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Residence Tract Surveys For: Mountain Yellow-Legged Frog (*Rana muscosa*), California Red-Legged Frog (*Rana aurora*) and Arroyo Toad (*Bufo californicus*)

Technical Report

Prepared for:

Angeles National Forest
Bill Brown

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY
WESTERN ECOLOGICAL RESEARCH CENTER

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INTRODUCTION

This report contains the results of surveys conducted in the San Gabriel Mountains, which focused on three species: California red-legged frog (*Rana aurora draytonii*) (CRLF), the mountain yellow-legged frog (*Rana muscosa*) (MYLF) and the arroyo toad (*Bufo californicus*). The focus of these surveys was to determine the habitat suitability for these three species in streams within selected recreation / residence tracts in the Angeles National Forest, and to determine the current status of these species at these sites. All three of these species are currently, or will shortly be, under federal protective status. The arroyo toad is listed as endangered, the CRLF is listed as threatened and a final rule is expected to list the MYLF as endangered in June 2002. The foothill yellow-legged frog (*Rana boylii*) was also included in this report as it historically occurred in several of the drainages surveyed. Although Arroyo Seco was not part of the Residence Tract surveys, it is included in this report as it was the only arroyo toad survey site in the Angeles National Forest and the only product for this survey was similar to the products of these surveys, the habitat suitability forms.

METHODS

MYLF, CRLF, and arroyo toad surveys were conducted along 18 drainages in the Angeles National Forest between April and November 2001 (Table 1). For several drainages, surveys were conducted along different reaches of the same canyon (i.e. lower and upper portions) and were conducted on multiple occasions. The surveys were divided into two phases. During Phase I, habitat suitability analysis was performed within the selected stream segments that are adjacent to the recreation / residence tracts. In Phase II, species presence surveys were conducted in those drainages where it had been determined during Phase I, that suitable habitat is present for any one or all three of these species. Sites deemed to have suitable MYLF habitat were then surveyed three times during the day with each return visit being no less than one week apart, and sites that contained suitable CRLF habitat and/or suitable arroyo toad habitat were surveyed additionally three times at night.

Surveys were conducted during the day and at night (specific for CRLF and arroyo toad) by walking slowly in or near the stream channel. The frogs usually are located basking on rocks in or near the water, and can potentially be captured by hand or with the aid of a small dip net. The captured frogs would be weighed, measured (snout to vent length), and examined to determine gender and any deformities. Water and air temperatures would be recorded for each capture. The frogs would then be photographed and the GPS location recorded. All frogs would be released after being processed. Detailed notes, identifying potential threats and general quality of the watercourse, were taken for each survey. Species lists for all amphibians and reptiles observed were also compiled.

SITE DESCRIPTIONS

Stonyvale and La Paloma (Fig. 1)

These two sites are in the lower Big Tujunga Canyon. These sites were combined and surveyed as one continuous reach. The dominant riparian vegetation consisted of alder/willow woodland with Arundo occurring in dense clusters. The majority of this low gradient (~1.0%) reach contained several perennial pools ≤ 0.5 meters (m) deep and two pools approximately 0.75 m deep. At the time this reach was surveyed, all these pools were characterized by low flows with quiet backwaters and appeared to be suitable habitat for California Red-Legged Frog. However all these pools are were dominated by introduced predatory species such as crayfish, bullfrogs, and trout (possibly a mix of native and introduced stock). In addition, these sites are below the Big Tujunga Dam. Effects of large impoundments on down stream riparian habitats include, reductions of peak flood flows, interruption of the natural process of sediment transport resulting in bed material becoming more coarse over time, and an increase in vegetation as a result of reduced flows and the scouring events. The net effect of altering the historical flows regimes and the subsequent structural changes of the riparian zone, in consort with introduction of predatory aquatic species, significantly degrade habitat quality for native aquatic breeding amphibians. No evidence of California Red-legged Frogs was observed (i.e., adults, juveniles, males producing advertisement calls, egg masses, larvae).

Wildwood (Fig. 1)

The dominant riparian vegetation of this low gradient reach (~1.0%) consists of an alder/willow woodland with the introduced giant reed (Arundo) occurring in clusters. Dry algae mats in holes below small water drops formed by snags of woody debris and/or bedrock did not contain standing water. Consequently, no ranid frog habitat occurs in this reach. Prior to the construction of the Big Tujunga Dam the hydroperiod would have been beyond early summer providing aquatic habitat for native ranid frog species.

Vogel Canyon (Fig. 1)

Vogel Canyon, a tributary to Big Tujunga Canyon, is primarily a dry rocky canyon most months of the year. The vegetation consists of mulefat, small willows and sycamore trees, which is typical of canyon bottoms in the Transverse Mountains with gradients in the range of 4.0%. The channel of this survey reach, which is at the foot of this canyon, is characterized by exposed bedrock and loose rock, gravel, and cobble. No perennial pools were found. Consequently, no ranid frog habitat occurs in this reach.

Trail Canyon (Fig. 2)

At the top of the reach, in association with the bedrock, the vegetation consists of alders and willows, and in the lower portion willow and mulefat are more common as the channel contains more sand and cobble. Neither California Red-legged Frogs nor

Mountain Yellow-legged Frogs were detected in the perennial pools in the upper portion of this survey reach. Pools were searched for adult, juvenile, eggs, and larvae of these species.

Lower Big Tujunga (Fig. 2)

This portion of Big Tujunga Canyon consists of a wide canyon bottom with a low gradient riverbed. The canyon bottom fill consisted of abundant sand, boulders, rock, cobble and gravel. As a result of these characteristics, the river channel is highly braided supporting sparse vegetation, which indicates periodic scouring. Consequently, the habitat along this survey reach does not support perennial pools ≥ 0.5 meters deep, no ranid frog habitat was observed in this reach. However, the habitat along this reach qualifies as high quality for arroyo toads. This section of stream will be resurveyed for arroyo toads in years following that provide adequate rainfall.

Bouquet Canyon (Fig. 3)

Bouquet Canyon was surveyed for a distance of 3.98 miles (4.60 km). The stream runs adjacent to the neighborhood of Bouquet Canyon. This stream was flowing and had various pools ranging in size from 1 meter in diameter to up to 4 meters in diameter for some of the manmade pools. The substrate was composed mostly of sand and silt with some cobble and large boulders. The vegetation was dominated by coast live oak, sycamore, willows and cottonwoods. Non-native trout were found in many of the large pools, and the damming, diverting, or pumping of the water in the stream by the residential houses was also evident. The area is subject to heavy use by the public, and contained large amounts of litter, as well as the presence of domestic dogs.

Lower Big Rock Creek (Fig. 4)

The 0.97 mile (1.56km) section of stream surveyed runs adjacent to Big Rock Creek Road. The substrate was composed primarily of cobble and boulder along a mild gradient. Vegetation along the creek was dominated by alder, sycamore and cottonwood trees. There was considerable perennial flow in this creek. The stream was relatively wide (around 5.0 meters) and there were numerous medium to large pools, many as a result of human built dams. This area receives substantial human impact as evidenced by abundant trash and graffiti. Overall the habitat appeared in poor shape with a low suitability for MYLF and non-suitable for CRLF and arroyo toad.

Millard Canyon (Fig. 5)

A 1.18mile (1.90 km) section of the stream was surveyed that had low flow with 6 pools greater than 0.66 meters in depth. The habitat was consistent with MYLF preferred habitat, but the stream itself is in close proximity to a parking lot (approx. 3 meters), RV campground, road crossing, and a high use trail. Trout were not observed in this drainage.

Big Santa Anita / Winter Creek (Fig. 6)

Because of length, this reach was divided into two sections. Big Santa Anita was surveyed for a distance of 2.99 miles (4.81km). The stretch surveyed had moderate flow with 37 pools greater than 0.66 meters in depth. A few short stretches of the survey were consistent with MYLF preferred habitat. An abundance of trout was found throughout the entire surveyed reach, many of which were large in size, over 30 cm in length.

The Winter Creek tributary to Big Santa Anita was surveyed for a distance of 1.74 miles (2.81 km). This stream had low steady flow the entire survey with 16 pools greater than 0.66 meters in depth. Debris dams interrupted this stream approximately every 50 meters. Although these dams provided an ample amount of pools, the overall habitat was not preferred MYLF habitat. The canopy was thick and allowed little light to reach the stream. A high number of trout were also observed.

Robert's Canyon (Fig. 7)

This canyon is a tributary to the San Gabriel River. The canyon bottom along this survey reach was characterized by exposed bedrock, rock, gravel, and cobble. The vegetation in this reach consisted of oak and sycamore trees on the canyon walls while mulefat and small willows dominated the creek bed that is subject to occasional scouring. Three pools were found within the reach but none greater than 15-centimeters deep. As evidenced by the dry algae mat along the perimeter of the pools, these pools were all in the process of drying. Because of the steep rocky canyon walls and lack of perennial pools $\geq$ 0.5 meters deep, no ranid frog habitat was observed in this reach.

San Gabriel River-North Fork (Fig. 8)

San Gabriel River-North Fork was surveyed for a distance of 2.46 miles (3.96 km). This stream had fairly high flow with 42 pools greater than 0.66 meters in depth. The habitat was consistent with MYLF preferred habitat. However, an abundance of non-native trout was observed, and the portion of the stream surveyed also runs parallel to Highway 39 and was easily accessible to the public. No part of the stream surveyed was found undisturbed or without trash.

San Dimas – West Fork (Fig. 9)

A 1.56 mile (2.51 km) reach of San Dimas – West Fork was surveyed. Vegetation consisted of alder, oak, and sycamore with a heavy understory growth consisting of an exotic vine and blackberry. Less than half of the reach surveyed contained water, and only a few shallow pools (< 0.66 meters) were observed. Cabins were observed in close proximity to the stream, and the road also crosses the stream. In some of the places where water was present it had a strong sewage odor and a white film was observed on the rocks and vegetation in these areas. Also, in one shallow pool, approximately 15 exotic goldfish were observed.

San Dimas / Wolfskill Canyon (Fig. 9)

A 1.91 mile (3.08 km) reach of San Dimas / Wolfskill Canyon was surveyed. The stretch of stream surveyed varied in flow over the three survey dates, with a definite increase in flow during the later survey. There were 17 pools greater than 0.66 meters in depth. A high number of trout were seen along the entire survey, many of which were large in size, over 30 cm. There are a number of houses along this stream, as well as an access road that parallels and often crosses the stream.

San Antonio Creek (Fig. 10)

San Antonio Creek is the main south flowing drainage off Mount Baldy. The gradient in the 0.66 mile (1.06 km) stretch of creek surveyed was low to moderate and the substrate composed of cobble, boulder and bedrock. The vegetation was dominated by alder, with a medium density overstory. Over the entire survey reach, there were only a limited number of pools suitable for mountain yellow-legged frogs. This area receives a considerable amount of human traffic, which was evident from the abundance of trash that was left behind.

Upper San Antonio Creek (Fig. 10)

A 0.65 mile (1.05 km) reach of creek was surveyed above the San Antonio Creek site. The gradient was steeper with loose cobble and boulders. Water flow diminished along this stretch and there were a few dry sections. It is unclear whether this drainage has perennial flow. There were several suitable pools for mountain yellow-legged frogs, but overall not many along the entire survey reach. Above the houses, it appeared this area received little human traffic due to its relative inaccessibility.

Icehouse Canyon (Fig. 10)

Icehouse Canyon is a tributary of San Antonio Creek, accessed beyond a trailhead parking lot near the confluence. A hiking trail parallels the stream keeping much of the human traffic out of the water and on the trail. It appears this area receives a moderate amount of anthropogenic impacts. A 2.11 mile (3.40 km) section was surveyed along a mild to moderate gradient flowing east to west. The dominant vegetation type was alder/ sycamore woodland with a fairly dense overstory cover. The substrate was composed of cobble and boulder and there were numerous small to medium pools. This habitat appeared relatively intact with a moderate suitability for mountain yellow-legged frogs.

Arroyo Seco Canyon (Fig. 11)

Surveys were conducted for arroyo toads from Oakwild picnic area down to the USFS boundary at California Institute of Technology Jet Propulsion Laboratory. This relatively high gradient drainage (~ 3.0) was surveyed for arroyo toads because of several reports of arroyo toad sightings. Only one single record is from the steeper portion of the canyon. All other reported sightings were from the alluvium wash habitat outside the Angeles

National Forest boundary just above the Devil's gate Reservoir. The only low gradient sandy habitat was created by sand, cobble and rock debris fill behind the debris dam near the mouth of Brown Canyon. No arroyo toads at any life history stages (egg stages, larvae, metamorphs, juveniles, adults) were detected. In addition, no calling males were heard.

RESULTS

No MYLF, CRLF or arroyo toads were detected at any of the survey locations (Table 2). The drainages that were surveyed generally lacked the habitat characteristics that either MYLF, CRLF or arroyo toads require. Specifically, these locations had little or no surface flow and, where water was present, contained small pools that were too shallow. Many sites also contained dense vegetative cover, resulting in the lack of open, sunny stream banks. Most sites were also present along areas of human recreation, which have negative impacts on MYLF, CRLF and arroyo toad habitat. Many of the sites also contained exotic fish and amphibians that can severely reduce the numbers of native amphibians.

Several other species of interest were detected during the surveys (Table 2). California treefrogs (*Hyla cadaverina*) were detected in Trail Canyon, Millard Canyon, Big Santa Anita / Winter Creek and San Dimas / Wolfskill Canyon; Pacific treefrogs (*Hyla regilla*) were detected in the Upper North Fork of the San Gabriel River; Western toads (*Bufo boreas*) were detected in La Paloma, Stonyvale and Wildwood; California newts (*Taricha torsa*) were detected in Millard Canyon, Big Santa Anita / Winter Creek, Robert's Canyon and San Dimas / Wolfskill Canyon; Arroyo chubs (*Gila orcutii*) were found in La Paloma, Stonyvale, Wildwood, Lower Big Tujunga and Robert's Canyon; Threespine stickleback (*Gasterosteus aculeatus*) were found at Bouquet Canyon and Speckled dace (*Rhinichthys osculus*) were found in the upper North Fork of the San Gabriel River. Many exotic species were also detected. Hatchery rainbow trout (*Oncorhynchus mykiss*) were found in La Paloma, Stonyvale, Big Santa Anita / Winter Creek, Upper North Fork of the San Gabriel River, San Dimas / Wolfskill Canyon, San Antonio Creek, Upper San Antonio Creek, Lower Big Tujunga, Bouquet Canyon and Icehouse Canyon; Bullfrogs (*Rana catesbeiana*) were detected in La Paloma, Stonyvale and Lower Big Tujunga; Crayfish (*Procambrius clarkii*) were found in La Paloma and Stonyvale.

RECOMMENDATIONS

Throughout our surveys on this project, no mountain yellow-legged frogs, California red-legged frogs, foothill yellow-legged frogs or arroyo toads were found, although there are still several native amphibian and fish species remaining.

Many of the sites are heavily used for recreation and/or residences. With this comes alterations of the habitat and the deposition of trash. Many of the sites have artificially created dams, which alter the natural flows and often create refuges for introduced fish. Trash can also negatively affect native species. Things such as oil cans, automobile coolant containers and other waste products can contaminate these areas. A more

aggressive monitoring of these areas will help minimize these stream alterations and reduce the trash.

The presence of exotic fish, amphibians and crayfish are a serious problem to native amphibians. Trout deleteriously impact frogs in several capacities. Trout have been observed preying on MYLF larvae and metamorphs (Hayes and Jennings 1986, Bradford 1989); additionally, experiments in Southern California have shown that the presence of trout eliminates tadpoles of other frogs in streams (Cooper et al. 1986). Also, bullfrogs are voracious predators and will eat anything that moves and will fit in their mouth (Porter, 1967), including treefrogs, arroyo chubs, speckled dace, threespine sticklebacks and any other small animals. In general, native amphibians and introduced fishes and bullfrogs tend not to co-occur (Fisher and Shaffer, 1996). Introduced crayfish, like the ones in La Paloma and Stonyvale, inhibit the reproductive success of the California newt (*Taricha torosa*) and can extirpate local populations (Gamradt and Kats, 1996). The development of an exotic removal project would in these areas would improve the habitat for the native animals and help insure their future survival.

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Table 1. Habitat Suitability, Presence Surveys, Angeles National Forest, 2001

Survey Site	Survey Dates	Survey Length	Potential For Suitable Habitat				Notes
			Rana muscosa	[1]*Rana boylii*	*Rana aurora*	*Bufo californicus*	
Big Tujunga Canyon							
La Paloma	10/11, 10/18, 11/1	1.0 mile	X	X	potential	X	Alder canopy, isolated pools
Stonyvale	10/11, 10/18, 11/1	1.0 mile	X	X	potential	X	Alder canopy, isolated pools
Vogel Canyon	10/18	1.0 mile	X	X	X	X	Alder canopy, isolated pools
Wildwood	10/18	1.0 mile	X	X	X	X	Alder canopy, isolated pools
Trail Canyon	10/11, 10/18, 11/1	1.0 mile	potential	potential	X	X	Alder canopy, isolated pools
Lower Big Tujunga	10/11, 10/18, 11/1	0.5 mile	X	X	X	potential	Alder canopy, isolated pools
Bouquet	10/4, 10/23, 11/8	3.5 miles	potential	potential	X	X	Alder canopy, cool clear flow, trout fishing
Lower Big Rock Creek[2]	10/30, 11/10, 11/29	1.0 mile	potential	X	X	X	Alder canopy, cool clear flow, trout fishing
Millard Canyon	10/22, 11/6, 11/26	0.5 mile	potential	X	X	X	Alder canopy, cool clear flow
Big Santa Anita/Winter Ck	10/5, 10/11; 10/22, 11/5; 11/6, 11/28	3.0 miles	potential	X	X	X	Alder canopy, cool clear flow, trout fishing
Robert's Canyon	10/9, 10/11	1.0 mile	X	X	X	X	Dry creek bed, one small pool
Upper N. Fork San Gabriel	10/9, 10/25, 11/15	1.0 mile	potential	potential	X	X	Alder canopy, cool clear flow, trout fishing
San Dimas - W. Fork	10/9	1.0 mile	X	X	X	X	Dry creek bed, few shallow pools
San Dimas/Wolfskill Canyon	10/9, 10/25, 11/26	1.0 mile	potential	X	X	X	Alder canopy, lots of quiet pools
San Antonio Creek	10/13, 11/2, 11/20	1.0 mile	potential	X	X	X	Alder canopy, cool clear flow
Upper San Antonio	10/13, 11/2, 11/20	0.5 mile	potential	X	X	X	Alder canopy, cool clear flow
Icehouse	10/13, 11/2, 11/20	1.5 miles	potential	X	X	X	Alder canopy, cool clear flow
Arroyo Seco[3]	4/26, 5/11, 5/17, 5/31, 6/14	2.8 miles	X	X	X	potential	Alder, Cottonwood canopy

[1]Surveys conducted for *Rana boylii* due to the historic presence of this species.
[2]Lower Big Tujunga will be resurveyed for *Bufo californicus* in years with more rainfall.
[3]Arroyo Seco was included in this report due to the close proximity of these site and similar survey techniques.

Table 2. Survey Results, Angeles National Forest, 2001

Survey Site	Survey Dates	Detection For Species Presence				Species Noted
		Rana muscosa	[1]*Rana boylii*	*Rana aurora*	*Bufo californicus*	
Big Tujunga Canyon						
La Paloma	10/11, 10/18, 11/1	Not Detected	Not Detected	Not Detected	Not Detected	rainbow trout, arroyo chub, *Bufo boreas,* Bullfrog, crayfish, fathead minnow
Stonyvale	10/11,10/18, 11/1	Not Detected	Not Detected	Not Detected	Not Detected	rainbow trout, arroyo chub, *Bufo boreas,* Bullfrog, crayfish, fathead minnow
Vogel Canyon	10/18	Not Detected	Not Detected	Not Detected	Not Detected	
Wildwood	10/18	Not Detected	Not Detected	Not Detected	Not Detected	Arroyo chub, *Bufo boreas*
Trail Canyon	10/11, 10/18, 11/1	Not Detected	Not Detected	Not Detected	Not Detected	*Hyla cadaverina, Batrachoseps nigriventris*, goldfish
Lower Big Tujunga[2]	10/11, 10/18, 11/1	Not Detected	Not Detected	Not Detected	Not Detected	Arroyo chub, fathead minnow, rainbow trout
Bouquet	10/4, 10/23, 11/8	Not Detected	Not Detected	Not Detected	Not Detected	three spine stickleback, rainbow trout
Lower Big Rock Creek	10/30,11/10, 11/29	Not Detected	Not Detected	Not Detected	Not Detected	rainbow trout
Millard Canyon	10/22, 11/6, 11/26	Not Detected	Not Detected	Not Detected	Not Detected	*Hyla cadaverina, Taricha torosa*
Big Santa Anita/Winter Ck	10/5,10/11; 10/22, 11/5;11/6, 11/28	Not Detected	Not Detected	Not Detected	Not Detected	*Hyla cadaverina*, rainbow trout, *Taricha torosa*
Robert's Canyon	10/9, 10/11	Not Detected	Not Detected	Not Detected	Not Detected	Arroyo chub, *Taricha torosa*
Upper N. Fork San Gabriel	10/9, 10/25, 11/15	Not Detected	Not Detected	Not Detected	Not Detected	*Hyla regilla,* speckled dace, rainbow trout
San Dimas - W. Fork	10/9	Not Detected	Not Detected	Not Detected	Not Detected	goldfish
San Dimas/Wolfskill Canyon	10/9, 10/25, 11/26	Not Detected	Not Detected	Not Detected	Not Detected	*Hyla cadaverina,* rainbow trout, goldfish, *Taricha torosa,* bluegill
San Antonio Creek	10/13, 11/2, 11/20	Not Detected	Not Detected	Not Detected	Not Detected	rainbow trout
Upper San Antonio	10/13, 11/2, 11/20	Not Detected	Not Detected	Not Detected	Not Detected	rainbow trout
Icehouse	10/13, 11/2, 11/20	Not Detected	Not Detected	Not Detected	Not Detected	rainbow trout, *Masticophis lateralis*(snake)
Arroyo Seco[3]	4/26, 5/11, 5/17, 5/31, 6/14	Not Detected	Not Detected	Not Detected	Not Detected	*Hyla cadaverina, Taricha torosa, Bufo boreas, Hyla regilla,*bullfrog, rainbow trout, *Elgaria multicarinatus*

[1]Surveys conducted for *Rana boylii* due to the historic presence of this species.
[2]Lower Big Tujunga will be resurveyed for *Bufo californicus* in years with more rainfall.
[3]Arroyo Seco was included in this report due to the close proximity of these site and similar survey techniques.

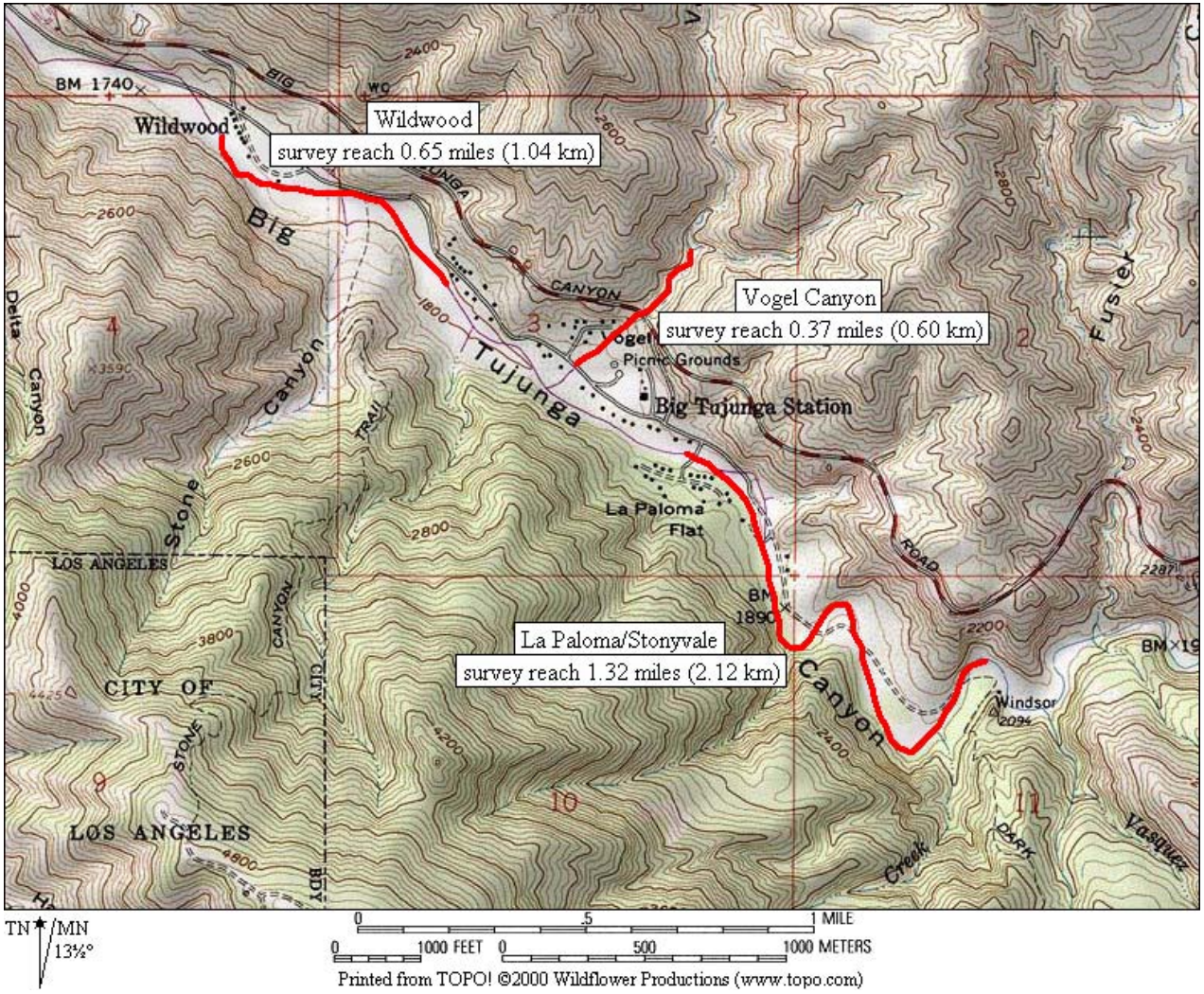

Figure 1. Wildwood, Vogel Canyon, and La Paloma/Stonyvale survey area. ∿ = Survey Reach

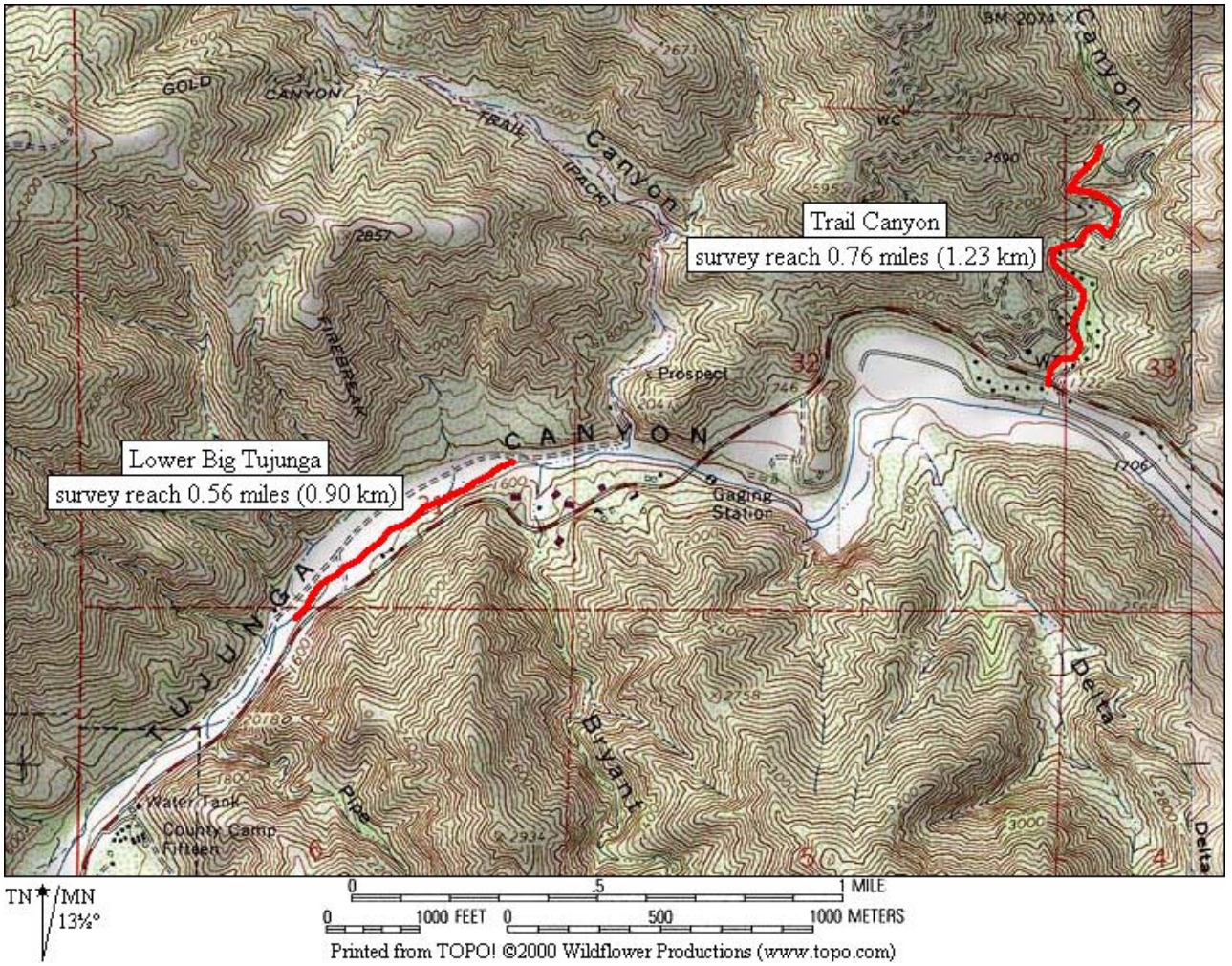

Figure 2. Lower Big Tujunga and Trail Canyon survey area. = Survey Reach

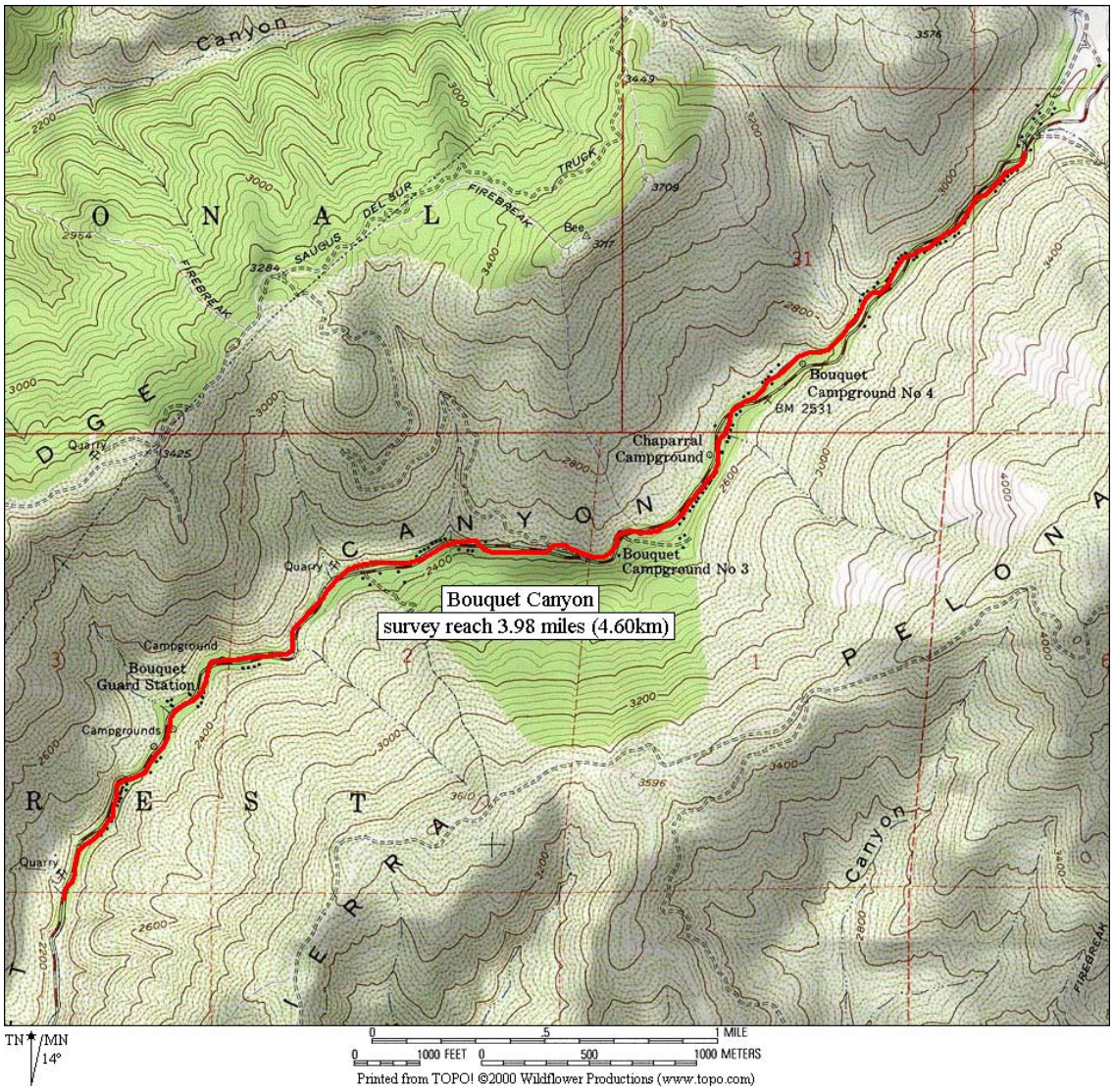

Figure 3. Bouquet Canyon survey area. = Survey Reach

Figure 4. Lower Big Rock Creek survey area = Survey Reach

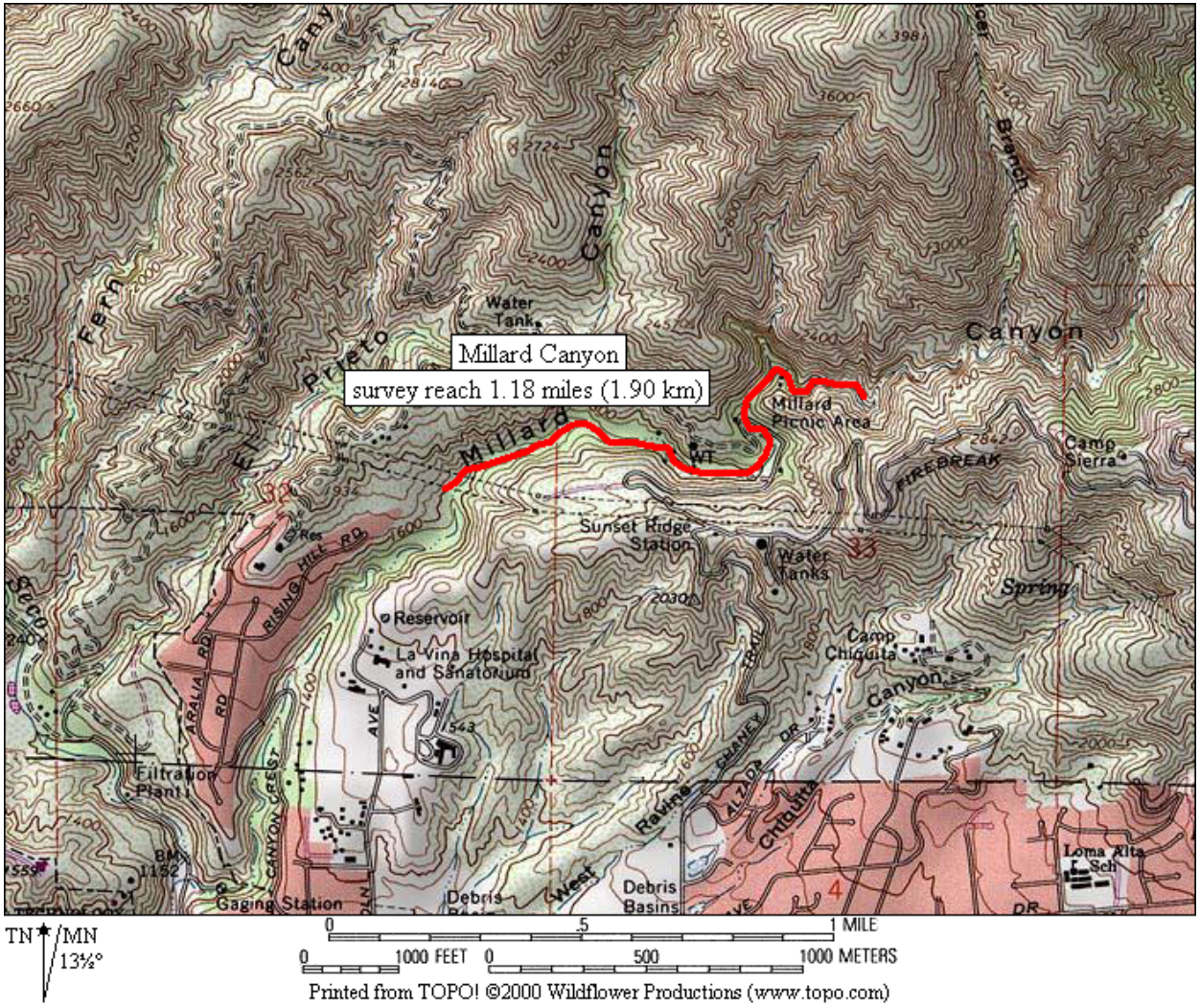

Figure 5. Millard Canyon survey area.

= Survey Reach

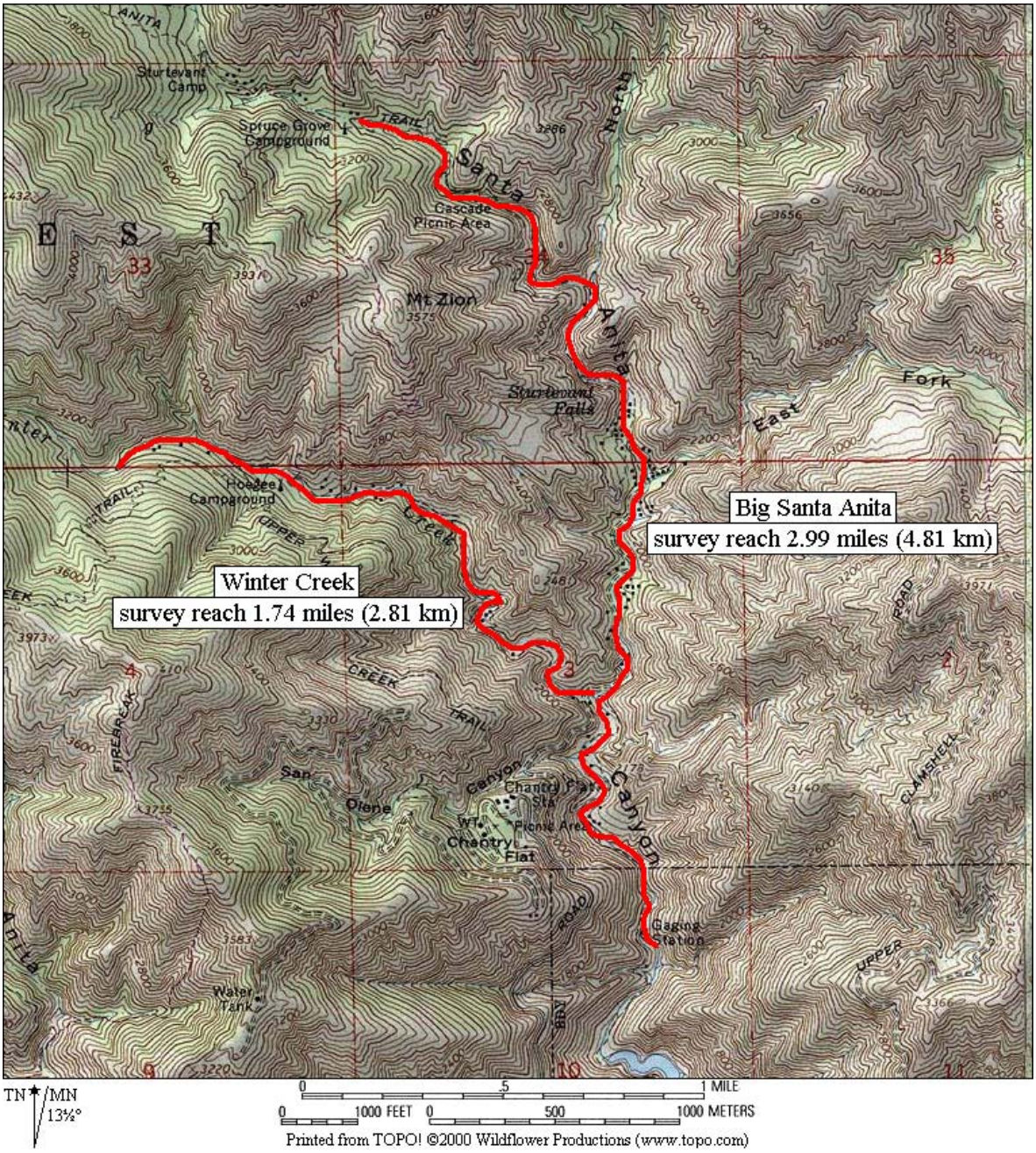

Figure 6. Big Santa Anita/ Winter Creek survey area = Survey Reach

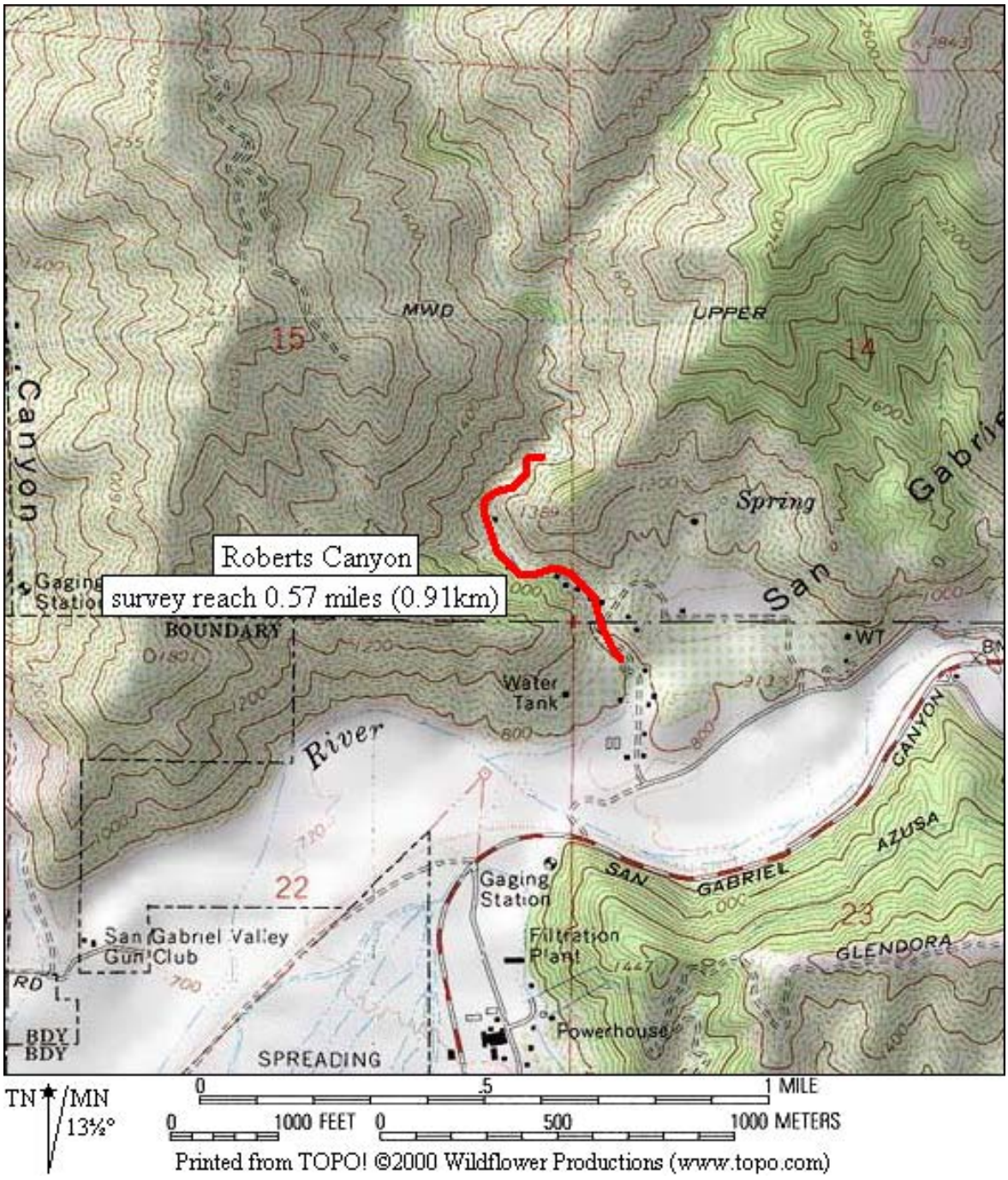

Figure 7. Roberts Canyon survey area. = Survey Reach

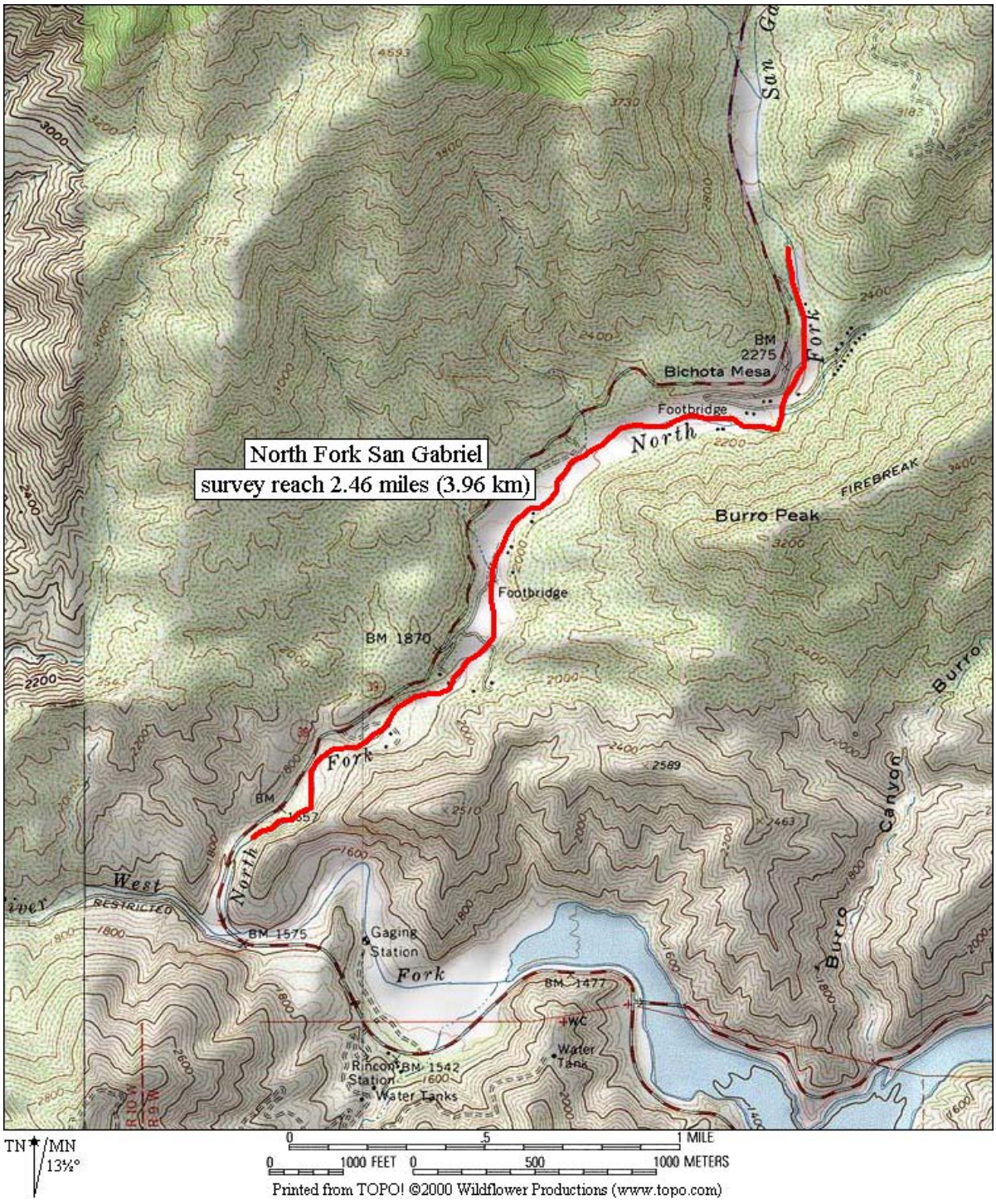

Figure 8. North Fork San Gabriel River survey area. = Survey Reach

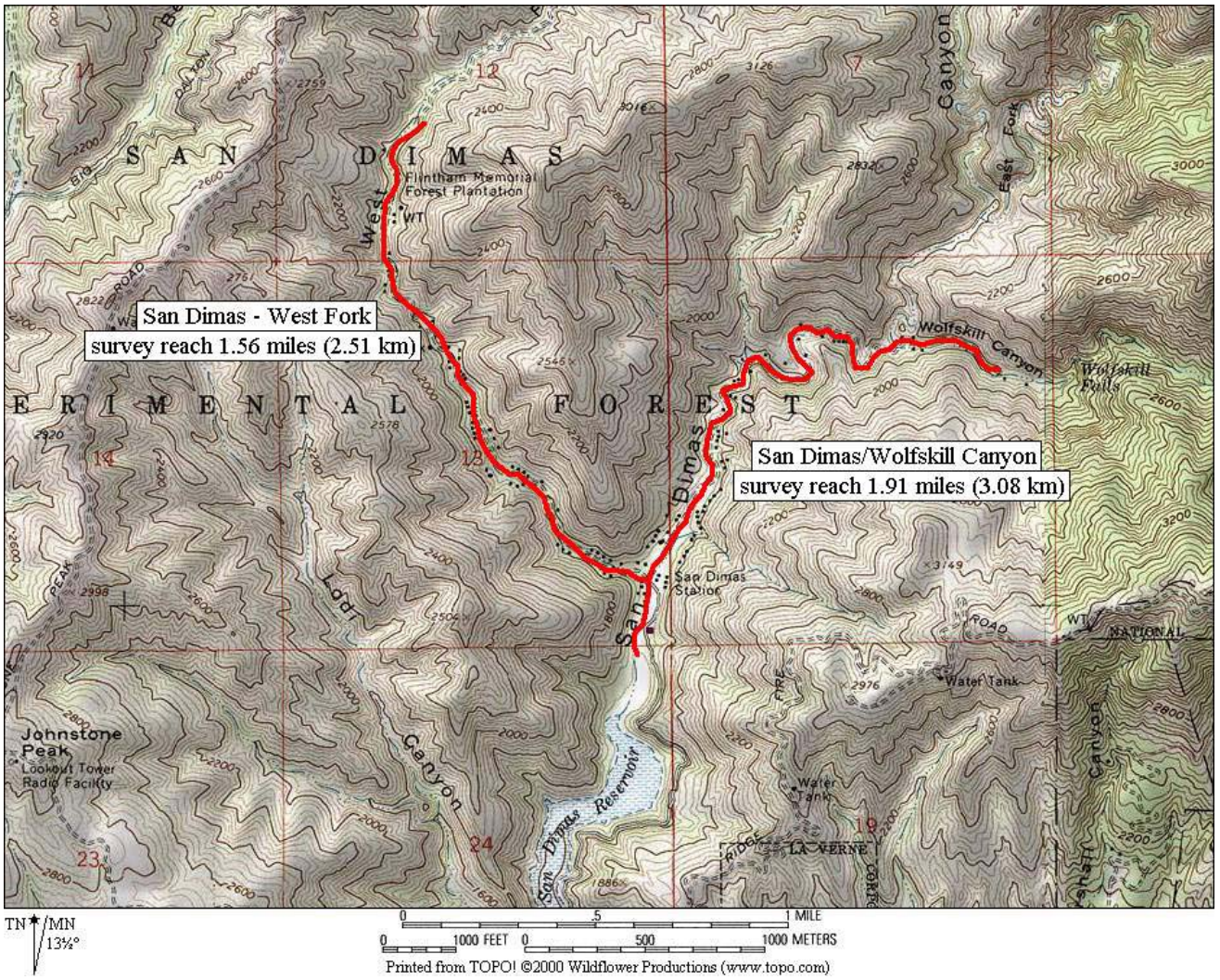

Figure 9. San Dimas – West Fork and San Dimas/Wolfskill Canyon survey area. = Survey Reach

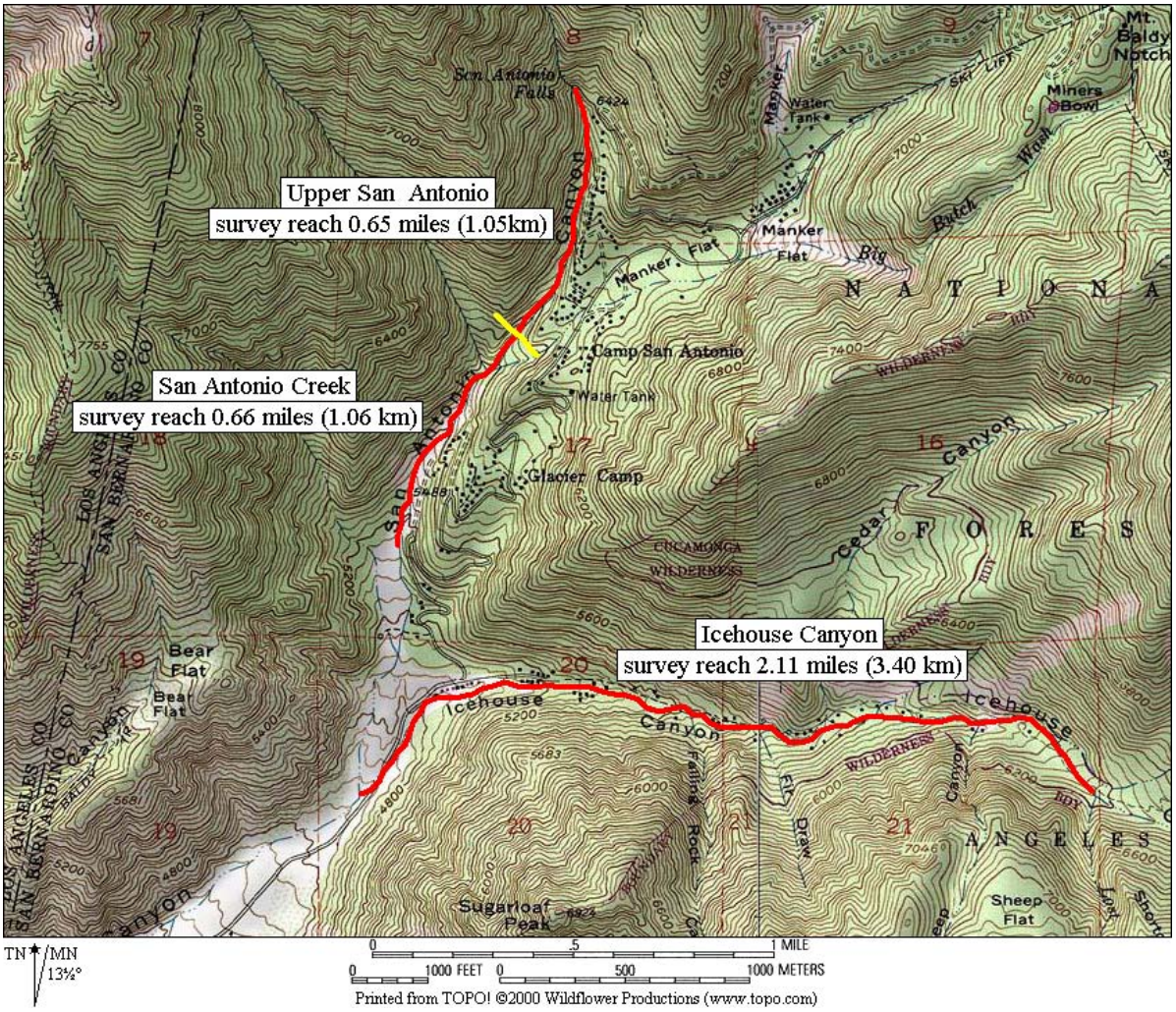

Figure 10. Upper San Antonio/San Antonio Creek and Icehouse Canyon survey area.

= Survey Reach

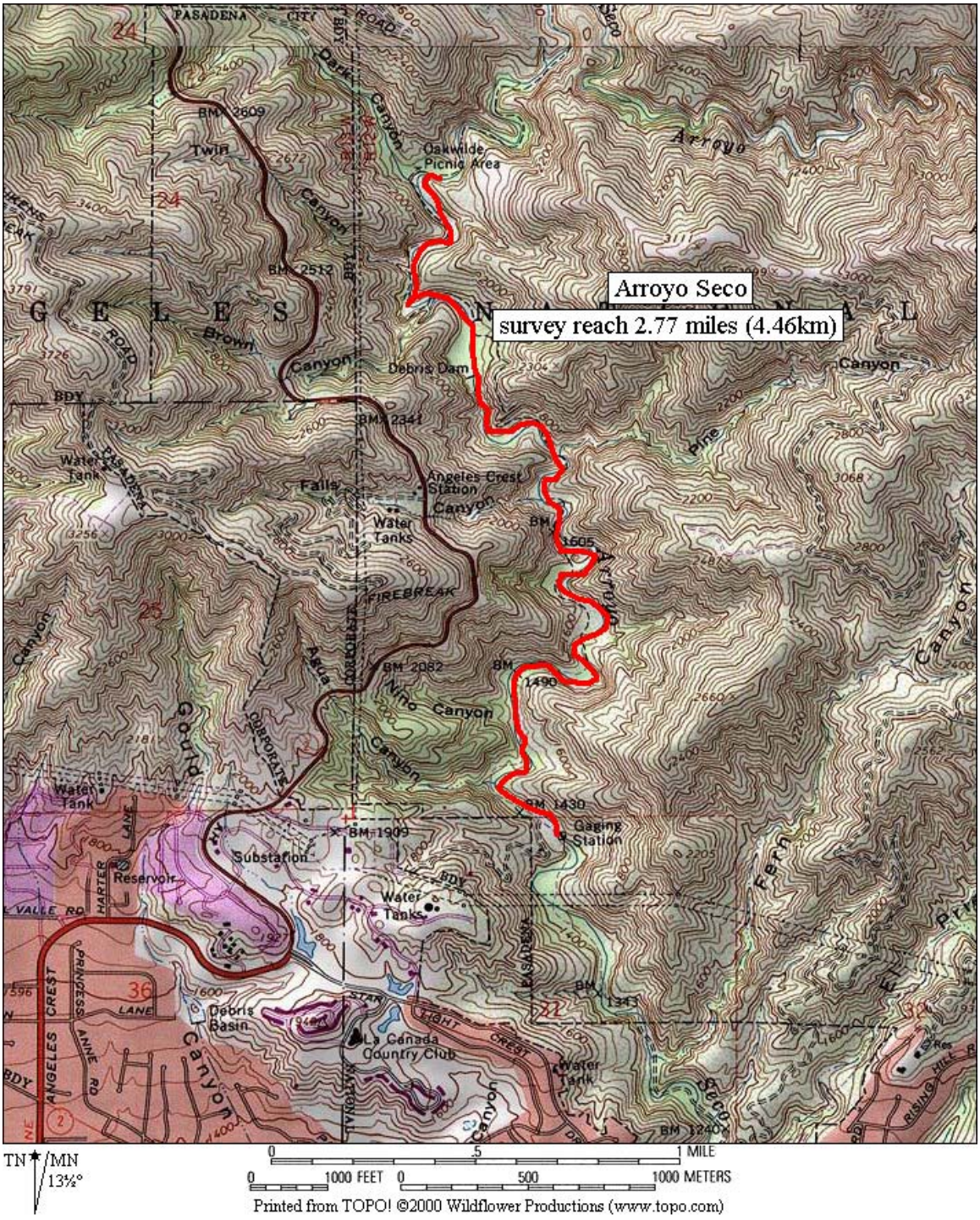

Figure 11. Arroyo Seco survey area. = Survey Reach