



## **Jollyville Plateau Salamander Interim Report, 2012, for the Balcones Canyonland Preserve**

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### **Introduction**

This document is a summary of the survey results for the Jollyville Plateau Salamander (*E. tonkawae*). We conducted salamander surveys on the following Balcones Canyonland Preserve (BCP) tracts: Hanks, Franklin, Lanier, managed by the City of Austin Wildlands Division; Stillhouse Hollow and Barrow Preserve tracts, jointly managed by the City of Austin Parks and Recreation Department and Wildlands; Sam Hamilton, managed by Travis County.

One major difference between data collected this year and previous years is that at each site, all individuals were captured and photographed. This was done in place of VIE marking at Lanier and Lower Ribelin springs. We also captured and photographed all individuals at count-only sites. This not only allows for tracking of individuals over time, but also gives a more accurate picture of size distributions within and among sites (since individuals are photographed on a standardized grid). The downside is that these data take longer to process, and thus, I am currently only able to present a summary of the number of individuals observed during each survey (Tables 1 and 2).

In addition to salamander counts, Pete Diaz (USFWS) conducted invertebrate sampling at Lanier Spring on 6/27/2012 using a Surber sampler. These results are included in a separate file. We also collected water-borne stress hormones from salamanders at Lanier and Franklin/Pit Spring sites. Preliminary results are included below.

### **Population Monitoring Methods**

We conducted count surveys using a drive survey technique at 13 sites in 2012. Salamanders were searched for by flipping rocks and other cover object, captured, and photographed on a standardized grid background. Individuals observed, but not captured were recorded as one of three size classes,  $\leq 1''$ ,  $1-2''$  and  $\geq 2''$ . Surveys were primarily conducted on a quarterly basis (every three months).

We intended to conduct two surveys per site this year at Wheless, Lanier and Ribelin springs, although somewhat dry conditions throughout most of 2012 did not allow any surveys at Wheless Spring.

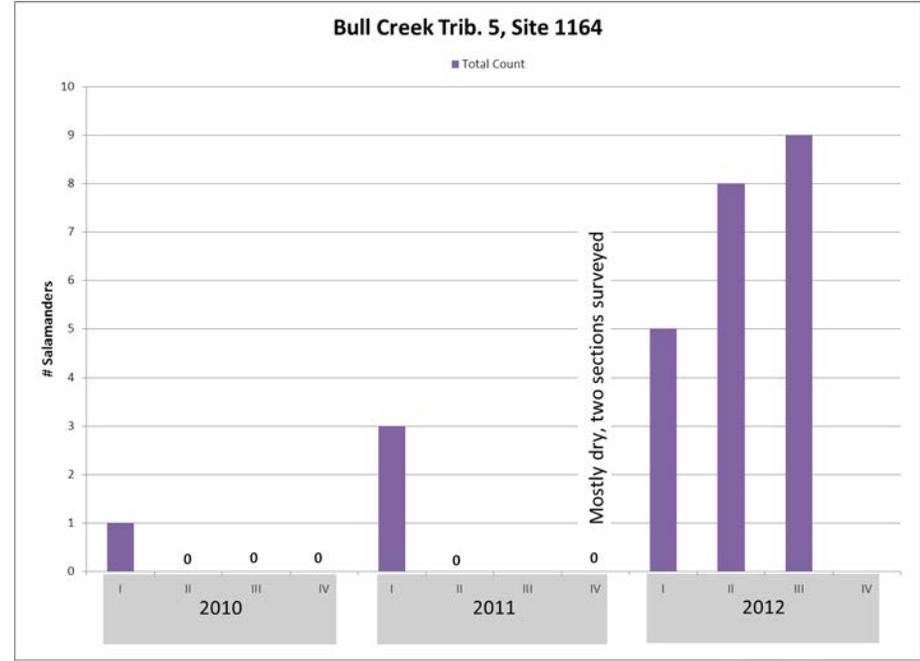
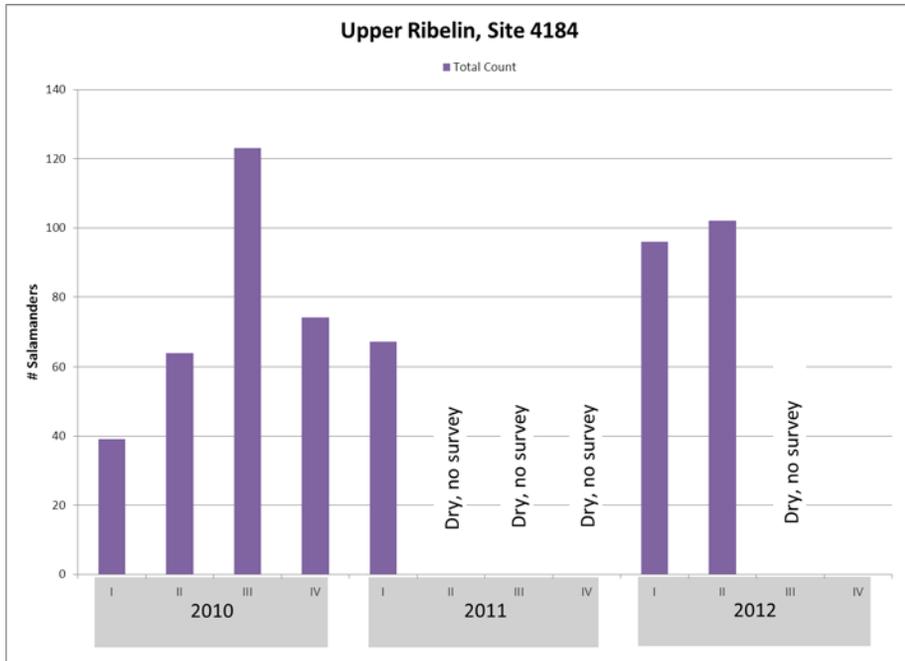
For additional details about the projects and including background and methods, please consult the original permit proposals, QAPPs and referenced reports therein.

**Table 1.** Summary of robust design capture-mark-recapture surveys conducted in 2012.

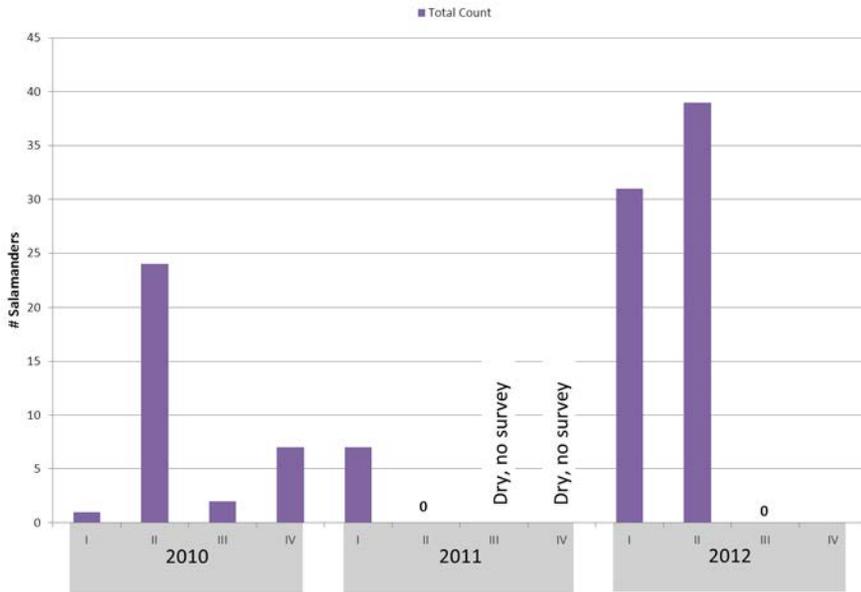
<b>Site</b>	<b>Month</b>	<b>3-day capture total</b>
Lanier Spring	March 2012	207
Lower Ribelin Spring	April 2012	147
Lanier Spring	September 2012	316
Lower Ribelin Spring	September 2012	267
<b>Totals</b>		814

Figure 1: Quarterly Count Summary

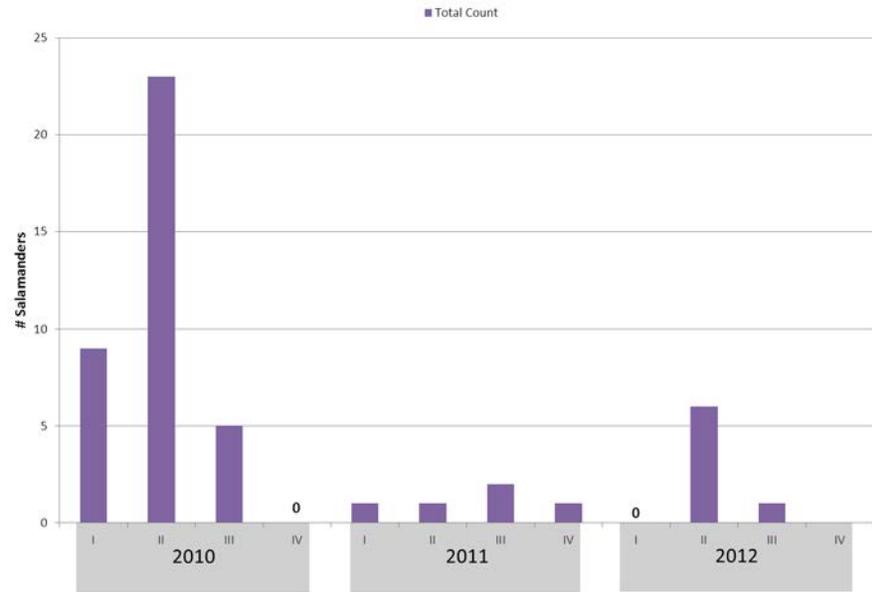
Below are the quarterly results of count surveys conducted at six sites between 2010 and 2012. Total salamander counts include the total of all size classes:  $\leq 1$  inch, 1-2 inches, and  $\geq 2$  inches. Each graph has the same x-axis, but different y-axes. Missing data are noted on each graph as “no survey” which were typically due to dry conditions. Zeroes indicate a survey which resulted in no salamander observations. Each quarter is three months long, starting in January, for quarter I. Quarter IV in 2012 is blank in all plots since these data have yet to be collected.



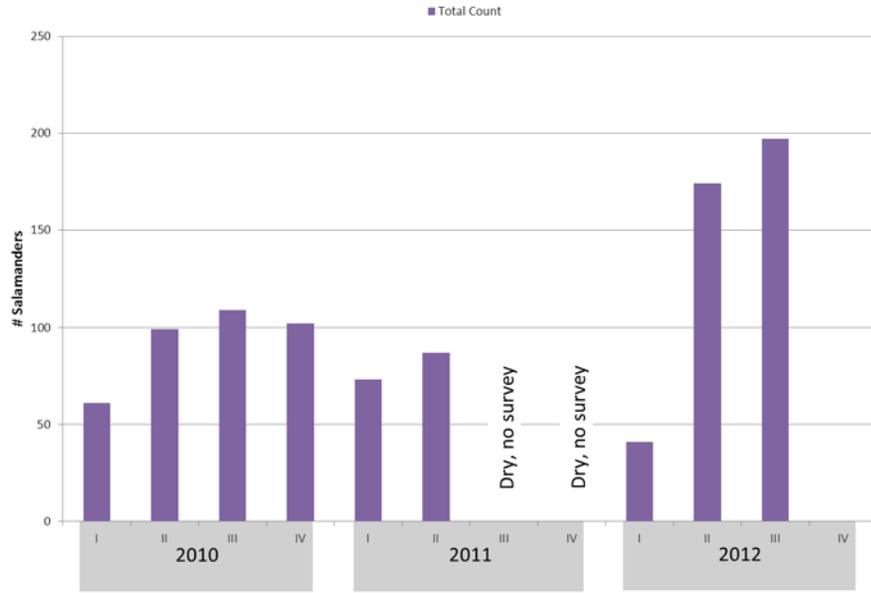
Barrow Hollow, Site 929



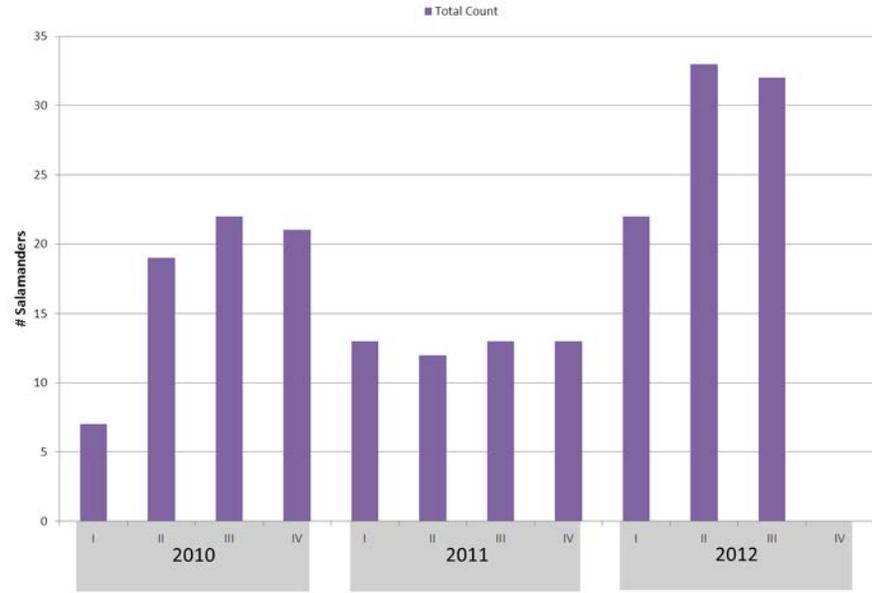
Stillhouse Hollow, Site 927



Bull Creek Franklin, Site 349



Bull Creek Trib. 6, Site 151



## Population Monitoring Results and Discussion

Figure 1 provides a summary of all count-based population monitoring on Preserve properties from 2010-2012. Table 1 contains a summary of the capture-mark-recapture results for 2012. Following substantial winter rains that provided much relief from the 2011 drought, counts were some of the highest observed in several years for Trib 5., Trib. 6, Franklin and Barrow sites. Number of captures were also higher for Ribelin and Lanier on average compared to recent estimates. Despite this positive trend in recent years, *E. tonkawae* densities in drainages with high disturbance are still lower compared to undisturbed sites (data not shown). A comprehensive analysis of all count data is currently underway by NFB and will be provided upon completion.

### Corticosterone (CORT) analysis of Jollyville Plateau salamanders (*Eurycea tonkawae*)

In addition to population monitoring, we also held 20 salamanders from four sites for a half hour per salamander in their natural water in order to collect water-borne stress hormone samples. While analysis is still underway, initial results indicate that stress-hormone levels are higher in salamanders within heavily-urbanized (disturbed) stream drainages (sites in red, in graph below).

Nested ANOVA

<i>Source</i>	<i>Nparm</i>	<i>DF</i>	<i>Sum of Squares</i>	<i>F Ratio</i>	<i>Prob &gt; F</i>
Disturbed or Non	1	1	5.5376104	49.4592	<.0001*
Site[Disturbed or Non]	2	2	0.3134682	1.3999	0.2537

<i>Level</i>	<i>Least Sq Mean</i>
[Disturbed]Trib 4	A 1.6879450
[Disturbed]Barrow Hollow	A 1.5454379
[Non]Franklin	B 1.1190840
[Non]Lanier	B 0.9960047

