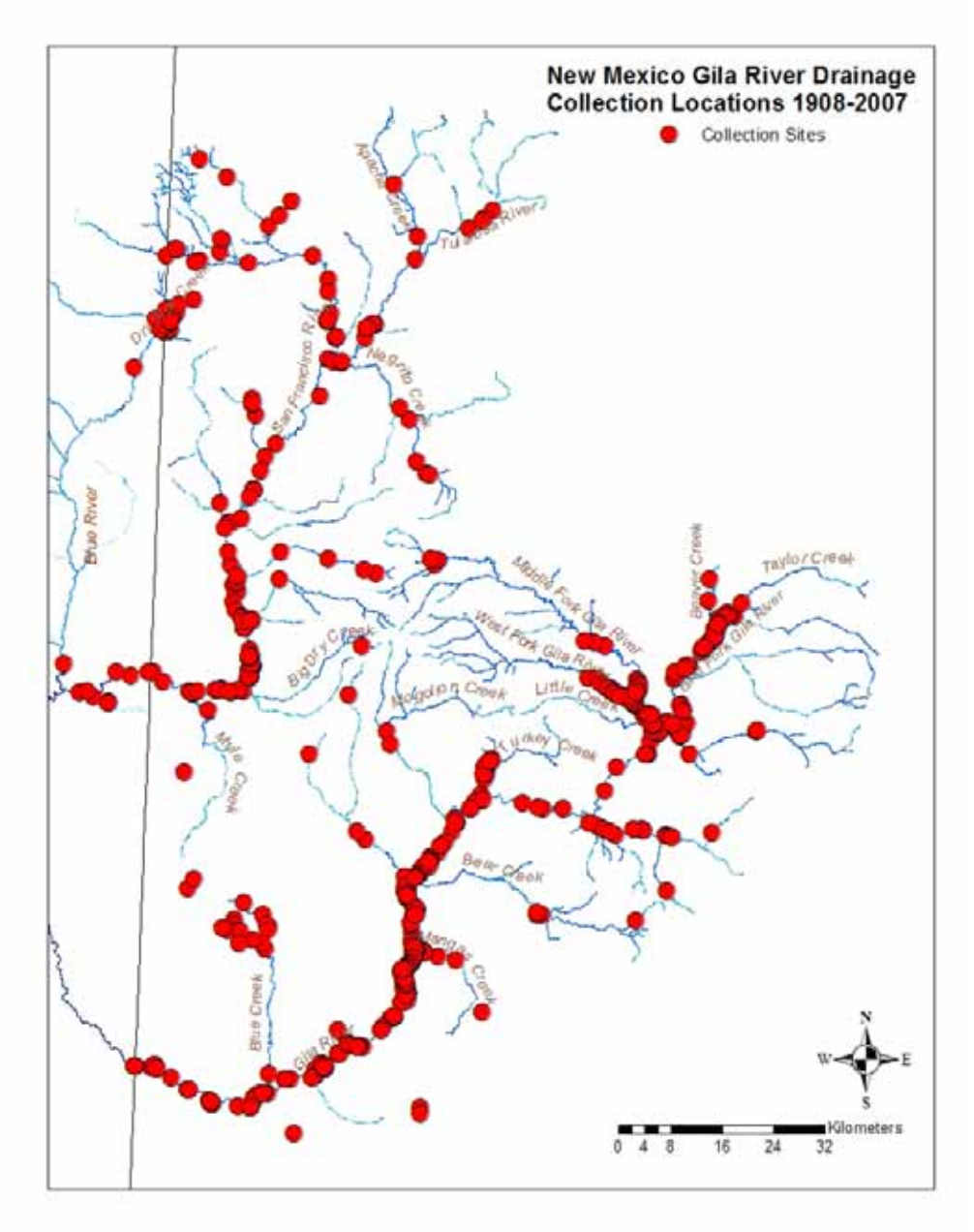
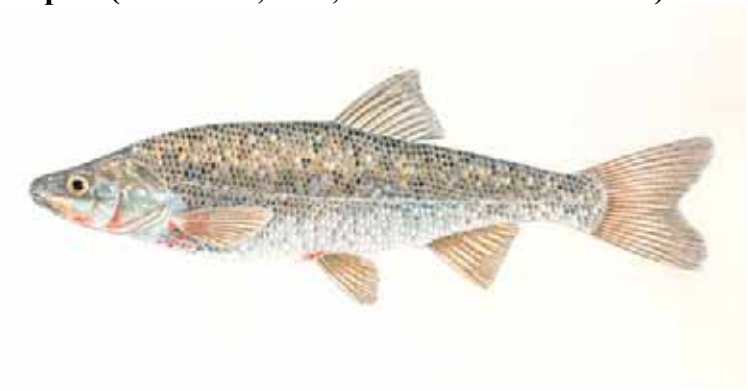


Figure 2. Fish collection sites in Gila River drainage in New Mexico and adjacent Arizona from 1908 through spring 2007.

Roundtail Chub Complex (Roundtail, Gila, and Headwater Chubs)



Headwater chub, W.H. Brandenburg

Roundtail Chub Complex Distribution

Prior to 1980, chubs were found in each of the Gila River forks and mainstem Gila River from Redrock upstream to near Sapillo Creek confluence. Based upon UNM-MSB specimens, mainstem Gila River chubs were likely roundtail chub and those in Gila River forks were likely headwater chub (W.H. Brandenburg, UNM-MSB, pers. com., 2006). From 1980 through 1999 chubs were irregularly collected throughout mainstem Gila River and in Gila River forks (Figure 4). Specimens from mainstem Gila River between Redrock and Mogollon Creek confluence reach were likely roundtail chub, but specimens found upstream in Gila Wilderness reach might have also included headwater chub. Although no sampling occurred in the Gila River wilderness reach during 2000-2006, there has been extensive sampling elsewhere on the mainstem Gila River and none of these efforts yielded a chub specimen downstream of the forks area of the Gila River (Figures 3, 4, and 5).

No chub specimen has been collected in the San Francisco River in New Mexico since 1948. Koster and Rafferty collected what they identified as roundtail chub just upstream of Big Dry Creek confluence. These specimens were deposited with Museum of Southwest Biology, University of New Mexico. Morphomeristic measurements indicated that these specimens are consistent with the characteristics of roundtail chub provided by Minkley and DeMarais (2000; W.H. Brandenburg, UNM-MSB, pers. com. 2006).

Gila chub was collected in the pre-1980 period in Harden Cienega, a San Francisco River tributary that headwaters in New Mexico but whose permanently-watered reaches are in Arizona. It was documented again (in Arizona portion of stream) in the 1980-1999 period and continues to persist there (D. Weedman, Arizona Game and Fish Department [AZGFD], pers. com. 2007). Turkey Creek, a Gila River tributary, supports a presumed population of Gila chub (Propst 1999). However, Schwemm (2006) found that Turkey Creek chubs are genetically quite similar to Gila River forks headwater chub. Insufficient analyses have been conducted to definitively resolve the taxonomic status of this population. This population was discovered in the pre-1980 period and its persistence has been documented in each subsequent period.

Chub specimens were collected in each sampling period in each Gila River fork. Based upon specimens (collected in late 1940s) from Beaver Creek, an East Fork Gila River tributary, and accessioned to UNM-MSB, these chubs were likely headwater chub (W.H. Brandenburg, MSB,

pers. com 2006). It is likely, but not confirmed by specimen examination, that chubs collected from West and Middle forks pre 1980 were also headwater chub. All recently collected chubs in the Gila Forks have been field identified as headwater chub. Chubs were collected in the Middle Fork of the Gila from 2000 through 2007, but with a 4-year hiatus when no chub was collected (2003 through 2006); sampling in the drainage, however, has been limited mainly to a site near Gila Wilderness Visitor Center near the confluence with the West Fork Gila River. Headwater chub is generally distributed in warmwater reaches of the West and East forks Gila River, though only adult chubs have been collected in East Fork Gila River since 2001. Recent sampling and angler reports (N.W. Smith pers. com. 2007) documented chubs throughout a 23 km reach of West Fork Gila River above the confluence with the Middle Fork Gila River to Hells Hole.

Roundtail Chub Complex Abundance

In the pre-1980 sampling period, collections of 11 to 100 specimens were made on the San Francisco River, East and Middle forks Gila River, and mainstem Gila River downstream of Turkey Creek confluence. The largest chub collection was from Turkey Creek. Few collections yielded more than 10 specimens during the 1980-1999 period. Comparatively large numbers were found only in East and Middle forks Gila River and Turkey Creek. During the most recent sampling period (2000-2007), only a few chub collections had more than 25 individuals. Over 200 individuals were collected in Turkey Creek in 2004 and in 2006 large numbers (88) of juvenile chubs were collected from the West Fork Gila River.

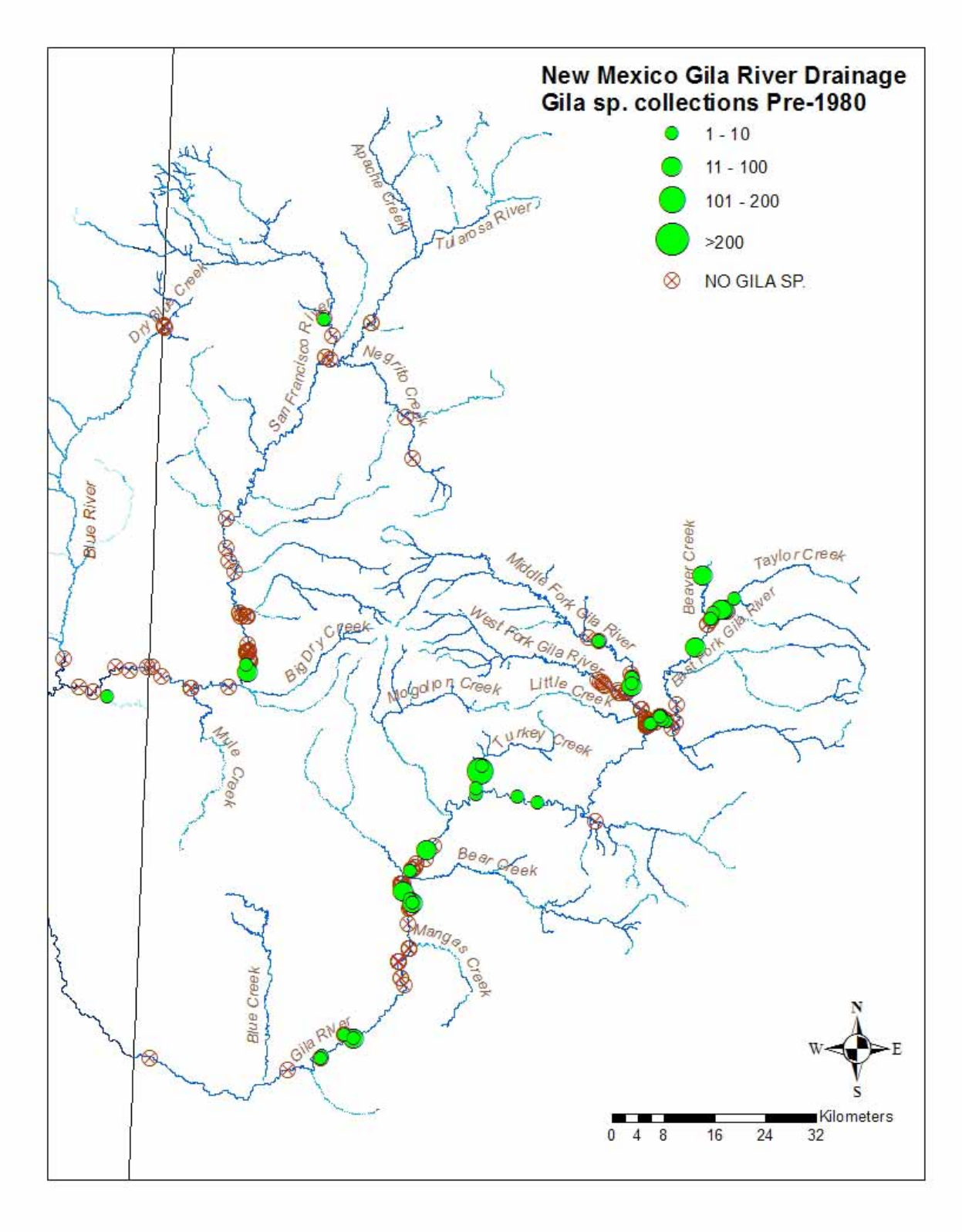


Figure 3. Distribution of *Gila sp.* collected prior to 1980 in New Mexico and proximal Arizona.

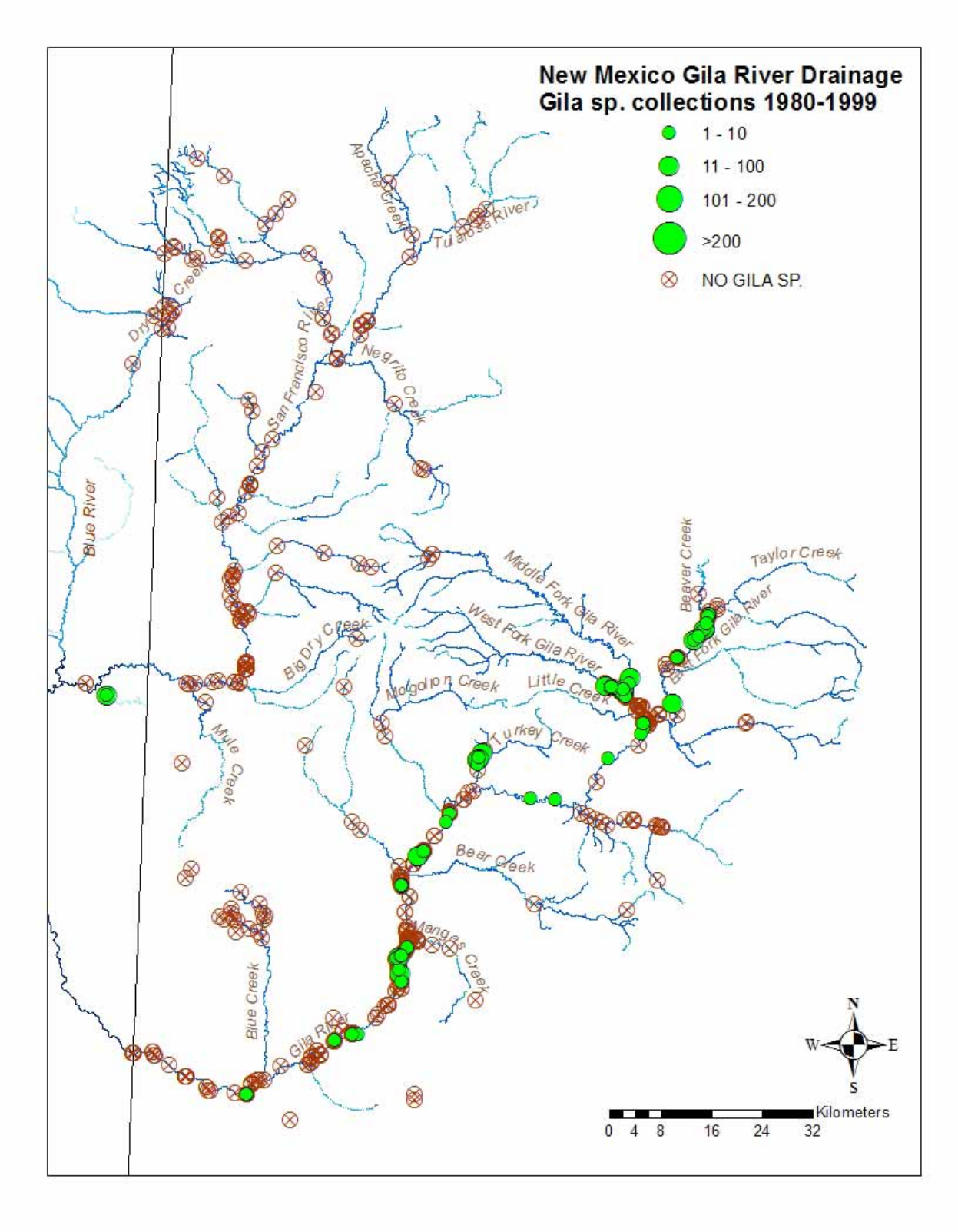


Figure 4. Distribution of *Gila sp.* collected from 1980 through 1999 in New Mexico and proximal Arizona.

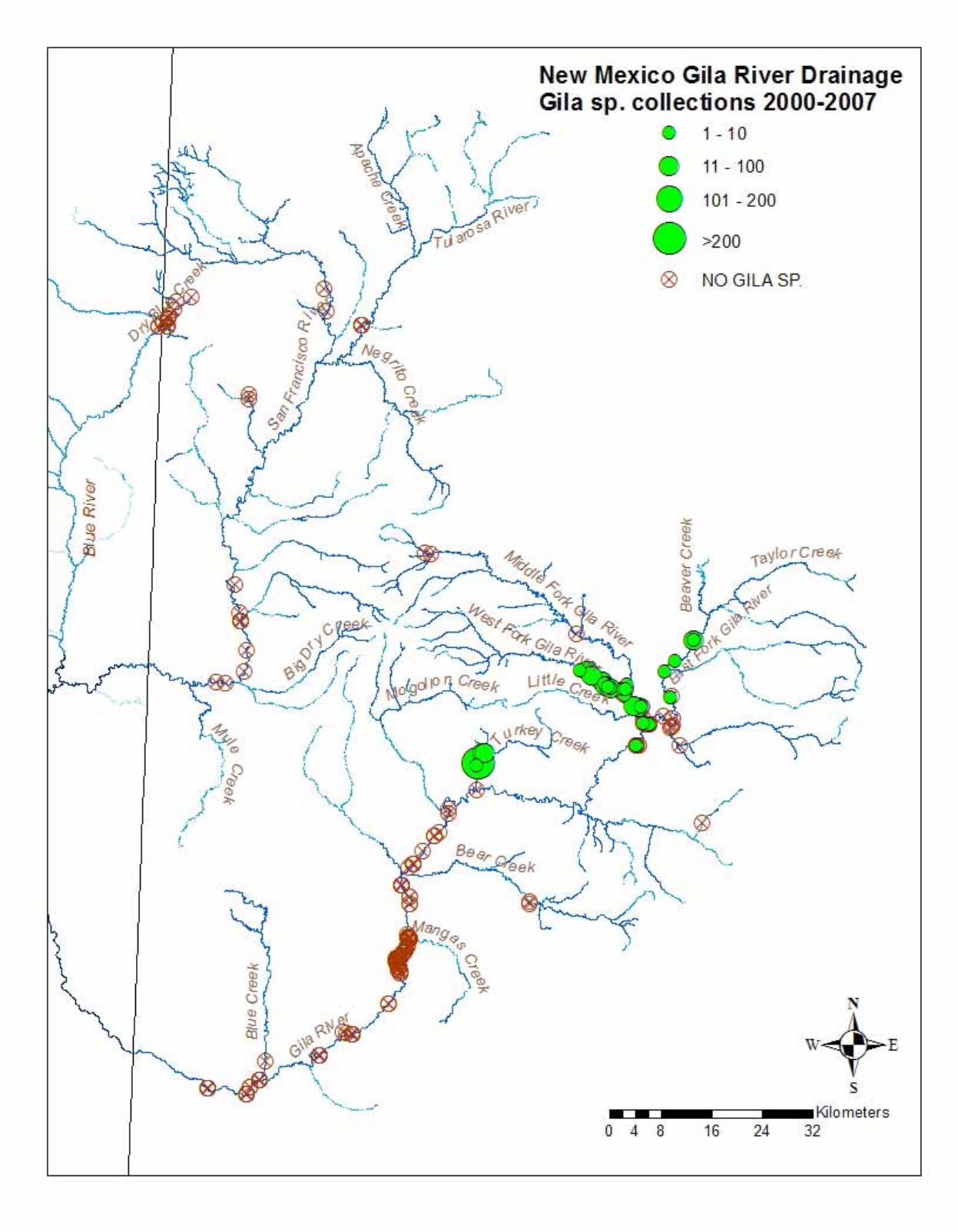
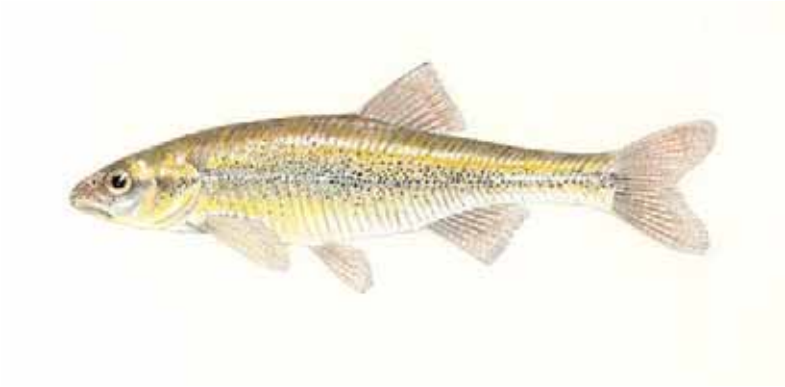


Figure 5. Distribution of *Gila sp.* collected from 2000 through April 2007 in New Mexico and proximal Arizona.

Spikedace



Spikedace, W.H. Brandenburg

Spikedace Distribution

Similar to chub species, spikedace was extirpated from the San Francisco River sub-drainage in New Mexico. It was last collected there in 1950 by W. J. Koster. Prior to 1980, spikedace was collected in much of the mainstem Gila River and in each of its forks (Figure 6) in New Mexico. It, however, has never been reported in the Gila Wilderness section of the mainstem Gila River. Despite extensive sampling, spikedace was not collected in the San Francisco River sub-drainage during the 1980-1999 period (Figure 7). With the exception of one collection in Mangas Creek, all spikedace collections during this period were from the mainstem Gila River and its forks. Currently, the reach of the Gila River between Cliff and Redrock is the only reach where spikedace is regularly collected (Figure 8). The species persists in the lower West Fork Gila River, and is irregularly collected in the Middle (2003) and East forks of the Gila River (2000, 2001, & 2003).

Spikedace Abundance

Collections of several hundred spikedace from a single location were comparatively common in the pre-1980 sampling period. Most of these collections were in the Cliff-Gila Valley reach of the Gila River, but several similar-sized collections were from the Gila River forks area. Collections of several hundred spikedace at Cliff-Gila Valley reach sites continued through the next sampling period (1980-1999) and several numerically large collections were made in the Gila River in the vicinity of Redrock. Spikedace continued to be regularly collected in the Gila River forks area, but most collections were of ≤300 individuals. Comparatively small collections (≤100 individuals) were made at several locations in the Gila River downstream of Blue Creek confluence. In the most recent sampling period, greatest numbers of spikedace were collected from Gila River in vicinity of Gila Bird Area. Elsewhere in Gila River sub-drainage, spikedace numbers were substantially lower (rarely exceeding 50 individuals) than in previous collecting periods.

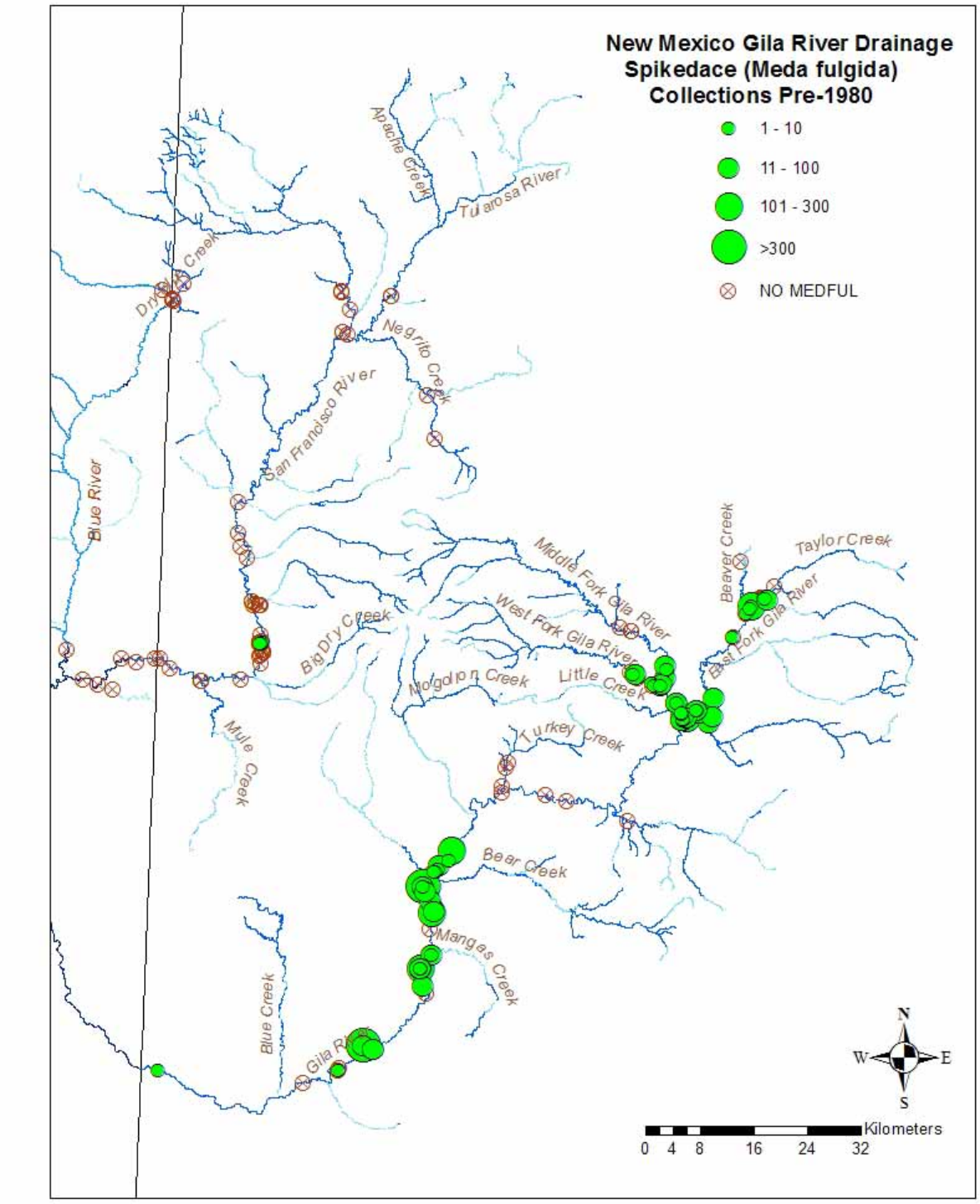


Figure 6. Distribution of *Meda fulgida* collected prior to 1980 in New Mexico and proximal Arizona.

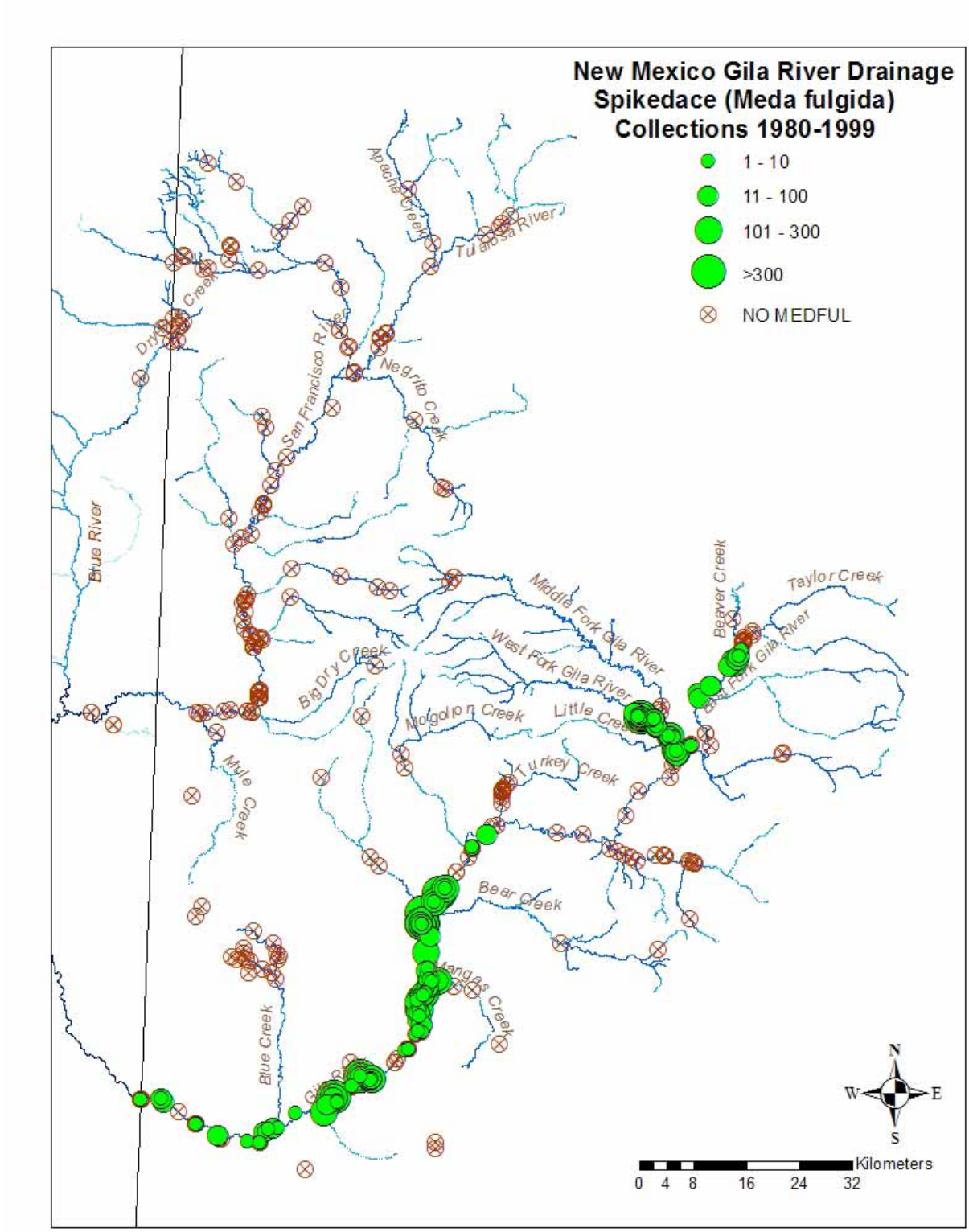


Figure 7. Distribution of *Meda fulgida* collected from 1980 through 1999 in New Mexico and proximal Arizona.

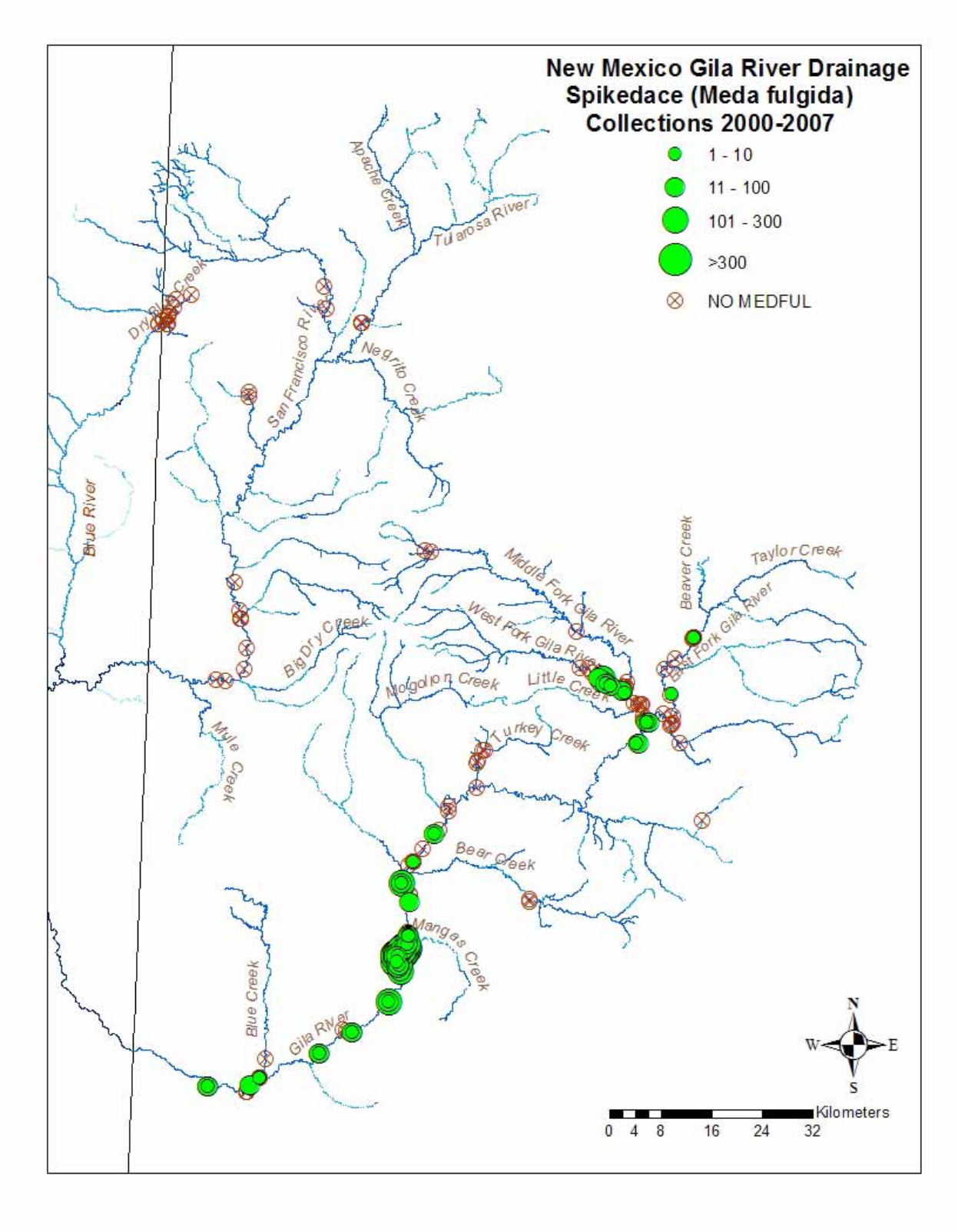


Figure 8. Distribution of *Meda fulgida* collected from 2000 through April 2007 in New Mexico and proximal Arizona.

Loach Minnow

Loach minnow, W.H. Brandenburg

Loach Minnow Distribution

In the pre-1980 sampling period, loach minnow was found at a comparatively large proportion of the warmwater sites sampled in both the San Francisco and Gila rivers sub-drainages (Figure 9). Notable exceptions were the Gila Wilderness reach of Gila River downstream of Sapillo Creek confluence and Gila River in vicinity of Redrock (except one collection). During the 1980-1999 period, much of Gila River drainage that had not been sampled in the previous period was inventoried (Figure 10). These efforts found loach minnow more widely distributed in Dry Blue Creek, San Francisco and Tularosa rivers confluence in vicinity of Reserve, San Francisco River upstream of Glenwood, and East Fork Gila River between its confluences with West Fork Gila River and Beaver Creek than pre-1980 collections indicated. This more broadly documented distribution, however, was not a range expansion, but, rather, a consequence of more thorough and complete inventory of the Gila River drainage in New Mexico. Although loach minnow was found in substantial portions of the Gila River drainage in New Mexico, it was not found in the Gila Wilderness reach of the Gila River and the San Francisco River between San Francisco Plaza and Reserve (though comparatively few collections were made in this reach). During the 2000-2007 period, sampling was less extensive than in preceding periods (Figure 11). Generally, loach minnow was present in reaches where it was previously documented. Very few loach minnows have been collected recently in the Gila Forks area. It is sporadically collected in the West and Middle forks Gila River and has not been collected in the upper East Fork Gila River since 2001. Loach minnow was last collected in the Tularosa River in 2002.

Loach Minnow Abundance

Loach minnow is annually collected in large numbers (>100 individuals) in the Gila Bird Area south of Cliff. Elsewhere, recent collections are normally smaller (less than 25 individuals). In the 1980-1999 period comparatively large numbers (>75) of loach minnow were collected at the permanent site in the San Francisco River near Glenwood. Though they are still present, normally fewer than 25 individuals are collected in a given year with similar effort.

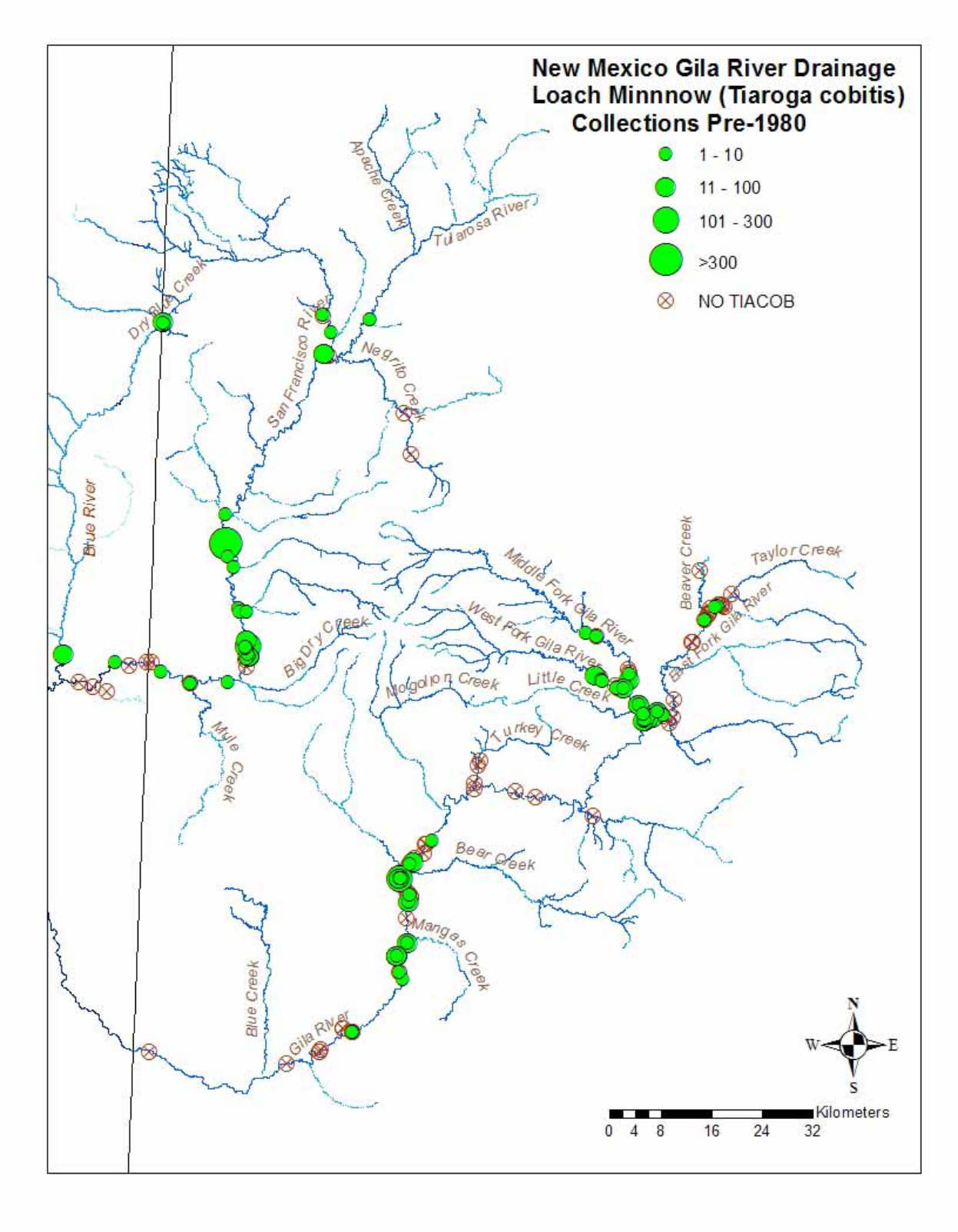


Figure 9. Distribution of *Tiaroga cobitis* collected prior to 1980 in New Mexico and proximal Arizona.

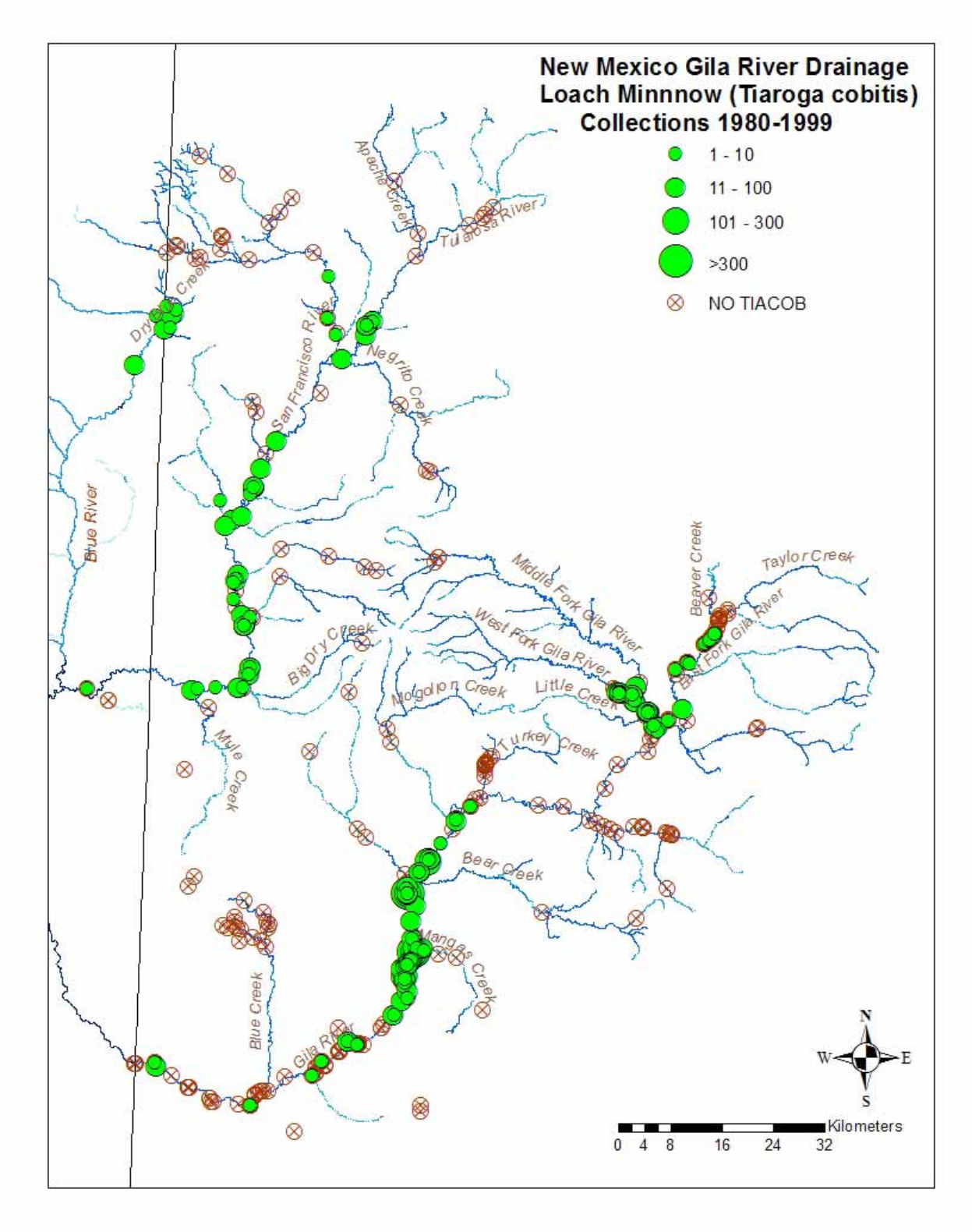


Figure 10. Distribution of *Tiaroga cobitis* collected from 1980 through 1999 in New Mexico and proximal Arizona.

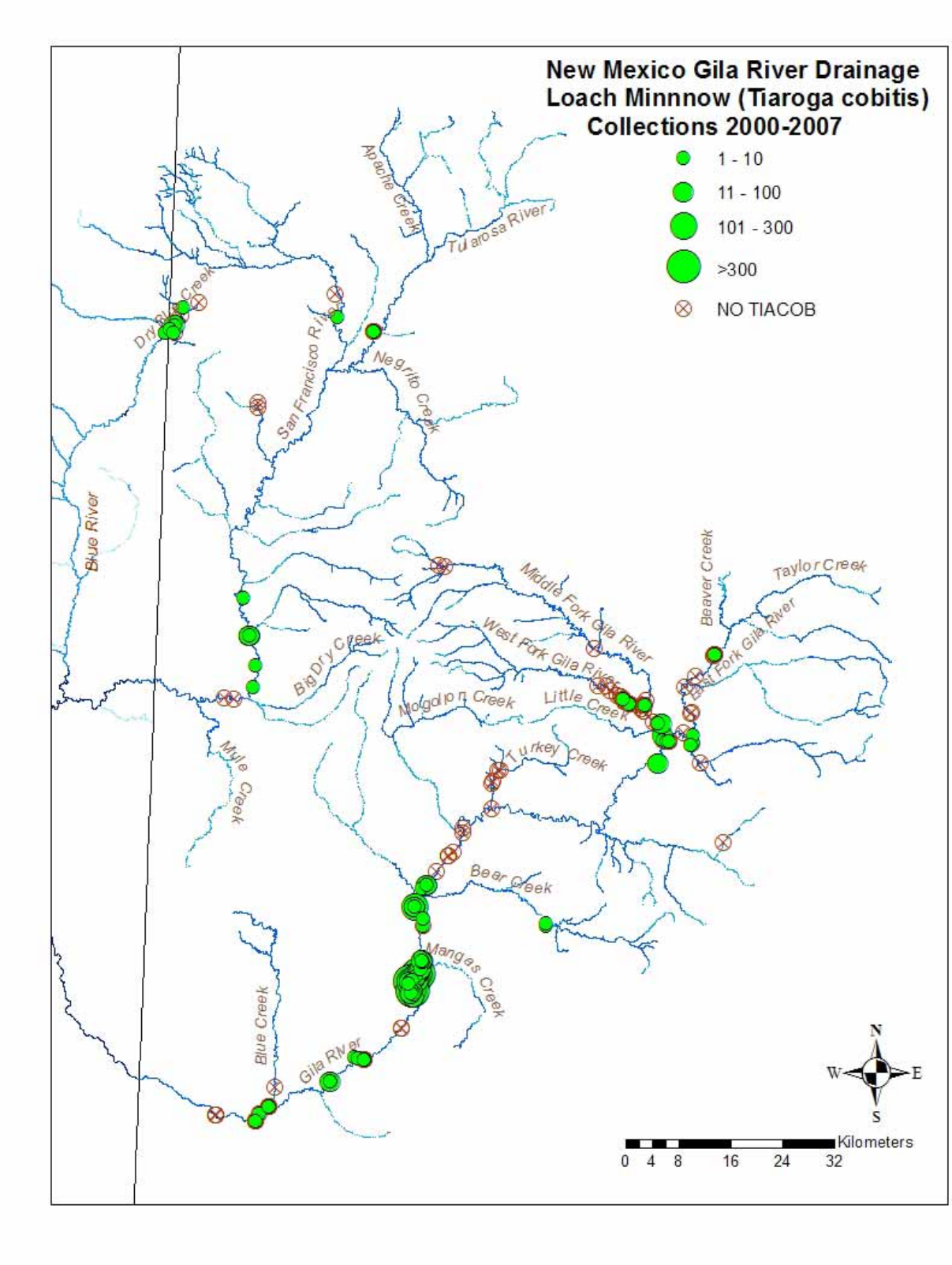


Figure 11. Distribution of *Tiaroga cobitis* collected from 2000 through April 2007 in New Mexico and proximal Arizona.

DISCUSSION

Although the map sets presented herein do not represent an absolute assessment or rigorously quantified characterization of abundance trends, status, or distribution of each species in New Mexico, they do provide a visual and comparatively accurate overview of their current status and how that has changed for each species over the past 100 years. Over the period of record reported herein, most permanently-watered stream reaches were sampled. This analysis, however, indicates stream reaches needing additional inventories or, in several instances, reaches where sampling has never occurred. Portions, or all, of Mule, Pueblo, and Negrito creeks (San Francisco River tributaries) and San Francisco River in the upper San Francisco Box (between Reserve and Luna) have never been adequately sampled. Although unlikely, it is possible one or more support rare fish populations. In addition, there are several stream courses that provide marginal habitat (e.g., Deep Creek, Bear Canyon, and Duck Creek) that merit sampling. Although each reach has been sampled within past 30 years, additional, and perhaps more intensive, sampling of San Francisco River drainage upstream of Luna, San Francisco River between Reserve and US 180 bridge, lower reaches of Whitewater Creek, and San Francisco River from Big Dry confluence downstream to Arizona/New Mexico border would more precisely document distribution of loach minnow in the San Francisco River subdrainage. In the Gila River sub-drainage, additional surveys in Gila River in Gila Wilderness reach, Middle Box reach, and Blue Creek headwaters are needed. Very little sampling has occurred in warmwater reaches of West and Middle forks Gila River upstream of the area of their confluence. Inventories of both forks, as well as East Fork Gila River, are currently being conducted by NMDGF and USFS Gila National Forest. Although few rare species populations were detected in surveys since the 1980s, intensive and systematic surveys of these reaches would provide more current documentation of ranges of all species and eliminate questions regarding distribution and status of each species.

In New Mexico the Gila River drainage historically supported a comparatively small native fish fauna (13 species), but one with a high degree of endemism (5 species). Although neither Colorado pikeminnow *Ptychocheilus lucius* nor razorback sucker *Xyrauchen texanus* was ever collected from the Gila River drainage within New Mexico, the collection of both a comparatively short distance downstream in Arizona prompted LaBounty and Minckley (1972) to infer that both likely occurred historically in the Gila River drainage in New Mexico, at least seasonally. Four species (longfin dace, speckled dace, desert sucker, and Sonora sucker) remain comparatively common in the Gila River drainage in New Mexico (NMDGF, unpublished data). However, a compilation and synthesis of data on their distribution and status, such as that conducted herein for rare species, is needed. Gila topminnow was extirpated, but efforts are underway to restore it to NMDGF Redrock Wildlife Area. Roundtail chub is perhaps extirpated from the Gila River drainage in New Mexico; no confirmed specimen has been collected in at least 15 years. Gila chub, if it persists in New Mexico, occurs as a single population in about 2 km of Turkey Creek. Headwater chub appears limited mainly to the Gila River forks, less than 60 km of habitat, and has declined in abundance in these reaches in past 15 to 20 years, especially in the East and Middle Forks. No chub species has been documented in the San Francisco sub-drainage in more than 50 years. Spikedace was eliminated from the San Francisco River sub-drainage by late 1950s and its range in the Gila River sub-drainage has declined in past 20 years. Currently, it is moderately common only in about 8 km of the Gila River in

vicinity of Gila Bird Area. Loach minnow persists in much of its historical Gila River drainage range in New Mexico. It has, however, declined in abundance at many locations of historical occurrence and may be eliminated from several reaches (e.g., upper Tularosa River and Middle Fork Gila River).

The range and abundance of each spikedace, loach minnow, headwater chub, and Gila chub have declined considerably over the past 100 years, and roundtail chub is likely extirpated from the Gila River drainage in New Mexico. Additional loss of range and reduction in abundance of each species will further compromise their conservation and increase the probability that each will be extirpated.

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