Ecological note confirming a locality of the Jollyville Plateau Salamander (*Eurycea tonkawae*) on the Balcones Canyonlands Preserve



Photo courtesy Mark Sanders

Travis County
Transportation and Natural Resources Department
Natural Resources Division
Project Number 0905-01904

January 2002

INTRODUCTION

The Balcones Canyonlands of central Texas are characterized by eroded and dissected Cretaceous limestones that form a complex and dynamic system of karst and hydrologic features. This region is home to a number of endemic organisms associated with these unique subterranean and spring habitats. These organisms often exhibit very limited distributions, and many are afforded protection under the 1996 Balcones Canyonlands Conservation Plan (BCCP) jointly held by Travis County and the City of Austin (CoA). Six of these organisms have been listed as endangered by the U. S. Fish and Wildlife Service (USFWS), and twenty-five additional species are covered under the plan as Species of Concern. Though not covered by the BCCP, the Jollyville Plateau salamander (*Eurycea tonkawae*, Chippendale *et al.* 2000) is among the unique vertebrate fauna of the area and is considered a Species of Concern by the USFWS (Matt Lechner, pers com).

The Jollyville Plateau salamander (JPS) is known to occur in springs and spring runs of tributaries draining the Jollyville Plateau in Travis and Williamson counties, including the drainages of Brushy Creek, Bull Creek, Cypress Creek, Long Hollow Creek, Shoal Creek and Walnut Creek (Chippendale *et al.* 2000). In 2001, Travis County's land acquisitions as part of the Balcones Canyonlands Preserve (BCP) comprised over 1100 acres (445 ha.) in the Jollyville Plateau area and included one historic locality for this species. In an attempt to verify the continued presence of JPS at this location, surveys were initiated during the 2001 field season.

BACKGROUND

Following the proposed listing of the Barton Springs salamander (*Eurycea sosorum*) under the Endangered Species Act, CoA and the Texas Parks and Wildlife Department (TPWD) entered into an interlocal agreement that established the Aquatic Biological Advisory Team (ABAT) in 1995. This group was composed of nationally recognized experts in aquatic biology, stream ecology, geohydrology, amphibian ecophysiology, and water quality management practices. ABAT was charged with reviewing the body of knowledge related to neotinic *Eurycea* species found in the Barton Creek and Bull Creek watersheds and making recommendations to guide future research, management, and conservation efforts related to these species (Bowles 1995).

ABAT's recommendations included further studies of JPS population abundance and distribution, habitat preferences, life history information, and potential threats to species viability, as well as development of management plans to guide conservation efforts

(Hutchison 1995). In 1996, CoA in cooperation with TPWD and USFWS, initiated a project to determine the physical, chemical, and biological factors that may potentially affect the distribution and abundance of this species. CoA described 33 locations with current or historic JPS sightings, of which 9 were selected as study sites (City of Austin 1999).

The MacDonald Well site (Figure 1) is known from a JPS specimen collected in the early 1980's from the collections of the Museum of Vertebrate Zoology at the University of California at Berkeley (Sweet 1982). This location was not among the study sites surveyed by CoA, and when surveyed in the mid-1990's the location was dry and no salamanders were observed. Chippendale *et al* (1994) suggested that the population may no longer exist due to human impacts. No other findings of salamanders from this site have been reported.

In January 2001 Travis County's Natural Resources Department acquired the Bunten tract of the Jollyville Unit as a portion of the BCP. This parcel encompasses drainages of the Cypress Creek watershed as well as the MacDonald Well site. In an attempt to define distribution information for this species, this historic locality and associated tributaries were surveyed for the presence of JPS in 2001.

SITE DESCRIPTION

Travis County's Jollyville Unit comprises 1496 acres (605 ha.) located 13 miles (21 km) northwest of downtown Austin on FM 2769. The MacDonald Well site (Figure 1) is located approximately 500' SSE of FM 2769 on an unnamed tributary draining into Cypress Creek on the Bunten tract of the Jollyville Unit. The site is marked by a large concrete structure that impounds natural spring flows running into the adjacent creek.

METHODS

Field activities followed the study protocols established by CoA Watershed Protection Department (City of Austin 1999). Surveys were conducted by searching springs and spring run habitats, including wetted surfaces under available cover (rocks, woody debris, leaves, etc.) and in the top layer of sediment or detritus. Clear plastic trays or bowls were used as viewing devices to minimize surface turbulence and glare (City of Austin 1999). Care was taken to minimize habitat disturbances, and to our knowledge, no salamanders were harmed through these sampling efforts.

On March 19, 2001, six biologists with Travis County Natural Resources and CoA Balcones Canyonlands Preserve and Watershed Protection departments surveyed the MacDonald Well

site and the associated unnamed tributaries. A total of approximately twenty-four hours of staff time was devoted to surveying for the presence/absence of JPS.

RESULTS

JPS were verified at the MacDonald Well location, and were recorded approximately 25 feet (7.6 m.) upstream and 400 feet (122 m.) downstream of the well. Adult, large juvenile and small juveniles (classification from City of Austin 1999) were observed. No JPS were observed within the surveyed areas of the associated upstream drainage and nearby creek drainages to the South (Figure 1).

DISCUSSION

The MacDonald Well site continues to support a population of JPS, though earlier surveys found habitats unsuitable (dry) and did not locate any individuals. This finding supports the conclusions reached by the CoA (1999) that JPS may retreat to the hyporheos or spring refuges when flow rates decrease. It is also possible that JPS may repopulate habitats as they become suitable by way of the interconnected karst features that characterize the area.

Surveys of the tributaries associated with the MacDonald Well site did not locate any additional salamanders beyond those in the immediate vicinity of the well. It is unclear from the data available if the JPS population is restricted physically, or by some undetermined factor to the area surrounding the well, or if additional survey effort may locate JPS in other portions of the watershed.

RECOMMENDATIONS

Although a JPS population was verified at the MacDonald Well location, no attempt has yet been made to quantify population size, record life history information, characterize habitat, or make any water quality or quantity measurements at this site. In keeping with the recommendations of ABAT, these minimum measures should be recorded on a regularly recurring basis for this known locality.

In addition, Travis County should map and survey springs and spring runs located on County managed property in an effort to further define distribution for the species. Populations should be surveyed on a regularly recurring basis to the same standards applied to the MacDonald Well population.

With the assistance of USFWS, CoA and TPWD have taken leadership roles in the study of this species. In an effort to best benefit the species while minimizing the resource costs to any single entity, a more integrated and cooperative approach to ongoing research, fieldwork, data collection, and conservation efforts among CoA, TPWD, Travis County, the Lower Colorado River Authority, and other agencies and private landowners is recommended.

Concerns related to the apparent global decline of amphibians and the potential transfer of pathogens between isolated populations suggest that researchers take steps to minimize impacts to these organisms. In an effort to avoid the spread of disease causing agents and parasites, adherence to the USGS Declining Amphibian Population Task Force Fieldwork Code of Practice (USGS 2001) is recommended.

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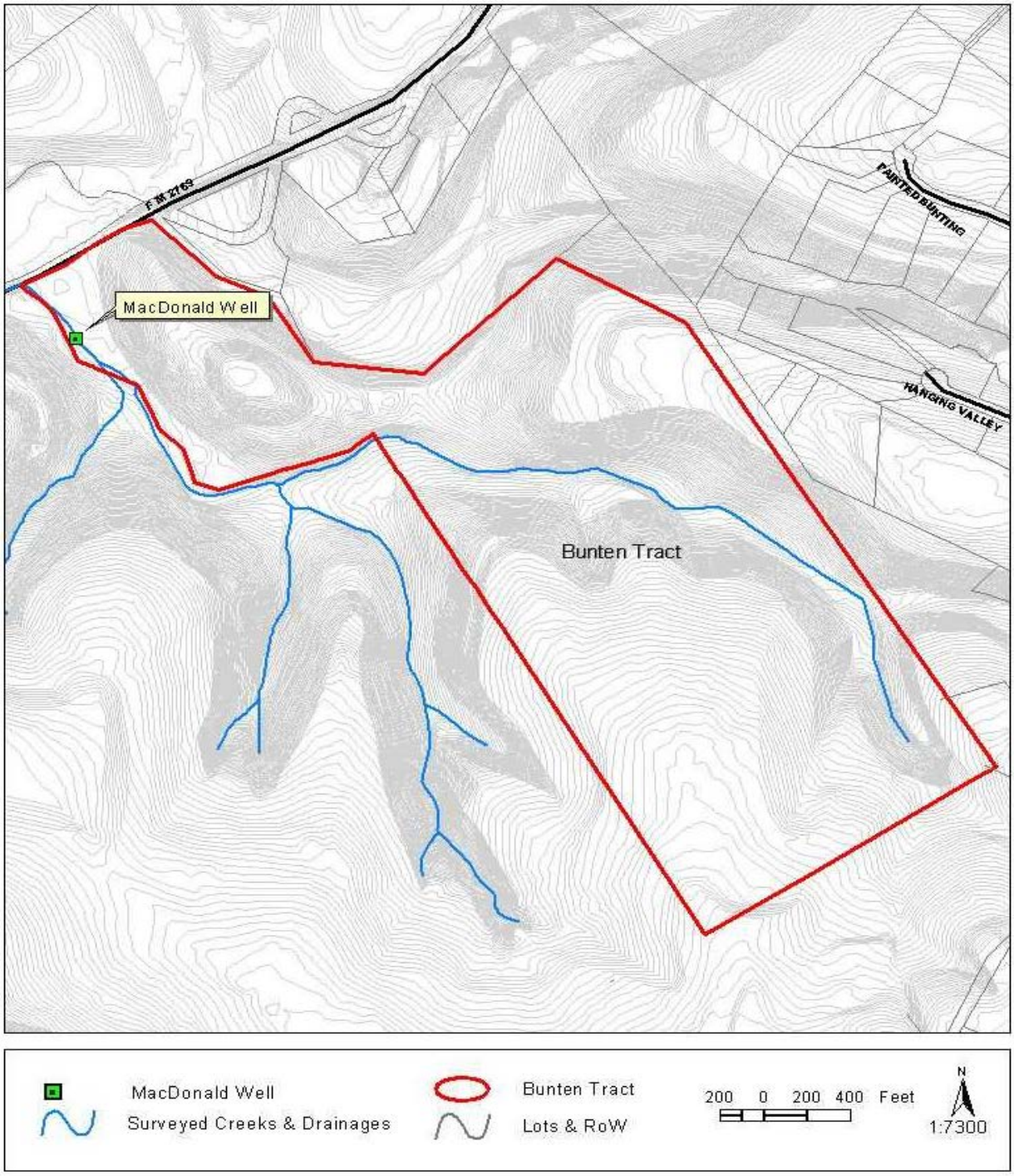

Figure 1. Location of MacDonald Well and associated unnamed tributaries surveyed on the Jollyville Unit of the BCP.