

**1997 Sensitive Species Survey Results for Pine Creek and Hauser Canyon  
Wilderness Areas, Descanso Ranger District, Cleveland National Forest,  
San Diego County, California.**

**Final Report**

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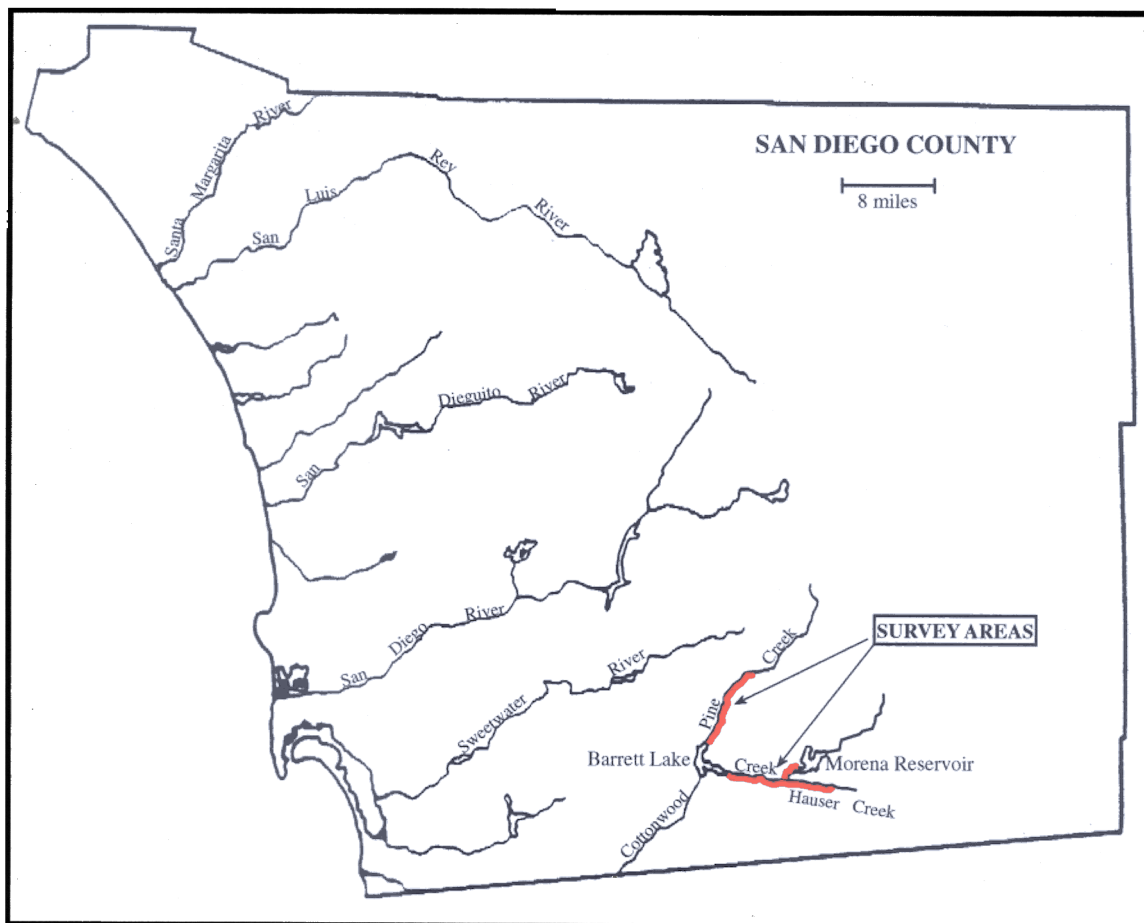
## Introduction

The following report summarizes the results of sensitive species surveys conducted for the Southwestern Willow Flycatcher (*Empidonax traillii extimus*), Least Bell's Vireo (*Vireo bellii pusillus*), Southwestern Arroyo Toad (*Bufo microscaphus californicus*), and Southwestern Pond Turtle (*Clemmys marmorata pallida*). Surveys were performed on the Pine Creek, Hauser Creek, and Cottonwood Creek drainages within the Pine Creek and Hauser Canyon Wilderness areas of the Cleveland National Forest. The purpose of these surveys was to determine both species presence, population number, and breeding status, as well as habitat conditions within the survey areas. Project work was performed in accordance with Contract Order No. 43-9104-0088 between the USDA Forest Service and TW Biological Services. Primary field biologists were Jeff Wells and Jennifer Turnbull with assistance from, Cheryl Boyd, Bill Haas, Barbara E. Kus, Sharon McKelvey, and Kirsten Winter.

## Study Area

Located in the south central section of San Diego County within the Descanso Ranger District of the Cleveland National Forest, survey areas included portions of Pine Creek, Cottonwood Creek and Hauser Creek (Fig.1). Representative of the coastal peninsular foothill ranges of southern California, the general habitat and topographic conditions of the survey areas consisted of steep relatively narrow rocky canyons with seasonal or semi-perennial streams and linear zones of willow riparian and oak woodland habitat, surrounded by relatively contiguous undisturbed areas of chaparral.

Figure. Pine, Cottonwood and Hauser Creek drainages, San Diego County.



Pine Creek (Figs. 8,9) - Originating in the northern Laguna Mountains, Pine Creek flows in a southwesterly direction for approximately 24 miles before it empties into Barrett Lake Reservoir. With the exception of Pine Valley and small areas of alluvial deposits where smaller streams or canyons empty into the drainage, Pine Creek is a narrow, rocky, and relatively steep gradient stream which is restricted to a deep and rugged canyon. The project survey area consisted of the lower 7.75 miles of Pine Creek from the Horsethief Ridge Trail crossing downstream to Barrett Lake Reservoir. Stream flow within this section of the drainage is seasonal, with surface flows typically ending by mid July or August. However surface water is present within occasional deep rock pools which hold water all year long. Riparian habitat within this section of the drainage is generally restricted to narrow strips or small patches of habitat immediately adjacent to the stream channel. Dominant overstory species include Arroyo willow (*Salix Lasiolepis*), Sycamore (*Platanus racemosa*), Coast live oak (*Quercus agrifolia*), Cottonwood (*Populus fremontii*), and occasional Engelmann oak (*Quercus engelmannii*) and Ash (*Fraxinus* spp.). Dominant understory species include Poison oak (*Toxicodendron diversilobum*), Wild rose (*Rosa californica*), False Indigo (*Amorpha californica*) and Mulefat (*Baccharis glutinosa*). Chaparral plant species are also an important component of the habitat, particularly where the streambed is narrow with limited suitability for riparian species establishment. Dominant species include Buckwheat (*Eriogonum* spp.), Manzanita (*Arctostaphylos* spp.), Wild-lilac (*Ceanothus* spp.), Scrub oak (*Quercus dumosa*) and Chamise (*Adenostoma fasciculatum*). In wider areas of the canyon bottom such as the Espinosa Trail crossing, the riparian habitat merges into oak woodland which occurs as the dominant canopy species along the canyon bottom and lower slopes. In addition to Pine Creek, 1.5 miles of Horsethief Canyon was also surveyed from Las Bancas Horsethief Road. (USFS Rd.16S04) to Pine Creek. This area is dominated by Coastal live oak and associated species such as Poison Oak, Squaw Bush (*Rhus trilobata*), and Wild Rose. The stream is seasonal in flow and riparian habitat occurs as scattered willow and Mulefat thickets in narrow linear strips or small patches.

Hauser Creek (Fig. 3) - Dropping 1000 feet in elevation over a distance of approximately 3.5 miles, Hauser Creek is a relatively straight, steep gradient stream which is dominated by oak woodland vegetation. Stream surface flow is intermittent and largely absent by June or July, however there are permanent seeps and wet areas scattered along the lower section of the drainage. Dominant overstory species include Coast Live Oak, Engelmann Oak, Sycamore, and scattered Cottonwood. Understory vegetation is dominated by dense patches of Poison Oak, Wild Rose, and California Blackberry (*Rubus ursinus*). Willow riparian habitat occurs as small patches scattered along the drainage. Surrounding habitat is mixed chaparral. Surveys were conducted on 2.75 miles of the drainage, from the USFS property boundary to the confluence with Cottonwood Creek.

Cottonwood Creek (Figs. 2,3) - With its headwaters located in the southern Laguna Mountains, Cottonwood Creek flows for over 35 miles and through 2 reservoirs before it eventually crosses the United States Mexico border and joins the Tijuana River. The project survey area consisted of the 5.75 mile section between the Morena Reservoir Dam and Barrett Lake Reservoir. Habitat and topography are varied along this section of the drainage. From the Morena Reservoir Dam to the confluence with Hauser Creek the stream flows through a deep, narrow, and very rugged canyon which contains a mixture of willow riparian and oak woodland habitat which is surrounded by mixed chaparral. From the confluence to the Marine Memorial the drainage broadens and supports a wider zone of high quality mature riparian and oak woodland habitat. Below the Marine Memorial to Barrett Lake, Cottonwood Creek flows through a large relatively flat valley where habitat is a mixture of grazed grassland and scattered oak woodland as well as disturbed mature willow riparian.

## Methods

A total of 14 surveys were conducted within the Pine Creek and Hauser/Cottonwood Creek drainages between April 26th and July 31st 1997 (Table-1). With the exception of upper Pine Creek and upper Cottonwood Creek, all survey areas within each drainage were visited a minimum of 3 times. Upper Pine Creek from Horsethief Ridge Trail to Secret Canyon was surveyed twice, and upper Cottonwood Creek from the Morena Dam to the confluence of Hauser Creek was only surveyed once. All locations of sensitive species were noted and mapped on U.S.G.S. 7.5 minute topographical maps. Habitat suitability



was noted within all survey areas and rated by overall habitat condition which included vegetation characteristics, dominant plant species present, sensitive species suitability, and level of human disturbance.

Table 1997 Survey schedule for Hauser Canyon and Pine Creek .

Site	Date	Survey Time	Survey Sections	Observers
Hauser Cyn.	26-Apr	0730-1630	Hauser Creek, Cottonwood Creek	JW,JT
Pine Cr.	02-May	0645-1700	Upper Pine Creek	JW,BH
Hauser Cyn.	15-May	0630-1500	Hauser Creek, Cottonwood Creek	JW,JT
Pine Cr.	18-May	0700-1200	Lower Pine Creek	JW,JT
Pine Cr.	21-May	0715-1400	Upper Pine Creek, Horsethief Cyn.	JW,JT
Pine Cr.	02-Jun	0615-1630	Lower Pine Creek, Horsethief Cyn.	JW,BH
Hauser Cyn.	05-Jun	0730-1500	Cottonwood Creek	JW,JT
Pine Cr.	12-Jun	0620-1320	Central Pine Creek	JW,BH,CB
Hauser Cyn.	15-Jun	0700-1600	Central Cottonwood Creek	JW,JT,BH,CB,KW,SM
Hauser Cyn.	19-Jun	0800-1630	Cottonwood Creek	JW,JT
Hauser Cyn.	27-Jun	0730-1445	Hauser Creek, Central Cottonwood Cr.	JW,JT
Hauser Cyn.	17-Jul	0730-1300	Central Cottonwood Creek	JW,JT,CB,KW,SM,BK
Pine Cr.	22-Jul	0735-1400	Central Pine Creek, Horsethief Cyn.	JW,JT,CB,KW
Hauser Cyn.	31-Jul	0800-1500	Upper Cottonwood Creek	JW,CB,KW

Survey efforts for Least Bell's Vireos and Southwestern Willow Flycatchers were initiated in the early morning hours when vireo and flycatcher behavior and weather conditions are the most conducive to species detection. Surveys were performed by observers walking along or through all suitable habitat areas observing and listening for each species distinctive song and/or vocalizations. Taped playbacks of each species' song were also utilized to aid in detection or confirmation of presence. Once an individual bird was detected, an effort was made to determine and record its location and breeding status. Monitoring frequency of individual locations ranged from 7 to 21 days, and was dependent upon the breeding or nesting status of individual territories. Nest site visits were limited to minimize disturbance or possible attraction of predators to nest site locations. Typically a nest site was visited between 3 and 4 times. The first visit was performed to establish the nest status and number of eggs, as well as remove any cowbird eggs or nestlings present. The second visit was timed to determine the age and number of nestlings. A possible third visit was conducted to band nestling vireos, with a fourth or final visit to confirm nest success, number of fledges, and record nest site characteristics. Once a nest was determined to have fledged or been abandoned, several nest site characteristics were recorded. These measurements included the nest height, nest cup diameter and depth, host plant species, host plant height and diameter, distance from nest to host plant edge, distance from nest to nearest open space or edge of vegetation clump, and distance from nest to habitat edge. In addition to vireo and flycatcher observations, all sightings of Brown-headed Cowbirds within the survey areas were noted and mapped as well.

Due to the time of year, and remote location of the study areas, survey efforts for the Southwestern Arroyo Toad were limited to breeding pool surveys during daylight hours. Surveys were performed by slowly walking along all appropriate suitable streamside habitat observing for the presence of Arroyo Toad tadpoles and/or juvenile toads. All observations of Arroyo Toads were mapped and noted, including number of toads and/or tadpoles present, approximate age class of individuals, breeding pool size and general site description, and presence of non-native predators.

Southwestern Pond Turtle surveys were limited to observations or incidental sightings of individual turtles which were observed either basking along the water edge or within pools. Because of this species'

elusive and timid behavior as well as the amount of effort required to conduct a thorough census of the population, information gathered on the Southwestern Pond Turtle was restricted to noting the estimated age class of individuals observed, general habitat conditions of the survey area, and the mapping of all turtle observations.

## Results and Discussion

### Least Bell's Vireo (*Vireo bellii pusillus*)

The Least Bell's Vireo is a small migratory songbird which is an obligate summer resident of riparian habitat within southern California and northwestern Baja California, Mexico. Historically considered a common species and found throughout California from the northern Sacramento Valley south into Baja California (Franzreb 1989), Least Bell's Vireo populations experienced widespread declines due to extensive habitat destruction and brood parasitism by the Brown-headed Cowbird (*Molothrus ater*). By 1978 the vireo was found in only small localized populations within 7 California counties (Goldwasser et al. 1980). With an estimated total population of less than 300 breeding pairs, the Least Bell's Vireo was listed as an endangered species by the state of California in 1980, and as a federally endangered species in 1986. Due to intensive research and management programs which include habitat protection and cowbird control, the vireo population has experienced a dramatic increase in population with over 1300 pairs documented in California in 1996 (Avery 1997).

### Population Number and Distribution

A total of 9 singing male vireos were detected within the Hauser Canyon survey area, including 6 breeding pairs, 1 single territorial male, 1 territorial male of unknown breeding status, and 1 transient male. The single transient male was determined to be within the study area for less than 30 days and was likely a non-territorial bird passing through the area. The single territorial male with unknown breeding status was observed on July 31st along upper Cottonwood Creek. Because there was only a single survey conducted in this area, the breeding status of this bird was not determined. Distribution of vireo territories during 1997 included: 2 pairs on Hauser Creek (Figs.3,5,7); 3 pairs, 1 single male, and 1 transient male within the central section of Cottonwood Creek between the confluence of Hauser Creek downstream to Barrett Lake (Figs.2,3,4,5); and 1 pair and 1 unknown territorial male on upper Cottonwood Creek between the Morena Reservoir Dam and the Hauser Creek confluence (Figs.3,6). There were no vireos detected within the Pine Valley Creek survey areas during 1997 (figs.8,9).

### Nest Success and Productivity

All six of the vireo pairs attempted to nest at least once. One pair attempted and successfully fledged a single nest, two pairs were successful in fledging 1 of 2 nests, one pair was successful in fledging 1 of 3 nests, and one pair was unsuccessful in their initial and only nest attempt. The sixth pair (UC-01) which was located on the upper section of Cottonwood Creek was not monitored and it is unknown whether this pair was successful in fledging any young. Evidence of nesting was determined by the discovery of a current years nest which was not in use. None of the monitored pairs were observed attempting a second nest after successfully fledging their first. Of the 9 total known nesting attempts by monitored pairs, 4 (44%) were successful in fledging at least 1 young (Table 2). Predation accounted for all 5 of the known nest failures. Nest site evidence indicated that these nests were predated by small mammals, birds, or snakes during the egg stage or shortly after hatching. In all cases there was no notable damage to the nest or host plant. Signs of nest site disturbance were limited to slight distortion of the nest lip or inner nest lining being pulled upward, indicating the removal of nestlings which typically hold on to nest material with their feet as they are removed (pers. observ.). Potential predators which were observed within the

area included Scrub Jay (*Aphelocoma coerulescens*), American Crow (*Corvus brachyrhynchos*), Gopher Snake (*Pituophis melanoleucus*), and California Whipsnake (*Masticophis lateralis*). Scrub Jays, which have been documented as nest predators of Least Bell's Vireos and other small passerine species, were common throughout the survey areas.

A total of 18 eggs were observed in 6 nests which survived incubation and were monitored over the entire nesting period, resulting in an average clutch size of 3.0 eggs per nest. Seven or 39 percent of these eggs hatched resulting in 0.9 nestlings per nest. All of the seven nestlings survived to fledge for an average of 0.9 fledges per nest. Because one pair was successful in producing 3 fledges from an unmonitored nest, overall productivity per breeding pair was somewhat higher with a known 10 fledges produced by 5 breeding pairs for an average of 2.0 fledges per pair.

Table 2. 1997 Nesting Data Summary.

Territory Information				Nest Number -1 Information						Nest Number -2 Information						Nest Number -3 Information					
MAP ID No.	Status	Nest Attempts	No. Successful	No. Eggs	No. Nestlings	No. Fledges Obs.	No. Fledges Est.	No. Banded	Comments / Reason for nest failure	No. Eggs	No. Nestlings	No. Fledges Obs.	No. Fledges Est.	No. Banded	Comments / Reason for nest failure	No. Eggs	No. Nestlings	No. Fledges Obs.	No. Fledges Est.	No. Banded	Comments / Reason for nest failure
H-01	P	1	0	2	0	0	0	0	predation B,S,R ?												
H-02	P	2	1	?	0	0	0	0	predation B,S,R ?	?	?	3	3	0	nest undiscovered						
UC-01	P	1	?	?	?	0	?	0	old nest, inactive												
UC-02	U	-	-	-	-	-	-	-	unk breeding status												
C-01	S	0	-	-	-	-	-	-	single male												
C-02	P	1	1	4	3	3	3	0	parasitized & 1 unh egg												
C-03	T	0	-	-	-	-	-	-	transient												
C-04	P	2	1	4	?	0	0	0	predation B,S,R ?	2	2	2	2	2	parasitized						
C-05	P	3	1	3	?	0	0	0	predation B,S,R ?	?	0	0	0	0	predation B,S,R ?	3	2	2	2	2	parasitized & 1 unh egg
9 Vireo locations	1	0	4	1	3	3	3	0		2	2	5	5	2		3	2	2	2	2	

Status Key: P=vireo pair, S=single territorial male, U=male vireo unknown breeding status, T=transient male vireo (present <30 days). Predation Category: B=bird, S=snake, R=rodent

Only two plant species were utilized as nest host by monitored vireo pairs including 8 nests in Poison Oak (*Toxicodendron diversilobum*), and two nests in California Wild Rose (*Rosa californica*) (Table 3). While these two plant species provide adequate conditions for nest placement, the predominance as a nest hosts by vireos is more an artifact of their dominance as an understory vegetation species, rather than any specific species preference.

Table 3. Least Bell's Vireo Nest Site Characteristics and Measurements.

Territory Info.		Nest Measurements			Host Plant Measurements			Distance from Nest to:		
Map ID No.	Nest No.	Ht. (m)	Dia. (cm)	Depth (cm)	Host Species	Ht. (m)	Dia. (m)	Host Edge (m)	Edge of Clump (m)	Riparian Edge (m)
H-02	1	1.00	3.5	4.0	Wild Rose	1.88	0.50	0.26	5.00	>25.0
C-02	1	0.96	4.7	4.2	Wild Rose	1.12	0.55	0.20	5.00	30.0
C-05	1	0.57	4.6	3.9	Poison Oak	3.00	3.50	2.00	2.00	20.0
C-04	1	0.56	4.0	4.5	Poison Oak	1.06	4.00	0.36	0.36	2.0
C-05	2	0.87	4.3	4.1	Poison Oak	-	8.00	0.25	1.00	15.0
H-01	1	0.71	4.8	4.6	Poison Oak	1.20	10.00	0.30	3.00	25.0
C-05	3	1.23	4.7	4.1	Poison Oak	2.00	4.00	0.60	4.00	30.0
C-04	2	0.73	4.9	4.0	Poison Oak	1.50	1.25	0.15	2.00	20.0

## Banding

In an effort to gain information on the demography of small isolated vireo populations, ten vireos were banded within the Hauser Canyon study area, including 6 adults and 4 nestlings (Table 4). Information from this banding may provide important insights on small population trends and whether they are dependent upon juvenile recruitment and site fidelity or continual immigration from outside population sources. Adult vireos were banded with a unique combination of a single U.S. Fish and Wildlife Service numbered aluminum band and a colored plastic band. Nestling vireos were banded with a single numbered aluminum band on the left leg and a colored plastic band on the right leg. Nestling vireos were banded when they were between 6 and 9 days old, or on known fledge day, which occurs at 11 to 12 days of age.

Table 4. Least Bell's Vireos banded within study area during 1997

MAP ID No.	Territory ID	Drainage	Date	Nest No.	No. Banded	SEX	Age (days)	Band Number(s)	BAND COMBINATION	
									Left	Right
C-02	Oak trail	Cottonwood Cr.	27-Jun	-	1	M	adult -AHY	1650-60049	LPBK/m	-
C-04	Cactus	Cottonwood Cr.	27-Jun	2	1	M	adult -AHY	1650-60046	LTPI/m	-
C-04	Cactus	Cottonwood Cr.	27-Jun	2	1	F	adult -AHY	1650-60045	-	LTPI/m
C-05	Boulder	Cottonwood Cr.	19-Jun	3	1	M	adult -AHY	1650-60088	-	LPBK/m
C-05	Boulder	Cottonwood Cr.	19-Jun	3	1	F	adult -AHY	1650-60087	LPBK/m	-
H-02	Chaparral	Hauser Cr.	19-Jun	-	1	M	adult -AHY	1650-60091	-	LTPI/m
C-05	Boulder	Cottonwood Cr.	19-Jun	3	2	-	(11,11)	1650-60089, 60090	m	LTPI
C-04	Cactus	Cottonwood Cr.	27-Jun	2	2	-	(6,6)	1650-60047, 60048	m	LTPI

Key to band abbreviations: **LPBK**=light pink black split plastic band, **LTPI**=light pink plastic band, **m**=numbered aluminum USFWS band.

## Brown-headed Cowbird Parasitism

Cowbird parasitism occurred within 3 of the 9 total observed vireo nests including 3 of 4 nests which were eventually successful in fledging vireo young. Three different vireo pairs were parasitized including pair ID No. C-02 which had a newly hatched cowbird nestling and 4 vireo eggs in their first nest on May 15th, pair ID No. C-05 which had a single cowbird egg and 3 vireo eggs within their third nest on June 5th, and pair ID No. C-04 which had a cowbird egg and 2 vireo eggs within their second nest on June 15th. Both the cowbird eggs and nestling were removed immediately upon discovery, and all three of the nests successfully fledged vireo young.

Adult cowbirds were observed during 11 of 14 surveys with a total of 25 individual sightings within the Hauser Canyon area and 24 within the Pine Creek area (Table 5). Actual number of cowbirds within the survey areas are likely substantially lower as indicated by the maximum number of cowbirds observed during a single survey consisting of 9 birds within the Hauser Canyon area on May 15th and 7 birds observed within the Pine Creek/Horsethief Canyon area on May 21st. Specific areas which appeared to have the highest amount of cowbird activity and number of individuals observed included the Horsethief Canyon and Espinosa Trail crossing area within the Pine Creek site, and the confluence of Hauser Creek and Cottonwood Creek within the Hauser Canyon site. Behavioral observations of cowbirds within both areas typically consisted of groups of 2 to 3 individuals, usually pairs, which were either courting and vocalizing from prominent perches in the morning, or flying along riparian areas. Incidental parasitism behavior observed during survey work included the discovery of a Lesser Goldfinch (*Carduelis psaltria*) nest in Horsethief Canyon which contained a single cowbird egg on June 2nd, and the interaction of a female cowbird and female Least Bell's Vireo near its nest site on Cottonwood Creek on June 5th. There were no observations of cowbirds foraging or roosting within the survey areas. Potential cowbird foraging locations within the survey areas are limited as cattle have been absent from the Pine Creek survey area for several years, and grazing within the Hauser Canyon area is on a seasonal (winter) basis. However, there are possible foraging locations within 2 to 3 miles of many of the survey areas. Private homes and small

ranches along Japatul Road are potential sources of cowbirds within the Pine Creek area due to horses and/or small numbers of cattle. Cowbirds within the Hauser Canyon area may be coming from the large cattle ranches within the Potrero or Morena area. Considering the number of cowbirds observed, relatively remote location of the drainages, and linear nature of the riparian habitat, it is likely that there are less than 12 to 15 cowbirds within either survey area at any one time. However, because female cowbirds are extremely fecund and able to produce several eggs per season, the impact of only a few cowbirds within these narrow drainages could be substantial, particularly when considering the apparent susceptibility of Least Bell's Vireos to cowbird parasitism.

Table 5. Number and Area of Brown-headed Cowbird Observations during 1997 Survey period.

Site	Date	Survey Sections	No. Observed		Total
			Male	Female	
Hauser Cyn.	26-Apr	Hauser Creek, Cottonwood Creek	3	2	5
Pine Cr.	02-May	Upper Pine Creek	2	1	3
Hauser Cyn.	15-May	Hauser Creek, Cottonwood Creek	6	3	9
Pine Cr.	18-May	Lower Pine Creek	3	2	5
Pine Cr.	21-May	Upper Pine Creek, Horsethief Cyn.	4	3	7
Pine Cr.	02-Jun	Lower Pine Creek, Horsethief Cyn.	2	2	4
Hauser Cyn.	05-Jun	Cottonwood Creek	1	1	2
Pine Cr.	12-Jun	Central Pine Creek	2	2	4
Hauser Cyn.	15-Jun	Central Cottonwood Creek	2	1	3
Hauser Cyn.	19-Jun	Cottonwood Creek	1	0	1
Hauser Cyn.	27-Jun	Hauser Creek, Central Cottonwood Cr.	3	2	5
Hauser Cyn.	17-Jul	Central Cottonwood Creek	0	0	0
Pine Cr.	22-Jul	Central Pine Creek, Horsethief Cyn.	1	0	1
Hauser Cyn.	31-Jul	Upper Cottonwood Creek	0	0	0
Total Cowbirds observed during 14 surveys			30	19	49

#### Habitat Conditions and Suitability

Habitat suitability was rated on general vegetation characteristics and habitat size, as well as current and historic vireo locations. Areas which are delineated as suitable habitat are generalized and should not be interpreted as an exclusion of possible future occurrences within other areas of the drainage.

**Pine Creek** - Due to both topographic and geologic conditions, suitable habitat for the Least Bell's Vireo within the Pine Creek survey area occurs as relatively linear fragmented patches of willow riparian and oak woodland habitat. Restricted to a narrow zone within the drainage bottom, vegetation is subject to intensive scouring during high water events, resulting in a narrow rocky substrate which supports limited amounts of dense riparian vegetation. High quality habitat areas which are over 1 acre in size are typically restricted to the wider areas of the drainage or where other drainages merge with Pine Creek, i.e. Horsethief Canyon area. Based on general habitat characteristics and historical vireo locations, there is approximately 2 linear miles of suitable vireo habitat within the Pine Creek drainage between Barrett Lake and Horsethief Ridge Trail. (Figs. 8,9).

**Hauser Creek** - Dominated by coast live oak and associated vegetation, Hauser Creek is predominantly an oak woodland habitat with limited willow riparian vegetation. Habitat suitability for the Least Bell's Vireo is high within the lower half of the drainage and except for limited and occasional cattle grazing activity near the USFS property boundary, there is little or no habitat disturbance within this drainage.

**Cottonwood Creek** - Habitat conditions and suitability are varied along Cottonwood Creek. From the Morena Reservoir Dam downstream to the confluence with Hauser Creek the habitat is that of mixed willow riparian and oak woodland restricted to a narrow rugged canyon bottom. Suitability is high within most of this section, with vireo occupation likely centered around areas with adequate understory and mid story vegetation cover from 0 to 3 meters. Extremely rugged and surrounded by dense chaparral habitat,



the area is virtually undisturbed by humans and there is no grazing activity. From the confluence of Hauser Creek to the Marine Memorial, Cottonwood Creek flows through a wider canyon which supports a mixture of high quality willow riparian and oak woodland habitats. Suitable vireo habitat exist throughout this section of the drainage with the potential to support several vireo territories. Habitat impacts within this area include limited grazing which occurs during the fall and winter months or when cattle are able to trespass into the area due to unclosed gates or downed fences. From the Marine Memorial to the vireo locations located at the center of section 19 (T17S R14E), Cottonwood Creek flows through a broad relatively flat valley with habitat consisting of grazed grasslands, scattered mature live oak, and disturbed willow woodland. Intensive grazing pressure has reduced the shrub and understory vegetation to a degree which is insufficient in cover for most nesting passerines. Remnant older stands of cottonwood, willow, sycamore and oak testify to this areas history and potential to support high quality riparian habitat. Suitable vireo habitat is restricted to a small section of drainage where the stream flows through a narrow canyon before entering Barrett Lake. Consisting of mixed willow and oak woodland habitat, this area has the potential to support a total of 3 to 4 vireo pairs. Steep and relatively rugged, this area of habitat does not suffer from the intensive grazing pressure and activity which is common throughout the remainder of the area. From section 19 to the actual reservoir, there is some potential for quality riparian habitat. However, due to fluctuating lake levels, grazing, and extensive Tamarisk (*Tamarix* spp.) establishment, the overall long term potential of this section is likely limited.

### Population Trends

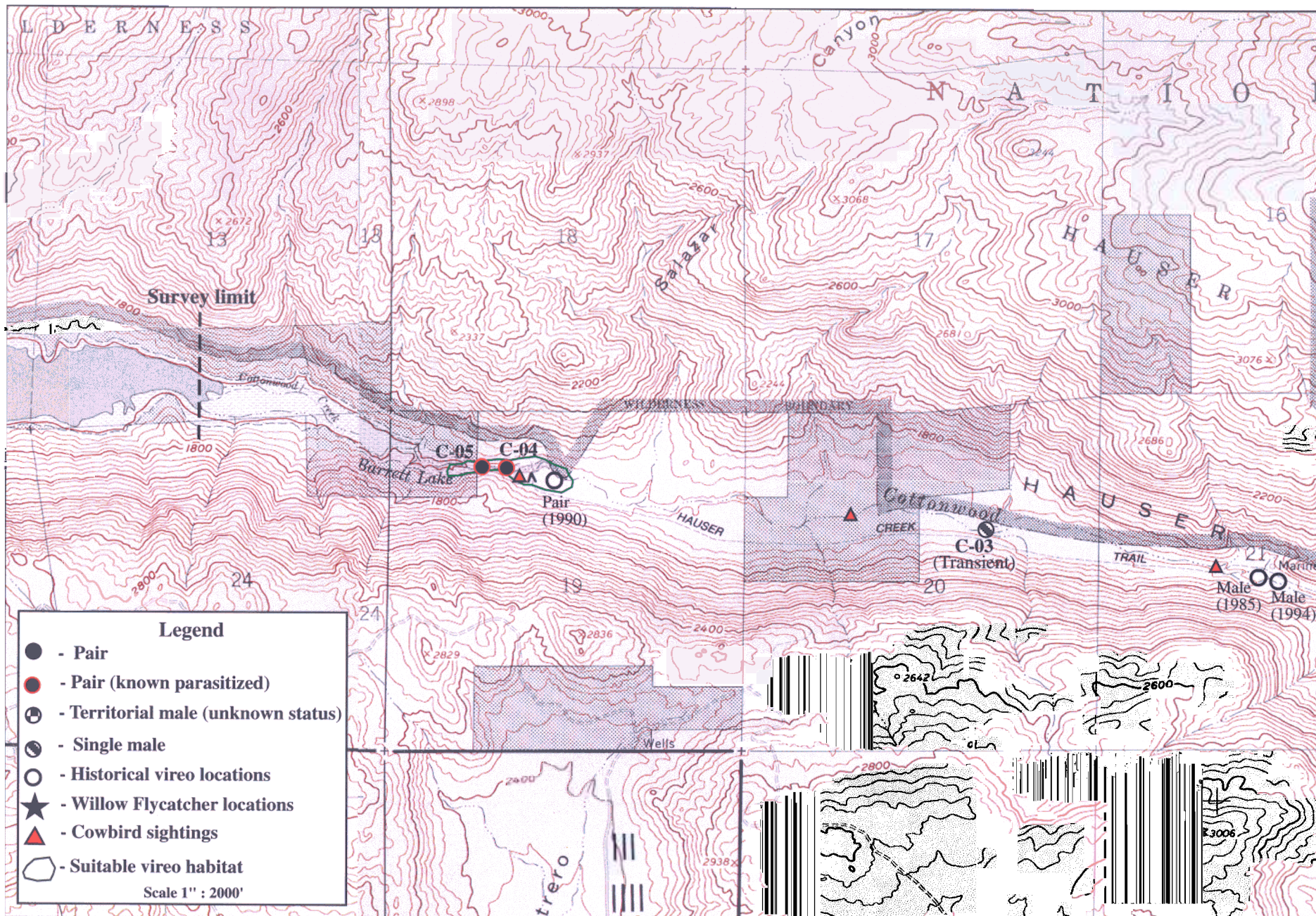
Results from the 1997 surveys indicate that while the vireo population within the Hauser Canyon area has remained relatively stable since 1985, the Pine Creek vireo population has apparently disappeared (Table 6). Reasons for the absence of vireos within this area are not readily clear, as this area has supported vireos consistently from 1990 to at least 1994 (Wells 1990, Jones 1994, Boyd pers. comm.) Typically, vireo population declines and extirpation can be related to habitat destruction or degradation, and/or intensive cowbird brood parasitism. Habitat conditions do not appear to be the reason for the decline in this case as both habitat availability and quality are currently higher than ever, particularly since the removal of cattle from the area approximately 4 years ago. Cowbird parasitism may be the main reason for the disappearance of vireos from Pine Creek, as they have been well documented during both current and historical surveys. However, it is interesting to note that survey efforts during 1990 and 1994 documented successful nesting in several of the vireo pairs. The dynamics of small isolated vireo populations may be substantially different from the larger more studied populations, and the reasons for their establishment or extirpation may be more complicated than just habitat conditions or cowbird parasitism.

Table 6. Least Bell's Vireo Population Trends within Pine Creek and Hauser Canyon from 1985 to 1997

Year	Survey Area	No. Pairs	No. Males (Unk status)	No. Single Males	No. Transients	Total Male	Locations	Source
	Pine Valley Cr. & Horsethief Cyn.	-				unk		no surveys
	Hauser Cr. & Cottonwood Cr.	0				6		Jones, B. 1985*
	Pine Valley Cr. & Horsethief Cyn.							Wells, J. 1990
	Hauser Cr. & Cottonwood Cr.							Wells, J. 1990
	Pine Valley Cr. & Horsethief Cyn.							Jones, B. 1994
	Hauser Cr. & Cottonwood Cr.							Jones, B. 1994*
1997	Pine Valley Cr. & Horsethief Cyn.	0	0			0		Wells, J. 1997
1997	Hauser Cr. & Cottonwood Cr.	6	1	1	1	9		Wells, J. 1997

\* Incomplete surveys, lower and upper sections of Cottonwood Creek were not surveyed.





**Figure 2. 1997 Least Bell's Vireo / Willow Flycatcher Locations: Hauser Canyon Wilderness Area, Descanso Ranger District, Cleveland National Forest, San Diego County, California.**









**Figure 4. 1997 Least Bell's Vireo Territory and Nest Locations: Hauser Canyon Wilderness Area, Descanso Ranger District, Cleveland National Forest, San Diego County, California.**

*TW Biological Services*





**Figure 5. 1997 Least Bell's Vireo Territory and Nest Locations: Hauser Canyon Wilderness Area, Descanso Ranger District, Cleveland National Forest, San Diego County, California.**





Figure 6. 1997 Least Bell's Vireo Territory and Nest Locations: Hauser Canyon Wilderness Area, Descanso Ranger District, Cleveland National Forest, San Diego County, California.

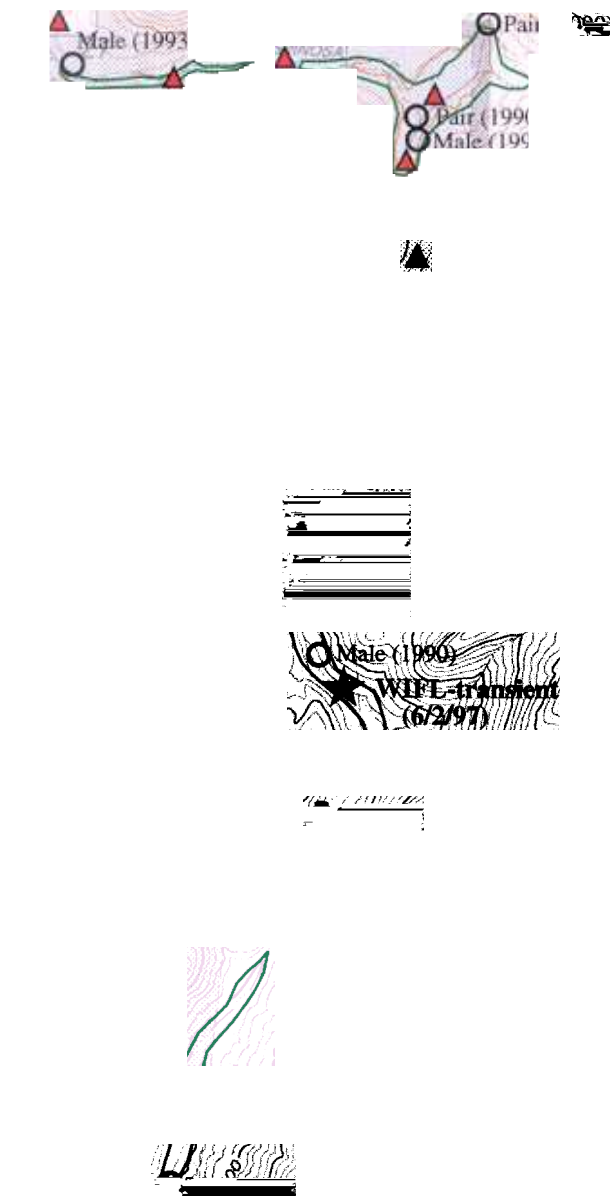




TW Biological Services

**Figure 7. 1997 Least Bell's Vireo Territory and Nest Locations: Hauser Canyon Wilderness Area, Descanso Ranger District, Cleveland National Forest, San Diego County, California.**



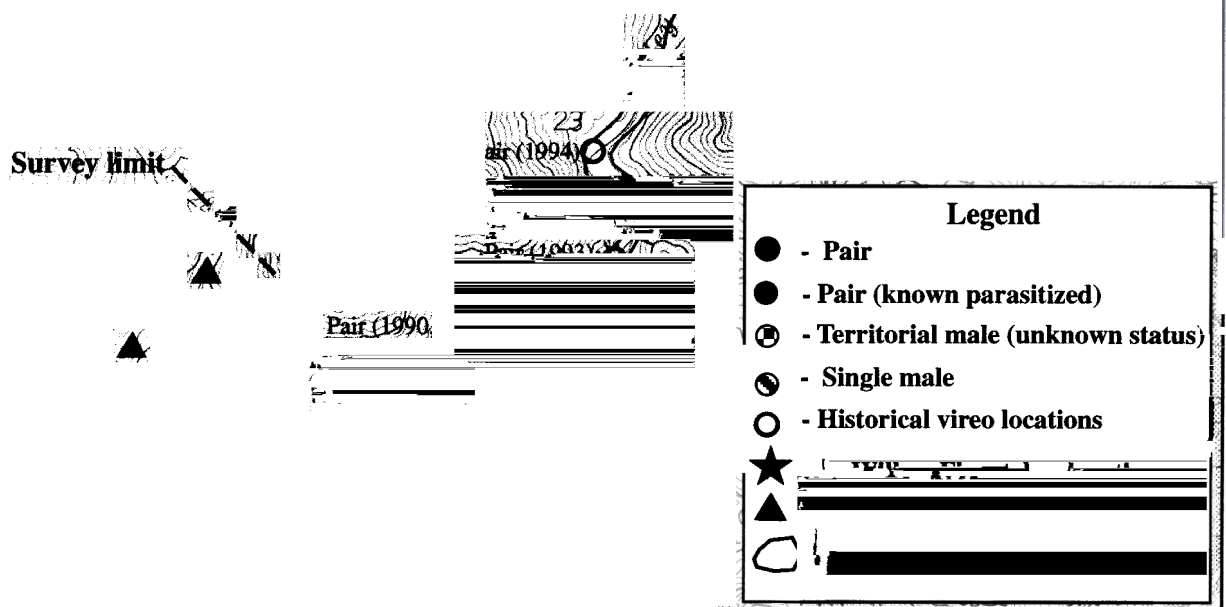


# Legend

- - Pair
- - Pair (known parasitized)
- ⊙ - Territorial male (unknown status)
- ⊙ - Single male
- - Historical vireo locations
- ★ - Willow Flycatcher locations
- ▲ - Cowbird sightings
- Suitable vireo habitat

Scale 1" : 2000'

Figure 8. 1997 Least Bell's Vireo / Willow Flycatcher Locations: Pine Creek Wilderness Area, Descanso Ranger District, Cleveland National Forest, San Diego County, California.



**Figure 9. 1997 Least Bell's Vireo / Willow Flycatcher Locations: Pine Creek Wilderness Area, Descanso Ranger District, Cleveland National Forest, San Diego County, California.**

### Southwestern Willow Flycatcher (*Empidonax traillii extimus*)

Similar in many aspects to the Least Bell's Vireo, the Southwestern Willow Flycatcher is also a small migratory insectivorous songbird which is an obligate summer resident of riparian habitat. Suffering from widespread habitat loss and disturbance as well as brood parasitism from the Brown-headed Cowbird, the Southwestern Willow Flycatcher population is currently estimated between 300 to 500 pairs which are distributed at approximately 75 known locations within limited portions of California, southern Nevada, Arizona, Utah, Colorado, and New Mexico (Sogge et al. 1997). Recent historical and currently known breeding locations within San Diego County are limited and include areas of the Santa Margarita River and Pilgrim Creek on Camp Pendleton (Griffith 1996), the upper San Luis Rey River below Lake Henshaw (Haas pers. comm.), and the Guajome Park area of the San Luis Rey River in Oceanside. Although there has been limited research on habitat preferences and quantification of breeding site characteristics, the Southwestern Willow Flycatcher appears to be more of a habitat specialist than the Least Bell's Vireo. Flycatchers prefer a mixture of densely vegetated riparian habitat for nesting and open areas for foraging within close proximity to surface water which is present for at least part of the breeding season. Vegetation structure appears to be as important as composition, as Southwestern Willow Flycatchers have been documented breeding within monotypical habitats, including almost pure stands of Tamarisk (Sogge et al. 1997). Listed by the state of California as endangered in 1991, the Southwestern Willow Flycatcher was listed as a federally endangered species in 1995.

#### Population Number and Distribution

A single Willow Flycatcher (subspecies unknown) was observed during the June 6th survey of the Pine Creek drainage. Located approximately 1.5 miles downstream of the Espinosa Trail crossing (Fig. 8), it was observed foraging and vocalizing for approximately 15 minutes. There were no other flycatchers observed or heard and the bird did not exhibit any nesting behavior. Habitat within the area consisted of dense willow riparian with a mixed canopy of live oak and sycamore. Repeat visits on June 12th, and July 22nd were unsuccessful in locating any flycatchers within this area. Subsequently, it was determined that this bird was a likely migrant or transient individual passing through the area. No other Willow Flycatchers were detected within the Pine Creek or Hauser Canyon survey areas.

#### Habitat Conditions and Suitability

With similar and possibly even more specialized habitat requirements than the least Bell's Vireo, habitat suitability within the Pine Creek and Hauser Canyon areas are likely limited to the higher quality riparian areas which provide adequate vegetation cover and canopy within close proximity to open foraging areas and standing water. With limited information available on preferred habitat characteristics in southern California, it is not possible to quantify habitat potential for this species within the survey areas. However, based upon personal observations of current or recent Southwestern Willow Flycatcher territories within San Diego County, it is possible to determine some of the more likely areas where this species may occur. Potential Willow Flycatcher habitat within Pine Creek includes the Espinosa Trail crossing area where there is a relatively large contiguous stand of willow riparian vegetation and live oak woodland, and the habitat area where the single bird was observed during the June 2nd survey. Both of these areas are the largest most contiguous patches of good quality habitat along that section of the drainage, with dense understory vegetation from 0 to 4 meters, moderate to dense overstory of live oak, sycamore, and willow and standing water within close or immediate proximity to the habitat areas.

Potential Willow Flycatcher habitat within the Hauser Canyon area includes Cottonwood Creek from the confluence of Hauser Creek to just upstream of the Marine Memorial (Fig. 3). Dominated by coast live oak, this area contains excellent quality mature mixed oak and willow riparian habitat which is relatively undisturbed by grazing or other impacts. Although currently not suitable for Willow Flycatcher occupation due to cattle grazing, potential future habitat areas occur within the central section of Cottonwood Creek from the Marine Memorial downstream to section 24 T17S R14E (Fig. 2).

## Arroyo Southwestern Toad (*Bufo microscaphus californicus*)

The Arroyo Southwestern Toad is a relatively small (2-3") greenish gray to light gray or tan cryptically colored toad. Historically found throughout the coastal drainages from San Luis Obispo County south into northwestern Baja California, Mexico, the Arroyo Toad has been extirpated from as much as 75 percent of its former range and is now found in only scattered populations within Santa Barbara, Ventura, San Bernardino, Riverside, Orange, and San Diego Counties (USFWS 1994). Due to extensive habitat loss and alteration as well as the introduction of both non-native fish species and Bullfrogs (*Rana castebiana*), the Arroyo Toad is now largely restricted to the less disturbed upper reaches of streams and rivers. Requiring specific riverine habitat conditions for breeding, the Arroyo Toad prefers undisturbed sandy or mixed sand and gravel streams which have persistent surface flows throughout all or much of the year. Shallow breeding pools with limited or no current and adjacent suitable shoreline and upland habitat areas for foraging and burrowing during periods of inactivity are particularly important for larval and juvenile toad survival (Jennings and Hayes 1994, Sweet 1991). The Arroyo Southwestern Toad was listed as a federally endangered species in 1995 and is listed as a species of "special concern" by the state of California.

### Population Number and Distribution

Surveys revealed the presence of 6 separate Southwestern Arroyo Toad breeding sites, all of which were located along Pine Creek (Fig. 12). No Arroyo Toads or evidence of breeding activity were observed along Hauser Creek or Cottonwood Creek within the Hauser Canyon survey area. All six of the breeding sites contained recently metamorphosed toads. Within 3 of these sites there were also a limited number of older stage larvae. Although there were both neonate and older or metamorphic larvae within the same area, all six of the breeding sites appeared to consist of single clutches only. Previous research has shown that newly metamorphosed neonate toads may range in size from 9 to 16 mm and that metamorphosis of single clutches may last several weeks (Sweet 1991). Based upon male breeding site fidelity and the distance between breeding sites, a conservative estimate of adult Arroyo Toads for the Pine Creek survey area is 12 adults. Due to the low amount of rainfall during 1997 and the widespread distribution and abundance of Green Sunfish (*Lepomis cyanellus*) within the drainage, it is possible that other breeding sites failed to produce any young or breeding age adults did not attempt to reproduce. A brief description of the 6 sites and the observed number of individual neonates and/or larvae present are summarized below. It should be noted that to avoid disturbing and/or accidentally destroying neonate toads, a minimum of time and activity were spent within the breeding site areas, thus the total number of individuals was likely higher than observed.

Site - A. On June 2nd approximately 30 neonate toads within the 9-13 mm size range and less than 15 older stage or metamorphic larvae were observed at this location. During a repeat visit on June 12th approximately 15 neonates were observed and a few metamorphic larvae. Habitat conditions within the site consisted of a relatively large sand and gravel bar approximately 50 meters in length. The stream channel within this area was relatively shallow and broad with very little current. Vegetation consisted of scattered emergent herbaceous plants along the bar and a vegetated bench area of grasses, emergent Mulefat (*Baccharis glutinosa*), Willow (*Salix* spp.), and False Indigo (*Amorpha californica*). In addition to Arroyo Toads, there was also a moderate number of Pacific Treefrog (*Hyla regilla*) neonates within the area. Green Sunfish were not present within the immediate area.

Site - B. On June 2nd approximately 25 neonate toads within the 9-13 mm size range and less than 10 metamorphic larvae were observed at this location. On June 12th there were less than 10 neonates observed which ranged in size from 18 to 22 mm in length. Site conditions at this location consisted of a large deep pool with minimal shallow areas. Substrate consisted of sand and scattered gravel, with a large sand and alluvial bar downstream. Vegetation cover was limited within the immediate channel area, and the upland area consisted of oak woodland and mixed chaparral habitat. Green Sunfish were numerous within the pool and there were no other frog or toad species observed within the immediate area.

Site - C. On June 2nd 15 neonate toads within the 9-13 mm size range, and less than 10 metamorphic larvae were observed at this location. On June 12th, over 25 neonates which had recently metamorphosed



were observed within the same site. Site conditions at this location consisted of a sandy beach area located at the downstream end of a large gradually sloped deep pool. Vegetation cover consisted of dense willow thickets which surrounded a majority of the site. Green Sunfish were present within the deeper sections of the pool and there was a limited number of both Pacific Treefrog and California Treefrog neonates and larvae within the area.

**Site - D.** Observed approximately 25 small, recently metamorphosed neonates at this location on June 2nd. Site conditions consisted of a narrow cobble and sand substrate pool which measured approximately 15 meters in length. Open shoreline or sandbar areas were relatively narrow with dominant vegetation including Mulefat, willow, and scattered sycamore. Green Sunfish were not present within the pool or immediate area, and there was a limited number of California Treefrog larvae at the site.

**Site - E.** Observed 25-30 neonates within the 9-13 mm size range. Site conditions included a relatively small pool area with a substrate of small cobble and mud. Vegetation consisted of mixed Mulefat, False Indigo, and Buckwheat (*Eriogonum fasciculatum*). Green Sunfish were present within the pool and adjacent areas.

**Site - F.** Observed approximately 20 neonates ranging in size from 10 to 17 mm at this site on June 2nd. Located immediately downstream of a large rocky pool, this site was somewhat atypical of breeding areas, as it was a relatively narrow channel area with a predominantly gravel substrate with large boulders and cobble scattered throughout the area. Dominant vegetation consisted of emergent Mulefat, willow, Cottonwood, and False Indigo. Green Sunfish were present within the deeper zones of the pool and there was a large number of California Treefrog larvae within the area.

#### Habitat Conditions and Suitability

Suitable habitat availability for the Southwestern Arroyo Toad is limited within the Pine Creek and Hauser Canyon survey areas. Natural conditions such as topography, geology, and vegetation communities as well as human caused alterations such as dams, grazing, and the introduction of non-native predators have restricted the potential of Arroyo Toad presence within the survey areas. Suitable habitat for the Arroyo Toad was defined by looking at the general drainage and habitat characteristics as well as the presence of non-native predators such as Bullfrogs and Green Sunfish. Specific criteria for breeding habitat suitability followed a set of 6 breeding site characteristics described by Dr. Sam Sweet which includes; a majority of a pool < 1 foot in depth, minimal water current, substrate of sand, gravel, or mixed mud, presence of a gently sloping shoreline or central bar, close proximity to a sandy or loose soil terrace, and bordering vegetation set back so that a majority of the pool is open to the sky (Sweet 1991).

Habitat suitability within the Pine Creek survey area is predominantly defined by the geology of the streambed. Much of the drainage flows through a relatively narrow canyon with large almost contiguous rocky areas in which the water is restricted to relatively deep rocky pools or channels with little or no shallow zones and areas of sand or gravel substrate. Subject to scouring, both suitable shoreline and bench areas are absent from many areas of the drainage. Another factor which influences the availability of suitable breeding areas is the seasonal water flow within this section of the drainage. Wider areas with a lower stream gradient and appropriate substrate and upland conditions for breeding are also the first to dry up in the summer months. During 1997 many areas along the drainage which contained many of the characteristics for suitable breeding habitat were dried up by mid June.

Habitat suitability within the Hauser Canyon survey area is restricted to potential occurrences along Cottonwood Creek from the Marine Memorial downstream to Barrett Lake Reservoir. Hauser Creek which is a small seasonal stream is too small and lacks appropriate conditions for supporting Arroyo Toads. Upper Cottonwood Creek from the Morena Reservoir Dam downstream to the Marine Memorial is a narrow high gradient streambed which is characterized by a swiftly flowing rocky channel with little or no shoreline. Habitat conditions are also a factor within this section of the stream, as almost the entire stretch is well canopied by mature oak woodland and mixed willow riparian. From the Marine Memorial downstream to Barrett Lake Reservoir, the drainage and habitat conditions are more suitable for Arroyo Toad existence. However, human caused impacts are the predominant problem within this section. Flowing through a relatively broad valley with a well defined upland bench, this section of Cottonwood Creek has been thoroughly grazed by cattle for many years. And while there is limited riparian vegetation and scattered oak woodlands along the drainage, the impacts of grazing and trampling are substantial. In

addition to this, Bullfrogs and Green Sunfish are well established along the entire section. Another factor which undoubtedly impacts the potential for Arroyo Toads to exist along this section of the drainage is the presence of the Morena Reservoir Dam. Located approximately 3.5 miles upstream, the Morena Dam manages the release of water down Cottonwood Creek to Barrett Lake Reservoir, thus eliminating any substantial fluctuation in stream flow which is essential for the creation of side channels, over flow areas, and sandbars.

### Exotic Species

Predation and/or competition for resources from exotic species is a primary suspect in the decline and extirpation of several native amphibian populations within California and is primarily the result of the widespread introduction of the Bullfrog and several non-native fish species. Arroyo Toads which had historically faced few if any fish and amphibian predator species appear to be particularly susceptible to these forms of predation (Sweet 1991).

Exotic species which were observed within the study areas include the Green Sunfish, Largemouth Bass (*Micropterus salmoides*), and Bullfrog. Green Sunfish were abundant within most of the Pine Creek drainage and present within a majority of Cottonwood Creek. Largemouth Bass which are common within both Barrett Lake Reservoir and Morena Reservoir were observed in only one location within the lower section of Cottonwood Creek, approximately 1.0 mile upstream of Barrett Lake. Bullfrogs, which appear to be absent from the Pine Creek drainage were common within the lower Cottonwood Creek area from the Marine Memorial downstream to Barrett Lake.

### Southwestern Pond Turtle (*Clemmys marmorata pallida*)

The Southwestern pond Turtle is a medium sized (5 - 7") olive brown to dark brown colored turtle which is the only freshwater species native to California. Historically found from the San Francisco Bay region south to northern Baja California, Mexico, the Southwestern Pond Turtle has been extirpated from much of its former range. In southern California it is estimated that there are less than 8 viable populations remaining south of the Santa Clara River (Jennings and Hayes 1994, Holland 1997). Habitat loss and alteration from urbanization, agriculture, dams, and flood control projects as well as predation and competition from introduced fish species and Bullfrogs have all but eliminated this species from most of San Diego County. Viable populations of Southwestern Pond Turtles are now restricted to the relatively undisturbed upper reaches and headwater areas of rivers and streams, and while individuals are occasionally observed within the coastal or lower river systems of the county, they are typically remnant adult populations with little or no successful reproduction or recruitment. The Southwestern Pond Turtle is an aquatic species, and with the exception of nesting, aestivation, or dispersing individuals, it is rarely encountered far from permanent water sources. Preferring slow moving streams and rivers the Southwestern Pond Turtle requires aquatic habitat with adequate vegetation cover and basking areas as well as undisturbed upland areas for nesting and aestivation (Jennings and Hayes 1994). Listed as a species of "Special Concern" by the state of California, the Southwestern pond Turtle is a federal candidate species for endangered status.

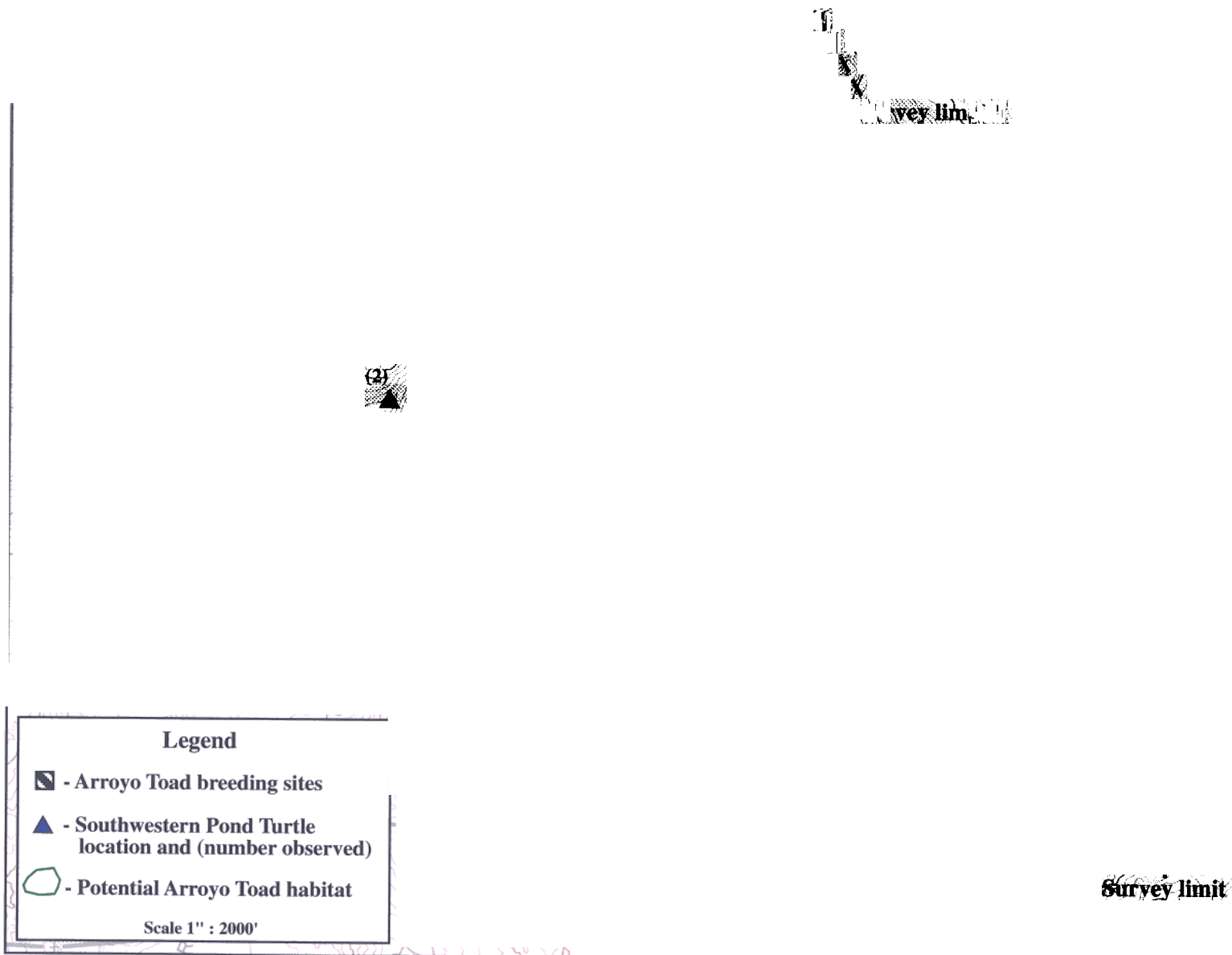
### Population Number and Distribution

A total of 72 individual Southwestern Pond Turtles were observed within the survey areas, including 62 individuals on Pine Creek, and 10 individuals on Cottonwood Creek (Table 7, Figs.10-13). To avoid double counting of the same individuals during subsequent surveys, only the highest number of individuals observed during a single survey and within a certain location, i.e. large pool, were utilized for the total count. All observed individuals were classified into 1 of 3 age groups, including adult, subadult, and juvenile. Adult classification included individuals which were estimated to be 100.00 mm or over in carapace length, sub-adults included individuals under 100.0 mm in length, and juvenile classification was restricted to small individuals which were estimated to be under 50.0 mm in length, and were likely under two years of age, or hatchlings which had overwintered in their nest from the previous year (Jennings and Hayes).



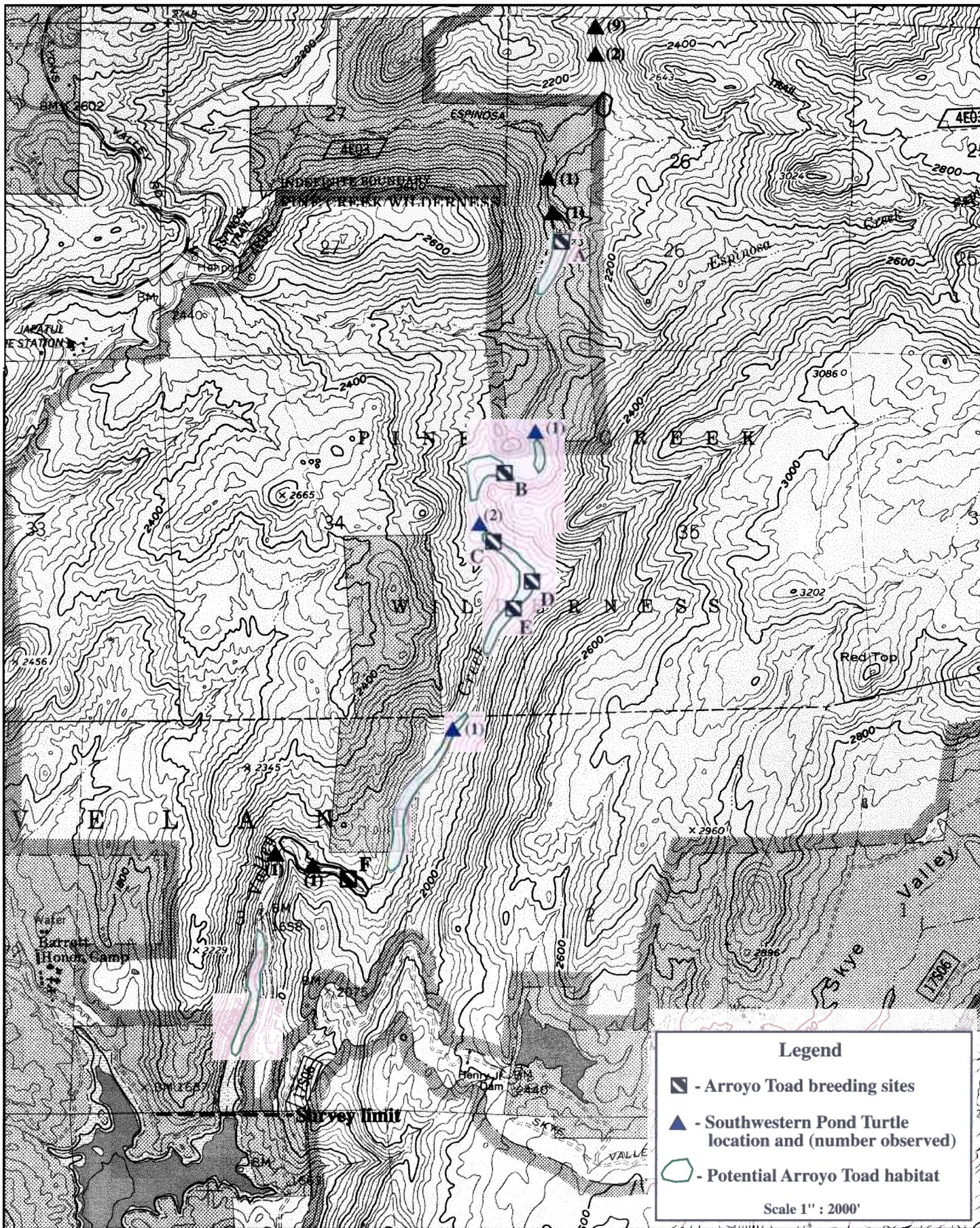




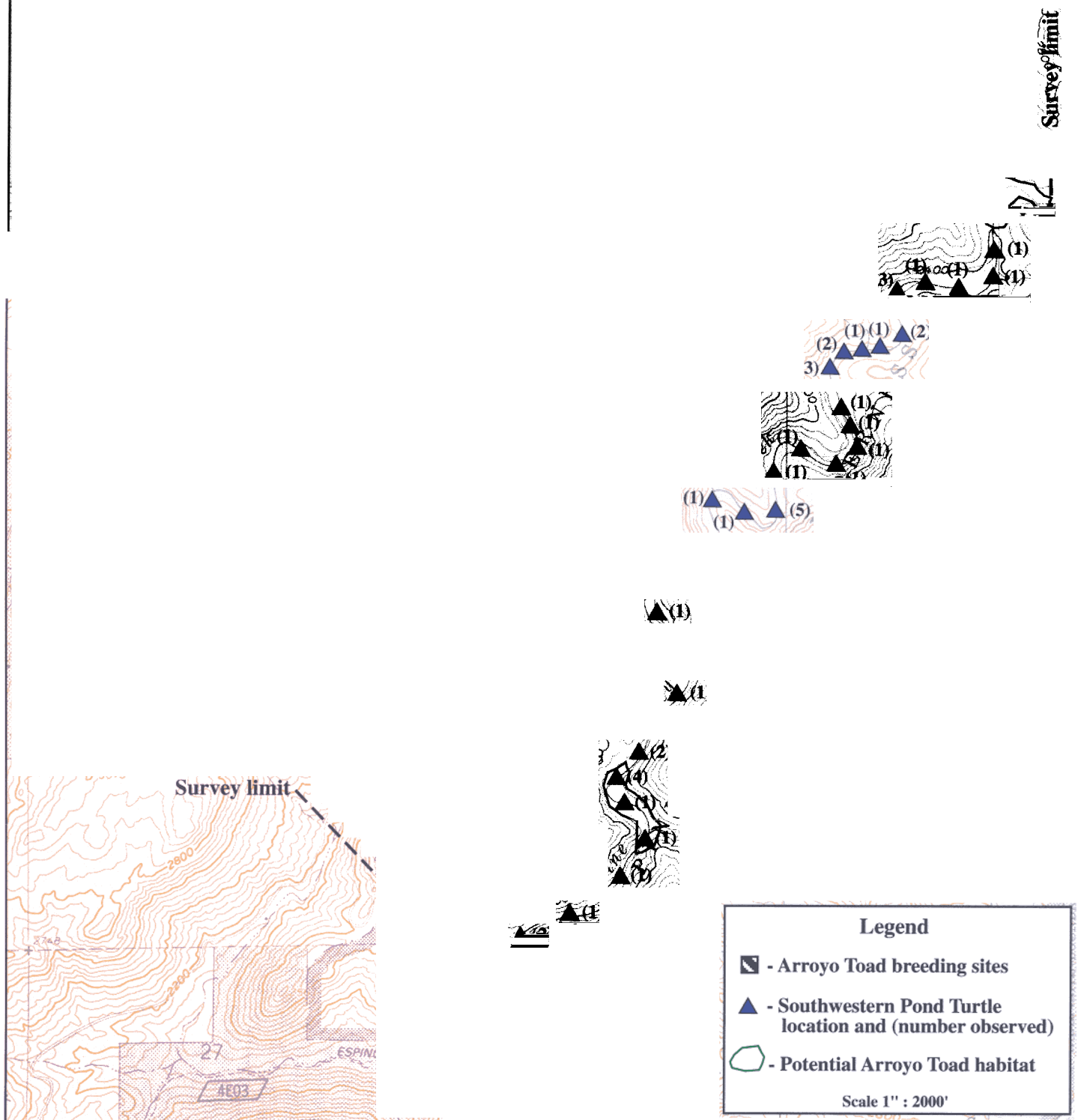


**Figure 11. 1997 Arroyo Toad / Southwestern Pond Turtle Locations: Hauser Canyon Wilderness Area, Descanso Ranger District, Cleveland National Forest, San Diego County, California.**









**Figure 13. 1997 Arroyo Toad / Southwestern Pond Turtle Locations: Pine Creek Wilderness Area Descanso Ranger District, Cleveland National Forest, San Diego County, California.**

Table 7. Number and Age Group of Southwestern Pond Turtles Observed During 1997 Survey Period.

<b>DRAINAGE</b>	No. Adults ≥ 100 mm CL	No. Subadults < 100 mm CL	No. Juveniles ≤ 50 mm CL	<b>TOTAL</b>
Pine Creek	38	15	9	62
Cottonwood Creek	9	1	0	10
<b>TOTAL</b>	<b>47</b>	<b>16</b>	<b>9</b>	<b>72</b>

### Habitat Conditions and Suitability

Suitable pond turtle habitat within Pine Creek is generally a condition of seasonal rainfall totals and climatic conditions. Relatively undisturbed, and with no dams or water diversion projects located upstream, Pine Creek is subject to yearly fluctuations of stream flow based upon seasonal rainfall totals. Thus, in certain times of the year, particular stretches of the drainage are more suitable to turtles than the remaining areas. Notable examples of this are the larger rock pools and channels located between Espinosa Trail crossing and Horsethief Ridge Trail where water is restricted during the late summer and fall months.

While the low number of turtles observed on Cottonwood Creek was partly an artifact of tougher surveying conditions, topography as well as habitat conditions, and disturbance along the lower section of the drainage may indicate less suitable habitat conditions and fewer turtles in comparison to Pine Creek. From the Morena Reservoir Dam to the confluence of Hauser Creek, Cottonwood Creek is restricted to a relatively narrow, rocky, high gradient streambed with limited pools or back water areas. A large portion of this section of the drainage is well shaded by an overstory of oak and riparian vegetation. Because natural seepage and releases from the Morena Reservoir occur at the base of the dam, water temperatures within the upper section of the drainage are substantially lower than Pine Creek as well. From the Hauser Creek confluence to the Marine Memorial, Cottonwood Creek has a lower gradient and a somewhat slower flow rate, however a majority of this section is well shaded by a canopy of oaks and mature willow riparian. From the Marine Memorial to Barrett Lake, the stream has a highly reduced gradient and appears to be more suitable for pond turtle occupation. However, cattle grazing has substantially impacted both the riparian and aquatic vegetation, which undoubtedly impacts turtle survival through increased predation and loss of both foraging and nesting habitat. In addition, Bullfrogs are common within this section of the drainage and are well documented as predators of hatchling and juvenile turtles (Holland 1997, Jennings and Hayes 1994).

### **Illegal Immigration Impacts**

With the increase in INS law enforcement activities and the reinforcement of the western section of the International Border, illegal alien activity has shifted to the eastern or inland areas of San Diego County where enforcement and control efforts are both more costly and difficult. Relatively remote with generally rugged terrain, the Pine Creek and Hauser Canyon Wilderness areas have become relatively well established routes for illegal alien activity. Problems associated with illegal immigration and its impacts on wildlife habitat and sensitive species can be substantial and include pollution, habitat or vegetation degradation, wildfires, and disturbance of sensitive species nesting or breeding sites. However, the majority of these problems are typically associated with large numbers of people moving through or being confined to relatively restricted or small areas on a continual basis.

Overall impacts observed from illegal immigration within the Hauser Canyon and Pine Creek area during the 1997 survey period did not appear to be substantial, and while habitat disturbance was noted

within some of the areas through increased trail use and establishment, as well as increased litter, there were no indications of serious threats or disturbance to any of the sensitive species populations present. Illegal aliens are moving through these areas over short periods of time and the impacts to vegetation and potential disturbance to breeding areas or nesting sites are generally short in duration. Current management of the illegal alien problem within these areas as it relates to sensitive habitat or species should include the continued clean-up of trash, fire prevention patrols, and the possible rerouting of trail sections which pass through or near sensitive areas.

## **Recommendations**

### Least Bell's Vireo and Southwestern Willow Flycatcher Management

Central issues to the management of the Least Bell's Vireo and Southwestern Willow Flycatcher within the Pine Valley and Hauser Canyon Wilderness areas are habitat protection and cowbird control. Habitat protection is primarily an issue involving the control of grazing impacts along the Cottonwood Creek drainage in Hauser Canyon. With the potential to support a large area of good quality riparian habitat, Cottonwood Creek from the Marine Memorial to Barrett Lake Reservoir has been severely degraded through a long history of cattle grazing. Although the initiation of seasonal grazing has helped alleviate some of the pressure on the area, it is still not adequate for the successful establishment of willow riparian habitat which is suitable to most riparian obligate species.

Cowbird management and parasitism control is usually most successfully employed through the use of traps which passively capture the target individuals with no impact to the targeted host species. Requiring minimal training and preparation, cowbird trapping has been successfully utilized in the protection of several sensitive or endangered passerine species. However, due to the relative inaccessibility and remote location of the Pine Creek and Hauser Canyon Wilderness areas, cowbird control through the use of traps is impractical and would likely provide inadequate coverage for the entire vireo or flycatcher population. An alternative to trapping which has also proved to be successful in providing protection to Least Bell's Vireos and Willow flycatchers is the control of parasitism impacts through nest monitoring. Although nest monitoring does not reduce the number of cowbirds within an area or prevent parasitism, it does provide substantial protection to nesting individuals allowing for increased productivity. Additional benefits to nest monitoring is the fact that accurate information can be gathered on population status and trends. Successful cowbird control and management is dependent upon many variables, and each case or location has its own unique factors which do not always provide for generalized or standard solutions. Future investigations into cowbird movements and possible foraging areas which are located near the survey areas may lead to a suitable long term management program for the Hauser and Pine Creek areas.

### Southwestern Arroyo Toad and Southwestern Pond Turtle Management

Management for the Southwestern Arroyo Toad within the Pine Creek and Hauser Canyon Wilderness Areas should be focused on the control of non-native predators and breeding habitat protection. Although the control of widespread exotics such as Green Sunfish and Bullfrogs is problematic at best, management of these species, particularly Bullfrogs can be relatively successful through intensive and regular removal efforts (Sweet 1991). Elimination or widespread control of Green Sunfish within Pine Creek and Cottonwood Creek would require substantial efforts and likely involve the use of poisons which would be prohibitive for a variety of reasons, as well as temporary, as fish would repopulate the drainages from Morena and Barrett Reservoirs. Another potential means of localized control might involve the removal of Green Sunfish from identified Arroyo Toad breeding pools prior to or during the early stages of toad breeding activity. Because of the seasonal flows within Pine Creek which restricts the movement of sunfish during the drier periods (early summer thru fall), this method could possibly be successful in increasing reproductive success. Currently, potential habitat impacts to the Arroyo Toad within Pine Creek involve the disturbance of breeding sites from human foot traffic. Because of the relatively narrow and rugged conditions within this drainage, trail crossings or foot traffic has the potential to be funneled into or across open shorelines or sandbars which are also the preferred breeding location of Arroyo Toads.



Future management of the Arroyo Toad within the Pine Creek and Hauser areas should include thorough surveys during the breeding season to accurately establish the number of breeding adults and locations within the drainages, and the investigation into practical methods of controlling exotic species.

Southwestern Pond Turtles are subject to many of the same impacts as the Arroyo Toad, including predation and competition from exotic species and habitat degradation from livestock grazing. The Pine Creek population appears to be healthy and relatively safe from serious impacts, however this species would also benefit from the control of Green Sunfish and the prevention of Bullfrog establishment within the drainage. With the increasing population of southern California and popularity of outdoor recreational activities, future management for this species within Pine Creek may also include the control of trails and number of people utilizing the area which can have negative impacts through habitat degradation, harassment and illegal collecting.

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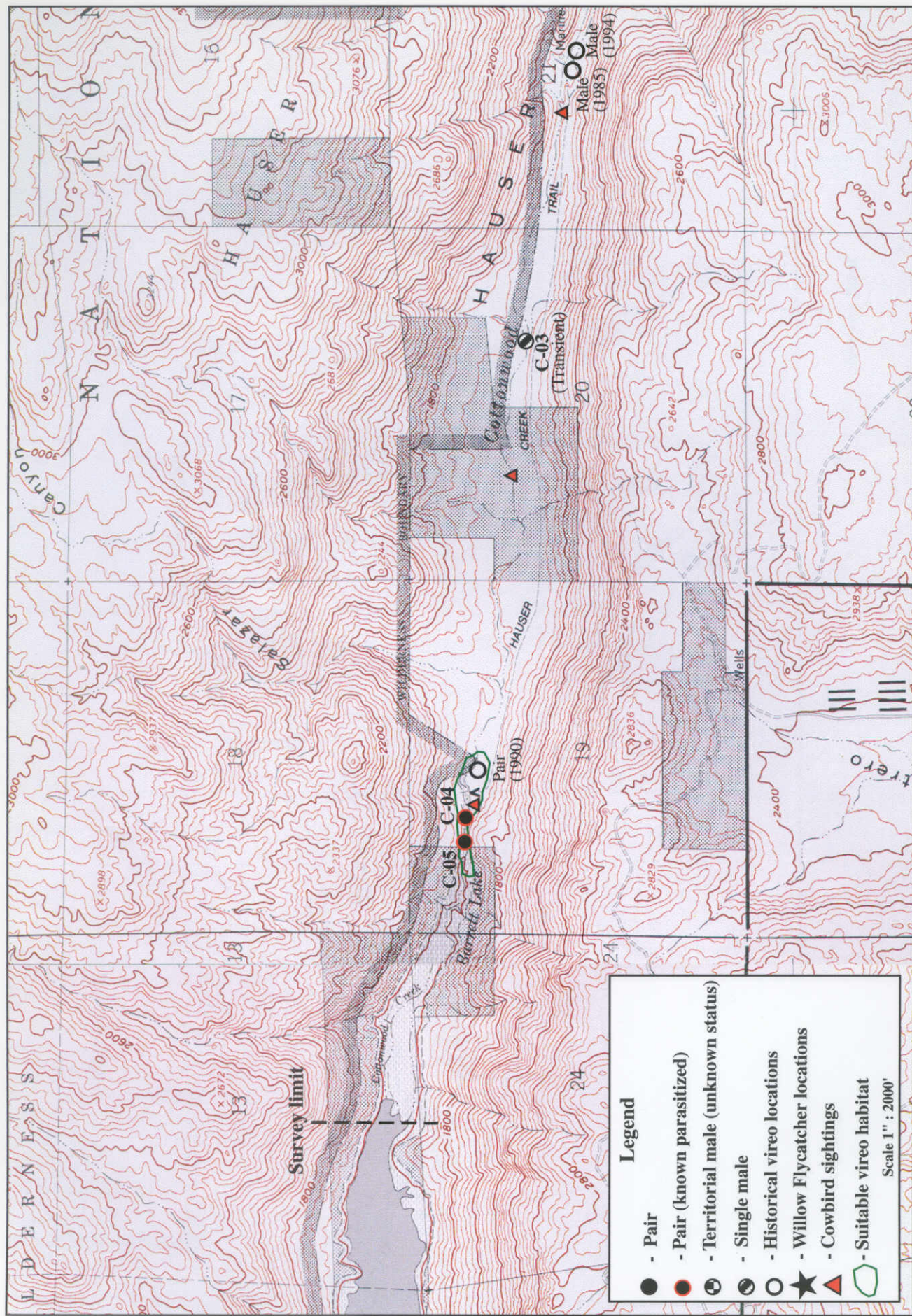


Figure 2. 1997 Least Bell's Vireo / Willow Flycatcher Locations: Hauser Canyon Wilderness Area, Descanso Ranger District, Cleveland National Forest, San Diego County, California.



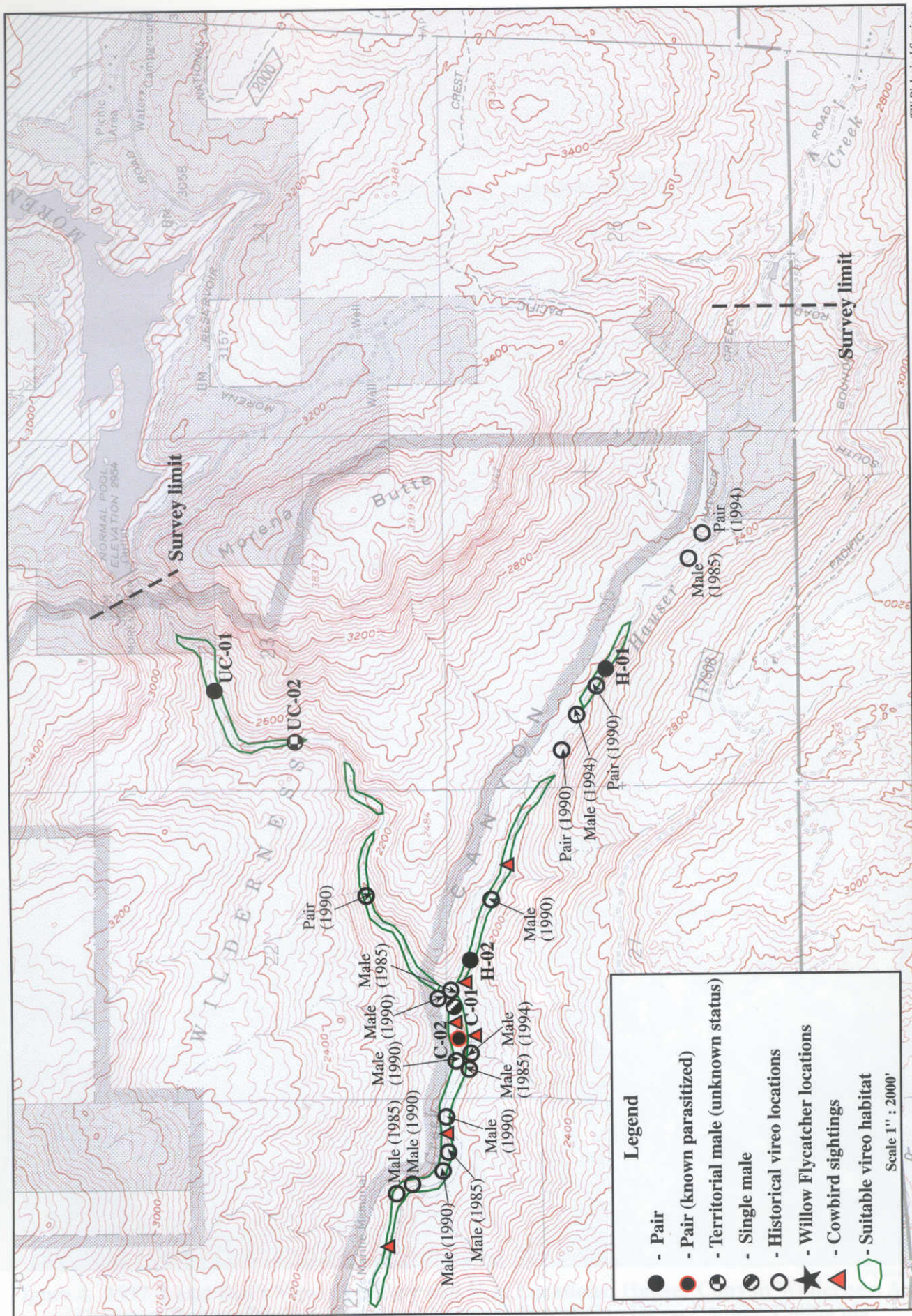


Figure 3. 1997 Least Bell's Vireo / Willow Flycatcher Locations: Hauser Canyon Wilderness Area, Descanso Ranger District, Cleveland National Forest, San Diego County, California.



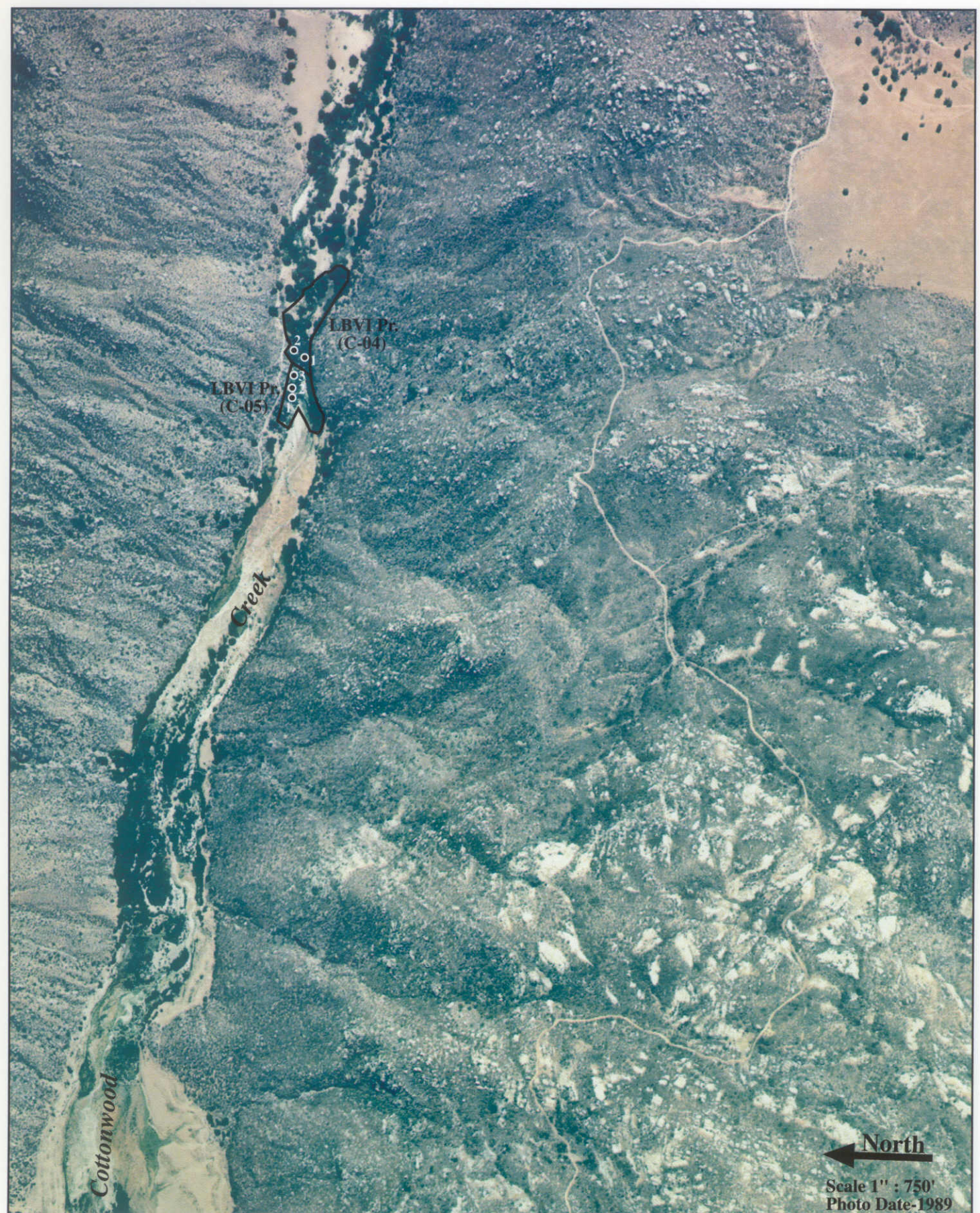


Figure 4. 1997 Least Bell's Vireo Territory and Nest Locations: Hauser Canyon Wilderness Area, Descanso Ranger District, Cleveland National Forest, San Diego County, California.

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**Figure 5. 1997 Least Bell's Vireo Territory and Nest Locations: Hauser Canyon Wilderness Area, Descanso Ranger District, Cleveland National Forest, San Diego County, California.**





Figure 6. 1997 Least Bell's Vireo Territory and Nest Locations: Hauser Canyon Wilderness Area, Descanso Ranger District, Cleveland National Forest, San Diego County, California.

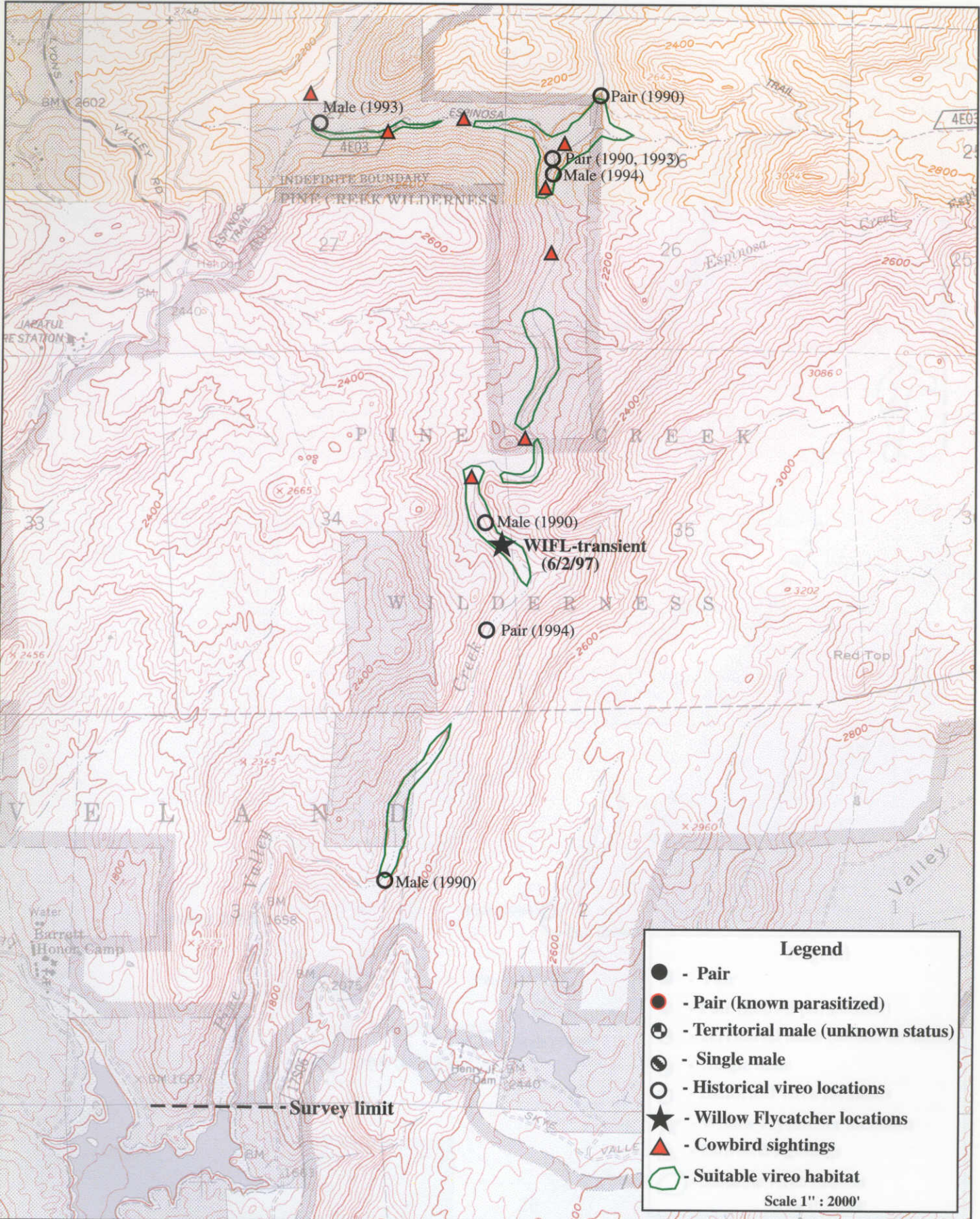




**Figure 7. 1997 Least Bell's Vireo Territory and Nest Locations: Hauser Canyon Wilderness Area, Descanso Ranger District, Cleveland National Forest, San Diego County, California.**

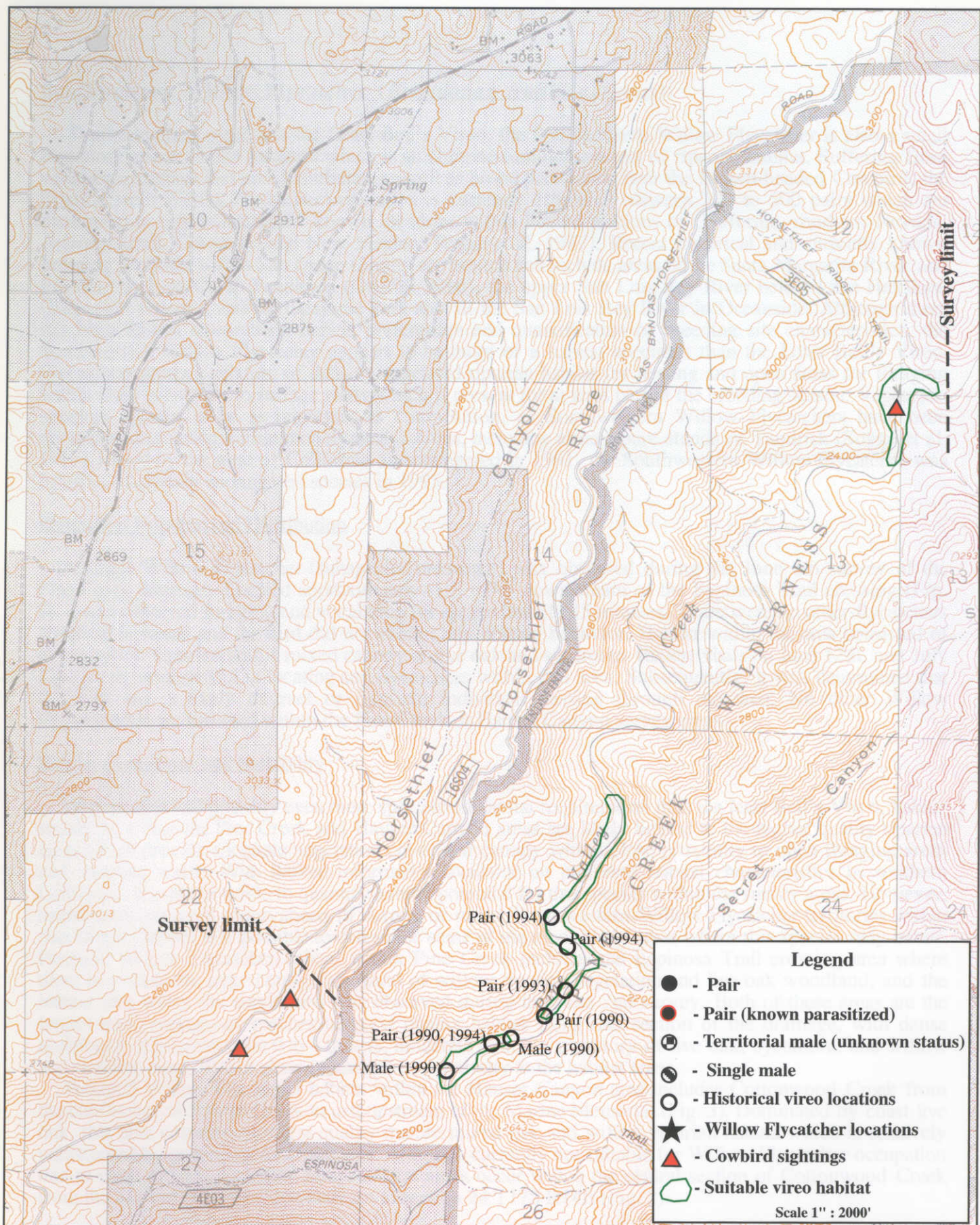
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**Figure 8. 1997 Least Bell's Vireo / Willow Flycatcher Locations: Pine Creek Wilderness Area, Descanso Ranger District, Cleveland National Forest, San Diego County, California.**





**Figure 9. 1997 Least Bell's Vireo / Willow Flycatcher Locations: Pine Creek Wilderness Area, Descanso Ranger District, Cleveland National Forest, San Diego County, California.**



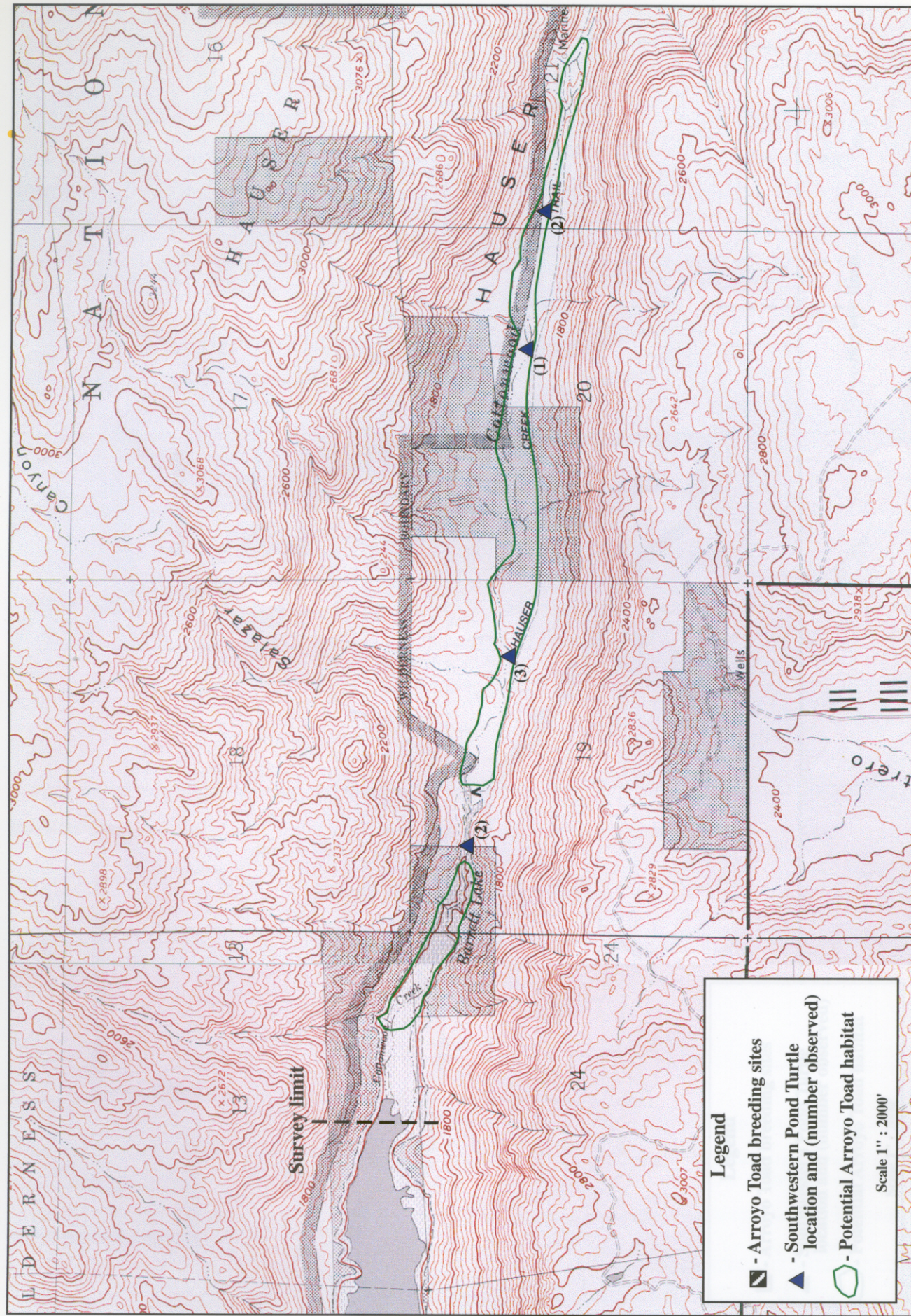
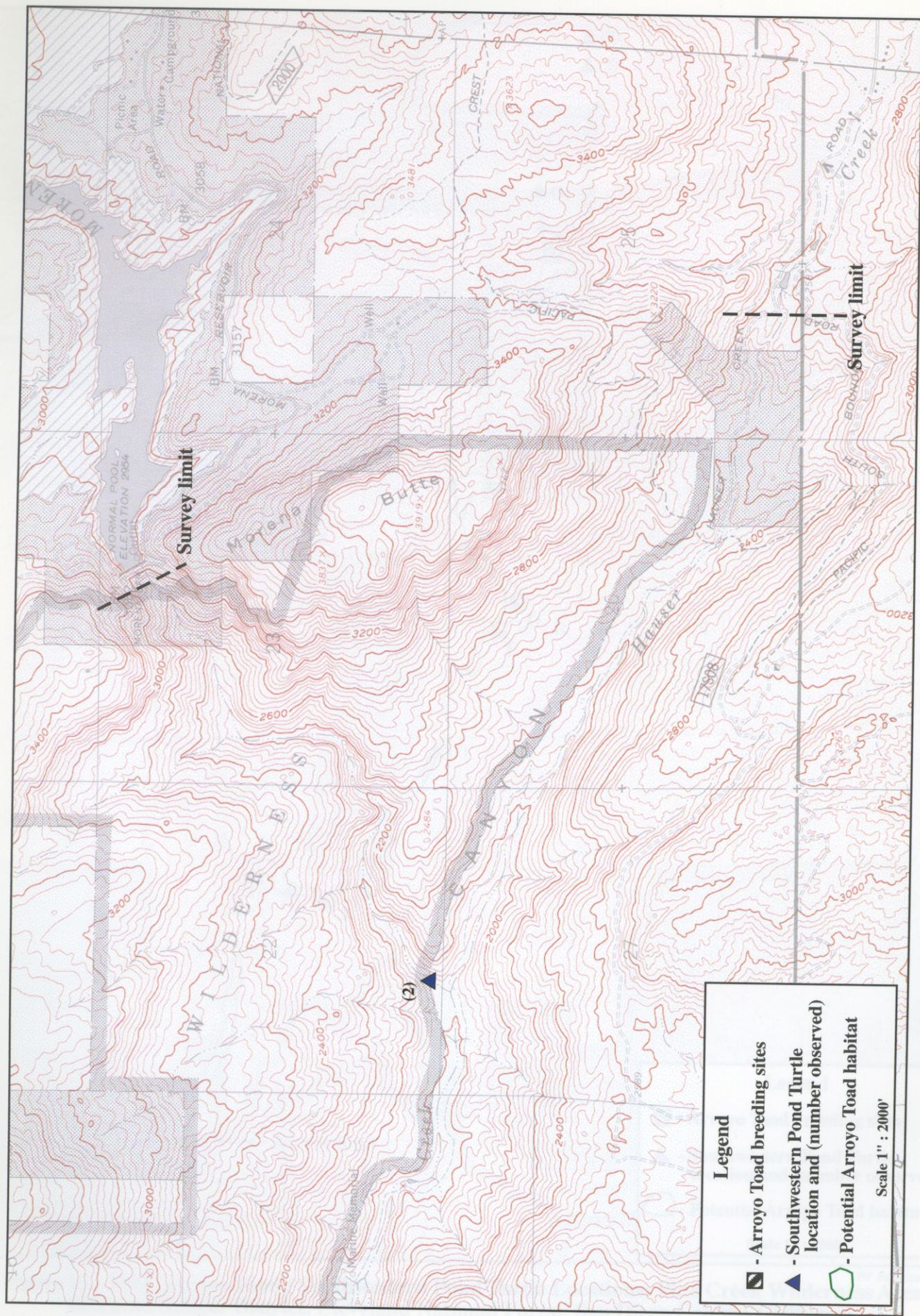


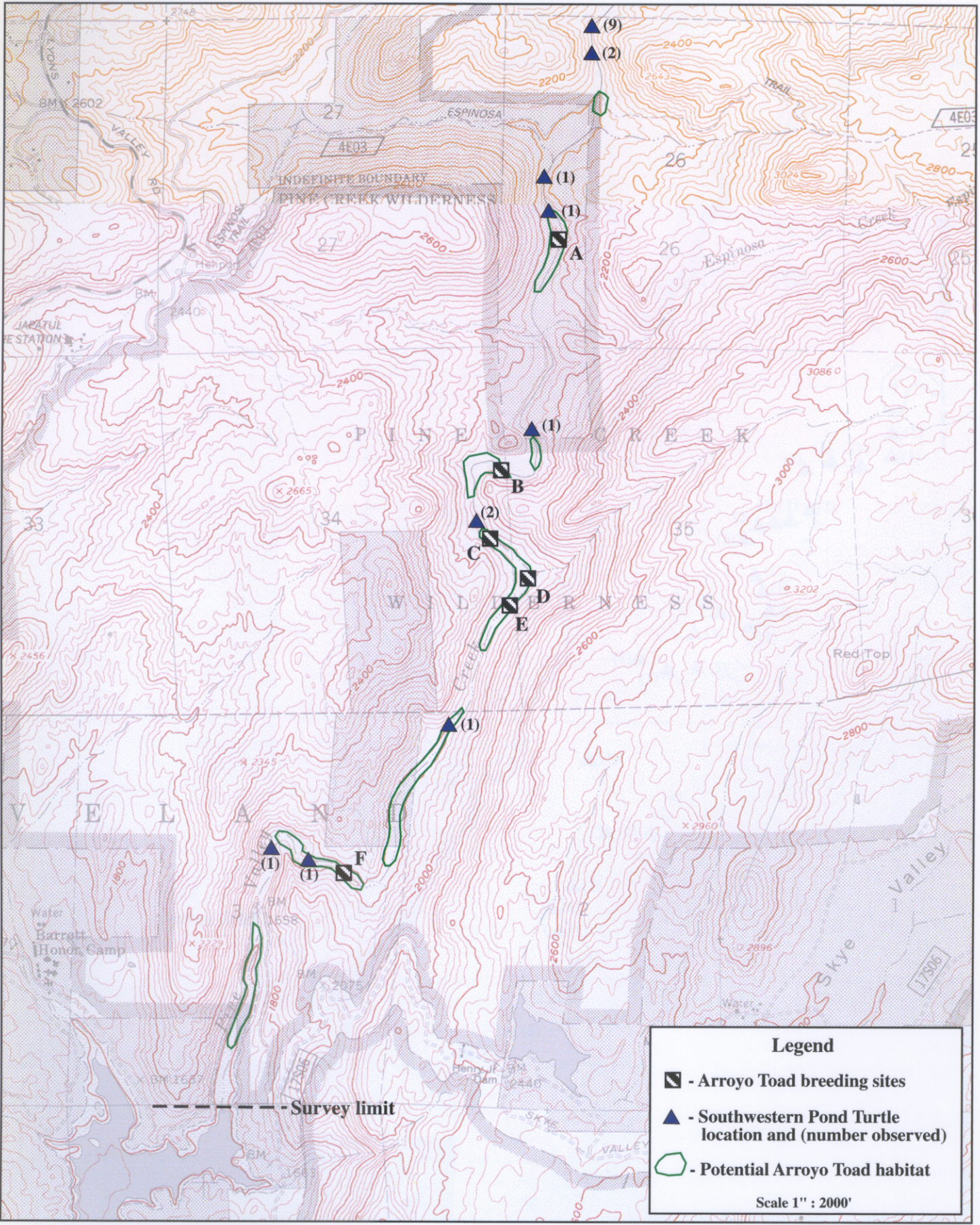
Figure 10. 1997 Arroyo Toad / Southwestern Pond Turtle Locations: Hauser Canyon Wilderness Area, Descanso Ranger District, Cleveland National Forest, San Diego County, California.





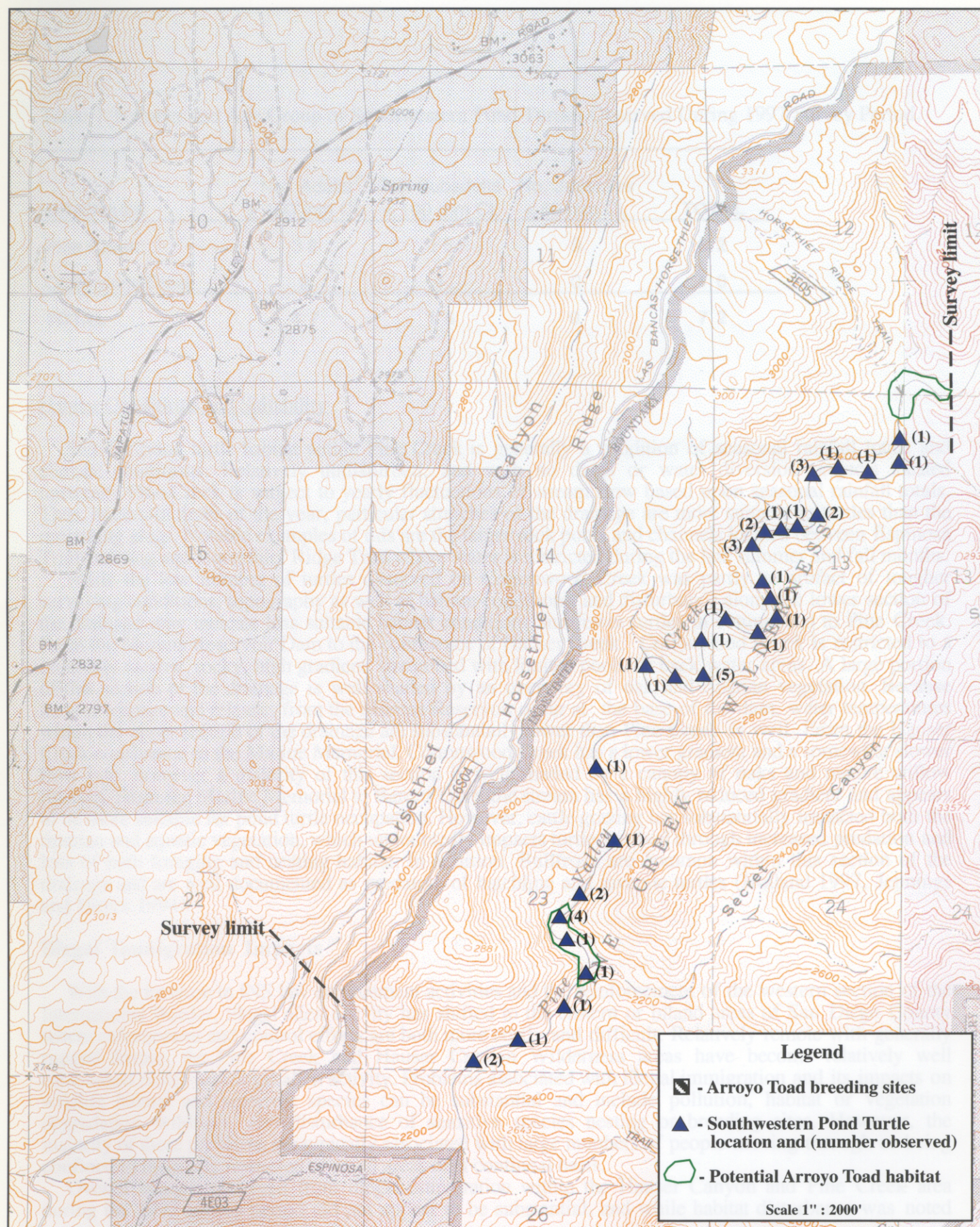
**Figure 11. 1997 Arroyo Toad / Southwestern Pond Turtle Locations: Hauser Canyon Wilderness Area, Descanso Ranger District, Cleveland National Forest, San Diego County, California.**





**Figure 12. 1997 Arroyo Toad / Southwestern Pond Turtle Locations: Pine Creek Wilderness Area, Descanso Ranger District, Cleveland National Forest, San Diego County, California.**





**Figure 13. 1997 Arroyo Toad / Southwestern Pond Turtle Locations: Pine Creek Wilderness Area, Descanso Ranger District, Cleveland National Forest, San Diego County, California.**