

ARROYO TOAD (*Bufo californicus*) SURVEYS
ON
SAN DIEGO NATIONAL WILDLIFE REFUGE

Report

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Introduction

The arroyo toad is endemic to southern California and adjacent Baja California, Mexico. It was federally listed as threatened under the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 et seq.) on 16 December 1994. It is considered a “covered” species under the Multiple Species Conservation Plan (MSCP): a habitat conservation plan formulated to support an incidental take permit pursuant to section 10(A)(1)(b) of the Act. The MSCP’s Biological Monitoring Plan considers the arroyo toad a focal animal species, and stipulates that arroyo toad surveys are to be conducted by parties signatory to the MSCP every third year. The U.S. Fish and Wildlife Service, as a participant in MSCP, manages and monitors wildlife on the refuges of the San Diego National Wildlife Refuge Complex, in accordance with the MSCP and federal guidelines governing refuge management. Arroyo toad survey location T-5, as described in Table 5-6 of the Biological Monitoring Plan for the Multiple Species Conservation Plan (Ogden 1996) is located on the San Diego National Wildlife Refuge. Surveys for arroyo toad (*Bufo californicus*) were conducted during the winter and spring of 2005. The surveys covered areas of the Sweetwater River and Steele Canyon Creek located on the San Diego National Wildlife Refuge including the reach between Cottonwood Golf Course and Sweetwater Reservoir, and approximately 1 km of the river between Singing Hills Golf Course and Cottonwood Golf Course (Figure 1).

Methods

Surveys were conducted for calling arroyo toads at night between sunset and midnight. Observers stopped to listen for calling arroyo toads at approximately 0.05 to 0.1 mile intervals. Where riparian vegetation appeared more open, or there was a broader flood plain, additional stops were made, as appropriate. Where appropriate breeding habitat (shallow, sand or gravel-bottom pools or backwaters) was known to occur, observers walked along the banks of the river checking pools and banks visually, for adult toads, egg masses and tadpoles. Surveys were initiated 1 March and continued until 19 May. The stretch of the Sweetwater River located south of the HWY 94 bridge was surveyed five times for calling arroyo toads. Pools and slow moving

portions of this stretch were checked five times for egg masses and/or tadpoles. All amphibians encountered were recorded.

Results

No arroyo toads were observed or heard on the refuge during 2005. Other adult amphibians found during the survey included western toad (*Bufo boreas*), western spadefoot toad (*Spea hammondi*), Bullfrog (*Rana catesbiana*), Pacific tree frog (*Pseudacris regilla*), and gray tree frog (*P. cadaverina*). Thousands of western toad tadpoles were observed during the surveys.

Discussion

Arroyo toads were last encountered between the Sweetwater Reservoir and Cottonwood Golf Course in 1997, when a small number of adults and a few larvae were discovered in old sand mining ponds on Sweetwater Authority-managed lands, approximately 200 meters downstream from the point at which the Sweetwater River leaves SDNWR (Pete Famolaro, Wildlife Biologist, Sweetwater Authority, pers. comm. Dec. 2004). Shortly after the toads were discovered, heavy rains and associated runoff occurred, and the toads were not seen thereafter. Annual surveys for arroyo toads have been conducted on SDNWR through 2005 (except 2004, when surveys were not conducted), and none have been detected. The climate in the San Diego area from 1998-2003 was characterized by below-average rainfall and low associated runoff. The lack of runoff-associated streambed scouring allowed some previously suitable arroyo toad breeding habitat to become overgrown with emergent aquatic vegetation such as cattails (*Typha latifolia*) or other riparian vegetation. However, in the winter of 2004-2005, approximately 61 cm of rain (approximately twice the annual average) fell on SDNWR. Scouring associated with the heavy rainfall restored high-quality arroyo toad breeding habitat in two areas: a reach from the sand mining ponds on Sweetwater Authority approximately 200 meters upstream, and from Singing Hills Golf Course approximately 1,000 m downstream. Though arroyo toads were not detected on SDNWR in 2005, John Martin heard one calling on the public road in Sloan Canyon, prior to a toad survey conducted on SDNWR on 14 March, 2005. Because Sloan Canyon is approximately 8 km upstream from SDNWR lands, there is the potential for arroyo toads to re-colonize SDNWR, especially during high runoff associated with heavy rains.

Surveys should be repeated if approximately normal rainfall is received during the coming rainy season (November-April). If arroyo toads are detected on SDNWR in the future, it may be advisable to mechanically clear breeding pools to maintain suitable habitat for arroyo toads. In addition, preventing horses and bikes from entering potential breeding pools would benefit arroyo toads that may occur on the refuge as well as other amphibians that breed in the pools.

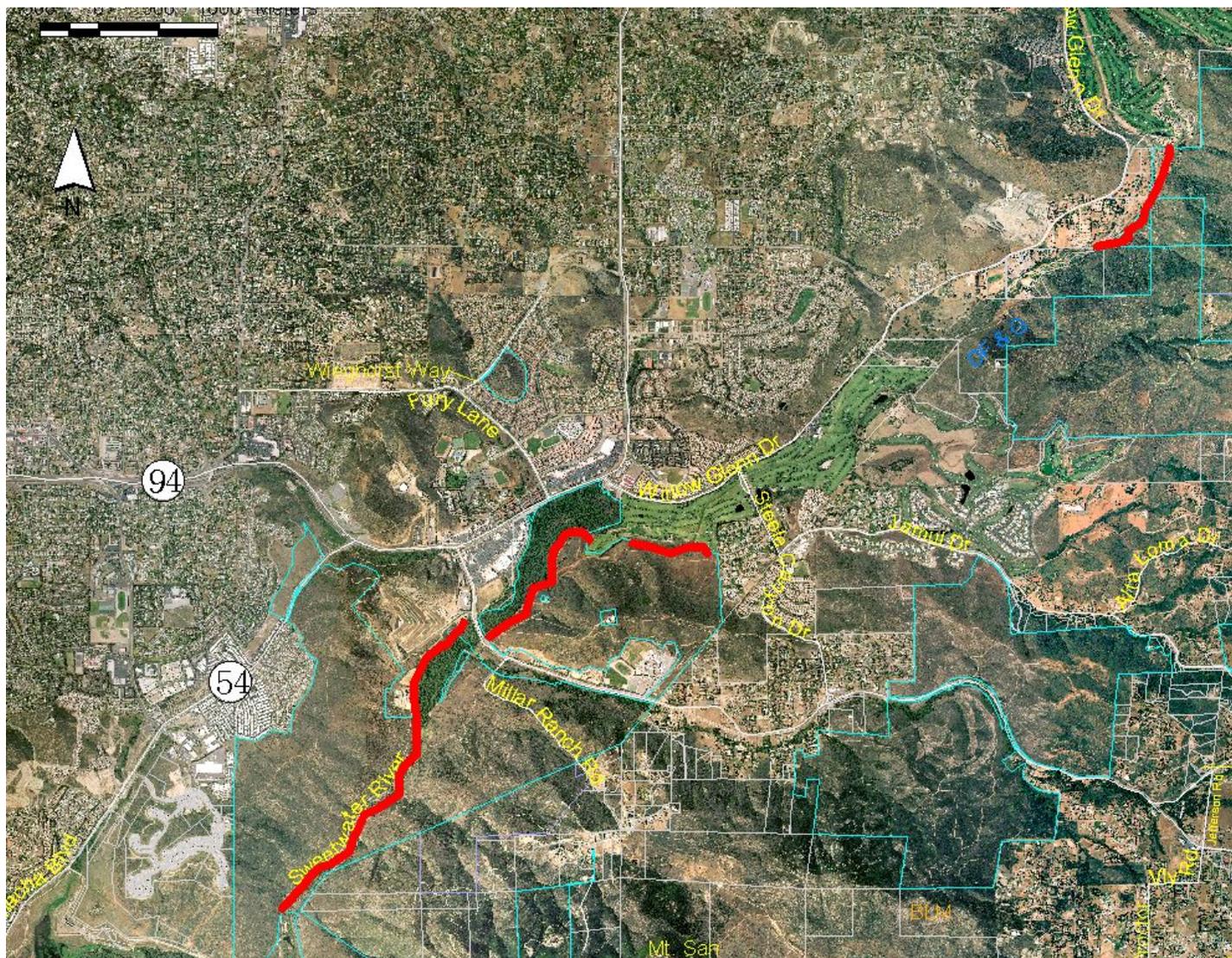
Introduced aquatic animals in the Sweetwater River include swamp crayfish (*Procambarus clarkii*) largemouth bass (*Micropterus salmoides*), green sunfish (*Lepomis cyanellus*) and bullfrogs (*Rana catesbiana*). All of these species were encountered during toad surveys, and all have the potential to eat toads and/or tadpoles. Control of introduced predators in the reach of the Sweetwater River below Singing Hills golf course has the potential to enhance potential habitat quality for arroyo toads, and other native amphibians and reptiles. As river flows

decrease seasonally to minima in October and November, refuge personnel should consider conducting control measures such as electroshocking.

Literature Cited

Ogden Environmental and Energy Services. 1996. Biological Monitoring Plan for the Multiple Species Conservation Plan. Unpubl. Plan, prepared for City of San Diego and California Department of Fish and Game, San Diego, California

Figure 1. Areas surveyed for arroyo toads on San Diego National Wildlife Refuge, 2005.



Appendix I

Arroyo Toad Survey Notes (2005)

Field Notes

Observers: John Martin, Pete Famolaro, Troy Murphree

Date: 1 March 2005

Start: 1834

cloud = 50%

wind = Beaufort 1

temp = 17.8°C

moon = waning qtr.

19:39 air.temp = 16.2°C

water temp = 16°C

Survey habitat at upper end of Sweetwater Authority, lower end of SDNWR.

Pseudacris regilla vocalizing abundantly.

2 *Spea* heard vocalizing.

Common Poorwill (*Phalaenoptilus nuttallii*) vocalizing on hillside.

20:32 end of survey with Pete.

20:44 I survey our reach of stream at west end of Cottonwood golf course. Multiple *Pseudacris regilla*, no arroyo toads.

End: 2100

Field notes

3/14/05

Toad survey

Began in Sloan Canyon prior to survey. Sloan Canyon known to be occupied by arroyo toads, therefore if croaking in Sloane Canyon, conditions should be suitable elsewhere.

Start = 1837

cloud = 0

wind = 0

temp = 18°C

moon = waxing 1/4

Pseudacris regilla, *Pseudacris cadaverina*, both common, vocalizing loudly in Sloan Canyon.

19:15 Large *Bufo boreas* in road.

19:34 Heard *Bufo californicus* from car. Near end of county maintained road. Heard calling only once. I waited about 10 minutes, toad did not re-croak. Waypoint TOAD01, approximately 50 m west of end of SD County maintained road.

20:20 At Rita Cloud's driveway, to survey areas of SDNWR land between Singing Hills and Cottonwood golf courses.

cloud = 0

wind = 0

temp = 13.3°C

Approx 30 *Bufo boreas* seen in water, along banks. No *B. californicus*. *Pseudacris regilla* vocalizing. Heard one *B. boreas* vocalization. 2005 winter runoff has deposited nice sandbanks along this area of the Sweetwater River, created high quality arroyo toad breeding habitat (sand-bottomed unvegetated backwaters and pools).

21:16 End.

Field notes

4/4/05

Observers = John Martin, Clark Winchell

20:00 begin survey

West of McGinty Mountain, Sweetwater River upstream from the home of Mrs. Rita Cloud.

Start = 20:00

cloud = 0

wind = Beaufort 1

moon = waning quarter

20:13

water temp = 20.5°C

This reach of the stream is still good habitat, as described in previous survey. Water is clearer than last time.

This reach of the stream supports 5000-10000 *Bufo boreas* larvae. In contrast to previous survey, no adult *B. boreas* were detected.

Approx. 20-30 *Pseudacris regilla*, 4-5 *P. cadaverina* vocalizing. One adult female *P. regilla* observed on sandbar. Western Screech-owl (*Otus kennicottii*), Common Barn-owl (*Tyto alba*), and Great Horned Owl (*Bubo virginianus*) all vocalize.

Clark and I walked from Par 4 Drive along SDNWR/Cottonwood Golf Course boundary, south of the west end of Cottonwood Golf Course, listening for amphibians. One *P. regilla*, otherwise very quiet.

Going to check recently established suitable toad habitat at boundary of Sweetwater Authority property and SDNWR.

22:04 adult *B. boreas* in road as we drove in, approx 500 m below Steele Canyon bridge.

On the drive in and out, we saw approximately 20-25 *Dipodomys* sp. (presumably *D. simulans*) hopping in road. Saw up to 3 at once!

22:30 Yellow-breasted Chat (*Icteria virens*) singing in riparian area. Continues singing at least until we leave. First YBCH observed on SDNWR in 2005.

Many *P. regilla* calling. Also one bullfrog (*Rana catesbiana*).

22:56 = end.

Field Notes
19/05/05

Arroyo toad survey

Start = 19:57
cloud = 0
wind = 0
temp = 13.7°C
moon = waxing gibbous

Begin downstream of Singing Hills Golf Course. Access via private residence of Ms. Rita Cloud.

GHOW, COBO, COPO

Approx 20 *Pseudacris regilla* vocalizing

Water in the river is considerably higher than during my last visit, though there has been no rain in cismontane southern California in the interim. Probably a water release from Loveland Reservoir.

Large adult *Bufo boreas* about 30 m upland from river. This is the only toad I saw all evening.

4 adult male *Pseudacris regilla* seen vocalizing.

Hundreds of *Pseudacris regilla* larvae in the river.

21:26

Par 4 Drive downstream about 200-300 m, south side of river.
About 10 *Pseudacris regilla* vocalizing.

KILL

21:48

Driving along north side of Sweetwater River, from Steele Canyon Bridge downstream, stopping at approx. 0.25 mile intervals to listen.
A few *Pseudacris regilla* vocalizing.

GHOW

YBCH

Peromyscus in road.

COPO

End = 23:00
cloud = 0
wind = 1.0
temp = 8.8°C