Report to New Mexico Department of Game and Fish
Share with Wildlife Program

Investigation of the current distribution of the Northern Leopard Frog (*Rana pipiens*) in New Mexico, 2023

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OBJECTIVES

The objectives of this investigation are to understand the current distribution of the northern leopard frog (*Rana pipiens*) in New Mexico through surveys of recent and historic localities for this species and to collect tissue samples from captured northern leopard frogs and other amphibians to submit for *Batrachochytrium dendrobatidis* (*Bd*) infection analysis.

INTRODUCTION

During the varied history of leopard frog study (1782 to present), there has been considerable evolution in our understanding of species and their relationships to one another. At one time, all leopard frogs were considered *R. pipiens*, which later gave rise to the "*R. pipiens* complex" designation (Hillis et al. 1983). As our understanding increased with new species descriptions based on morphology, call variables, genetics, and habitat uses, the variation in this group of frogs became evident. All "true frogs" are in the family Ranidae and until recently, those in North America were categorized in the genus *Rana*. Frost et al. 2006 proposed generic nomenclatural changes in North American anurans which are not universally accepted within the herpetological community (Pauly et al. 2009). There are currently approximately 27 leopard frog species known in the New World which range from Canada in the north to Panama in the south (Hillis and Wilcox 2005), three of which are believed to be extinct and eight of which have not been described. There are five species of leopard frogs known to be native in New Mexico. These five species represent three separate clades within the *R. pipiens* "complex" (Hillis and Wilcox 2005); three of the five species have experienced declines in the last 40 years. The lowland leopard frog (*Rana yavapaiensis*) is state listed as endangered and is likely extirpated in NM, as only one observation has been reported in the last 23 years (Christman and Painter 2000). The Chiricahua leopard frog (*Rana chiricahuensis*) was listed as threatened under the Endangered Species Act (ESA) and has experienced a >70% decline in populations in Arizona and New Mexico (USFWS 2002). The northern leopard frog (*R. pipiens*) population that occurs west of the Mississippi was proposed for listing; however, a 12-month status review did not recognize differences between eastern and western populations (USFWS 2011).

R. pipiens ranges from southern Quebec west to extreme southern Mackenzie District of Canada, south to Pennsylvania and Kentucky in the east, with isolated records in Maryland and West Virginia. It occurs west to the Pacific states; south to Nevada, Arizona, and New Mexico; and throughout the Rocky Mountain states (Degenhardt et al. 1996 and Stebbins 2003). It occurs in a broad array of elevations from near sea level to ca. 3050 m and its habitats include any slow-moving freshwater in grasslands, shrublands, woodlands, and forests (Stebbins 2003).

R. pipiens is listed as a Species of Greatest Conservation Need (SGCN) in New Mexico (New Mexico Department of Game and Fish [NMDGF] 2016), but this species currently has no legal protection in New Mexico except from commercial collection. *R. pipiens* is considered vulnerable (S3) in the state of New Mexico by NatureServe (https://www.natureserve.org/). Recently, the Center for Biological Diversity and other environmental groups petitioned the U.S. Fish and Wildlife Service (USFWS) to list the western populations of *R. pipiens* under the Endangered Species Act, recognizing its vulnerable status in the southwest (Nichols 2006).

Declines have been reported throughout the range of *R. pipiens*, but mostly in the west. These areas include Alberta and British Columbia in Canada and Montana, Idaho, Washington, Oregon, California, and Nevada (Stebbins 2003, Lannoo 2005); parts of Utah (Lannoo 2005), and Colorado (Corn and Fogelman 1984; Hammerson 1999); Arizona (Clarkson and Rorabaugh 1989); and New Mexico (NMDGF, C. W. Painter and R. D. Jennings *unpubl. data*) in the United States (U.S.).

In New Mexico declines have been reported from the Lower Rio Grande (below Caballo Reservoir), in the Jemez Mountains (*pers. obs.*, Cummer et al. 2002), and in the Chuska Mountains (Painter and Jennings *unpubl. data*). The suggested reasons for *R. pipiens* declines have varied as our understanding of the scope of worldwide declines has increased; amphibian pathogens such as the emerging chytridiomycetes pathogen, *Batrachochytrium dendrobatidis* (*Bd*) are more widespread and problematic within amphibian populations than other threats. *Bd* is considered an emerging pathogen on a world scale (Daszak et al. 2000) and has been implicated as the primary factor in the declines of amphibians in the Western U.S. (Corn 2003, Fellers et al. 2001), Central America and Australia (Berger et al. 1998), and others. *Batrachochytrium dendrobatidis* has been documented in North America (Quebec) as early as 1961 (Ouellet et al. 2005), in New Mexico as early as 1984 (Christman and Jennings 2018) and has been shown to have originated in Asia in Korea (O'Hanlon et al. 2018). This pathogen has been documented on every continent except the South Pole. In New Mexico *Bd* is known from every major river drainage (Christman and Jennings 2018) where there are 12 species of amphibians which have been documented to be infected with *Bd*; two salamanders (Jemez Mountains salamander, *Plethodon neomexicanus* and barred tiger salamander, *Ambystoma mavortium*), and 10 anurans representing four families (cricket frog, *Acris crepitans*; boreal chorus frog, *Pseudacris maculata*; boreal toad, *Bufo boreas*; southwestern toad, *Bufo microscaphus*; Woodhouse's toad, *Anaxyrus woodhousii*; plains leopard frog, *Rana blairi*; American bullfrog, *Rana catesbeiana*; Chiricahua leopard frog, *Rana chiricahuensis*; and northern leopard frog, *R. pipiens*). Ranid frog species have been the most affected by *Bd* with *Rana chiricahuensis* being the most affected (70% or more decline in populations in NM and AZ). *Rana catesbeiana*, *R. pipiens,* and *Ambystoma tigrinum* have been implicated as potential carriers or reservoir species of *Bd* (Daszak et al. 2004, Woodhams et al. 2008, and Davidson et al. 2003), a designation which implies that these species are not adversely affected by *Bd.* In fact, there is evidence that suggests that *R. pipiens* is susceptible to *Bd* (Voordouw 2010). There are other amphibian species in NM which test positive for *Bd* but appear to persist on a population level (*Acris crepitans* and *Pseudacris maculata,* Christman and Jennings 2018). However, we do not have sufficient data to suggest that those species are unaffected. *Rana catesbeiana* has not shown evidence of *Bd*-related declines despite evidence of infection across their native and introduced ranges. Declines in *R. pipiens* in western Canada and the U.S. were significant enough to warrant a full status review by the USFWS, but a 12-month finding found listing to not be warranted (USFWS 2011). Mock and O'Donnel 2016 suggest that genetic differences between western and eastern populations may affect differences in *Bd* infection rates and susceptibility in these two populations.

Bullfrogs (*R. catesbeiana*) are a non-native invasive species in New Mexico and have been implicated in the decline of native ranid frogs and other riparian obligate herpetofauna in the

west (Hammerson 1982, Hayes and Jennings 1986, Schwalbe and Rosen 1988). Bullfrogs may impact other frog species through intense predation, predatory or competitive larval interactions, and the transmission of parasites or pathogens (Hammerson 1999, and Garner et al. 2006). However, native frogs have declined in the absence of bullfrogs (Corn and Fogleman 1984, Christman *pers. obs.*), and bullfrogs are just one factor associated with declines of native frog species. Bullfrogs in New Mexico nevertheless are an invasive species in the state and considered undesirable.

METHODS

Locality Data

Locality data used to determine historic sites (Appendix 1) were obtained from the Museum of Southwest Biology at the University of New Mexico and from earlier U.S. museum inquiries conducted by Dr. Randy Jennings during prior leopard frog investigations. Data collected during this investigation involved the use of 1:100,000 scale Bureau of Land Management (BLM) maps, 7.5 min United States Geological Service (USGS) quad maps and a Garmin eTrex Global Position Satellite (GPS) unit set to North American Datum 1983 (NAD 83) and collected in Universal Transverse Mercator (UTM) coordinates in zone 12 or 13. Mapping was done using ArcGIS Pro.

Surveys

Amphibians were surveyed in aquatic habitats following USFWS survey protocols for Chiricahua leopard frogs (USFWS 2003). Surveys involved walking the perimeter of stock tank and stream habitats watching for jumping frogs (plop counts), listening for calls, and dip-netting under banks and in vegetation for adult and larval amphibians. Binoculars were used to observe frogs at a distance. Temperature data were collected at aquatic habitats surveyed. Temperature data were collected using a thermometer (appropriate for air or water).

Sites where tadpoles were observed are considered breeding localities. Localities were generally defined as being more than a mile distant from one another or otherwise geographically separated.

Chytrid Fungus (*Bd*) Investigations

All leopard frogs that could be captured were swabbed for *Bd* testing. Tissue samples were tested for *Bd* by Pisces Molecular Boulder, Colorado using genetic PCR techniques developed for this purpose (Annis et al. 2004). Tissue samples were collected by swabbing the ventral skin surface of the body and thighs of frogs with sterile wooden cotton swabs. The end of the wooden swab was then cut off and placed into a vial with 70% ethanol and labeled with date, locality, and species for later reference. Samples were pooled at each locality where two or more amphibians of a species were captured. Each frog for which a skin swab was collected was weighed, measured, and sexed. Each frog was handled using new nitrile gloves (discarded after handling each frog) and clean bags to prevent contamination between samples. This portion of this investigation was focused on identifying the presence of *Bd* in *R. pipiens* or other amphibians at surveyed sites.

Collections
Specimens were collected at sites with populations with 20 or more frogs and 100 tadpoles (not exceeding two adults or five tadpoles per site) to provide voucher specimens for future research, and genetic samples were collected at each site (not exceeding 20 samples per site). Adult amphibian and reptile specimens were preserved in 10% formalin and larval amphibian specimens were preserved in 5% formalin. A tissue sample was collected from each voucher specimen prior to being fixed in formalin. All amphibian and reptile specimens were deposited at the Museum of Southwestern Biology (MSB) at the University of New Mexico in Albuquerque, NM.

Permits
Investigations and collections were conducted under the appropriate state permit (NMDGF Scientific Collecting Permit 2969). Permits were granted by the Gila, Cibola, Santa Fe, and Carson National Forests; Bureau of Land Management; New Mexico State Parks (Coyote Creek, Morphy Lake, Cimarron Canyon); the Navajo Nation; Sevilleta, Bosque del Apache, Rio Mora, and Maxwell National Wildlife Refuges; and the Middle Rio Grande Conservancy District (MRGCD). In addition, permissions were granted to survey private lands.

RESULTS

Historic localities of northern leopard frogs were compiled from the Museum of Southwestern Biology at the University of New Mexico in Albuquerque, NM (Appendix 1). Dr. Randy Jennings compiled a spreadsheet of historic records received from various museums across the country which held collections of *Rana pipiens* from New Mexico (Appendix 2). Maps were generated from data in Degenhardt (1996), from 2009–2010 surveys (Figure 1), and 2023 surveys (Figure 2).

Historic vs. Current Distribution
There are approximately 382 museum records for *R. pipiens* from New Mexico housed at 25 museums. Of those 382 records, approximately 235 historic localities can be identified.
A review of museum records, 2009–2010 data, and unconfirmed reports indicate several areas where *R. pipiens* likely remain extant: San Juan River below Navajo Dam (San Juan Co.), Chama area (Rio Arriba Co.), Mora area (Mora Co.), north to Vermejo Park Ranch (Colfax Co.), and downstream of Cochiti Reservoir (Sandoval Co.) on the Rio Grande. This last area is governed by a patchwork of tribal entities.

During the 2023 survey, we surveyed 81 sites in 10 counties (Bernalillo, Catron, Colfax, McKinley, Mora, Sandoval, San Juan, San Miguel, Santa Fe, and Socorro) and found *R. pipiens* at 15 sites (Appendix 3). Forty of the 81 sites surveyed were previously surveyed in 2009–2010; eight of those 40 sites still had *R. pipiens* present. In 2009 – 2010, 18 of the same 40 sites had *R. pipiens.* In 2023, five of those 40 sites (two stock tanks in Van Bremmer Canyon, two sites along Van Bremmer Creek and one on Cerrosos Creek on the Vermejo Park Ranch in Colfax County) were dry and one had been severely affected by the 2022 Calf Creek Fire (Manuelitas Creek, a private property in San Miguel County) on the east slopes of the Sangre de Cristo

Mountains, which accounts for the potential loss of those populations. Twenty-three of the 81 sites surveyed were historic (pre-2009) sites; we found *R. pipiens* at three historic sites: Sapello River, Coyote Creek State Park, and Cimarroncito Reservoir.

Table 1. Summary of *Rana pipiens* surveys conducted in 2023.

	# of sites surveyed (# pos., %)	# of Localities (# pos., %)
Historic	23 (3, 13%)	~17 (3, 18%)
2009–2010	26 (8, 31%)	~32 (8, 25%)
new	32 (4, 13%)	31 (4, 13%)
Totals	81 (15, 19%)	~70 (15, 21%)

Tribal lands

No surveys were conducted on tribal lands in 2023. We had a permit to survey along the San Juan River on the Navajo Nation but were unable to conduct surveys due to time constraints. We plan to conduct these surveys in 2024.

National Forest Lands

We conducted surveys on four national forests (NF) during this effort: Carson, Cibola, Gila, and Santa Fe. We found *R. pipiens* at two sites on the Jemez district of the Santa Fe NF at San Antonio Creek and Redondo Creek. These two observations on the Santa Fe NF are believed to represent dispersing juvenile frogs coming from populations on the Valles Caldera National Preserve. We also surveyed Rio Grande del Rancho on the Taos District of the Carson NF where *R. pipiens* were observed in 2010 but did not detect them in 2023.

Surveys on the Gila NF at Largo Creek above Quemado Lake and Cibola NF on Mount Taylor District did not detect *R. pipiens.* Largo Creek was dry, as were two tanks in Mount Taylor District. One *R. pipiens* was observed at a tank in 2009 but none were observed in 2023. The weather and timing of this survey was not conducive to frog activity, however, and we plan to revisit this site in 2024.

Bureau of Land Management

We surveyed sites on the Santa Fe and Chama Rivers located on lands managed by the Bureau of Land Management. We did not detect *R. pipiens* on either river, but we did detect bullfrogs (n=7) on the Santa Fe River and Woodhouse's toad tadpoles at the confluence of the Cebolla and Chama Rivers. One of the two bullfrogs that we captured on the Santa Fe River was positive for *Bd*.

State Parks

Coyote Creek State Park was the only state park surveyed in 2023; *R. pipiens* and *P. maculata* were detected here. *Rana pipiens* was detected here in 2009 and tested positive for *Bd* at that

time. Both northern leopard frogs and *Bd* have persisted since 2009. We also detected common snapping turtle (*Chelydra serpentina*; n=2) and wandering gartersnake (*Thamnophis elegans*) at this site. We plan to visit the following state parks in 2024: Navajo Lake, Cimarron Canyon, and Eagle Nest Lake.

NMDGF State Wildlife Areas
Upper Charette Lake at Charette Lakes State Wildlife Area was the only NMDGF property surveyed. This was a positive site for northern leopard frog in 2010, but the site (Upper Charette Lake) has dried up in recent years. We plan to revisit and survey the lower of the Charette lakes in 2024, as well as Marquez, Sargent, Humphries, and Los Pinos River State Wildlife Areas.

Middle Rio Grande
We were given permission to survey Middle Rio Grande Conservation District lands in 2023 but were unable to conduct surveys due to time constraints once permissions were received. We plan to conduct these surveys in 2024.

Grants/ Zuni area
In 2023, six surveys were conducted on Cibola National Forest lands on the Mt. Taylor Ranger District. *Rana pipiens* were not detected. In 2009, we detected *R. pipiens* at two sites in the area. In 2023, we were only able to revisit one of these sites and didn't detect any frogs. There are a number of historic localities in this area that we will try to visit in 2024.

Chama Area West of Continental Divide
In 2023, no surveys were conducted for *R. pipiens* in this area. However, *R. pipiens* were observed during boreal toad surveys at Trout Lakes (L. Pierce NMDGF *pers. comm*.).

San Juan River Basin
We surveyed the wetland habitat below Navajo Dam adjacent to the San Juan River and found *R. pipiens* to be relatively common, much as they were in 2009. Frogs at this site tested positive for *Bd* as they did in 2009. This is another site where *R. pipiens* continues to persist with *Bd.* Additional surveys along the San Juan River are planned for 2024.

Upper Canadian River Basin
This includes the Cimarron, Vermejo, Dry Cimarron and Mora River drainages. In 2023, 40 surveys were conducted and 11 sites were positive for *R. pipiens* (28% detection rate). In 2009, where many of the same sites were surveyed, 47 surveys resulted in 15 sites where *R. pipiens* was detected (32% detection rate). Several sites were surveyed; *R. pipiens* were found to be widespread and locally common but appeared to be absent at higher elevations.

Interspecific associations
In 2023, *R. pipiens* were found sharing habitats with several other amphibian species at 11 localities: *B. woodhousei* (6), *P. maculata* (2) and A. *mavortium* (3). At one of these 11 localities, *R. pipiens* were observed with two other species: *B. woodhousii* and *A. mavortium* (Appendix 3).

Chytrid Fungus (*Batrachochytrium dendrobatidis*) Investigations

We tested 11 *R. pipiens,* two *R. catesbeiana,* and one *P. maculata* from eight sites. *Bd* was detected at three of those sites: Santa Fe River, Coyote Creek State Park, and San Juan River (Appendix 7). We detected *Bd* from two *R. pipiens* from Coyote Creek and San Juan River with a third detection from a *R. catesbeiana* from the Santa Fe River.

Invasive Predators

Invasive species which are thought to be detrimental to leopard frog species in the southwest include various crayfish species, bullfrogs, many of the centrarchid fish, salmonid fish, and ictalurid fish. During this investigation *R. pipiens* were present at the same localities with trout and crayfish (Appendix 3). Crayfish were found with *R. pipiens* at 11 sites and trout were present with *R. pipiens* at five survey sites.

DISCUSSION

Although *R. pipiens* populations still occur over much of their North American range, there is significant evidence that declines in both the number and size of populations have occurred and continue to occur. There is no single overarching factor causing declines but rather the synergistic effects of pollution, disease, habitat loss, and global climate change that are more likely the causes of amphibian declines. In New Mexico *R. pipiens* populations persist in the northern portion of the state, but there are few localities with a high abundance of frogs. Based on recovery criteria in the Chiricahua Leopard Frog Recovery Plan (USFWS 2007) a robust population is 40 or more adult frogs for this closely related species. We did not observe any populations with this number of frogs. Timing of surveys may affect how many frogs are observed, such as during breeding events, post breeding (e.g., time when frogs may be active away from water), or post metamorphosis (e.g., when observed numbers may be skewed to juveniles).

We found *R. pipiens* that tested positive for *Bd* at two sites (Coyote Creek State Park and the San Juan River below Navajo Dam). Both sites had *R. pipiens* in 2009 and *R. pipiens* at both sites tested positive for *Bd* at that time, demonstrating that in some cases *R. pipiens* can persist in the face of *Bd.* In both of these cases, 10 or fewer frogs were observed. It is possible that *R. pipiens* at these sites had disappeared and then subsequently recolonized the sites after the 2009 survey, but it is impossible to know. It is our professional opinion that frog populations at these sites have persisted with *Bd*. This opinion is based on experience with the *Bd* in Chiricahua leopard frog (*Rana chiricahuensis*) populations where some populations have persisted with *Bd* since 1987. Rollins-Smith et al. (2002) discussed the potential buffering effect of skin peptides in *R. pipiens* against *Bd*. Woodhams et al. (2008) discussed the possibility of *R. pipiens* as a reservoir or carrier species for *Bd*, however they were considering scientific supply shipments of frogs as potential means of transmission more than wild to wild populations. However, there is insufficient data to suggest that wild populations of *R. pipiens* thrive in the presence of *Bd*.
As a wide-ranging species in North America, *Rana pipiens* overlaps the range of many aquatic species (bullfrogs, various crayfish, centrarchid fish and ictalurid fish), which are considered to be invasive and predatory with regards to other southwestern amphibians. This overlap of ranges may have exerted evolutionary pressures, resulting in differences in *R. pipiens* that may allow this species to co-exist with predatory invasive species in New Mexico that are common in the

eastern portions of its range (e.g., bullfrogs, crayfish, centrarchid fish, and other native fish species). In arid regions such as the southwest *R. pipiens* is more likely to spend more time near water post breeding than in more mesic parts of its range, thereby spending more time in proximity to bullfrogs where the two species co-occur and thereby increase chances of predation or disease transmission. O'Donnell et al. (2016) suggest that genetic differences between eastern and western populations may be as significant as to represent two different species and that ecological differences with regards to native predator species and susceptibility to *Bd* may affect populations differently.

The reasons remain unclear for why some populations appear robust in the face of *Bd* or non-native predatory pressures while other populations appear small despite extensive potential habitat. It should be noted that within the scope of this investigation there are no data to support any definitive conclusions as to the reasons for declines in *R. pipiens* in New Mexico, only factors which may contribute to amphibian decline. Because this is the first year of survey effort and all historic sites have yet to be surveyed, we do not yet have a complete picture of the current distribution or *R. pipiens* in New Mexico.

RECOMMENDATIONS

Further surveys are needed to determine the complete current distribution of *R. pipiens*. Areas in need of survey include sites on tribal lands in the Grants area and Rio Grande from Espanola to Albuquerque, also historic localities between Socorro and Las Cruces.
Considering *Bd* being present in the environment it should be standard procedure to clean any gear used in aquatic environments when moving between sites. A 10% bleach solution or a fungicide with Quat 128 should be used to clean waders, nets, and other gear to limit the spread of *Bd*.

Current knowledge of amphibian declines suggests that proactive conservation measures should be implemented to offset population losses prior to federal listing and or during ongoing research that might be used in recovery actions. *Rana pipiens* is a species that could benefit from habitat improvements and enhancements on state and federal lands. Enhancements might include partial exclusion of livestock from sensitive habitats or limiting grazing time within riparian corridors, planting beneficial plants, and raising frogs for release into historic unoccupied habitats or habitats within their historic range.

Monitoring programs could be established with the cooperation of land management agencies that might provide information useful in preventing the loss of populations and therefore the continued persistence of *R. pipiens* in New Mexico and the southwest.

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Figure 1: Map of *Rana pipiens* distribution.

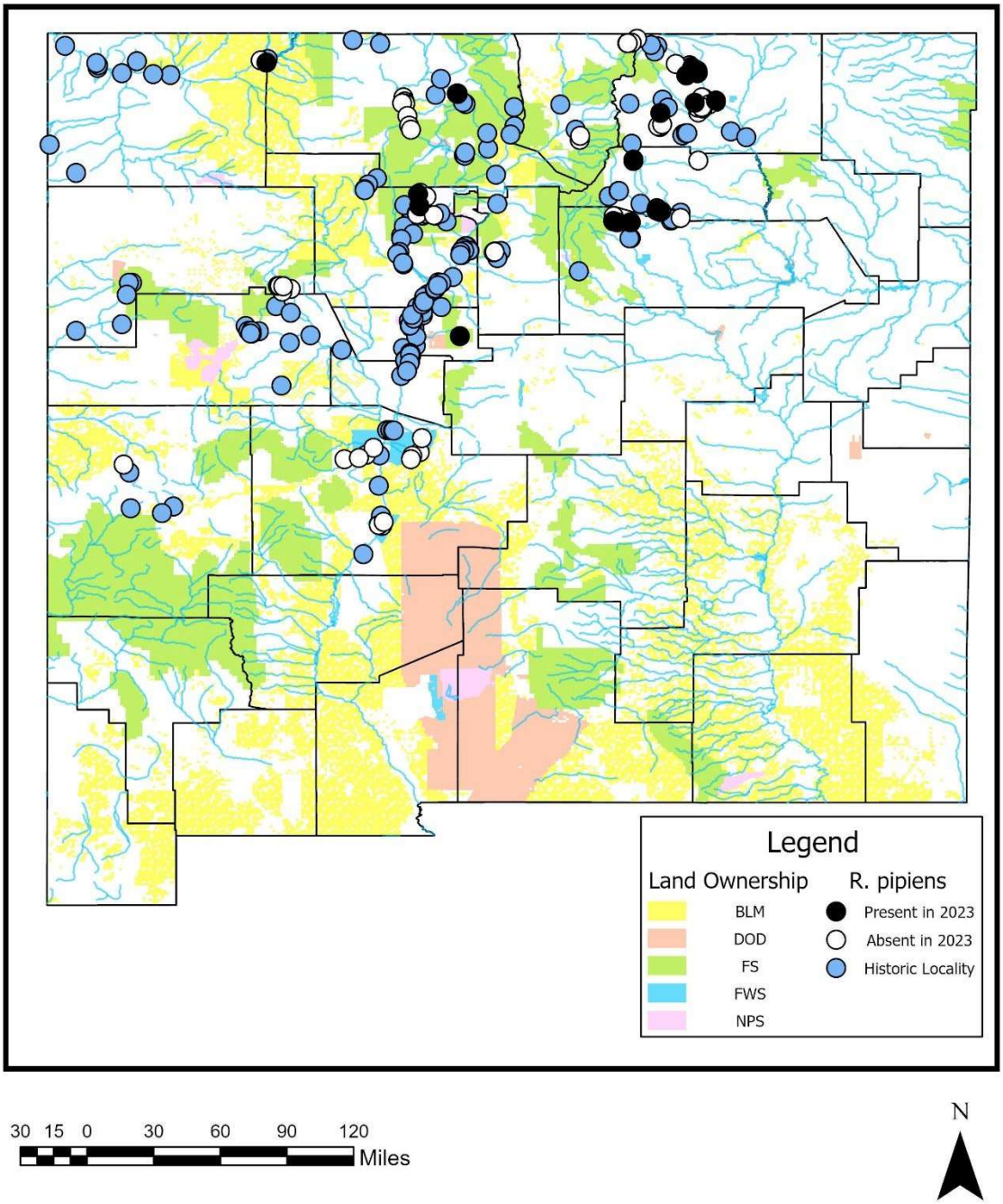
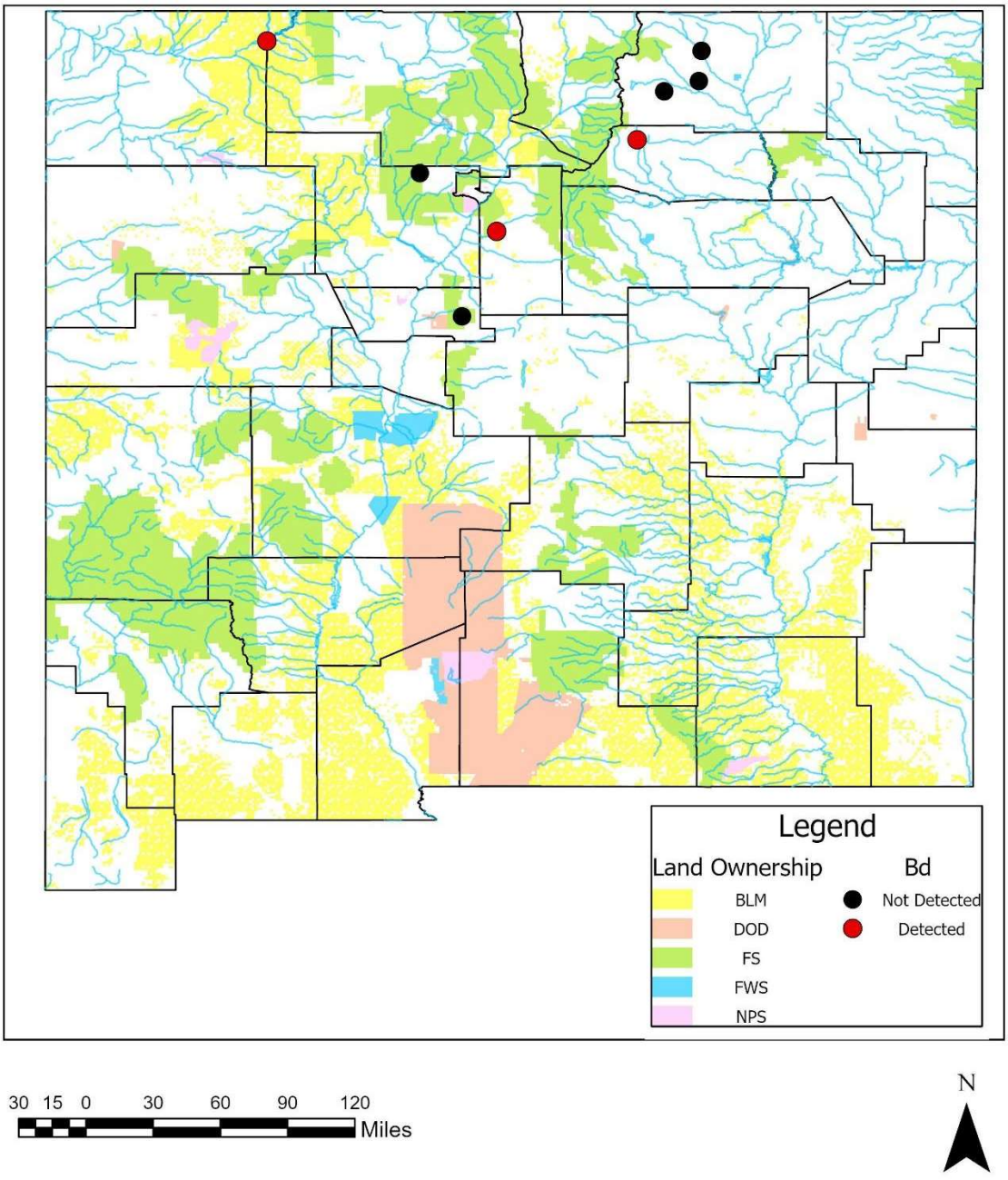


Figure 2: Map of 2023 *Bd* results.



Appendix 1: Museum of Southwestern Biology (MSB) *R. pipiens* records.

Museum No.	Collected By	Date Collected	Locality Name	County
793-809	Koster WJ	22-Sep-38	Isleta Indian Reservation, Ponds approximately 2 miles South North Boundary	Bernalillo
940	Koster WJ	13-Oct-38	Conservancy Ditch between Albuquerque and Alameda	Bernalillo
41821	Koster WJ, Koster LR, Bretney P	9-Jun-39	Rio Grande just North of Valencia county line	Bernalillo
945	Koster WJ	26-Mar-46	3 miles North Albuquerque, West of Rio Grande	Bernalillo
832-840	Koster WJ	30-Jun-49	Isleta, East of Rio Grande	Bernalillo
922-23	Koster WJ, Coburn KR	21-Oct-49	Rio Grande, Isleta Rail Road Bridge	Bernalillo
898	Koster WJ	5-Nov-49	Drain, 1.25 miles North West Alameda, West of Rio	Bernalillo
810	Koster WJ	18-Nov-49	East Riverside Drain, North of Alameda	Bernalillo
894	Koster WJ, Coburn KR, Atkinson G	19-Nov-49	Alameda Drain near Sandoval County border	Bernalillo
221	Jones-Burdick WH	27-Sep-50	Isleta Slough	Bernalillo
3819	Wright JW	26-Sep-59	Artificial Lake, Albuquerque	Bernalillo
5395	Dixon HN	3-Apr-61	Isleta Sod Pits, 8 miles South Albuquerque	Bernalillo
5201	Forbes RB	18-Apr-61	Albuquerque, Ernie Pyle Beach	Bernalillo
5202	Forbes RB	18-Apr-61	Conservancy Ditch, West of US 66 Bridge, Albuquerque	Bernalillo
10879	Hatton N	12-Mar-63	Albuquerque, Tingley Beach	Bernalillo
11256	Laycock D	5-May-63	Sandia Mountains, Juan Tabo Picnic Area	Bernalillo
13033	Odell DH	4-Apr-65	irrigation ditch, 5 miles South Corrales	Bernalillo
12454	Jennings DT	14-Apr-65	1.5 miles North Alameda Bridge, Corrales	Bernalillo
12457-58	Jennings DT	21-Apr-65	0.2 miles South US 66, Tingley Park, Albuquerque	Bernalillo
12193	Arasim TM	23-Apr-65	0.5 miles North of Isleta, 100 yards East of Rio Grande	Bernalillo
12336-37	Gustafson CC	25-Apr-65	3 miles South of Isleta	Bernalillo
12270	Johnson L, Troublefield SG	12-May-65	Isleta Swamp	Bernalillo
12882	Lederer EM, Troublesfield S	12-May-65	Isleta area, US Highway 85	Bernalillo
12194	Arasim TM	14-May-65	Isleta Indian Reservation	Bernalillo
12813	Fleck A	16-May-65	Albuquerque, Tingley Park Pond	Bernalillo
15339-42	Viney JF	12-Apr-66	Isleta Marsh	Bernalillo
16524-25	Gutierrez RE	7-Mar-67	Isleta Pueblo, swamp, 9 miles South Junction Rio Bravo and NM Highway 47	Bernalillo
17099	Mares MA	12-Mar-67	Isleta Swamp, 10 miles South Albuquerque, by road,	Bernalillo
16717-22	Weber N	19-Mar-67	North of Albuquerque City Limits, Ditch at intersection Rio Grande and Chavez Road	Bernalillo
17097	Mares MA	6-Apr-67	swamp, near NM Highway 47, 9 miles South NM Highway 47 and Rio Bravo Blvd	Bernalillo
16487-88	Jones CB	18-Apr-67	Albuquerque, Pond East of Rio Bravo Bridge	Bernalillo
21917-21	Willmarth JL	11-Mar-68	Irrigation Ditch, Rio Grande Blvd, approximately 0.5 miles North of Chavez Road	Bernalillo
18124	Willmarth JL	17-Mar-68	Isleta Marsh	Bernalillo
18125	Boyle TP	29-Mar-68	2 miles North Isleta Bridge	Bernalillo

Museum No.	Collected By	Date Collected	Locality Name	County
18126	Kirk JJ	29-Mar-68	East of Atchison Topeka Railroad Tracks, 1 mile North Isleta Pueblo	Bernalillo
18127	Carreno GM	24-May-68	2.2 miles North northeast Alameda	Bernalillo
19079	Williams M	2-Apr-69	2 miles South and 1 mile West of Isleta Pueblo	Bernalillo
19075	Garcia JD	14-Apr-69	Isleta Marsh, 3 miles South of Isleta	Bernalillo
19074	Garcia JD	15-Apr-69	3 miles South of Isleta	Bernalillo
19076-78	Garcia JD	18-Apr-69	3 miles South of Isleta, on US Highway 85	Bernalillo
19935	Hendrickson G	22-Apr-69	Albuquerque, Rio Grande Floodplain, end of Mountain Road North West	Bernalillo
19073	Lucchino R	24-Apr-69	Isleta Swamp, NM Highway 47	Bernalillo
23569	Keister K	10-Apr-71	2 miles North along Corrales Drain from Corrales Road	Bernalillo
34844-48	Murphy JK	2-May-71	ABQ, 2 blocks N of Montano Road on Rio Grande Boulevard, on W side of Road (Griegos Ditch)	Bernalillo
23484-85	Matey KO	11-May-71	NM Highway 194, 2 Road miles S W of Junction of NM Highway 46, ABQ North Valley	Bernalillo
34849-51	Taylor SA	12-May-71	ABQ, 2 blocks N of Montano Road on Rio Grande Boulevard, on W side of Road (Griegos Ditch)	Bernalillo
43980	Conder TD	12-May-71	Approximately 3 miles N Candelaria road, Rio Grande Boulevard	Bernalillo
37701	Stuart JN	11-Sep-82	4.2 kilometers S, 2.7 kilometers West of center of Isleta, on US 85, S end of marsh	Bernalillo
52883	Stuart JN	12-Aug-89	US Highway 85, approximately 0.5 miles North of Valencia County line Isleta Marsh	Bernalillo
884-88	Koster WJ, Rafferty K	3-Sep-48	Largo Canyon	Catron
878-83	Koster WJ, Coburn NR	20-Aug-49	Horse Springs Pond, Old Horse Springs	Catron
10571-75	Koster WJ	30-Aug-56	Mangas Ranger Station	Catron
1638	Koster WJ	31-Aug-56	Patterson Spring and Lake	Catron
1643	Koster WJ	31-Aug-56	Patterson Spring and Lake	Catron
1646-47	Koster WJ	31-Aug-56	Patterson Spring and Lake	Catron
3820	Findley JS	13-Jun-59	2 miles East and 2 miles North Aragon	Catron
943	Babcock JM	12-May-46	Rio San Jose, near McCarty's	Cibola
944	Koster WJ, Lindsey AA	11-May-47	Anzae	Cibola
871-72	Koster WJ, Campbell H	10-Apr-48	Suwanee, Spring Run into Rio San Jose	Cibola
889-90	Koster WJ, Taylor HO	24-Jul-48	Rio San Jose, approximately 11 miles East Grants	Cibola
895-96	Koster WJ, Taylor HO	24-Jul-48	Rio San Jose, Laguna	Cibola
1689-94	Koster WJ, Rafferty K	30-Aug-48	Acoma Reservation, 4 miles South Casa Blanca PO	Cibola
26113	Gottlieb G	4-Apr-72	Gottlieb Ranch, 7.5 miles East and 7 miles South of Grants	Cibola
26114	Gottlieb G	4-Apr-72	Marsh near Anzac, water from Horace Spring, 8 miles E and 5 miles S of Grants	Cibola
26115	Gottlieb G	4-Apr-72	Gottlieb Ranch, stream fed by Horace Spring, 7 miles E and 7 miles S of Grants	Cibola
54897	Anderson RE	18-Sep-92	Mount Taylor, Water Canyon	Cibola
60773	Carr SE	19-May-97	Pueblo of Laguna, 4.5 miles North Ecinal, White Springs	Cibola
891	Koster WJ, Koster LR, Bretney P	10-Aug-39	North Inlet of Eagle Nest Lake	Colfax
957-58	Koster WJ, Koster LR, Bretney P	12-Aug-39	Cimarron River at Springer	Colfax

Museum No.	Collected By	Date Collected	Locality Name	County
957-58	Koster WJ, Koster LR, Bretney P	12-Aug-39	Cimarron River at Springer	Colfax
41810	Koster WJ, Koster LR	24-Aug-39	Taylor Springs, Junction of Canadian and Cimarron Rivers	Colfax
931	Koster WJ, Wolfrom WH	7-Sep-54	Vermejo Park, Bernal Lake	Colfax
927-28	Koster WJ, Wolfrum WH	9-Sep-54	Vermejo River, Old Stage House	Colfax
935	Koster WJ, Wolfrum WH	10-Sep-55	Tributary to Black Lake	Colfax
5353-55	Traut GL	19-Jul-61	Crater Lake, Philmont Scout Ranch	Colfax
5356-57	Traut GL	7-Aug-61	Crater Lake, Philmont Scout Ranch	Colfax
23842-45	Lussenhop J, Traut GL	7-Aug-61	Crater Lake, Philmont Scout Ranch	Colfax
5349-52	Traut GL	21-Aug-61	Philmont Scout Ranch, Lower Bonito Cow Camp	Colfax
23846-47	Treikel D, Traut GL	21-Aug-61	Philmont Scout Ranch, Lower Bonito Cow Camp	Colfax
9282-90	Koster WJ	24-Aug-61	Merrick Lake, 7 miles North West Vermejo Park, HQ	Colfax
23848	Wenzel J, Traut GL	23-Jun-62	Philmont Scout Ranch, North West side of Cimarron Reservoir	Colfax
23849	Bates D, Traut GL	26-Jul-62	Philmont Scout Ranch, Harlan Camp	Colfax
19929	Applegarth JS	21-Aug-67	25 1/2 miles North and 10 miles West Cimarron near Castle Rock	Colfax
25711	Applegarth JS	21-Aug-67	About 25.5 miles North and 10 miles West of Cimarron, near Castle Rock	Colfax
18681-82	Applegarth JS	13-Jul-68	WS Ranch, Merrick Lake 8.5 miles East and 2.5 miles North Costilla Lake	Colfax
38556	Campbell JM	3-Jun-80	Approximately 20 miles North of Cimarron, lower most Salyers Canyon	Colfax
38557	Campbell JM	4-Jun-80	Approximately 20 miles North of Cimarron, near windmill in Salyers Canyon	Colfax
38554	Campbell JM	16-Jun-80	pond beisde Vermejo River, approximately 1 mile upstream from Horse Ranch Camp	Colfax
38555	Campbell JM	16-Jun-80	pond beside Vermejo River, near Horse Ranch Camp	Colfax
38749	Campbell JM	3-Jun-82	Approximately 20 miles North of Cimarron, lower most Salyers Canyon	Colfax
44258-60	Jennings RD, Scott NJ	7-Sep-85	Philmont Scout Ranch, Crater Lake	Colfax
44324-26	Scott NJ, Jennings RD	7-Sep-85	La Maquina Creek, Highway 21, approximately 13 miles South Cimarron	Colfax
44330-35	Scott NJ, Jennings RD	7-Sep-85	Philmont Scout Ranch, Crater Lake	Colfax
44256-57	Jennings RD, Scott NJ	8-Sep-85	5 miles West Miami, just East of Miami Lake	Colfax
44346-50	Scott NJ, Jennings RD	8-Sep-85	unnamed creek, 6.75 miles West, 0.75 miles South Miami	Colfax
44351-59	Scott NJ, Jennings RD	8-Sep-85	ponds west of Miami Lake, approximately 5.5 miles West Miami	Colfax
44377	Scott NJ, Jennings RD	8-Sep-85	ponds west of Miami Lake, approximately 5.5 miles West Miami	Colfax
45069	Jennings RD, Scott NJ	8-Sep-85	ditch just East of Miami Lake, 5 miles West Miami	Colfax
60951	Lang BK, Gordon ME	23-Jul-97	Carson National Forest, Valle Vidal Unit	Colfax
38750	Campbell JM		Approximately 20 miles North of Cimarron, lower most Salyers Canyon	Colfax
919-921	Koster WJ, Rafferty K	1-Sep-48	Zuni River, 1mi below Zuni Pueblo	McKinley
847	Koster WJ, Rafferty K	2-Sep-48	Rio Pescado, Pescado Dam	McKinley
11891	Degenhardt PB, Degenhardt WG	8-Jun-64	McGaffey Lake area	McKinley
13653-56	Degenhardt PB, Degenhardt WG	9-Jun-64	1 mile East McGaffey Lake	McKinley
23694	Degenhardt WG	1-Jun-70	McGaffey Lake	McKinley

Museum No.	Collected By	Date Collected	Locality Name	County
40569	Campbell H	24-Jun-75	Zuni Indian Reservation, Nutria Canyon	McKinley
934	Koster WJ	3-Oct-44	Coyote Creek 3.6 miles above (North) Guadalupita	Mora
18668	Applegarth JS	16-Jun-68	Wolf Creek, 3 miles North and 3 miles East Watrous	Mora
22197-98	Seidel ME	26-Jul-70	Rd to Morphy Lake?	Mora
41813	Seidel ME	26-Jul-70	Mora	Mora
23380-83	Seidel ME	22-May-71	NM Highway 38, 0.2 miles South West of Mora	Mora
44263-65	Jennings RD, Scott NJ	6-Sep-85	Sapello River, NM Highway 161 bridge	Mora
44286-88	Scott NJ, Jennings RD	6-Sep-85	Mora River, Golondrinas	Mora
44290-92	Scott NJ, Jennings RD	6-Sep-85	Sapello River, NM Highway 161, 2 Kilometers South West Watrous	Mora
44294-313	Scott NJ, Jennings RD	6-Sep-85	Sapello River, Interstate 25, 2 Kilometers South Southwest Watrous	Mora
44342-45	Scott NJ, Jennings RD	6-Sep-85	Sapello River, Interstate 25, 2 Kilometers South South West Watrous	Mora
49307	Painter CW, Propst D	17-Oct-86	Mora River, Watrous, Old Highway 85 bridge	Mora
959-960	Koster WJ, Coburn KR	8-Jun-49	El Rito Creek, 2 miles below Cenjillon Camp	Rio Arriba
825-831	Koster WJ, Coburn KR	9-Jun-49	El Rito Creek, 5 miles above mouth	Rio Arriba
950	Koster WJ, Coburn KR	10-Jun-49	Tusas Creek, 1 mile above Petaca	Rio Arriba
211-14	Koster WJ	24-Jun-54	Emboer L.	Rio Arriba
929	Koster WJ	2-Sep-54	Rio Armargo, approximately 3 miles East Lumberton	Rio Arriba
930	Koster WJ	2-Sep-54	Rio Armargo, approximately 3 miles East Lumberton	Rio Arriba
20950	Edmondson JJ	28-Jun-69	Tusas Creek, 2.7 miles North East of La Madera, 9 yds up	Rio Arriba
24383	Jones KL	22-Jul-70	7 miles North of Espanola via US 84	Rio Arriba
24406	Jones KL	22-Jul-70	4.8 miles North of Cebolla via US 84	Rio Arriba
22193-96	Degenhardt WG	26-Jul-70	3.5 miles East Tierra Amarilla	Rio Arriba
24416	Jones KL	27-Jul-70	3 miles North of Ojo Caliente via NM 111	Rio Arriba
42704	Mitchell S, Woodward B	6-Aug-84	9 miles East Cebolla	Rio Arriba
48396	Bestgen K	5-Sep-86	Chama River, 2 kilometers upstream from Abiquiu,	Rio Arriba
48397-98	Bestgen K	5-Sep-86	El Rito Creek, El Rito, pond, NM Highway 96	Rio Arriba
50731	Platania SP, Bestgen KR	30-Sep-86	Rio Grande, bridge crossing in Espanola	Rio Arriba
57109	Bestgen KR	28-Sep-88	Navajo River, bridge crossing, approximately 2 Kilometers North West of Dulce	Rio Arriba
56781	Stuart JN	22-Jul-93	Carson National Forest, Lower Canjilon Lakes	Rio Arriba
66638-39	Platania SP, Lein GM, Dudley RK	29-Aug-95	Rio Grande Drainage, Rio Chama, 0.5 mi upstream US Hwy 84 bridge(See Note)	Rio Arriba
73065	JT Giermakowski	14-Jun-03	Trout Lakes, end of FS-125 road	Rio Arriba
73486	BL Christman	11-Jul-06	Upper Trout Lakes	Rio Arriba
73490	BL Christman	11-Jul-06	Lower Trout Lakes	Rio Arriba
66637	Platania SP, Lein GM, Dudley RK		Rio Grande Drainage, Rio Chama, 4.0 mi upstream Abiquiu on County road 162	Rio Arriba
223	Sands JL	10-Sep-55	1.5 miles West Farmington	San Juan
2296-98	Sands JL	10-Sep-55	1.5 miles West Farmington	San Juan
2807	Harris AH	20-Aug-58	Los Pinos River (tributary to Navajo Lake)	San Juan

Museum No.	Collected By	Date Collected	Locality Name	County
2793-2801	Findley JS	15-Jul-59	Chuska Mountains, Washington Pass	San Juan
2806	Harris AH	16-Aug-60	4 miles North and 1 miles East Waterflow	San Juan
3150	Harris AH	3-Aug-61	Approximately 6 miles E. and 6 miles S. Four Corners	San Juan
85474-85	D. Pettus, A. Spencer, & D. Po	29-Aug-67	Whiskey Lake	San Juan
24157	Jones KL	20-Jul-69	1.3 road miles West of Shiprock (town) via NM 504	San Juan
40609	Schmitt G	3-Aug-77	Chuska Mountains, 18.3 miles West Newcomb, Doo ahaat Tii inili' Creek, Wheatfield Creek	San Juan
40610-12	Schmitt G	29-Aug-77	Kirtland, Schmitts North East field, drain ditch	San Juan
54982	Bestgen KR, Platania SP	6-Aug-87	San Juan River, approximately 2 Kilometers downstream of the Hogback diversion	San Juan
50693	Platania SP	8-Aug-87	San Juan River, 2 miles below Shiprock	San Juan
57774	Plantania SP	29-Jul-88	San Juan River, 4 miles downstream of Shiprock	San Juan
44272	Scott NJ, Jennings RD	5-Sep-85	Storrie Lake near Las Vegas, Marshes below Dam	San Miguel
44322-23	Scott NJ, Jennings RD	5-Sep-85	Storrie Lake near Las Vegas, Marshes below Dam	San Miguel
44261-2	Jennings RD, Scott NJ	6-Sep-85	Sapello, Sapello River	San Miguel
44279	Scott NJ, Jennings RD	6-Sep-85	Sapello, Sapello River	San Miguel
44321	Scott NJ, Jennings RD	6-Sep-85	Sapello, Sapello River	San Miguel
63016	Burton J	2-Sep-01	Pecos River, approximately 0.7 air miles North West of South San Ysidro	San Miguel
893	Koster WJ	10-Jun-43	Senorita Canyon, approximately 11 miles South East Cuba	Sandoval
41826	Anderson E	5-May-46	3.5 miles above Jemez Springs, along Jemez River	Sandoval
41819	Koster WJ	19-May-46	2 miles below Battleship Rock on Jemez River	Sandoval
937	Koster WJ	8-Jun-46	Jemez River, just approximately mouth of Guadalupe Creek	Sandoval
2201-2220	Koster WJ	8-Jun-46	Jemez River, 3 miles above Jemez Springs	Sandoval
41320	Koster WJ	8-Jun-46	Jemez River, 3 miles above Jemez Springs	Sandoval
901-916	Koster WJ	15-Mar-47	Small ponds adjacent to Jemez River, 3.5 miles above Jemez Springs	Sandoval
936	Koster WJ, Mertz G	25-Oct-47	Rio Grande, 0.25 miles below Angostura Diversion Dam	Sandoval
41817	Koster WJ	7-Jul-48	La Cueva, Jemez River	Sandoval
41825	Koster WJ	10-Jul-48	Jemez River above Jemez falls	Sandoval
953	Koster WJ, Coburn KR	16-Oct-48	Jemez River, 2 miles above mouth of Guadalupe Creek	Sandoval
942	Koster WJ, Coburn KR	23-Oct-48	Jemez River, 2 miles above mouth of Guadalupe Creek	Sandoval
41820	Koster WJ, Coburn KR	13-Nov-48	3 miles above Jemez Springs near Jemez River	Sandoval
932	Koster WJ, Coburn KR	8-Jun-49	Jemez River, 1 mile above mouth Guadalupe Creek	Sandoval
8985	Koster WJ, Cobrun KR	24-Jul-49	Jemez River, 1 mile above mouth Guadalupe Creek	Sandoval
1695-99	Koster WJ	18-Oct-50	Riverside Drain, 3 miles North Alameda	Sandoval
933	Koster WJ	3-May-52	Bernalillo, Riverside Drain	Sandoval
2294-5	Koster WJ	10-May-52	Jemez River, near San Ysidro	Sandoval
41822	Koster WJ	11-Jun-56	Jemez River, 3 miles North of Guadalupe Creek	Sandoval
990	Koster WJ	15-Jun-56	Rio San Antonio, 0.5mi above La Cueva	Sandoval

Museum No.	Collected By	Date Collected	Locality Name	County
41823	Koster WJ, Garcia N	30-Jun-59	Cochiti Pueblo, Rio Grande, 1 miles below Cochiti Pueblo	Sandoval
5312	Traut GL	20-May-61	1 mile North Confluences of Jemez and Guadalupe Rivers	Sandoval
6801	Degenhardt WG	5-Aug-62	Jemez Mountains, South Camp Zia	Sandoval
11076	Green J	4-Apr-63	Corrales	Sandoval
11475	Rogers D	21-Apr-63	Jemez Springs	Sandoval
12134	Klasson DE	16-May-64	9 miles North of Jemez Pueblo	Sandoval
14644	Reagan DP	22-May-66	1 mile East Del Norte Canyon, North of Route 4, Jemez Mountains	Sandoval
16845-49	Cooper DL	27-Mar-67	Rio Grande, 3.6 miles South NM Highway 44	Sandoval
16400	Singh SP	16-Apr-67	East Fork Jemez River, 0.6 miles North East Highway 4	Sandoval
16904	Roberts ER	7-May-67	Reservoir, 2.5 miles North Ponderosa	Sandoval
16905	Roberts ER	7-May-67	Reservoir, 2.5 miles North Ponderosa	Sandoval
16978	Snipes MB	15-May-67	Jemez River, 0.25 miles North La Cueva	Sandoval
16979	Snipes MB	15-May-67	Jemez River, 0.25 miles North La Cueva	Sandoval
17215	Koster WT	20-May-67	San Ysidro, East Fork Jemez River	Sandoval
17216	White JA	1-Jun-67	8 miles South-southwest Jemez Springs, Jemez River	Sandoval
17997-18000	Degenhardt WG	14-Jun-67	Jemez Mountains, near Las Conchas Campground	Sandoval
18001-04	Degenhardt WG	23-Jun-67	East Fork Jemez River	Sandoval
19065-69	Raczka PM	29-Mar-69	12 miles North (Via US Highway 85) of Bernalillo	Sandoval
19937-40	Applegarth JS	2-May-69	Upper Corrales Riverside Drain, approximately 1.3 miles West Sandia Pueblo	Sandoval
19931-34	Applegarth JS	17-May-69	Ditch 100' East of Jemez River, 2 1/3 miles South and 1.75 miles West of Jemez Pueblo	Sandoval
41818	Koster WJ	17-May-69	San Ysidro, Jemez River	Sandoval
19081	Hessing M	20-May-69	3 miles North of Bernalillo on US Highway 85	Sandoval
41824	Hessings M	20-May-69	3 miles North Bernalillo on old Highway 85	Sandoval
24606-08	Williams M	28-May-69	2 road miles North of junction of US 85 and NM 44 via US85	Sandoval
24090	Jones KL	10-Jul-69	San Ysidro Village on NM Highway 4	Sandoval
24337	Jones KL	19-Jul-70	0.8 road miles Southwest of Zia Pueblo on entrance road	Sandoval
24344-46	Jones KL	19-Jul-70	0.8 miles West of Zia Pueblo on entrance road	Sandoval
24358	Jones KL	19-Jul-70	0.3 miles South of Cuba via NM 44	Sandoval
23468	Kelly LA	15-May-71	3.8 road miles via US 85 North of junction of US 85 North of junction of US 85 and US 44	Sandoval
23512-3	Mullen WC	15-May-71	Road from Bernalillo to Algodones, 5.5 Road miles North of Junction with NM Highway 44	Sandoval
23906	Farr GD	15-May-71	3.8 road miles Northeast of US 85 - NM 44 intersection, alongside US 85	Sandoval
23266	Williams SR	16-May-71	North side of Highway 4, 39 miles WNW, of Junction 44 and Highway 4 on Highway 4	Sandoval
26077-8	Bock S	16-Apr-72	Jemez Mountains, Fenton Lake	Sandoval
31055	Kietzke KK	6-Apr-74		Sandoval
37750	Brown TL	22-Jul-81	1 1/2 kilometers South, 1 1/4 kilometers West of center of Pena Blanca	Sandoval

Museum No.	Collected By	Date Collected	Locality Name	County
37750	Brown TL	22-Jul-81	1 1/2 kilometers South, 1 1/4 kilometers West of center of Pena Blanca	Sandoval
37749	Brown TL	23-Jul-81	1 1/2 kilometers South, 1 kilometer West of center of Pena Blanca, on Rancho de Pena Blanca ditch	Sandoval
47298	Stuart JN	5-Jun-82	NM Highway 44, 3 Road miles South of Junction 44/NM Highway 126, Cuba,	Sandoval
41732-37	Jennings RD, Fritts TH, Scott NJ, Fitzgerald LA	23-Aug-84	3.5 miles South Cuba NM 44 Lagunitas	Sandoval
49572-74	Stuart JN	18-Aug-87	1 mile North, 2 miles East Pena Blanca, Santa Fe River, Cochiti Springs	Sandoval
50480-82	Pease CS	24-Jun-88	Wetlands, Rio Grande, 1 mile downstream of Cochiti Dam	Sandoval
50681	Platania SP, Bestgen KR	18-Jul-88	Rio Grande, old channel just below Cochiti Dam	Sandoval
50686	Platania SP, Bestgen KR	19-Jul-88	East side of Channel, 1 Kilometer downstream of Cochiti Dam	Sandoval
50687	Platania SP, Bestgen KR	19-Jul-88	Santa Fe River, 2.5 Kilometers upstream of NM Highway 22 bridge crossing	Sandoval
50682-85	Platania SP, Bestgen KR	20-Jul-88	Santa Fe River, 100 m upstream of confluence with Rio Grande	Sandoval
56160	Lang BK, Platania SP, Altenbach CS	3-Aug-93	Pena Blanca Riverside Drain, approximately 0.5 miles downstream of Santa Fe River, Cochiti Pueblo	Sandoval
72279	SP Platania, CS Altenbach, NM Johnston	24-Jul-94	Rio Grande 1.8 mi upstream of Angostura Diversion Dam (San Felipe Pueblo NM Quadrangle).	Sandoval
62912-3	Chung-MacCoubrey A	19-Jul-00	Rio Grande, south of Cochiti Reservoir	Sandoval
63015	Watson M	9-Sep-01	Rio Grande, West of Pena Blanca	Sandoval
951-52	Koster WJ, Freshley H, McDavid PE	7-Aug-43	Rio Grande, San Ildefonso	Santa Fe
873-77	Koster WJ	1-Nov-47	La Cienega, Cienega Creek, approximately 2 miles above	Santa Fe
40570-72	Campbell H, Campbell RS	17-Sep-75	Approximately 10 miles SW of Santa Fe, at site of Bonanza (ghost town), Bonanza (Alamo?) Creek	Santa Fe
938	Campbell H	18-Aug-48	near Socorro	Socorro
14600	Wilson DE	16-Apr-66	Junction US Highway 60 and US Highway 85, Bernardo	Socorro
16928	Williamson MA	22-Apr-67	East Rio Grande, 0.25 miles South of US Highway 60,	Socorro
16975-77	Snipes MB	22-Apr-67	US Highway 60, Rio Grande	Socorro
17042	Williams DF	22-Apr-67	1 mile East Bernardo, on Rio Grande	Socorro
19080	Williams M	10-May-69	Rio Grande Bridge, US Highway 60 East of Bernardo	Socorro
19936	Hendrickson G	10-May-69	Irrigation Ditch, East of Rio Grande on US Highway 60	Socorro
25934	Henckel WP	28-Apr-73	Bosque del Apache Wildlife Refuge, 1 miles East and 0.25 miles North of refuge HQ	Socorro
40270-73	Woodward BD	13-Jul-77	Bosque del Apache National Wildlife Refuge	Socorro
33763	Franklin MK	22-Apr-78	3/4 miles East of San Acacia, Cor Base line, principle meridian	Socorro
36854	Woodward BD	27-Jun-78	Bosque del Apache National Wildlife Refuge -from Bosque, pond 15	Socorro
57369	Woodward BD	27-Jun-78	Bosque Del Apache National Wildlife Refuge, competition exp. 1, pond 11	Socorro
57370	Woodward BD	27-Jun-78	Bosque Del Apache National Wildlife Refuge, competition exp. 1, pond 27	Socorro
61043.1	Woodward BD	27-Jun-78	Bosque del Apache National Wildlife Refuge, Bosque Competion Experiment 1 Pond 2	Socorro
61045.1	Woodward BD	27-Jun-78	Bosque del Apache National Wildlife Refuge, Bosque Competion Experiment 1 Pond 2	Socorro
61047.1	Woodward BD	27-Jun-78	Bosque del Apache National Wildlife Refuge, Bosque Competion Experiment 1 Pond 2	Socorro

Museum No.	Collected By	Date Collected	Locality Name	County
57374-77	Woodward BD	28-Jun-78	Bosque Del Apache National Wildlife Refuge, competition exp. 3, pond 32	Socorro
57380	Woodward BD	28-Jun-78	Bosque Del Apache National Wildlife Refuge, competition exp. 3, pond 33	Socorro
61048.1	Woodward BD	28-Jun-78	Bosque Del Apache National Wildlife Refuge Bosque Competion Exp. 3 Pond 37	Socorro
34644-50	Painter CW, Chavez BC, Gloss SP	7-Aug-78	5 miles South San Marcial Gaging Station	Socorro
34630-43	Painter CW, Chavez DL	8-Aug-78	Bosque del Apache National Wildlife Refuge, Conveyance Channel at refuge Southern Boundary	Socorro
43925	Woodward BD	2-Aug-79	Bosque del Apache National Wildlife Refuge, West old US85	Socorro
58200	Lang BK, Larson JP, Diffendorfer DH	8-Jun-92	Ca. 6.8 miles downstream of US Hwy 60 bridge at Bernado. Rio Grande SW of La Joya at Arroyo Los Alamos	Socorro
5311	Traut GL	12-May-61	1 mile North Ranchos de Taos	Taos
13578	Degenhardt WG	20-Aug-65	Junction of Rio Grande and Rio Hondo	Taos
24414	Jones KL	27-Jul-70	14 miles North of Velarde via US 64	Taos
71702	BL Christman	15-Jun-04	Beaver Lake	Taos
954	Koster WJ, Koster LR, Bretney P	15-Aug-39	Dry Cimarron river, approximately 5 miles above valley	Union
899	Koster WJ, Koster LR, Bretney P	16-Aug-39	Unnamed Trib to Dry Cimarron River, North of Mases	Union
10992-3	Brown TL	30-Mar-63	Junction of Isleta Bridge Road and NM Highway 47	Valencia
11513	Moore J	5-May-63	Bluewater Canyon, Bluewater State Park	Valencia
12135	Klasson DE, Brown JL	12-May-64	Isleta Pueblo, Junction of NM Highway 47 and Isleta Bridge	Valencia
12649-51	Corbin JS	28-Mar-65	West Riverside Drain, 1 mile South Isleta Indian Reservation	Valencia
12453	Jennings DT	3-Apr-65	0.6 miles West Highway 47, North of Peralta	Valencia
12767	Moore GF	26-Apr-65	3-4 miles South Isleta, NM 47	Valencia
15452	Curfman B	24-Apr-66	2.5 miles South of Los Lunas on Highway 85	Valencia
18131-2	Arnberger R	30-Mar-68	2.5 miles South Isleta Pueblo, Highway 85	Valencia
18130	Dudding JF	20-May-68	Isleta Marsh, West side of Highway 85	Valencia
54964-5	Altenbach CS	25-Nov-89	Los Lunas, below wooden bridge 0.2 miles North of NM Highway 49 crossing of Peralta Canal	Valencia

Appendix 2: Museum records for *Rana pipiens* in NM, other than MSB.

MUSEUM	NUMBER	COLLECTOR	MONTH	DAY	YEAR	COUNTY	LOCALITY
UMMZ	72641	C Burt	8	26	1932	Bernalillo	1 mi SE Isleta
ENMU	984-87	T Salb	8	3	1967	Bernalillo	Rio Grande , Bernalillo
USNM	3294		.	.		Bernalillo	Albuquerque
CU	A 5372	AA Lindsay	7	29	1944	Cibola	Grants lava flow
NMSU	4270	RH Parnell	4	30	1966	Cibola	4.1 mi W. Grants
UAZ	39324	M Robbins	8	10	1974	Cibola	15 mi S. NM Hwy 53 and NM/AZ line, Zuni Wash, Zuni Res.
TU	13888		.	.		Cibola	on Hwy 66, 40 mi, W. ABQ
ENMU	4214	F Beard	8	21	1973	Colfax	2 mi E. of Springer, Cimarron River
ENMU	4170-4172	JT Villanyi	8	15	1980	Colfax	Palo Blanco Creek, T26N, R27E, Sec 4
ENMU	4177-4182	JT Villanyi	8	15	1980	Colfax	W. bank of Ute Creek, T26N, R27E, Sec 15
AMNH	46206		.	.	.	Colfax	18 mi SSW Cimarron, Philmont Ranch
MVZ	150262-64	RD Sage		9	1975	Dona Ana	18 mi N. Las Cruces, along Rio Grande
LACM	13830		.	.	.	Colfax	3 mi E. Abbott, St Hwy 58
NMSU	686-88	Fish Class	9	19	1961	Dona Ana	Rio Grande 2 mi W. Las Cruces
UTEP	555-56		4	29	1962	Dona Ana	3 mi NW Las Cruces
UTEP	600		4	12	1962	Dona Ana	W of Las Cruces, 3.6 mi N. Rio Grande bridge on Hwy 70/80
UTEP	950		4	12	1962	Dona Ana	3.6 mi N. Deming Hwy, E. side Rio Grande in ditch
UTEP	951-53		4	29	1962	Dona Ana	3 mi NW Las Cruces
UTEP	954-57		4	17	1962	Dona Ana	Las Cruces, 3.6 mi N. Hwy 70, River rd.
UTEP	958-59		4	24	1962	Dona Ana	2.1 mi N. Fairacres
UTEP	960-61		4	27	1962	Dona Ana	2 mi N. Hwy 80, along Rio Grande
UTEP	962		5	18	1962	Dona Ana	Las Cruces, head of del Rio irrigation ditch
NMSU	2855	SW Taft	4	18	1964	Dona Ana	Burk Tank, Picacho Peak
UTEP	557		4	27	1967	Dona Ana	2 mi E. Mesilla Dam
ENMU	530	TL Best	5	14	1967	Dona Ana	1.9 mi W, 0.25 mi S. Mesilla
UTEP	401		4	20	1969	Dona Ana	3 mi W. Canutillo
CM	107318	LL Hinsley	5	15	1975	Dona Ana	2.2 mi N. Radium Springs, St Hwy 85
NMSU	3286	AH Price	5	29	1975	Dona Ana	US Hwy 85, 16.6 mi S. Hatch
NMSU	3287	AH Price	5	29	1975	Dona Ana	US Hwy 85, 18.3 mi S. Hatch
KU	73018		.	.	.	Dona Ana	7.1 mi, S., 0.2 mi W. Univ. Park
KU	73019-20		.	.	.	Dona Ana	1.4 mi W., 2 mi S., Univ. Park
KU	73021		.	.	.	Dona Ana	4.5 mi W., 1 mi N. Univ. Park
LACM	132826-28		.	.	.	Dona Ana	2 mi W., Las Cruces, Rio Grande
LACM	1980-81		.	.	.	Dona Ana	2 mi W., Las Cruces, Rio Grande
TCWC	34769		.	.	.	Dona Ana	2.1 mi N. Fairacres
TCWC	34770		.	.	.	Dona Ana	3 mi N. Hatch
TCWC	34771		.	.	.	Dona Ana	5 mi N. Las Cruces, Hwy 70

MUSEUM	NUMBER	COLLECTOR	MONTH	DAY	YEAR	COUNTY	LOCALITY
UIMNH	39624-25	Reese	4	13	1952	Lincoln	1.5 mi W. Hondo
SDSNH	25803-06	LM Klauber	5	10	1936	Mc Kinley	Bluewater confined to McKinley Co., Bluewater Lake
CU	A 6340	Chenoweth	8	16	1949	McKinley	6 mi S. Thoreau
CU	A5773	FR Gehlbach	7	8	1951	McKinley	6 mi S. Thoreau
NMSU	686-88	Fish Class	9	19	1961	Dona Ana	Rio Grande 2 mi W. Las Cruces
CU	A 6306	FR Gehlbach	7	12	1957	McKinley	6 mi S. Thoreau
MCZ	33300-05	T Monath		.	1960	McKinley	Thoreau
ENMU	2566	D Nelson	6	5	1971	McKinley	11 mi E., 10 mi S. Gallup
ENMU	2571	D Nelson	8	15	1971	McKinley	54 mi N., 8 mi W. Gallup
UAZ	36417	Spicer	8	3	1973	McKinley	Berland Lake, Chuska Mts., ca.17.4 mi SW US Hwy 666, ca. 10 mi S. Newcomb
UAZ	36513	Spicer	8	3	1973	McKinley	Marshy Lake, Chuska Mts., ca. 15.7 mi SE US Hwy 666, ca. 10 mi S. Newcomb
USNM	16760		.	.	.	McKinley	Fort Wingate
UMMZ	72640	C Burt	8	27	1932	Mora	Watrous
ENMU	3740	M Hatch	3	23	1978	Mora	Sapello River at Watrous Bridge
USNM	25441		6	18	1898	Otero	Mescalero
LACM	91348		.	.	.	Otero	0.9 mi S. Royal Ambassador Camp, St hwy 24
LACM	91349		.	.	.	Otero	0.9 mi S. Royal Ambassador Camp, St hwy 24
USNM	63057-60		6	10	1918	Rio Arriba	Lake Burford
UMMZ	68982	N Hartweg	7	24	1930	Rio Arriba	El Rito
UMMZ	68983	N Hartweg	7	27	1930	Rio Arriba	swamp, 14 mi NW El Rito
UMMZ	68984	N Hartweg	7	28	1930	Rio Arriba	El Rito River, 12 mi S. El Rito
UMMZ	68985	N Hartweg	7	29	1930	Rio Arriba	4 mi NW El Rito
MVZ	25207	GW Barrington	6	12	1933	Rio Arriba	1.5 mi S. Canjilon Canyon
MVZ	25208	GW Barrington	6	29	1933	Rio Arriba	Canjilon Crk. Camp, 1.5 mi S. Canjilon Canyon
UMMZ	84331	C Tarzwell	5	13	1937	Rio Arriba	El Rito Creek 10 mi above El Rito, Carson Nat'l Forest
UOMZ	27125	E Sandoval	6	23	1940	Rio Arriba	Chimayo
UCM	1238		8	24	1947	Rio Arriba	small pond at jct. Hwy 84 & 17, Ca. 13 mi W. Rio Chama
UTEP	4188-90		7	12	1974	Rio Arriba	Carson Nat'l Forest, Trout Lakes Area
MVZ	133301-12	RD Sage	7	20	1975	Rio Arriba	Arroyo Seco Crk., near Ghost Ranch Living Museum
AMNH	43780-85		.	.	.	Rio Arriba	Chama
KU	9571-77		.	.	.	Rio Arriba	4 mi N. El Rito
USNM	9427		.	.	.	Rio Arriba	Plaza del Alcalde
USNM	8499		8	.	.	Rio Arriba	Abiquiu
USNM	63054-56		7	1	1918	San Juan	Chuska Mts
ENMU	2632-2642	D Nelson	8	22	1971	San Juan	24 mi E. Aztec
KU	38447-53		.	.	.	San Juan	Aztec

MUSEUM	NUMBER	COLLECTOR	MONTH	DAY	YEAR	COUNTY	LOCALITY
MVZ	16468-69	AM Alexander		.		San Juan	Aztec
TCWC	5068-69		.	.		San Juan	6 mi SE Blanco
UMMZ	67885	EB Williamson	10	27	1929	San Miguel	Pecos River camp, Pecos
UMMZ	68755	EB Williamson	10	27	1929	San Miguel	Pecos River camp, Pecos
USNM	87075		8	27	1932	San Miguel	1 mi N Las Vegas
UMMZ	83351	C Tarzwell	9	24	1937	San Miguel	Gallinas R., above Las Vegas
UOMZ	21667-70	AN Bragg	6	26	1940	San Miguel	Las Vegas, Gallinas River
UOMZ	21667-70	AN Bragg	6	26	1940	San Miguel	Las Vegas, Gallinas River
UOMZ	27061	AN Bragg	6	6	1940	San Miguel	Gallinas River, 0.5 mi N. Montezuma
UOMZ	27036-38	AN Bragg	7	30	1940	San Miguel	1.4 mi S. Romeroville
UOMZ	21446	AN Bragg	8	8	1940	San Miguel	3 mi S. Las Vegas
FMNH	29399-403		.	.	.	San Miguel	no exact data given
FMNH	57403		.	.	.	San Miguel	Las Vegas
TTC	1169		.	.	.	San Miguel	Las Vegas
MVZ	18052	AE Borell	11	13	1934	Sandoval	Valle Grande, head of Frijoles Canyon
MVZ	57643	JC Russel	8	27	1952	Sandoval	Jemez Creek, 6 mi NW Bland
MVZ	57651	JC Russel	8	28	1952	Sandoval	Jemez Creek, 6 mi SW Bland
UCM	23178		5	26	1963	Sandoval	8 mi NNE Bernalillo, Hwy 46
CM	86094	SR Williams	7	9	1970	Sandoval	4 mi N. Cabin in Jemez = (Biology Cabin)
NMSU	4663	W Waguiu	3	31	1974	Sandoval	Jemez Pueblo, 45 mi NW of ABQ
ENMU	3731	P Albert	6	2	1978	Sandoval	0.5 mi above campground Las Conchas
USNM	252525	RD Jennings	8	23	1984	Sandoval	Lagunitas, NM, Hwy 44, 3.5 mi S. of Cuba
USNM	252590	RD Jennings	8	23	1984	Sandoval	Lagunitas, NM, Hwy 44, 3.5 mi S. of Cuba
USNM	8500		9		1874	Santa Fe	Santa Fe
CAS	65033-43	P Ruthling	7	10	1927	Santa Fe	Buckman
CU	A 6349	Chenoweth	8	3	1951	Santa Fe	US 85, 15 mi W. Santa Fe
MVZ	57652	RI Bowman	9	13	1952	Socorro	1 mi S. Bernardo
MVZ	57655	SO Landry	9	15	1952	Socorro	1 mi S. Bernardo
LACM	13811-20		.	.	.	Socorro	Rio Grande at San Antonio
LACM	13821		.	.	.	Socorro	3.4 mi N. Valverde
TCWC	9436		.	.	.	Socorro	Bosque del Apache Refuge
UMMZ	84694	C Tarzwell	5	11	1937	Taos	Rio Grande, near Taos, Carson Nat'l Forest
ENMU	4215	Sublette		.	.	Taos	Rio Ojo Caliente, at Ojo Caliente
KU	9469		.	.	.	Taos	Taos
WTSU	1056-57		.	.	.	Taos	5mi NW Pilar
WTSU	808-09		.	.	.	Taos	ca. 4 mi N. Pilar
USNM	8497		8	.	.	Taos	Taos
UMMZ	70124	W Mosauer		1930	1930	Taos/ Rio Arriba	between Taos and Espanola
ENMU	4175	JT Villanyi	8	16	1980	Union	Cimarron River, T31N, R37E Sec 18

MUSEUM	NUMBER	COLLECTOR	MONTH	DAY	YEAR	COUNTY	LOCALITY
ENMU	4176	JT Villanyi	8	16	1980	Union	34 mi NE of Mt. Dora, Arroyo to Cimarron River
ENMU	4183-4184	JT Villanyi	8	16	1980	Union	Cimarron River, T32N, R34E Sec 35
UMMZ	65053	Hubbs&Schultz	9	20	1926	Valencia	Rio Grande at Los Lunas
UMMZ	139128	RR Miller	9	21	1961	Valencia	Rio San Jose, on N. side US Hwy 66
FMNH	57403		.	.	.	San Miguel	Las Vegas
TTC	1169		.	.	.	San Miguel	Las Vegas
MVZ	18052	AE Borell	11	13	1934	Sandoval	Valle Grande, head of Frijoles Canyon
MVZ	57643	JC Russel	8	27	1952	Sandoval	Jemez Creek, 6 mi NW Bland
MVZ	57651	JC Russel	8	28	1952	Sandoval	Jemez Creek, 6 mi SW Bland
UCM	23178		5	26	1963	Sandoval	8 mi NNE Bernalillo, Hwy 46
CM	86094	SR Williams	7	9	1970	Sandoval	4 mi N. Cabin in Jemez = (Biology Cabin)
NMSU	4663	W Waguiu	3	31	1974	Sandoval	Jemez Pueblo, 45 mi NW of ABQ
ENMU	3731	P Albert	6	2	1978	Sandoval	0.5 mi above campground Las Conchas
USNM	252525	RD Jennings	8	23	1984	Sandoval	Lagunitas, NM, Hwy 44, 3.5 mi S. of Cuba
USNM	252590	RD Jennings	8	23	1984	Sandoval	Lagunitas, NM, Hwy 44, 3.5 mi S. of Cuba
USNM	8500		9		1874	Santa Fe	Santa Fe
CAS	65033-43	P Ruthling	7	10	1927	Santa Fe	Buckman
CU	A 6349	Chenoweth	8	3	1951	Santa Fe	US 85, 15 mi W. Santa Fe
MVZ	57652	RI Bowman	9	13	1952	Socorro	1 mi S. Bernardo
MVZ	57655	SO Landry	9	15	1952	Socorro	1 mi S. Bernardo
LACM	13811-20		.	.	.	Socorro	Rio Grande at San Antonio
LACM	13821		.	.	.	Socorro	3.4 mi N. Valverde
TCWC	9436		.	.	.	Socorro	Bosque del Apache Refuge
UMMZ	84694	C Tarzwell	5	11	1937	Taos	Rio Grande, near Taos, Carson Nat'l Forest
ENMU	4215	Sublette		.	.	Taos	Rio Ojo Caliente, at Ojo Caliente
KU	9469		.	.	.	Taos	Taos
WTSU	1056-57		.	.	.	Taos	5mi NW Pilar
WTSU	808-09		.	.	.	Taos	ca. 4 mi N. Pilar
USNM	8497		8	.	.	Taos	Taos
UMMZ	70124	W Mosauer			1930	Taos/ Rio Arriba	between Taos and Espanola
ENMU	4175	JT Villanyi	8	16	1980	Union	Cimarron River, T31N, R37E Sec 18
ENMU	4176	JT Villanyi	8	16	1980	Union	34 mi NE of Mt. Dora, Arroyo to Cimarron River
ENMU	4183-4184	JT Villanyi	8	16	1980	Union	Cimarron River, T32N, R34E Sec 35
UMMZ	65053	Hubbs&Schultz	9	20	1926	Valencia	Rio Grande at Los Lunas
UMMZ	139128	RR Miller	9	21	1961	Valencia	Rio San Jose, on N. side US Hwy 66

Appendix 3: 2023 *Rana pipiens* survey results.

Date	Locality	County	Species	Yr last obs	Predators
30-Apr-23	La Jencia Creek	Socorro	Buwo		
30-Apr-23	Cedro Canyon, Cibola NF	Bernalillo	Rapi	2010	
	Cedro Canyon				
1-May-23	Santa Fe River, BLM	Santa Fe	Raca	2010	
	Santa Fe River	Santa Fe			
2-May-23	E. Fork Jemez River, above Battleship Rock, Santa Fe NF	Sandoval	none	1946	
	E. Fork Jemez River				
2-May-23	Redondo Creek, Santa Fe NF	Sandoval	Rapi		
	Redondo Creek				
2-May-23	Sulphur Canyon, Santa Fe NF	Sandoval	none		
2-May-23	E Fork Jemez River, Los Conchas, Santa Fe NF	Sandoval	none	1967	
3-May-23	San Antonio Creek, Santa Fe NF	Sandoval	Rapi, Psma	1956	crayfish
	San Antonio Creek				
6-May-23	Manuelitas Creek	San Miguel	none	2009	
23-Jun-23	Rio Grande del Rancho, Carson NF	Taos	none	2010	
23-Jun-23	Rio Chiquito, Carson NF	Taos	none		
24-Jun-23	Chama River - Boat launch	Rio Arriba	none		
24-Jun-23	Chama River - Above Nutria	Rio Arriba	none		crayfish
24-Jun-23	Chama River - Hotsprings	Rio Arriba	none		
25-Jun-23	Chama River - Above Archilleta	Rio Arriba	none		
26-Jun-23	Cebolla River	Rio Arriba	Buwo		carp
26-Jun-23	Chama River - Above Monastery	Rio Arriba	none		crayfish
26-Jun-23	Rio Gallenas	Rio Arriba	none		
30-Jun-23	Sepultura, stock tank	Socorro	none		
5-Jul-23	222, concrete drinker	Socorro	none		
7-Jul-23	Canyon Ojitos	Socorro	none		
7-Jul-23	Esquival, metal drinker	Socorro	none		
10-Jul-23	unnamed stock tank, Vermejo Park Ranch	Taos	none		
11-Jul-23	Vermejo River, Vermejo Park Ranch	Colfax	Rapi, Buwo	2009	crayfish
11-Jul-23	Vermejo River, off channel pool, Vermejo Park Ranch	Colfax	Rapi	2009	
11-Jul-23	Vermejo River at Salyer's Canyon, Vermejo Park Ranch	Colfax	Rapi, Buwo	2009	crayfish
11-Jul-23	Van Bremmer Canyon, Vermejo Park Ranch	Colfax	Rapi, Buwo, Amma	2009	crayfish
11-Jul-23	unnamed Tank Van Bremmer Canyon	Colfax	none	2009	
11-Jul-23	Van Bremmer Canyon, Vermejo Park Ranch	Colfax	Rapi, Amma	2009	crayfish, T.elegans
12-Jul-23	unnamed stock tank, Vermejo Park Ranch	Colfax	Amma		
12-Jul-23	Lower Vermejo River, upstream Van Bremmer	Colfax	Rapi, Buwo	2009	

Date	Locality	County	Species	Yr last obs	Predators
11-Jul-23	Van Bremmer Canyon, Vermejo Park Ranch	Colfax	Rapi, Amma	2009	crayfish, T. elegans
12-Jul-23	unnamed stock tank, Vermejo Park Ranch	Colfax	Amma		
12-Jul-23	Lower Vermejo River, upstream Van Bremmer	Colfax	Rapi, Buwo	2009	
12-Jul-23	Van Bremmer Canyon, upstream of Vermejo R.	Colfax	none	2009	
12-Jul-23	pond in the plains, Vermejo Park Ranch	Colfax	Buwo, Psma		
12-Jul-23	Ponil Creek, 6.25 miles E of Cimarron, Vermejo Park Ranch	Colfax	Raca	2009	
13-Jul-23	pond, Fowler Pass, Philmont Scout Ranch	Colfax	Psma, Amma		T. elegans
13-Jul-23	wetland, Fowler Pass, Philmont Scout Ranch	Colfax	Psma, Amma		T. elegans
13-Jul-23	Cerrososos Cr, Vermejo	Colfax	none	2009	
13-Jul-23	windmill, Cerrososos Cr, Vermejo	Colfax	Rapi, Buwo	2009	Odonates
14-Jul-23	windmill, lower Cerrososos Cr, Vermejo	Colfax	Raca, Buwo, Amma	2009	T..radix
14-Jul-23	Cerrososos Cr, Vermejo	Colfax	none	2009	
14-Jul-23	unnamed stock tank, Vermejo Park Ranch	Colfax	tadpole shrimp		
28-Jul-23	San Antonio Creek, Santa Fe NF	Sandoval	none		3 T. elegans
20-Sep-23	Rio Grande del Rancho, Carson NF	Taos		2009	
21-Sept-23	Riverside Canal, southside, BdA NWR	Socorro	Raca		
21-Sept-23	Largo Creek above Quemado Lake, dry	Catron	none		
2-Oct-23	San Juan River, below Navajo Dam	San Juan	Rapi	2009	
2-Oct-23	San Juan River at Simon Canyon	San Juan	none		
6-Oct-23	Interior Drain, BdA NWR	Socorro	Raca		
6-Oct-23	Riverside Canal, northside, BdA NWR	Socorro	Raca		
8-Oct-23	unnamed stock tank, Cibola NF	McKinley	none		
8-Oct-23	unnamed stock tank, Cibola NF	McKinley	none		
8-Oct-23	unnamed stock tank, Cibola NF	McKinley	none		

Appendix 4: 2009-2010 *Rana pipiens* survey results.

Date	Locality	County	Species	# Obs.	Elev
Jun-24-09	Stone Lake, NE (Boulder Lake), Jicarilla	Rio Arriba	R. pipiens, A. tigrinum	5ad, 1000 tads	2213
Jun-24-09	Hayden Lake, Jicarilla Apache Res.	Rio Arriba	R. pipiens, B. woodhousei	1ad, Rapi	2200
Jun-24-09	stock tank head of Amargo drainage, Humphries	Rio Arriba	R. pipiens, P. maculata	2 ad, 10tads	2278
Jun-25-09	arroyo along US84/64, 5.2 rd mi S. of NM115	Rio Arriba	R. pipiens, A. tigrinum	1ad Rapi	2174
Jul-15-09	stock pond, Sargent W/L Area	Rio Arriba	R. pipiens	1 ad, 10 tad	2464
Aug-13-09	Ponil Creek, ca.7 rd mi E. Cimarron	Colfax	R. pipiens	1ad, 7 juv	1875
Aug-18-09	Ponil Creek, ca.7 rd mi E. Cimarron	Colfax	R. pipiens	6 juv	1890
Aug-19-09	Vermejo River, at Salyer's Canyon confl.	Colfax	R. pipiens	2 ad, 1 juv	2094
Aug-19-09	unnamed stock tank, Van Bremmer Canyon	Colfax	R. pipiens	4 ad, 4 juv	2446
Aug-19-09	unnamed stock tank, Van Bremmer Canyon	Colfax	R. pipiens	15 juv	2357
Aug-20-09	Van Bremmer Canyon, upstream of US 64	Colfax	R. pipiens	2 ad, 4 juv	1920
Aug-20-09	Vermejo River, upstream of Van Bremmer Cr.	Colfax	R. pipiens, R. blairi, R. spp.	4 ad, 2 juv	1875
Aug-20-09	Van Bremmer Creek, upstream of Vermejo Riv.	Colfax	R. pipiens	15ad&juv, 10 tad	1875
Aug-20-09	Cerrososos Creek, upstream of US 64	Colfax	R. pipiens	5 ad&juv	1932
Aug-25-09	San Juan River, Cottonwood campground, BLM	San Juan	R. pipiens	2ad, 2 juv	1731
Aug-26-09	San Juan River, Marsh below Navajo Dam, BLM	San Juan	R. pipiens, R. catesbeiana	2 ad, 25 juv	1740
Aug-26-09	Los Pinos River, trib. To Navajo Reservoir	San Juan	R. pipiens, B. woodhousei	1 ad	1853
Aug-26-09	spring below Citizens Ditch, 6mi E. Bloomfiled, BLM	San Juan	R. pipiens, P. maculata	1 juv	1670
Sep-02-09	pond, Mora Nat'l Fish Hatchery	Mora	R. pipiens, A. tigrinum	2 ad, 4 juv	2110
Sep-02-09	wellfield, Mora Nat'l Fish Hatchery	Mora	R. pipiens	3 juv	2184
Sep-03-09	Coyote Creek, Coyote Creek State Park	Mora	R. pipiens	1ad, 1 juv	2340
Sep-21-09	Cerro Canyon, Cibola N.F., Sandia RD	Bernalillo	R. pipiens	11 juv	2104
13-Apr-10	Cerro Canyon, Cibola N.F., Sandia RD	Bernalillo	Rana pipiens	2ad, 1 juv	2104
11-May-10	Ocate Creek, Charette Lakes State W/L Area	Mora	R. blairi	1 juv	1928
17-May-10	Cerro Canyon, Cibola N.F., Sandia RD	Bernalillo	R. pipiens	1 ad	2104
26-May-10	Dry Cimarron, 3 mi NE of Folsom, NMDGF access	Union	R. blairi	3 ad, 9 juv	1879
26-May-10	Dry Cimarron, NM Hwy 456 ca. 19 rd mi E Folsom	Union	R. blairi, R catesbeiana	1 ad Rabl, 1 ad Raca	1606
6-Jul-10	Cerro Canyon, Cibola N.F., Sandia RD	Bernalillo	R. pipiens 3 ad 2 juv	.	2103
7-Jul-10	Pecos River, Santa Fe N.F. Anton Chico	San Miguel	Rana sp? Likely R. blairi, B. woodhousei	.	1712
21-Jul-10	Rio Grande, Pena Blanca, MRGCD	Sandoval	R. pipiens, R. catesbeiana	.	1593
22-Jul-10	clear ditch, Pena Blanca, MRGCD	Sandoval	R. pipiens, R. catesbeiana	Rapi 13 juv, Raca 20+	1582
23-Jul-10	Rio Grande, Pena Blanca, N. from Santo Domingo, MRGCD	Sandoval	R. pipiens, R. catesbeiana	Rapi 26 juv, Raca 8	1575
16-Sep-10	San Juan River, bank, Navajo Nation	San Juan	R. pipiens, R. catesbeiana, B. woodhousei	3 juv, 1 juv, 1 juv	.

Date	Locality	County	Species	# Obs.	Elev
16-Sep-10	San Juan River, bank, Navajo Nation	San Juan	R. pipiens, R. catesbeiana, B. woodhousei	3 juv, 1 juv, 1 juv	.
17-Sep-10	pond above San Juan River, N. end Jicarilla Dst. Carson N.F.	Rio Arriba	R. pipiens	50 (10 ad, 40 juv)	.
17-Sep-10	unnamed gas well pond, Carracas Mesa, Carson NF	Rio Arriba	R. pipiens	1 ad, 1 juv	2198
2-Oct-10	Rio Grande del Rancho, ca. 1 rd mi S. Talpa, Carson NF	Taos	R. pipiens	1 juv	2182
3-Oct-10	Rio Grande del Rancho, ca. 2 rd mi S. Talpa, Carson NF	Taos	R. pipiens	1 ad, 5 juv	2206
13-Oct-10	Cerro Canyon, Cibola N.F., Sandia RD	Bernalillo	R. pipiens	2 ad	2104

Appendix 5: *Bd* test results (2023)

Date	Species	Sex	Locality	County	BLC-Field #	Total Bd Target Copies in Original Sample	Comments
2-Oct-23	Rana pipiens	Juv	Below Navajo Dam, San Juan River	San Juan	BLC-1191	0.00E+00	1 of 10 observed
2-Oct-23	Rana pipiens	M	Below Navajo Dam, San Juan River	San Juan	BLC-1192	0.00E+00	1 of 10 observed
2-Oct-23	Rana pipiens	M	Below Navajo Dam, San Juan River	San Juan	BLC-1193	0.00E+00	1 of 10 observed
2-Oct-23	Rana pipiens	M	Below Navajo Dam, San Juan River	San Juan	none	**1.62E+02**	1 of 10 observed
13-Jul-23	Rana pipiens	M	Philmont Scout Ranch	Colfax	none	0.00E+00	1 of 10 observed
13-Jul-23	Rana pipiens	F	windmill, Cerrososos Creek, Vermejo Park Ranch	Colfax	none	0.00E+00	1 of 1
5-May-23	Rana pipiens	F	Coyote Creek State Park	Mora	none	**5.55E+04**	1 of 4
11-Jul-23	Rana pipiens	F	below Salyers Canyon, Vermejo River, Vermejo Park Ranch	Colfax	none	0.00E+00	1 of 1
30-Apr-23	Rana pipiens	F	Cedro Canyon, Sandia Dist, Cibola NF	Bernalillo	none	0.00E+00	1 of 4
30-Apr-23	Rana pipiens	M	Cedro Canyon, Sandia Dist, Cibola NF	Bernalillo	none	0.00E+00	1 of 4
3-May-23	Rana pipiens	Juv	San Antonio Cr, Jemez Dist, Santa Fe NF	Sandoval	none	0.00E+00	1 of 1
1-May-23	Rana catesbeiana	F	Santa Fe River, BLM	Santa Fe	none	**3.18E+03**	1 of 4
1-May-23	Rana catesbeiana	M	Santa Fe River, BLM	Santa Fe	none	0.00E+00	1 of 4
5-May-23	Pseudacris maculata	M	Coyote Creek State Park	Mora	none	0.00E+00	calling