Western Riverside County
Multiple Species Habitat Conservation Plan
Biological Monitoring Program

2012 Western Pond Turtle
(*Clemmys marmorata pallida*)
Survey Report

21 May 2013

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NOTE TO READER:

This report is an account of survey activities conducted by the Biological Monitoring Program for the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). The MSHCP was permitted in June 2004. The Monitoring Program monitors the distribution and status of the 146 Covered Species within the Conservation Area to provide information to Permittees, land managers, the public, and the Wildlife Agencies (i.e., the California Department of Fish and Game and the U.S. Fish and Wildlife Service). Monitoring Program activities are guided by the MSHCP species objectives for each Covered Species, the information needs identified in MSHCP Section 5.3 or elsewhere in the document, and the information needs of the Permittees.

MSHCP reserve assembly is ongoing and it is expected to take 20 or more years to assemble the final Conservation Area. The Conservation Area includes lands acquired for conservation under the terms of the MSHCP and other lands that have conservation value in the Plan Area (called public or quasi-public lands in the MSHCP). In this report, the term "Conservation Area" refers to the Conservation Area as understood by the Monitoring Program at the time the surveys were planned and conducted.

We would like to thank and acknowledge the land managers in the MSHCP Plan Area, who in the interest of conservation and stewardship facilitate Monitoring Program activities on the lands for which they are responsible. A list of the lands where data collection activities were conducted in 2012 is included in Section 7.0 of the Western Riverside County Regional Conservation Authority (RCA) Annual Report to the Wildlife Agencies. Partnering organizations and individuals contributing data to our projects are acknowledged in the text of appropriate reports.

While we have made every effort to accurately represent our data and results, it should be recognized that data management and analysis are ongoing activities. Any reader wishing to make further use of the information or data provided in this report should contact the Monitoring Program to ensure that they have access to the best available or most current data.

The primary author of this report was the 2012 Herpetology Program Lead, Robert Packard. If there are any questions about the information provided in this report, please contact the Monitoring Program Administrator. If you have questions about the MSHCP, please contact the Executive Director of the RCA. For further information on the MSHCP and the RCA, go to www.wrc-rca.org.

Contact Info:

Executive Director
Western Riverside County
Regional Conservation Authority
Riverside Centre Building
3403 10th Street, Suite 320
Riverside, CA 92501
Ph: (951) 955-9700

Western Riverside County MSHCP
Monitoring Program Administrator
c/o Adam Malisch
4500 Glenwood Drive, Bldg. C
Riverside, CA 92501
Ph: (951) 248-2552

INTRODUCTION

The western pond turtle (*Clemmys marmorata pallida;* pond turtle) is a California species of special concern and is the state's only native freshwater turtle. Two subspecies of *Clemmys marmorata* occur in California: the northwestern subspecies (*C. m. marmorata*), which ranges north of the American River, and the western subspecies (*C. m. pallida*), which is distributed from the San Francisco area south across the Western Riverside County MSHCP Plan Area and into Baja California (Seelinger 1945; USFWS 1992; Holland 1994). The pond turtle genus has recently been changed to *Actinemys*, but we will retain the old name in this report to stay consistent with the MSHCP. The western pond turtle prefers permanent water bodies with emergent vegetation and basking areas (Lemm 2006) and requires a buffer of at least 500 m of upland habitat for nesting, aestivating and hibernating (Reese & Welsh 1997).

MSHCP species-specific conservation objective 5 requires maintaining pond turtle occupancy within at least 75% of eight listed Core Areas as measured once every three years (Dudek & Associates 2003). Core Areas for this species are: Cajalco Creek, San Mateo Creek, Santa Ana River, Chino Creek, Temecula Creek, Murrieta Creek, Santa Rosa Plateau, and the San Jacinto River east of Interstate 215. These Core Areas include a 2-km buffer of upland habitat adjacent to each water system. MSHCP species-specific conservation objective 4 also lists over 20 riparian/wetland and overland dispersal areas in the Plan Area.

We have surveyed for pond turtle within Core Areas and other suitable areas in conservation since 2006. Prior to 2012 surveys, but within the current reporting period (i.e., 2010 – 2012), only Cajalco Creek, Murrieta Creek, and the Santa Rosa Plateau were confirmed as occupied. Our 2012 survey effort therefore focused on four Core Areas that we either had not trapped, or had surveyed but did not detect, turtles within the three-year time period required for the species objective. These areas included San Mateo Creek, the Santa Ana River, San Jacinto River, and the Santa Rosa Plateau (Fig. 1). Trapping was conducted at the Santa Rosa Plateau even though the area was already documented as occupied because the existing data consisted of scant incidental observations of pond turtles while focused trapping provides a much better summary of current species status. There is little, if any, appropriate habitat currently in the Conservation Area in the remaining Core Areas: Temecula Creek and Chino Creek.

Our preferred survey method is trapping stations that are monitored daily for one week and which increase the likelihood of capturing individuals if present and allow us to better track populations in the long term (USGS 2006). We also conduct visual or directed search surveys, which allow for a rapid search over a greater area and are an alternative to trapping stations when these are not an option.

Additionally, we assisted with trapping efforts led by the MSHCP Management Program on the Bolton Property along Cajalco Creek. Management Program biologists also trapped at the non-core area of Warm Springs Creek in Murrieta (Fig. 1). Both of

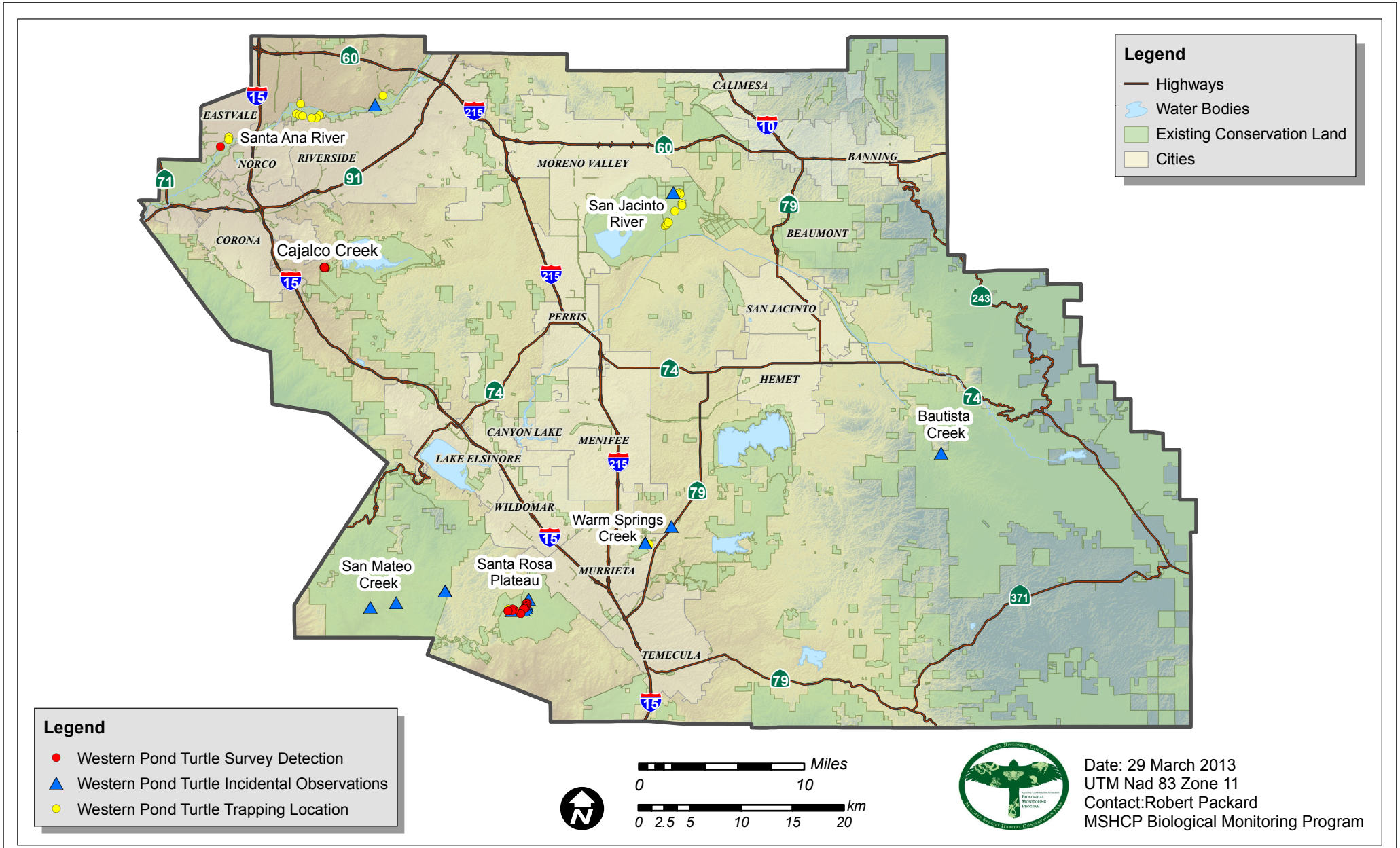

Figure 1. Western pond turtle trapping locations and detections in 2012.

these surveys were a continuation of the Management Program's efforts to track turtle movements using radio telemetry.

Goals and Objectives

1. Locate suitable habitat in Core Areas and dispersal units not surveyed in recent years.
   a. Conduct visual habitat assessments based on U.S. Geological Survey (USGS) protocol.
2. Collect information about species distribution and demographics in the Plan Area.
   a. Determine presence and abundance at surveyed Core Areas.
   b. Mark turtles with Passive Integrative Transponder (PIT) tags.
3. Collaborate with USGS on their ongoing population study of reptiles in southern California.
   a. Collect and deliver tissue samples from USGS target species for genetic analysis.

METHODS

Protocol Development

We evaluated potential trapping sites using a visual habitat assessment that was based on variables identified in Madden-Smith et al. (2005). The trapping protocol developed by USGS (2006) has been the basis of our protocol since surveys began in 2006. The protocol details a trapping procedure that maximizes our ability to detect all turtle species present in a given area. We amended the protocol in 2008 (Biological Monitoring Program 2009) to include water-quality data that were excluded from our visual habitat assessment protocol (Madden-Smith et al. 2005).

Survey Design

We targeted the Santa Ana River, Santa Rosa Plateau, San Jacinto River, and San Mateo Creek Core Areas in 2012 (Fig. 1). We selected trap locations and dispersal units based on presence of suitable habitat, as determined by visual assessments conducted along streams and pond shorelines (Appendix A). We conducted visual assessments on 29 May along the Santa Ana River, 31 May and 19 June at the Santa Rosa Plateau, and 1 June along the San Jacinto River and adjacent San Jacinto Wildlife Area. We did not conduct visual assessments along San Mateo Creek as we did not trap at that location due to U.S Forest Service restrictions. We considered habitat to be suitable if there was slow-moving water >0.5 m deep and if the area was qualitatively assessed as marginal or better according to known habitat preferences (Lemm 2006).

The number of trap sites per Core Area or dispersal unit, and the number of trap locations per site, depended upon the extent of appropriate habitat (Table 1). We selectively placed traps where vegetative cover, basking sites, and appropriate water depth occurred within identified suitable habitat. We also attempted to prevent vandalism

and theft of traps by placing them out of public view. Each trap site consisted of either a large or small hoop trap, depending on water depth, baited with a punctured tin of sardines. We also monitored fish and crayfish populations by placing one standard minnow trap for every 10 hoop traps at each site, or one for every trap site with <10 hoop traps. We left traps open all night and checked them each morning.

Table 1. Trap sites per survey area in 2012.

Site	Trapping Area	Trap Sites (*n*)	Description (# of traps per site)
Core Area			
Santa Ana River	Hidden Valley	6	Pools and creek (1–13)
	Mira Loma	1	Pool (10)
	Norco Pools	3	Pools (4-18)
	Rancho Jurupa	1	Pool (7)
Santa Rosa Plateau	Cole Creek and tributaries	12	Creeks (1–10)
San Jacinto River	San Jacinto Wildlife Area pools	5	Pools and creek (2-15)
	Old San Jacinto River	4	Creek (1-4)
Cajalco Creek	Bolton Property	2	Pools (4-6)
Non-core Area			
Murrieta	Warm Springs Creek	8	Creek (1–5)

We surveyed each trap site during a single effort that consisted of four consecutive trap nights. We installed traps on Monday morning, checked them each subsequent morning (Tuesday–Friday), and removed them on Friday. In 2012 we conducted trap surveys from 4-8 June and 25-29 June at the Santa Rosa Plateau, from 2-6 July and 9-13 July in the San Jacinto River Core Area, and from 16-20 July and 30 July-3 August along the Santa Ana River. We did not trap during consecutive weeks at two of the sites due to scheduling conflicts with other Monitoring Program surveys.

In addition to trapping surveys at other locations, we conducted a directed search survey along approximately 5 km of the San Mateo Creek drainage in Cleveland National Forest (CNF). CNF prohibits the placement of traps in its Wilderness Areas so instead we conducted these visual surveys to determine the presence of the species. We conducted a one-day search along the drainage on 31 May and recorded any turtle observations.

We also assisted the MSHCP Management Program with their turtle trapping efforts in 2012 (Table 1). We assisted at the Core Area of Cajalco Creek on 9-13 April. The Management Program trapped at the non-core area of Warm Springs Creek on 14-18 May. Both are part of a radio-tracking project the Management Program has undertaken to understand turtle dispersal.

Field Methods

Teams of at least two surveyors conducted visual habitat assessments by walking upstream along lake or stream banks and within stream channels. We qualitatively ranked the suitability of each pool or 250-m stream segment according to presence or absence of slow moving water, maximum water depth, quantity of basking sites, aquatic and

streamside refugia, and upland habitat (Appendix A). We also recorded the ease of human access and level of naturalness, and identified all reptile and amphibian species that we encountered at each potential trapping location.

We trapped at sites that contained appropriate habitat based on the habitat assessment. We recorded UTM coordinates of each trap on the day it was set, and uniquely numbered trap locations in the order in which they were selected. We collected the following data before setting traps at each pool or stream segment: date, observer, time, general weather conditions, temperature in shade at 1 m above ground, average wind speed, water temperature, pH, dissolved oxygen, conductivity, water width, water velocity, and area of water (Appendix B). We also took upstream photos at the start of each segment and noted the presence and abundance of exotic plant species. For non-covered animal species, we recorded a species observation at the first encounter of each life stage (i.e., tadpole, juvenile, or adult) within a pool or stream segment for animals outside of traps. For all Covered Species, we noted each individual and recorded its location as a waypoint on handheld GPS units.

We set traps on Monday morning and baited them with a punctured can of sardines. We first recorded general weather information at each pool before checking traps. We then checked traps daily between 0730 and 1330 h to retrieve trapped turtles and other aquatic species (e.g., fish, frogs, invertebrates). We recorded trap site, sex, carapace length, carapace width, plastron length, and weight for each captured turtle. We also notched the right femoral scute of the plastron of all turtles except spiny softshells (*Apalone spinifera*), and collected tissue samples from each turtle by clipping the last 3 mm of the tail, or a small strip of skin from the feet of softshells. We did not notch softshell turtle scutes due to the delicate nature of their soft shell. We preserved tissue samples in alcohol and stored them in a freezer at the Biological Monitoring Program office before delivering them to the USGS office in San Diego.

We took at least four photos of all pond turtles (face-on, carapace, side of carapace, and plastron orientations) and noted shell damage. After scanning individuals with a PIT-tag reader, we marked all untagged adult pond turtles with a subcutaneous PIT tag (American Veterinary Identification Devices, Inc., Norco, CA) inserted at the medial ventral fold of the right rear leg (Fig. 2). Processing time took 5–10 min per animal depending on whether the turtle had already been PIT-tagged. We then returned all western pond turtles to the pool from which they came. We collected and donated all exotic turtles to the California Turtle and Tortoise Club (Orange County, CA) which were then put up for adoption. We either released on-site or destroyed all other exotic animals we collected, according to reserve manager's desires and each surveyor's personal preference. We then re-set traps after each check and removed the traps on the fourth trapping day.

Personnel and Training

Biological Monitoring Program training for pond turtle surveys in 2012 included

an in-office presentation of key characteristics that distinguish local species and examination of live specimens. Additionally, we trained crew members to safely insert PIT tags and collect tissue samples using live specimens of locally captured non-native species or, in the field, using red-eared sliders (*Trachemys scripta*) or pond turtles.

Figure 2. PIT tag being inserted into the medial ventral fold of the right rear leg of a western pond turtle. Notch mark used for identifying a recaptured animal is also visible on the right femoral scute.

Biological Monitoring Program personnel were funded by the Regional Conservation Authority (RCA) and the California Department of Fish and Wildlife (DFW, formerly Department of Fish and Game); volunteers are noted. The following personnel conducted pond turtle surveys in 2012:

- Robert Packard, Herpetology Program Lead (Biological Monitoring Program)
- Ana Hernandez (Biological Monitoring Program)
- Ashley Ragsdale (Biological Monitoring Program)
- Daniel Orr (DFW)
- Elizabeth Dionne (Riverside County Parks)
- Jennifer Hoffman (Biological Monitoring Program)
- Joanna Gibson (DFW)
- Jonathan Reinig (Biological Monitoring Program)
- Joseph Sherrock (Biological Monitoring Program)
- Juan Torres (DFW)
- Karyn Drennen (Biological Monitoring Program)
- Kim Freeburn (DFW)
- Lynn Miller (Biological Monitoring Program)

- Maricela Paramo (Biological Monitoring Program)
- Masanori Abe (Biological Monitoring Program)
- Michele Felix (Biological Monitoring Program)
- Nicholas Peterson (Biological Monitoring Program)
- Tara Graham (Biological Monitoring Program)
- Veronica Valencia (Volunteer)
- Whitney Meier (DFW)

Data Analysis

We present here summary information for 2012, for the current reporting period (2010-2012) and for the duration of the turtle trapping effort beginning in 2006. Data analysis consisted of mapping observations in a geographic information system and qualitatively assessing both distribution with respect to Core Areas and relative abundance. All survey data are stored in the Biological Monitoring Program's central database. Paper data sheets and survey maps are retained in the program office in Riverside, CA.

RESULTS

We captured a total of 65 pond turtles and recorded incidental observations of another 16 in 2012. The greatest concentration of pond turtles was at the Santa Rosa Plateau (Table 2). We also assisted with the capture of 49 pond turtles during the MSHCP Management Program's trapping effort along Cajalco Creek.

Incidental pond turtle observations were reported from various agencies in 2012. The MSHCP Management Program recorded six pond turtles at Warm Springs Creek during their trapping efforts in 2012. Additional incidental observations recorded include six pond turtles along the San Mateo Creek drainage in CNF in a directed search for pond turtle on 31 May. We also incidentally recorded one pond turtle at the San Jacinto Wildlife Area during visual assessments for pond turtle and two in French Valley during American Bittern surveys.

Land managers also reported incidental observations of pond turtles. The Riverside-Corona Resource Conservation District reported three pond turtles along Sunnyslope Creek, a tributary of the Santa Ana River in the community of Rubidoux, while they were removing invasive species (Brett Mills, personal communication). U.S. Forest Service staff reported one adult found dead in the road near the dispersal area of Bautista Canyon on 18 April (Kim Boss, personal communication).

We captured many invasive species during trapping efforts in 2012 (Table 2). We trapped two species of invasive turtle along the Santa Ana River, spiny softshell and red-eared slider (*Trachemys scripta*), and incidentally captured one female common snapping turtle (*Chelydra serpentina*) at the San Jacinto Wildlife Area. We also detected invasive fish, amphibians, and crustaceans at the San Jacinto Wildlife Area and the Santa Ana River. Only one individual of one invasive animal species, a bullfrog (*Lithobates*

catesbeiana), was detected at the Santa Rosa Plateau in 2012. Invasive species were not recorded during the trapping efforts at Cajalco or Warm Springs Creeks. However, during a separate project to remove invasive species at Warm Springs Creek, we documented red swamp crayfish *(Procambarus clarkia),* fathead minnow *(Pimephales promelas),* green sunfish (*Lepomis cyanellus*), and bullfrog (*Lithobates catesbeiana).*

Table 2. Number of individuals trapped, by site and species, during pond turtle surveys in 2012. MSHCP Covered Species are indicated in **bold,** invasive species with an asterisk (*).

Site	Common Name	Scientific Name	Number
Core Area			
Santa Rosa Plateau	**Coast range newt**	***Taricha torosa***	20
	Pacific chorus frog	*Pseudacris hypochondriaca*	11
	Western pond turtle	***Clemmys marmorata***	46
	Two-striped garter snake	*Thamnophis hammondi*	20
San Jacinto River	Red swamp crayfish*	*Procambarus clarkii*	4
	Mosquitofish*	*Gambusia affinis*	11
	Western toad	*Anaxyrus boreas*	1
	Baja California chorus frog	*Pseudacris hypochondriaca*	2
	Bullfrog*	*Lithobates catesbeiana*	8
Santa Ana River	Yellow bullhead*	*Ameiurus natalis*	1
	Mosquitofish*	*Gambusia affinis*	37
	Green sunfish*	*Lepomis cyanellus*	48
	Common carp*	*Cyprinus carpio*	3
	Bullfrog*	*Lithobates catesbeiana*	13
	African clawed frog*	*Xenopus laevis*	71
	Western pond turtle	***Clemmys marmorata***	1
	Spiny softshell*	*Apalone spinifera*	6
	Red-eared slider*	*Trachemys scripta*	25
Cajalco Creek[a]	**Western pond turtle**	***Clemmys marmorata***	49
Non-core Area			
Warm Springs Creek[a]	**Western pond turtle**	***Clemmys marmorata***	6

[a]Non-native species were not recorded during trapping efforts.

Most areas that we trapped had a variety of invasive fish species, including common carp (*Cyprinus carpio*), yellow bullhead (*Ameiurus natalis*) and green sunfish (*Lepomis cyanellus*). We also found the invasive red swamp crayfish (*Procambarus clarkii*) in the San Jacinto River drainage. We did not detect any native fish in any drainage trapped in 2012 (Table 2).

We collected tissue samples from 91 individual turtles, representing four species. We also collected tissue samples from 17 individuals of two reptile and two amphibian species. We delivered all samples to USGS in support of their ongoing population genetics study of reptiles and amphibians in southern California.

We encountered no incidents of vandalism or theft at our trapping sites in 2012.

DISCUSSION

We focused 2012 survey efforts on documenting the presence of pond turtles in

Core Areas in which we had not detected them in the three-year time period required per species objective 5, and in areas where we had not previously trapped due to access and personnel limitations. We detected pond turtles in the Santa Ana River, San Jacinto River, Santa Rosa Plateau, San Mateo Creek, and Cajalco Creek Core Areas.

We have visually surveyed all eight pond turtle Core Areas for appropriate habitat from 2006–2012 and conducted trapping surveys in seven of them (Appendix C). We have surveyed but not trapped the San Mateo Creek Core Area due to access restrictions in the Cleveland National Forest Wilderness Area.

Western pond turtles have been detected in six of eight (75%) Core Areas, as well as in two dispersal areas, the Santa Margarita River and Bautista Creek, from 2010-2012 (Table 3). This meets species objective 5, which requires occupancy of at least 75% of Core Areas every three years. Temecula Creek has little if any appropriate habitat currently in the Conservation Area, and Chino Creek has been highly impacted by human activities, although a population is known to occur along Chino Creek just north of the Plan Area, in San Bernardino County.

Table 3. Summary of pond turtle survey efforts and detections by year and site, 2010-2012. Survey type is coded (V=visual, T=trapping, I=incidental), with **bold** lettering indicating turtle detection.

Site	Trapping Site	2010	2011	2012
Core Areas				
Chino Creek	Chino Creek	-	-	-
	Mill Creek	-	-	-
	Prado Wetlands	-	T	-
	Goldberry Ponds	-	-	-
Murrieta Creek	Murrieta Creek	-	V, **T**	-
Cajalco Creek	Bolton Property	**T**	**T**	**T**
San Jacinto River	San Jacinto River	-	-	V, T
	San Jacinto Wildlife Area	-	-	V, **I,** T
San Mateo Creek	San Mateo Canyon	-	-	**I**
Santa Ana River	Norco Pools	-	T	V, **T**
	Prado Wetlands	-	T	-
	Hidden Valley Wildlife Area	-	-	V, T
	Rancho Jurupa Park	-	-	V, T
Santa Rosa Plateau	Santa Rosa Plateau	**I**	-	V, **T**
Temecula Creek	Temecula Creek	-	-	-
Dispersal Sites				
Bautista Creek	Bautista Creek	-	-	**I**
Santa Margarita River	Santa Margarita River	**I**	-	-
Non-core Areas				
Warm Springs Creek	Warm Springs Creek	-	**T**	**T**

Recommendations

We will survey inhabited Core Areas every three years, and attempt to identify other potential turtle habitat outside of listed Core Areas, focusing on listed dispersal

areas. Dispersal areas found to contain adequate habitat should be surveyed for turtles to provide the best summary of current species status within the Conservation Area. We will also continue to use incidental observations made by Monitoring Program biologists and reported by land managers to help us assess pond turtle status.

The absence of pond turtles in many areas may be due to the presence of invasive turtles, fish, and crayfish. In particular, snapping turtles, spiny softshells and red-eared sliders compete for the same resources that pond turtles use and can transmit disease to pond turtles (Spinks et al. 2003). Invasive fish, frogs, and crayfish can also compete with pond turtles for food, and prey on turtle hatchlings (Dudek & Associates 2003). We urge local land managers to focus attention on controlling invasive non-native species when they are present in these waterways. We also recommend that the Management Program record the presence of invasive species during all related survey efforts. Documenting invasive species adds little time to the total survey effort but can provide invaluable information that can help managers prioritize management activities and document the impacts of those activities on threats to the pond turtle.

A more comprehensive assessment of upland habitat would help facilitate management of pond turtles. Pond turtles have been known to travel as far as 1.9 km streamside and 500 m into upland habitat (Rathbun et al. 1992; Reese & Welsh 1997), so a thorough evaluation of conditions within the 2-km buffer would help managers make better-informed decisions when managing for this species. We currently collect information on water quality and aquatic variables (Appendix A and Appendix B) but an assessment of the surrounding habitat, including upland slope and distance to suitable nesting locations, could provide additional information about the biological and ecological needs of the species. We recommend the Management Program collect this additional information in conjunction with their radio telemetry studies, which are specifically designed to track turtle movement.

We recommend that genetically-similar local pond turtles be translocated into the pools at the San Jacinto Wildlife Area to facilitate reproduction there. We believe that at this time only one female pond turtle inhabits the wildlife area (Biological Monitoring Program 2007, 2009). This site contains few invasive turtles (Table 2) and has extensive suitable habitat, which if managed properly, could lead to successful repopulation of this Core Area.

The amount of conserved pond turtle habitat is very limited and/or heavily disturbed in two of the Core Areas listed in the MSHCP. Temecula Creek contains little suitable habitat in the current Conservation Area. Chino Creek has been heavily disturbed and ongoing management for the benefit of pond turtles is complicated due to fluctuating water levels behind the Prado Dam. Based on previous efforts, we know that a pond turtle population occurs within the reserve along the Santa Margarita River (Biological Monitoring 2007). Therefore, it seems appropriate to replace a more highly disturbed or unsuitable Core Area with the Santa Margarita Ecological Reserve. This reserve contains

a significant amount of suitable habitat and a viable population of pond turtles. The population at this location, along with the one at Murrieta Creek, could potentially replenish the population at Temecula Creek should sufficient suitable habitat be acquired.

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Appendix A. Pond turtle habitat assessment datasheet.

Block (stream/ pond): _____ **DATE**: _____
Site (reach/ pool #): _____

Observer(s) Initials: _____

Habitat Quality

slow moving water circle one: no yes___

≥ 0.50 m of pooling water circle one: no yes___

basking sites circle one: 0 ("none") 1 ("few") 2 ("many")

aquatic refugia circle one: 0 ("none") 1 ("few") 2 ("many")

streamside refugia circle one: 0 ("none") 1 ("few") 2 ("many")

upland nesting habitat circle one: 0 ("none") 1 ("few") 2 ("many")

Total: _____

High=7-8 **Good=**5-6 **Marginal=**3-4 or water more than 0.5 m deep **Poor=**0-2 or water less than 0.5 m deep

Ease of Human Access (circle one)

Low - Remote sites or sites with restricted or limited access.

Medium - Sites with restricted or limited access, but with a moderate frequency of trespassing (e.g., private reservoirs), or sites with only limited restrictions on access & have only moderate use (e.g., parks imbedded in low density housing, parks in a developing area with only moderate use at this time).

High - Sites with few access restrictions, usually designated recreational areas (e.g., fishing/boating areas).

Level of Naturalness (circle one) – If not able to assess in the field, please leave for Program Lead.

Natural - Sites with 10% or less modification of the natural habitat (e.g., mostly natural river or stream channel).

Modified Natural - Sites with greater than 10% artificial modification of the natural habitat (e.g., dammed or channelized river or stream).

Artificial - Sites that were completely artificial and occur outside of a natural channel or wetland (e.g., artificial ponds in a park setting, agricultural ponds).

NOTES:_____
_____
_____

Appendix B. Pond Turtle Trapping Datasheet

Turtle Trapping Survey Form--Animal Data

Date _____ Area Name _____ TRAP DAY: _____

Start Time _____ Pool/Stream Name _____

End Time _____ Pool/Segment # _____

Observer1 _____ Observer2 _____ Observer3 _____

Weather

Air Temp (ºC) _____ Water Temp (ºC) _____ Sky* _____ Wind Speed (km/hr) avg. max.

*Sky Condition: 0=clear/few clouds, 1=party cloudy or variable, 2=cloudy/overcast, 3=fog, 4=mist/drizzle, 5=showers/light rain, 6=heavy rain, 7=sleet/hail, 8=snow

Animals:

Location #	Spp Code	Lat / Long (or pool/stream segment)	Age Class**	Disposition***	# Indiv	Sex	Notes (Habitat, Behavior, etc.)

* audio, hand, trap, visual **ADL, JUV, Meta, LRV1, LRV2, Hatch, Egg Mass, UNK ***Disposition : R=Released, D=Dead, E=Escaped, C=Collected, Dis=Disposed

Appendix B. Continued.

Individual turtle information.

#	Trap #	Spp Code	Age Class	Notched?	Tissue?	Tissue ID #	Sex	Dispostion***	Gravid?	Notes	Pit Tag ID# (if applic.)
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											

**ADL, JUV, Meta, LRV1, LRV2, Hatch, Egg Mass, or UNK

***Disposition : R=Released, D=Dead, E=Escaped, C=Collected

Additional Fields for Turtles. ** Make sure Animal # matches up!!

#	Carapace Length (mm)	Carapace Width (mm)	Shell Height (mm)	Plastron Length (mm)	Weight (g)	Shell Damage?	Shell Damage Notes/Other ID markings	Recap?	Photos?	# Photos	Photo ID #s
1											
2											
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Appendix C. Summary of pond turtle surveys from 2006-2012.

Survey efforts and detections by year and site. Survey type is coded (V=visual, T=trapping, I=incidental), with **bold** lettering indicating detection.

Site	Trapping Site	2006	2007	2008	2009	2010	2011	2012
Core Areas								
Chino Creek	Chino Creek	V, T	V	-	V, T	-	-	-
	Mill Creek	-	-	-	V, T	-	-	-
	Prado Wetlands	-	-	-	V, T	-	T	-
	Goldberry Ponds	-	-	-	V, T	-	-	-
Murrieta Creek	Murrieta Creek	V	-	V	V	-	V, **T**	-
Cajalco Creek	Cajalco Creek	-	-	**T**	**V**	**T**	**I**	**T**
San Jacinto River	San Jacinto River	V, T	-	V, T	-	-	-	V, T
	San Jacinto Wildlife Area	V, T	V	T	-	-	-	V, **I,** T
San Mateo Creek	San Mateo Canyon	V	**V**	**I**	**I**	-	-	**I**
Santa Ana River	Norco Pools	-	-	-	V, **T**	-	-	V, **T**
	Prado Wetlands	V, T					**T**	
	Hidden Valley	-	-	-	-	-	-	V, T
	Rancho Jurupa	-	-	-	-	-	-	V, T
Santa Rosa Plateau	Santa Rosa Plateau	**I**	**I**	**I**	**I**	**I**	-	V, **T**
Temecula Creek	Temecula Creek	V	-	T	-	-	-	-
Dispersal Sites								
Railroad Canyon Lake	Canyon Lake	-	-	-	V, T	-	-	-
Bautista Creek	Bautista Creek	-	-	-	-	-	-	**I**
Santa Margarita River	Santa Margarita River	V, T	V, **T**	-	**I**	**I**	-	-
Non-core Areas								
Chino Hills State Park	Lower Aliso Canyon	-	**T**	-	-	-	-	-
Warm Springs Creek	Warm Springs Creek	-	-	-	-	-	**T**	**T**