Final Report
Wheless Preserve
Golden-cheeked Warbler Territory Mapping
Spring 2014

Prepared for

ENERGY • WATER • COMMUNITY SERVICES

Natural Resource Conservation

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1.0 INTRODUCTION

The Lower Colorado River Authority (LCRA) owns and manages the 2,317-acre Wheless Preserve, which is part of the larger Balcones Canyonlands Preserve (BCP) system. The BCP is a system of preserves associated with the Balcones Canyonlands Conservation Plan (BCCP), a regional habitat conservation plan (HCP) in which LCRA is a Managing Partner. The Wheless Preserve is bordered on the west side by Lime Creek Road, north of the Village of Volente, in northwestern Travis County, Texas (see **Figure 1.0** in **Appendix A**). Around the remainder of the Wheless Preserve boundary are additional preserve lands owned and/or managed by Travis Audubon Society, Travis County, City of Austin and The Nature Conservancy, and private landowners. The Wheless Preserve contains approximately 1,715 acres of suitable habitat for the endangered golden-cheeked warbler (GCW, *Setophaga chrysoparia*), of which 1,400 acres are considered high-quality habitat.

The purpose of this report is to present the results of 2014 GCW territory mapping within a portion of the Wheless Preserve. The survey methods followed the U.S. Fish and Wildlife Service's (USFWS) recommended minimum procedures for determining the presence/absence of GCWs (USFWS 2010), as outlined in LCRA's Federal Fish and Wildlife Permit (Permit No. TE800900-0, issued April 5, 2011), unless otherwise stated. In addition, GCW territory-level mapping was conducted according to the *Land Management Plan Protocol for Conducting Territory Mapping on BCP Lands (Appendix A – 100-acre Plot Protocol for Field Season 2002 and Beyond)* (BCCP 2007).

Section 2.0 of this report describes the two survey plots. Section 3.0 describes the methods used to perform the 2014 surveys and territory mapping, and Section 4.0 presents the results of the territory mapping.

2.0 DESCRIPTION OF SURVEY AREAS

2.1 Prime Plot

The Prime Plot is approximately 93.2 acres (per ArcGIS estimate of boundary shapefile provided to B&A by LCRA). Topography of the Prime Plot is highly variable due to a portion of the plot being bisected by Long Hollow Creek, a spring-fed stream that flows north to south along the west side of the Prime Plot. An unnamed tributary to Long Hollow Creek also flows north to south through the center of the Prime Plot, intersecting Long Hollow Creek near the southern end of the plot. These two streams have created small canyons that are separated by a narrow ridge. East of the unnamed tributary, the Prime Plot extends to the western edge of a relatively flat plateau that separates the Long Hollow Creek watershed from the Cypress Creek watershed. Multiple ephemeral streams contribute to the Long Hollow Creek watershed, creating numerous smaller draws and drainages. Elevations within the Prime Plot range from approximately 780 feet above mean sea level (msl) to approximately 950 feet above msl. Representative Photographs of the Prime Plot are found in **Appendix B**.

Vegetation/habitat within the Prime Plot largely conforms to a mature forest community structure (Diamond et al. 1987), with a relatively open understory, a high degree of species overlap (interspersion), and canopy cover ranging from 50 to 90 percent. The groundcover is largely exposed rock and leaf litter,

with a low-diversity of sparse herbaceous plants. However, some portions of the Prime Plot support less-mature woodlands, largely on southwest-facing slopes, that are dominated primarily by shorter-statured Ashe juniper (*Juniperus ashei*), Texas red oak (*Quercus buckleyi*), and plateau live oak (*Quercus fusiformis*). These areas are characteristically more open (greater interstitial space between plants), thereby creating less interspersion of plants or plant species.

Dominant canopy species within suitable GCW habitat of the Prime Plot include Ashe juniper, Texas red oak, plateau live oak, Durand oak (*Quercus sinuata*), cedar elm (*Ulmus crassifolia*), Arizona walnut (*Juglans major*), Escarpment black cherry (*Prunus serotina* var. *eximia*), Texas ash (*Fraxinus texensis*), sycamore (*Platanus occidentalis*), and sugarberry (*Celtis laevigata*). Common midstory and understory species include Ashe juniper, plateau live oak, Texas red oak, Texas mountain laurel (*Sophora secundiflora*), Texas redbud (*Cercis canadensis* var. *texensis*), evergreen sumac (*Rhus virens*), Lindheimer's silktassel (*Garrya ovata* ssp. *lindheimeri*), Texas persimmon (*Diospyros texana*), and Mexican buckeye (*Ungnadia speciosa*). Other common understory species include cedar sage (*Salvia roemeriana*), frostweed (*Verbesina virginica*), greenbriar (*Smilax bona-nox*), mustang grape (*Vitis mustangensis*), and other various grasses and forbs.

2.2 Transitional Plot

The topography of the Transitional Plot (approximately 128.6 acres, per ArcGIS estimate of boundary shapefile provided by LCRA) is also highly variable, with two primary ridges (one north and one south) and two associated valleys. The Transitional Plot is bisected by a primary tributary of Long Hollow Creek. This stream forms a shallow canyon that rises to the north and south. South of the unnamed tributary, the Transitional Plot is moderately sloping with eastern-facing topography. Multiple ephemeral streams occur in the Transitional Plot, creating numerous small topographic depressions and swales. Elevations within the Transitional Plot range from approximately 840 feet above msl to 900 feet above msl.

Vegetation/habitat on the ridge tops is largely scattered mature Texas red oak and mature Ashe juniper, with a moderate degree of interspersion. The habitat generally conforms to a semi-mature woodland community structure (Diamond et al. 1987), with a relatively high degree of open interstitial space. The ridge-top communities do not support a significant understory community. The groundcover is largely exposed rock and leaf litter, with a low-diversity of sparse herbaceous plants. Side slopes are droughty with thin calcareous soil over shallow, exposed limestone. Vegetation consists of dense, low-statured Ashe juniper with very little diversity or interstitial space. Valleys contain dry ephemeral watersheds, and the associated vegetation is largely consistent with the ridge tops, but with greater understory development, higher diversity, greater interspersion, and greater canopy cover. Estimated canopy cover within the Transitional Plot varies from 30 percent to 90 percent.

Dominant canopy species within suitable GCW habitat of the Transitional Plot include Ashe juniper, plateau live oak, Texas ash, and sugarberry. Common midstory and understory species include Ashe juniper, plateau live oak, Texas mountain laurel, Texas redbud, evergreen sumac, agarito (*Berberis trifoliolata*), Texas kidneywood (*Eysenhardtia texana*), Roosevelt weed (*Baccharis neglecta*), elbow-bush (*Forestiera angustifolia*), and Texas persimmon. Other understory species include cedar sage,

frostweed, greenbriar, mustang grape, Texas pricklypear (*Opuntia engelmannii* var. *lindheimeri*), and other various grasses and forbs.

3.0 METHODS

Surveys began on April 1, 2014 and were completed on May 22, 2014 (**Table 1**). Observations began no earlier than one-half hour after official sunrise, when temperatures were above 55 degrees Fahrenheit, wind speeds were below 15 mph, and with no or light precipitation. Two biologists surveyed each plot for at least three hours. The Transitional Plot was surveyed three times, and the Prime Plot was surveyed 10 times. Surveyors used spot-mapping techniques consistent with the USFWS protocol for GCW presence/absence (USFWS 2010), International Bird Census Committee (IBCC 1970), and Bibby et al. (2003).

During each visit, surveyors walked slowly through the survey area and listened for GCWs. If a GCW was observed, surveyors recorded the location of the bird on a paper field map and with a Garmin GPS Map 62s receiver. The GPS location recorded was the actual or estimated location of the bird. Locations of birds observed more than 30 feet from the observer were moved to the estimated location of the bird, and the accuracy of the location was estimated. Observers also noted other observations, including song type (A or B), time of observation, sex, presence of bands, and presence of juveniles. Contemporary contacts of multiple birds (counter-singing) were noted on the field maps and notebooks. No audio tapes were used during this survey.

After completion of the field surveys, all GCW locations were mapped using ArcGIS 10.2.1 in NAD 1983 Texas State Plan Coordinate System. An area was considered a potential territory if a male and female were present, if a male or female and juveniles were present, if counter-singing was observed from a neighboring male, if there were repeated observations in the same area, if there were sequential movements of an individual male, or if one male was observed singing in an area where no other birds were observed (Bibby et al. 2000). Some areas identified as a territory met multiple criteria.

Reproductive success metrics were determined as follows:

1. Territory density: number of territories per 100 acres (edge territories counting as 0.5 territory);
2. Calculation of edge territories: each territory that straddles plot boundary counted as a half territory (i.e., 0.5 territory) (Verner 1985); and
3. Productivity measures (Anders 2000) - calculated for full territories ONLY, as follows:
    a. Pairing success: pairing success of male GCW determined by observing one or more of the following conditions: a territorial male associating with a female, the nest of a territorial male, and/or a male tending ≥1 fledgling. Pairing success rate = number of territories determined to have pairing success / total number of full territories;
    b. Breeding success: breeding success rate = number of territories that successfully fledged at least one young / total number of full territories;
    c. Estimated brood size: average brood size per successful pair (based on "breeding success"); and
    d. Productivity = sum of the highest number of fledglings recorded at any one time for each full territory / total number of full territories.

Table 1. Survey Dates, Times, and Weather Conditions for GCW Surveys

Date	Time				Temperature (°F)		Wind Direction		Wind Speed (mph)		Cloud Cover (%)		Surveyor	Comments
	Sunrise	Start	End	Total Hrs	Start	End	Start	End	Start	End	Start	End		
Prime Plot														
4/1/2014	7:20	8:07	12:06	3:59	65	78	variable	SE	3	8	100	50	C.Ladd	South end of prime plot
4/1/2014	7:20	8:07	12:06	3:59	65	78	variable	SE	3	8	100	50	E.Herbez	North end of prime plot
4/8/2014	7:12	7:59	11:10	3:11	48	63	variable	NW	<5	17	0	0	C.Ladd	North end of prime plot; wind picked up at about 10:30
4/8/2014	7:12	7:59	11:04	3:05	48	63	variable	NW	<5	15	0	0	G.Casares	South end of prime plot; wind picked up at about 10:30
4/15/2014	7:04	11:00	14:45	3:45	52	60	N	SE	7	9	0	0	N.Wallisch	Prime plot north end; start delayed by cold temperature early
4/15/2014	7:04	11:00	14:45	3:45	52	60	N	SE	7	9	0	0	C.Ladd	Prime plot south end; accompanied by Trevor Allen
4/17/2014	7:02	7:35	11:15	3:40	57	60	variable	variable	5	<5	100	100	C.Ladd	North end of prime plot
4/17/2014	7:02	7:41	10:46	3:05	57	60	variable	variable	5	<5	100	100	E.Herbez	South end of prime plot
4/22/2014	6:56	7:30	11:15	3:45	65	77	S	S	7	12	0	10	C.Ladd	South end of prime plot
4/22/2014	6:56	7:35	11:31	3:56	65	77	calm	S	<5	12	0	10	E.Herbez	North end of prime plot
4/24/2014	6:54	8:30	11:32	3:02	67	74	SSE	SS	5-10	5-10	100	75	G.Casares	North half of prime plot
4/24/2014	6:54	8:25	11:55	3:30	67	74	SSW	SW	5-10	5-10	100	30	J.Schindler	Prime plot south end; accompanied by Jeremy Henson
4/29/2014	6:49	7:35	10:50	3:15	66	76	N	N	6	12	0	0	N.Wallisch	Prime plot south end
4/29/2014	6:49	7:40	10:53	3:13	66	76	N	N	10	12	0	0	C.Ladd	Prime plot north end; accompanied by Trevor Allen
5/7/2014	6:43	7:20	10:40	3:20	68	72	SSW	SSW	3	3	100	100	C.Ladd	Prime plot south end; brief slight rain sprinkle 1035-1040
5/7/2014	6:43	7:20	11:00	3:40	68	74	SSW	SSW	3	3	100	100	G.Casares	Prime plot north end
5/15/2014	6:37	7:17	10:30	3:13	54	63	calm	SW	0	5	0	0	C.Ladd	Prime plot north end
5/15/2014	6:37	7:18	10:25	3:07	55	63	calm	S	0	5	0	0	E.Herbez	Prime plot south end
5/22/2014	6:33	7:41	10:40	2:59	70	77	ESE	ESE	1-10	2-10	100	75	G.Casares	Prime plot south end
5/22/2014	6:33	7:40	11:15	3:35	69	78	S	S	0-5	5-10	100	80	J.Schindler	Prime plot north end
		Prime Plot Total Time:		69:04:00										
Transitional Plot														
4/9/2014	7:11	8:00	11:20	3:20	55	70	calm	S	0	10	0	0	C.Ladd	Transitional plot, north half; accompanied by Jeremy Henson
4/9/2014	7:11	8:00	11:15	3:15	55	70	calm	S	0	10	0	0	J.Schindler	Transitional plot, south half
4/16/2014	7:03	7:35	11:30	3:55	44	60	SE	SE	<5	12	0	20	C.Ladd	South half transitional plot
4/16/2014	7:03	7:35	11:30	3:55	44	60	SE	S	0-5	10-15	0	20	J.Schindler	North half transitional plot
4/23/2014	6:55	7:35	11:19	3:44	67	77	calm	SE	<5	6	0	10	G.Casares	North half of transitional plot
4/23/2014	6:55	7:35	11:10	3:35	67	77	S	S	5	6	0	10	C.Ladd	South half transitional plot
		Transitional Plot Total Time:		21:44:00										

4.0 RESULTS

4.1 Prime Plot

Golden-cheeked warblers were observed at 131 points in the Prime Plot, including 125 observations of a male and six observations of a female (**Figures 2.0** through **2.10**). No banded birds were observed during the surveys; birds could be seen clearly enough in 21 of the 131 observations to see that they were not banded. All observation data are included in **Table 2**.

Figure 2.0 shows the survey results of the Prime Plot survey for the entire season (10 visits), **Figures 2.1** through **2.10** show the results by day (April 1 through May 22, 2014). Three full territories (labeled A, B, and C) were observed, and females were observed in all three (**Figure 2.0**). Additionally, three juveniles were observed on May 22 with the male in territory B.

Three edge territories were also identified (D, E, and F) (**Figure 2.0**). Females were seen in territories D and F. No juveniles were noted in any of the edge territories.

Territory density in the Prime Plot was estimated at 4.8 / 100 acres. This calculation was based on three full territories and three edge territories in 93.2 acres.

The pairing success rate in the Prime Plot was 100 percent (three out of the three full territories). The breeding success rate was estimated at 33 percent, based on one of the three full territories in which juveniles were detected (territory B). The average brood size was three, again based on the observations on territory B. The productivity was estimated at 1.0, based on the three juveniles observed in three full territories.

4.2 Transitional Plot

Golden-cheeked warblers were observed at 33 points in the Transitional Plot, including 33 observations of a male and two observations of a female (**Figure 3.0**). No banded birds were observed during the surveys; birds could be seen clearly enough in four of the 33 observations to see that they were not banded. All observation data are included in **Table 3**.

Figure 3.0 shows the results of the Transitional Plot survey for the entire season (three visits). One full and two edge territories were identified. A female was seen in the full territory (territory A), but no nest or fledglings were observed. A female was also seen in one of the two edge territories (territory B).

Table 2. Survey Observation Data: Prime Plot

MAP #	Way Point #	Latitude	Longitude	Y_PROJ	X_PROJ	Time	Observer	Banded	Feature	Sex	Precision (Feet)	Movement/Counter-singing
1	001	30.4603	-97.8738	3370326.5824	608117.9247	2014/04/01 08:37:57	E Herbez	unknown	GCW	male	60	none
2	001	30.4598	-97.8738	3370279.9187	608117.8136	2014/04/01 08:47:04	C Ladd	unknown	GCW	male	90	none
3	002	30.4564	-97.8732	3369894.2555	608178.5017	2014/04/01 09:17:27	C Ladd	unknown	GCW	male	30	none
4	003	30.4564	-97.8734	3369894.6699	608164.4783	2014/04/01 09:18:26	C Ladd	no	GCW	female	30	none
5	005	30.4562	-97.8726	3369873.1320	608238.7261	2014/04/01 09:47:40	C Ladd	unknown	GCW	male	30	none
6	002	30.4615	-97.8712	3370460.8081	608362.4865	2014/04/01 09:54:44	E Herbez	unknown	GCW	male	30	moved 002, 003, 003-2
7	003	30.4620	-97.8692	3370527.9715	608561.6259	2014/04/01 10:55:26	E Herbez	unknown	GCW	male	30	moved 002, 003, 003-2
8	003 -2	30.4616	-97.8689	3370481.5769	608588.3988	2014/04/01 11:01:02	E Herbez	unknown	GCW	male	30	moved 002, 003, 003-2
9	006	30.4587	-97.8702	3370152.8717	608470.4158	2014/04/01 11:06:03	C Ladd	no	GCW	male	30	moved 006, 007, 008, 009
10	007	30.4586	-97.8703	3370139.7928	608459.3122	2014/04/01 11:08:21	C Ladd	no	GCW	male	30	moved 006, 007, 008, 009
11	008	30.4586	-97.8707	3370145.0990	608413.5537	2014/04/01 11:11:48	C Ladd	no	GCW	male	60	moved 006, 007, 008, 009
12	009	30.4585	-97.8703	3370133.7717	608455.7236	2014/04/01 11:14:01	C Ladd	no	GCW	male	60	moved 006, 007, 008, 009
13	003 -3	30.4622	-97.8680	3370542.7105	608672.0893	2014/04/01 11:20:21	E Herbez	unknown	GCW	male	30	none
14	010	30.4592	-97.8698	3370216.9435	608504.4382	2014/04/01 11:32:55	C Ladd	no	GCW	male	30	calling only (chipping)
15	011	30.4601	-97.8720	3370311.3850	608294.4617	2014/04/08 08:23:06	C Ladd	unknown	GCW	male	30	moved 011, 012
16	012	30.4601	-97.8724	3370311.2681	608249.4303	2014/04/08 08:25:18	C Ladd	unknown	GCW	male	30	moved 011, 012
17	014	30.4595	-97.8714	3370248.6773	608352.6029	2014/04/08 08:38:00	C Ladd	unknown	GCW	male	30	counter-singing 014, 015
18	015	30.4595	-97.8718	3370242.0895	608314.4532	2014/04/08 08:41:00	C Ladd	unknown	GCW	male	30	counter-singing 014, 015
19	016	30.4606	-97.8705	3370365.3998	608431.3241	2014/04/08 08:58:08	C Ladd	unknown	GCW	male	180	none
20	014	30.4559	-97.8720	3369842.3046	608292.8062	2014/04/08 09:35:58	G Casares	unknown	GCW	male	30	none
21	017	30.4606	-97.8712	3370363.1100	608368.5513	2014/04/08 09:38:41	C Ladd	no	GCW	male	30	moved 017, 018
22	018	30.4605	-97.8711	3370351.5778	608379.1324	2014/04/08 09:44:36	C Ladd	no	GCW	male	30	moved 017, 018
23	019	30.4615	-97.8714	3370460.0367	608351.8363	2014/04/08 10:02:29	C Ladd	unknown	GCW	male	30	none
24	015	30.4589	-97.8702	3370182.2959	608464.5525	2014/04/08 10:30:18	G Casares	unknown	GCW	male	30	moved 015, 016
25	016	30.4588	-97.8702	3370169.3734	608469.0986	2014/04/08 10:33:59	G Casares	unknown	GCW	male	30	moved 015, 016
26	021	30.4597	-97.8728	3370265.9153	608214.0678	2014/04/08 10:34:42	C Ladd	unknown	GCW	male	30	moved 021, 022
27	022	30.4601	-97.8725	3370310.3470	608245.9828	2014/04/08 10:36:57	C Ladd	unknown	GCW	male	30	moved 021, 022
28	023	30.4597	-97.8736	3370261.9834	608142.0930	2014/04/08 11:06:11	C Ladd	unknown	GCW	male	150	none
29	013	30.4577	-97.8739	3370046.9578	608108.6126	2014/04/08 11:26:23	G Casares	unknown	GCW	male	200	none
30	021	30.4610	-97.8725	3370409.7314	608242.3027	2014/04/15 11:55:15	N Wallisch	unknown	GCW	male	30	none
31	001	30.4584	-97.8711	3370119.8647	608383.9436	2014/04/15 11:58:49	C Ladd	unknown	GCW	male	60	none
32	002	30.4585	-97.8705	3370128.8497	608440.1216	2014/04/15 12:07:32	C Ladd	unknown	GCW	male	60	none
33	022	30.4603	-97.8712	3370337.8080	608365.4434	2014/04/15 12:28:56	N Wallisch	unknown	GCW	male	30	none
34	023	30.4605	-97.8685	3370356.8200	608626.2304	2014/04/15 13:15:39	N Wallisch	unknown	GCW	male	30	moved 023, 024
35	024	30.4602	-97.8683	3370325.3255	608646.7096	2014/04/15 13:26:50	N Wallisch	unknown	GCW	male	30	moved 023, 024
36	010	30.4598	-97.8738	3370271.3212	608122.6042	2014/04/17 07:53:31	C Ladd	unknown	GCW	male	90	moved 010, 011
37	011	30.4605	-97.8736	3370349.5142	608139.0121	2014/04/17 08:03:35	C Ladd	unknown	GCW	male	120	moved 010, 011
38	012	30.4601	-97.8710	3370315.8221	608383.6184	2014/04/17 08:30:03	C Ladd	unknown	GCW	male	300	none
39	013	30.4612	-97.8685	3370430.5215	608625.6845	2014/04/17 09:14:27	C Ladd	no	GCW	male	30	none
40	014	30.4612	-97.8685	3370437.5487	608630.1269	2014/04/17 09:14:48	C Ladd	no	GCW	female	30	none
41	015	30.4611	-97.8685	3370428.2867	608623.8825	2014/04/17 09:16:54	C Ladd	unknown	GCW	male	30	aggressive encounter (only such encounter all season)
42	016	30.4610	-97.8685	3370416.3059	608622.8503	2014/04/17 09:17:51	C Ladd	no	GCW	male	30	counter-singing 016, 019
43	017	30.4612	-97.8686	3370433.9660	608615.4721	2014/04/17 09:19:05	C Ladd	unknown	GCW	male	30	none
44	018	30.4613	-97.8688	3370446.1323	608601.8119	2014/04/17 09:19:47	C Ladd	unknown	GCW	male	30	none
45	019	30.4613	-97.8689	3370448.2585	608592.7650	2014/04/17 09:20:51	C Ladd	unknown	GCW	male	30	counter-singing 016, 019
46	020	30.4614	-97.8689	3370452.9394	608584.2686	2014/04/17 09:21:27	C Ladd	unknown	GCW	male	30	none
47	021	30.4614	-97.8685	3370456.8895	608624.5563	2014/04/17 09:22:30	C Ladd	unknown	GCW	male	30	none
48	022	30.4612	-97.8685	3370433.5648	608630.7429	2014/04/17 09:23:12	C Ladd	unknown	GCW	male	30	none
49	023	30.4612	-97.8683	3370433.1404	608643.7095	2014/04/17 09:23:38	C Ladd	unknown	GCW	male	30	none

Table 2. Survey Observation Data: Prime Plot

MAP #	Way Point #	Latitude	Longitude	Y_PROJ	X_PROJ	Time	Observer	Banded	Feature	Sex	Precision (Feet)	Movement/Counter-singing
50	033	30.4577	-97.8699	3370046.8997	608491.4475	2014/04/17 09:42:26	E Herbez	unknown	GCW	male	30	moved 033, 034
51	034	30.4576	-97.8706	3370035.8880	608432.1208	2014/04/17 09:43:15	E Herbez	unknown	GCW	male	30	moved 033, 034
52	024	30.4604	-97.8711	3370339.1086	608373.5919	2014/04/17 09:56:44	C Ladd	no	GCW	male	30	moved 024, 026
53	025	30.4604	-97.8711	3370345.1115	608375.3563	2014/04/17 09:57:19	C Ladd	unknown	GCW	female	30	none
54	026	30.4605	-97.8711	3370355.9993	608377.9360	2014/04/17 09:58:17	C Ladd	no	GCW	male	30	moved 024, 026
55	035	30.4586	-97.8707	3370140.5628	608414.3672	2014/04/17 10:20:08	E Herbez	unknown	GCW	male	120	counter-singing 035, 036
56	027	30.4603	-97.8710	3370332.8514	608390.7457	2014/04/17 10:30:37	C Ladd	unknown	GCW	male	30	moved 027, 028
57	028	30.4605	-97.8711	3370356.5439	608376.9704	2014/04/17 10:32:13	C Ladd	unknown	GCW	male	30	moved 027, 028
58	036	30.4586	-97.8708	3370141.9498	608408.9762	2014/04/17 11:18:43	E Herbez	unknown	GCW	male	120	counter-singing 035, 036
59	029	30.4589	-97.8708	3370178.2634	608404.8686	2014/04/22 08:18:51	C Ladd	unknown	GCW	male	90	none
60	036	30.4616	-97.8720	3370471.1842	608291.6183	2014/04/22 08:20:19	E Herbez	no	GCW	male	30	
61	030	30.4582	-97.8705	3370105.0810	608435.1740	2014/04/22 09:15:19	C Ladd	unknown	GCW	male	120	counter-singing 030, 031
62	031	30.4593	-97.8710	3370221.0132	608390.4227	2014/04/22 09:17:51	C Ladd	unknown	GCW	male	300	counter-singing 030, 031
63	037	30.4602	-97.8715	3370325.5055	608343.2900	2014/04/22 09:24:42	E Herbez	no	GCW	male	30	moved 037, 038
64	038	30.4606	-97.8713	3370369.7400	608355.4266	2014/04/22 09:34:37	E Herbez	no	GCW	male	30	moved 037, 038
65	039	30.4607	-97.8706	3370381.6289	608424.9207	2014/04/22 10:10:45	E Herbez	no	GCW	female	30	none
66	040	30.4610	-97.8685	3370410.7037	608627.8993	2014/04/22 10:37:43	E Herbez	unknown	GCW	male	30	counter-singing 040, 041
67	041	30.4597	-97.8686	3370268.9426	608616.8362	2014/04/22 10:42:43	E Herbez	unknown	GCW	male	120	counter-singing 040, 041
68	042	30.4611	-97.8677	3370425.8276	608699.2809	2014/04/22 10:52:01	E Herbez	unknown	GCW	female	30	none
69	033	30.4597	-97.8735	3370266.6888	608147.1351	2014/04/22 11:33:33	C Ladd	unknown	GCW	male	120	none
70	038	30.4546	-97.8727	3369699.6170	608233.2551	2014/04/24 08:54:39	J Schindler	unknown	GCW	male	30	moved 038, 039, 040, 041, 042, 043
71	039	30.4545	-97.8729	3369684.5231	608209.0156	2014/04/24 09:03:05	J Schindler	unknown	GCW	male	60	moved 038, 039, 040, 041, 042, 043
72	040	30.4544	-97.8724	3369676.9183	608257.7756	2014/04/24 09:04:37	J Schindler	unknown	GCW	male	60	moved 038, 039, 040, 041, 042, 043
73	041	30.4546	-97.8726	3369699.7652	608236.9986	2014/04/24 09:04:44	J Schindler	unknown	GCW	male	60	moved 038, 039, 040, 041, 042, 043
74	042	30.4546	-97.8726	3369699.6572	608237.2877	2014/04/24 09:04:52	J Schindler	unknown	GCW	male	60	moved 038, 039, 040, 041, 042, 043
75	043	30.4549	-97.8725	3369736.1778	608253.9196	2014/04/24 09:06:13	J Schindler	unknown	GCW	male	60	moved 038, 039, 040, 041, 042, 043
76	052	30.4599	-97.8680	3370289.0451	608676.2626	2014/04/24 09:16:59	G Casares	unknown	GCW	male	30	none
77	053	30.4575	-97.8692	3370022.4691	608564.3797	2014/04/24 09:34:27	G Casares	unknown	GCW	male	30	none
78	054	30.4609	-97.8707	3370398.4491	608411.1181	2014/04/24 10:17:02	G Casares	no	GCW	male	30	none
79	044	30.4576	-97.8711	3370031.0381	608379.3578	2014/04/24 10:38:55	J Schindler	unknown	GCW	male	90	moved 044, 045
80	045	30.4578	-97.8713	3370059.0605	608366.3071	2014/04/24 10:38:58	J Schindler	unknown	GCW	male	60	moved 044, 045
81	055	30.4602	-97.8721	3370323.8975	608282.1425	2014/04/24 10:58:14	G Casares	no	GCW	male	30	none
82	046	30.4594	-97.8733	3370230.7642	608168.0412	2014/04/24 11:29:35	J Schindler	unknown	GCW	male	60	moved 046, 047, 048, 049, 050
83	047	30.4591	-97.8731	3370200.4536	608185.0508	2014/04/24 11:32:22	J Schindler	unknown	GCW	male	60	moved 046, 047, 048, 049, 050
84	048	30.4596	-97.8730	3370255.0263	608200.2537	2014/04/24 11:37:35	J Schindler	unknown	GCW	male	60	moved 046, 047, 048, 049, 050
85	049	30.4598	-97.8732	3370272.1695	608174.3497	2014/04/24 11:38:15	J Schindler	unknown	GCW	male	60	moved 046, 047, 048, 049, 050
86	050	30.4593	-97.8737	3370217.9373	608126.5929	2014/04/24 11:41:41	J Schindler	unknown	GCW	male	60	moved 046, 047, 048, 049, 050
87	055	30.4563	-97.8732	3369885.6321	608180.7001	2014/04/29 08:17:08	N Wallisch	unknown	GCW	male	120	none
88	050	30.4613	-97.8689	3370448.2392	608590.8449	2014/04/29 08:51:40	C Ladd	unknown	GCW	male	120	none
89	056	30.4575	-97.8710	3370021.8102	608387.6117	2014/04/29 09:00:10	N Wallisch	unknown	GCW	male	90	none
90	051	30.4609	-97.8685	3370406.7486	608631.3955	2014/04/29 09:01:15	C Ladd	unknown	GCW	male	120	none
91	057	30.4586	-97.8708	3370145.6406	608412.3001	2014/04/29 09:23:10	N Wallisch	unknown	GCW	male	30	none
92	052	30.4573	-97.8690	3370000.2974	608586.1103	2014/05/07 07:57:48	C Ladd	unknown	GCW	male	180	none
93	057	30.4599	-97.8727	3370292.3277	608228.4952	2014/05/07 08:12:37	G Casares	unknown	GCW	male	30	With female same location
94	059	30.4608	-97.8727	3370390.4576	608221.2751	2014/05/07 09:10:30	G Casares	unknown	GCW	male	30	none
95	054	30.4565	-97.8721	3369912.8684	608288.8372	2014/05/07 09:15:30	C Ladd	unknown	GCW	male	30	moved 054, 055, 056
96	055	30.4566	-97.8720	3369922.9098	608295.4585	2014/05/07 09:16:49	C Ladd	unknown	GCW	male	30	moved 054, 055, 056
97	056	30.4563	-97.8723	3369891.1343	608265.6247	2014/05/07 09:37:59	C Ladd	unknown	GCW	male	120	moved 054, 055, 056
98	060	30.4615	-97.8717	3370469.0153	608318.6208	2014/05/07 09:43:48	G Casares	unknown	GCW	male	60	counter-singing 060, 061
99	061	30.4606	-97.8696	3370371.5244	608522.8639	2014/05/07 10:16:47	G Casares	unknown	GCW	male	60	counter-singing 060, 061

Table 2. Survey Observation Data: Prime Plot

MAP #	Way Point #	Latitude	Longitude	Y_PROJ	X_PROJ	Time	Observer	Banded	Feature	Sex	Precision (Feet)	Movement/Counter-singing
100	062	30.4550	-97.8728	3369745.365	608222.7627	2014/05/15 no time data	E Herbez	unknown	GCW	male	120	none; add to map
101	063	30.4572	-97.8740	3369987.286	608100.9907	2014/05/15 no time data	E Herbez	unknown	GCW	male	120	none; add to map
102	060	30.4600	-97.8679	3370304.5490	608685.9972	2014/05/15 08:10:30	C Ladd	no	GCW	male	30	moved 060, 061, 062, 063, 064
103	061	30.4606	-97.8680	3370366.7527	608677.3085	2014/05/15 08:16:10	C Ladd	unknown	GCW	male	30	moved 060, 061, 062, 063, 064
104	062	30.4610	-97.8682	3370411.5396	608656.0241	2014/05/15 08:22:07	C Ladd	unknown	GCW	male	30	moved 060, 061, 062, 063, 064
105	063	30.4605	-97.8684	3370360.7015	608637.5217	2014/05/15 08:32:04	C Ladd	unknown	GCW	male	30	moved 060, 061, 062, 063, 064
106	064	30.4604	-97.8680	3370342.1927	608670.8333	2014/05/15 08:34:23	C Ladd	no	GCW	male	30	moved 060, 061, 062, 063, 064
107	065	30.4611	-97.8710	3370423.4940	608388.4958	2014/05/15 09:12:16	C Ladd	unknown	GCW	male	30	moved 065, 066
108	066	30.4609	-97.8715	3370402.0827	608342.1412	2014/05/15 09:14:22	C Ladd	unknown	GCW	male	60	moved 065, 066
109	067	30.4605	-97.8718	3370349.5652	608310.7877	2014/05/15 09:23:10	C Ladd	unknown	GCW	male	30	moved 067, 068, 069
110	068	30.4606	-97.8713	3370368.2239	608358.9944	2014/05/15 09:24:52	C Ladd	unknown	GCW	male	30	moved 067, 068, 069
111	069	30.4605	-97.8713	3370352.5172	608362.2239	2014/05/15 09:25:49	C Ladd	unknown	GCW	male	30	moved 067, 068, 069
112	070	30.4599	-97.8718	3370292.3366	608307.1342	2014/05/15 09:33:36	C Ladd	unknown	GCW	male	30	moved 070, 071
113	071	30.4602	-97.8721	3370316.4884	608283.8487	2014/05/15 09:35:30	C Ladd	unknown	GCW	male	30	moved 070, 071
114	064	30.4555	-97.8719	3369796.6972	608309.6813	2014/05/22 08:10:00	G Casares	unknown	GCW	male	60	none
115	065	30.4572	-97.8740	3369986.1389	608100.5767	2014/05/22 08:30:41	G Casares	unknown	GCW	male	1000	none; this might be too imprecise to use, other than direction
116	066	30.4576	-97.8711	3370032.7389	608383.1816	2014/05/22 08:53:26	G Casares	unknown	GCW	male	30	none
117	072	30.4592	-97.8723	3370213.8597	608262.3085	2014/05/22 08:56:31	J Schindler	unknown	GCW	male	60	moved 072, 073, 074
118	073	30.4592	-97.8726	3370211.2698	608236.0251	2014/05/22 08:56:44	J Schindler	unknown	GCW	male	30	moved 072, 073, 074
119	074	30.4594	-97.8729	3370231.5962	608207.0167	2014/05/22 09:42:10	J Schindler	unknown	GCW	male	60	moved 072, 073, 074
120	075	30.4601	-97.8709	3370312.0717	608396.5223	2014/05/22 09:42:13	J Schindler	unknown	GCW	male	30	Male with 3 juveniles; moved 075, 076, 077, 078, 079, 080, 081
121	076	30.4600	-97.8712	3370299.8022	608366.5911	2014/05/22 09:46:16	J Schindler	unknown	GCW	male	90	moved 075, 076, 077, 078, 079, 080, 081
122	077	30.4603	-97.8711	3370335.0272	608375.5530	2014/05/22 09:47:13	J Schindler	unknown	GCW	male	90	moved 075, 076, 077, 078, 079, 080, 081
123	078	30.4604	-97.8708	3370342.7519	608405.4335	2014/05/22 09:47:39	J Schindler	unknown	GCW	male	90	moved 075, 076, 077, 078, 079, 080, 081
124	079	30.4603	-97.8706	3370333.6161	608422.9041	2014/05/22 09:48:28	J Schindler	unknown	GCW	male	90	moved 075, 076, 077, 078, 079, 080, 081
125	080	30.4600	-97.8708	3370303.4877	608402.6572	2014/05/22 09:56:15	J Schindler	unknown	GCW	male	30	moved 075, 076, 077, 078, 079, 080, 081
126	081	30.4606	-97.8707	3370363.7129	608417.8024	2014/05/22 10:07:02	J Schindler	unknown	GCW	male	30	moved 075, 076, 077, 078, 079, 080, 081
127	082	30.4610	-97.8686	3370407.2944	608619.4839	2014/05/22 10:51:19	J Schindler	unknown	GCW	male	90	moved 082, 083, 084, 085
128	083	30.4607	-97.8684	3370378.4414	608638.1122	2014/05/22 10:58:06	J Schindler	unknown	GCW	male	30	moved 082, 083, 084, 085
129	084	30.4604	-97.8684	3370349.6189	608637.6326	2014/05/22 11:00:23	J Schindler	unknown	GCW	male	60	moved 082, 083, 084, 085
130	085	30.4602	-97.8683	3370320.9754	608643.9686	2014/05/22 11:03:12	J Schindler	unknown	GCW	male	30	moved 082, 083, 084, 085

Table 3. Survey Observation Data: Transitional Plot

MAP #	Way Point #	Latitude	Longitude	Y_PROJ	X_PROJ	Time	Observer	Banded	Feature	Sex	Precision (Feet)	Movement/Counter-singing
1	003	30.45181200	-97.87782200	3369385.71402164	607741.94607982	2014/04/16 08:14:37	C Ladd	unknown	GCW	male	150	moved 003, 004, 005
2	004	30.45108100	-97.88042800	3369302.21895477	607492.52874822	2014/04/16 08:18:36	C Ladd	unknown	GCW	male	90	moved 003, 004, 005
3	005	30.45034700	-97.88021000	3369221.07994906	607514.26638759	2014/04/16 08:20:20	C Ladd	unknown	GCW	male	60	moved 003, 004, 005
4	006	30.45053600	-97.88239400	3369239.95076151	607304.35558924	2014/04/16 09:27:25	C Ladd	unknown	GCW	male	180	counter-singing with 007
5	007	30.45028400	-97.88523200	3369209.33190029	607032.13204600	2014/04/16 09:28:15	C Ladd	unknown	GCW	male	180	counter-singing with 006
6	008	30.45180500	-97.88631700	3369376.87132467	606926.29157862	2014/04/16 09:50:11	C Ladd	unknown	GCW	male	180	none
7	009	30.45104800	-97.87824400	3369300.64067914	607702.26724752	2014/04/16 11:11:00	C Ladd	unknown	GCW	male	240	none
8	025	30.45227800	-97.87937800	3369435.87681457	607592.03195378	2014/04/16 08:34:02	J Schindler	unknown	GCW	male	30	none
9	026	30.45630000	-97.88331000	3369877.88299150	607210.09207935	2014/04/16 09:08:40	J Schindler	unknown	GCW	male	150	none
10	029	30.45206900	-97.88392900	3369408.39086210	607155.29055348	2014/04/16 10:39:04	J Schindler	unknown	GCW	male	60	moved to 029, 031, 032
11	030	30.45213000	-97.88377500	3369415.29725724	607170.01032818	2014/04/16 10:49:58	J Schindler	unknown	GCW	female	30	none
12	031	30.45238100	-97.88359000	3369443.29001840	607187.49861789	2014/04/16 10:51:35	J Schindler	unknown	GCW	male	60	moved to 029, 031, 032
13	032	30.45195600	-97.88341100	3369396.35871411	607205.15078534	2014/04/16 10:52:22	J Schindler	unknown	GCW	male	60	moved to 029, 031, 032
14	034	30.45096500	-97.87824500	3369291.44115838	607702.26251312	2014/04/23 08:11:59	C Ladd	unknown	GCW	male	300	none
15	036	30.45047300	-97.88673800	3369228.85294997	606887.32240045	2014/04/23 09:09:43	C Ladd	unknown	GCW	male	300	none
16	037	30.45085100	-97.88467400	3369272.69873642	607085.09019211	2014/04/23 10:17:51	C Ladd	no	GCW	male	30	none
17	043	30.45348100	-97.87961100	3369568.97887229	607568.33863423	2014/04/23 11:11:04	G Casares	unknown	GCW	male	150	two GCW counter-singing from SW and NE of 043
18	044	30.45468700	-97.87971900	3369702.53241851	607556.64426664	2014/04/23 08:35:20	G Casares	unknown	GCW	male	150	two GCW counter-singing
19	045	30.45408600	-97.88486400	3369631.04092807	607063.30984720	2014/04/23 09:34:10	G Casares	unknown	GCW	male	30	
20	046	30.45375800	-97.88496500	3369594.59431561	607053.97098970	2014/04/23 09:43:02	G Casares	unknown	GCW	male	30	moved 045, 046, 047, 048, 049
21	047	30.45227200	-97.88487800	3369429.98924366	607063.94900307	2014/04/23 10:19:13	G Casares	unknown	GCW	male	30	moved 045, 046, 047, 048, 049
22	048	30.45220200	-97.88502200	3369422.09503047	607050.19918845	2014/04/23 10:20:47	G Casares	unknown	GCW	male	30	moved 045, 046, 047, 048, 049
23	049	30.45151700	-97.88371800	3369347.41494662	607176.15416378	2014/04/23 10:46:07	G Casares	unknown	GCW	male	30	moved 045, 046, 047, 048, 049
24	050	30.45393000	-97.87841800	3369619.87583411	607682.39092930	2014/04/23 11:13:12	G Casares	unknown	GCW	male	30	moved 050, 051
25	051	30.45417700	-97.87855200	3369647.12223569	607669.25335765	2014/04/23 11:18:05	G Casares	unknown	GCW	male	30	moved 050, 051
26	024	30.45370400	-97.87938600	3369593.90726187	607589.69701596	2014/04/09 08:14:00	C Ladd	unknown	GCW	male	90	none
27	025	30.45317800	-97.87846900	3369536.48597492	607678.32112384	2014/04/09 08:27:23	C Ladd	unknown	GCW	male	30	none
28	026	30.45318600	-97.88411500	3369532.00722662	607136.20939289	2014/04/09 09:04:17	C Ladd	unknown	GCW	male	180	none
29	027	30.45204400	-97.88630800	3369403.36724920	606926.89476022	2014/04/09 09:13:44	C Ladd	no	GCW	male	30	moved 027, 028, 029
30	028	30.45207300	-97.88591400	3369406.95399688	606964.69356081	2014/04/09 09:15:44	C Ladd	no	GCW	male	30	moved 027, 028, 029
31	029	30.45190600	-97.88559100	3369388.75176874	606995.88933190	2014/04/09 09:17:51	C Ladd	no	GCW	male	30	moved 027, 028, 029
32	030	30.45391500	-97.87840100	3369618.22963852	607684.03967553	2014/04/09 11:10:35	C Ladd	unknown	GCW	male	30	none
33	031	30.45396900	-97.87828600	3369624.32382499	607695.02197737	2014/04/09 11:11:01	C Ladd	unknown	GCW	female	30	none

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Appendix A

Figures

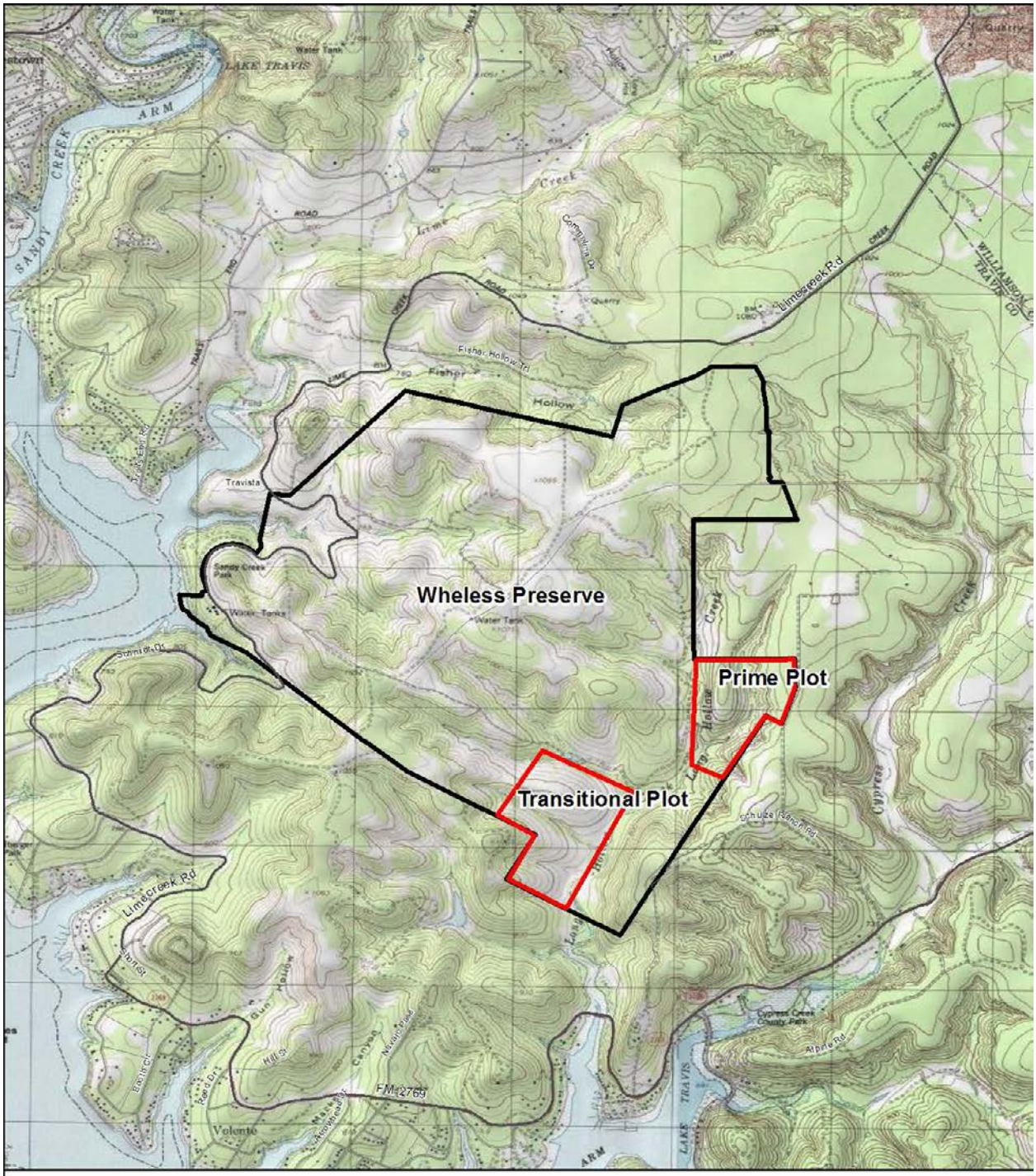


Figure 1.0
Wheless Preserve
GCW Territory Mapping
Spring 2014
Location Map

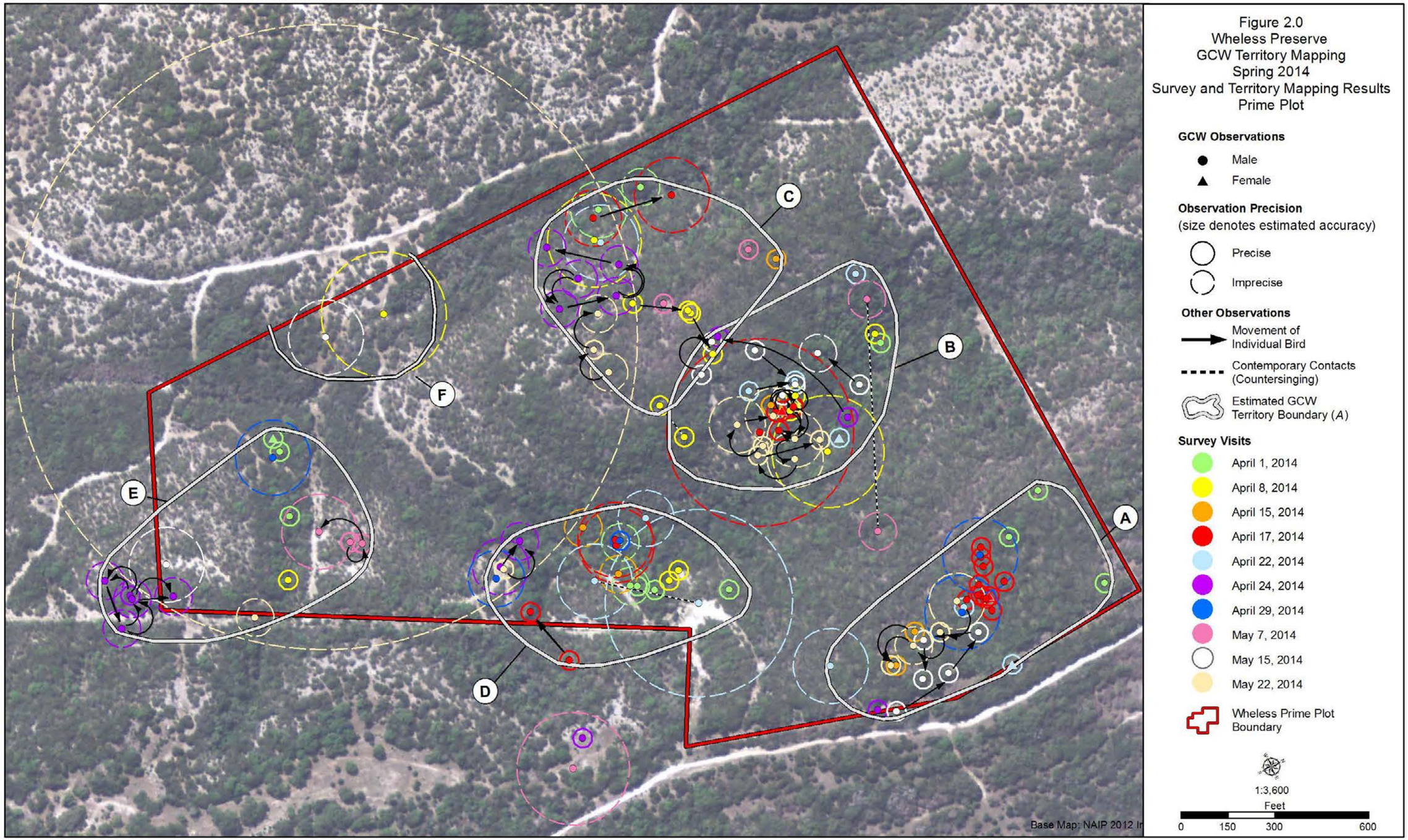

C
B
F
E
A
D
Base Map: NAIP 2012 Ir
Figure 2.0
Wheless Preserve
GCW Territory Mapping
Spring 2014
Survey and Territory Mapping Results
Prime Plot
GCW Observations
Male
Female
Observation Precision
(size denotes estimated accuracy)
Precise
Imprecise
Other Observations
Movement of Individual Bird
Contemporary Contacts (Countersinging)
Estimated GCW Territory Boundary (A)
Survey Visits
April 1, 2014
April 8, 2014
April 15, 2014
April 17, 2014
April 22, 2014
April 24, 2014
April 29, 2014
May 7, 2014
May 15, 2014
May 22, 2014
Wheless Prime Plot Boundary
1:3,600
Feet
0
150
300
600

Figure 2.1
Wheless Preserve GCW Territory Mapping
Spring 2014
April 1, 2014 Survey Results
Prime Plot



GCW Observations

- Male
- Female

Observation Precision
(size denotes estimated accuracy)

- Precise
- Imprecise

Other Observations

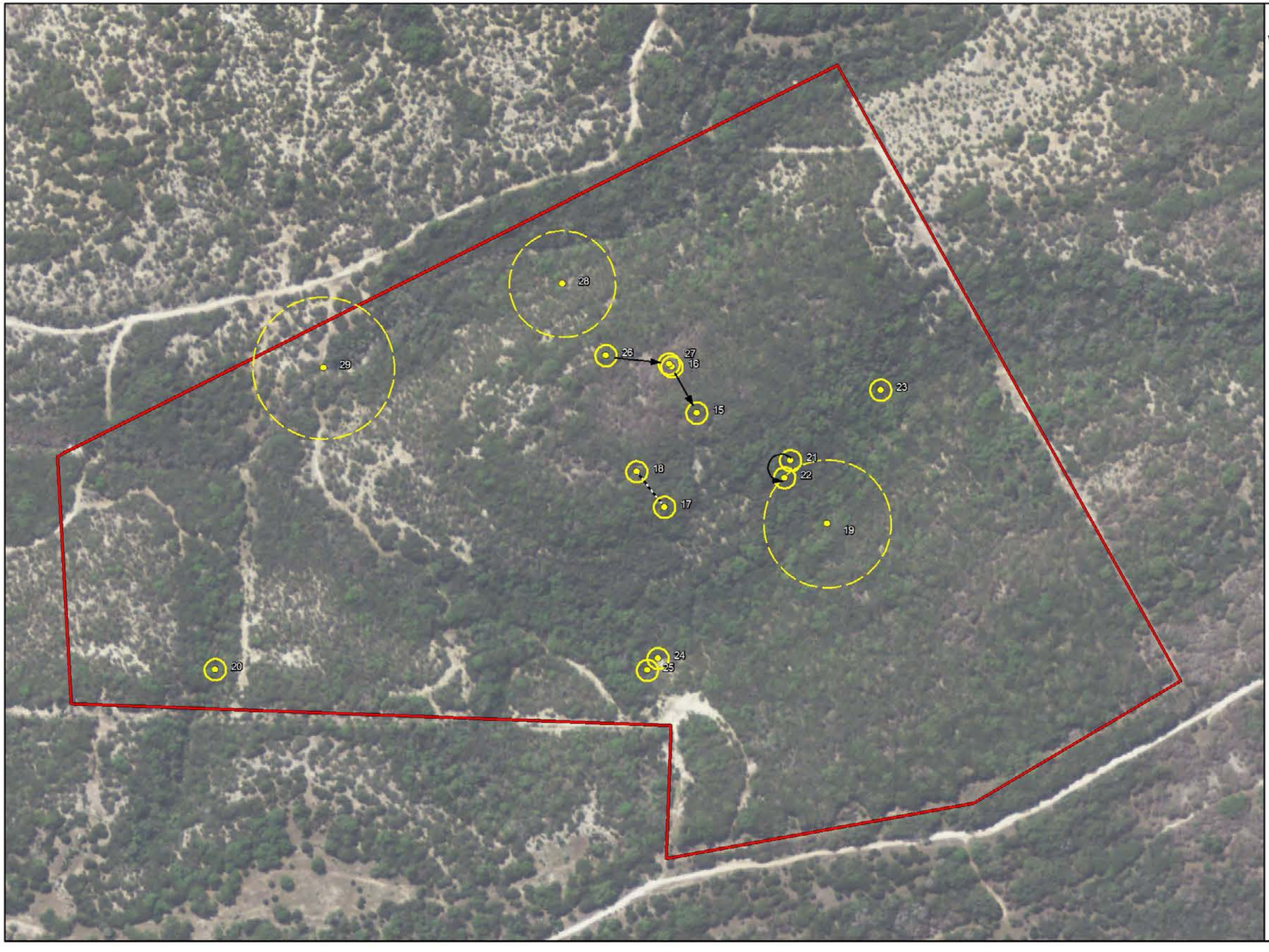
- Movement of Individual Bird
- Contemporary Contacts (Countersinging)
- # Map ID
- Wheless Prime Plot Boundary

1:3,600

Feet
0 75 150 300 450

Base Map: 2012 NAIP Imagery

Figure 2.2
Wheless Preserve GCW Territory Mapping
Spring 2014
April 8, 2014 Survey Results
Prime Plot



GCW Observations

- Male
- Female

Observation Precision
(size denotes estimated accuracy)

- Precise
- Imprecise

Other Observations

- Movement of Individual Bird
- Contemporary Contacts (Countersinging)
- # Map ID
- Wheless Prime Plot Boundary

1:3,600

Feet
0 75 150 300 450

Base Map: 2012 NAIP Imagery

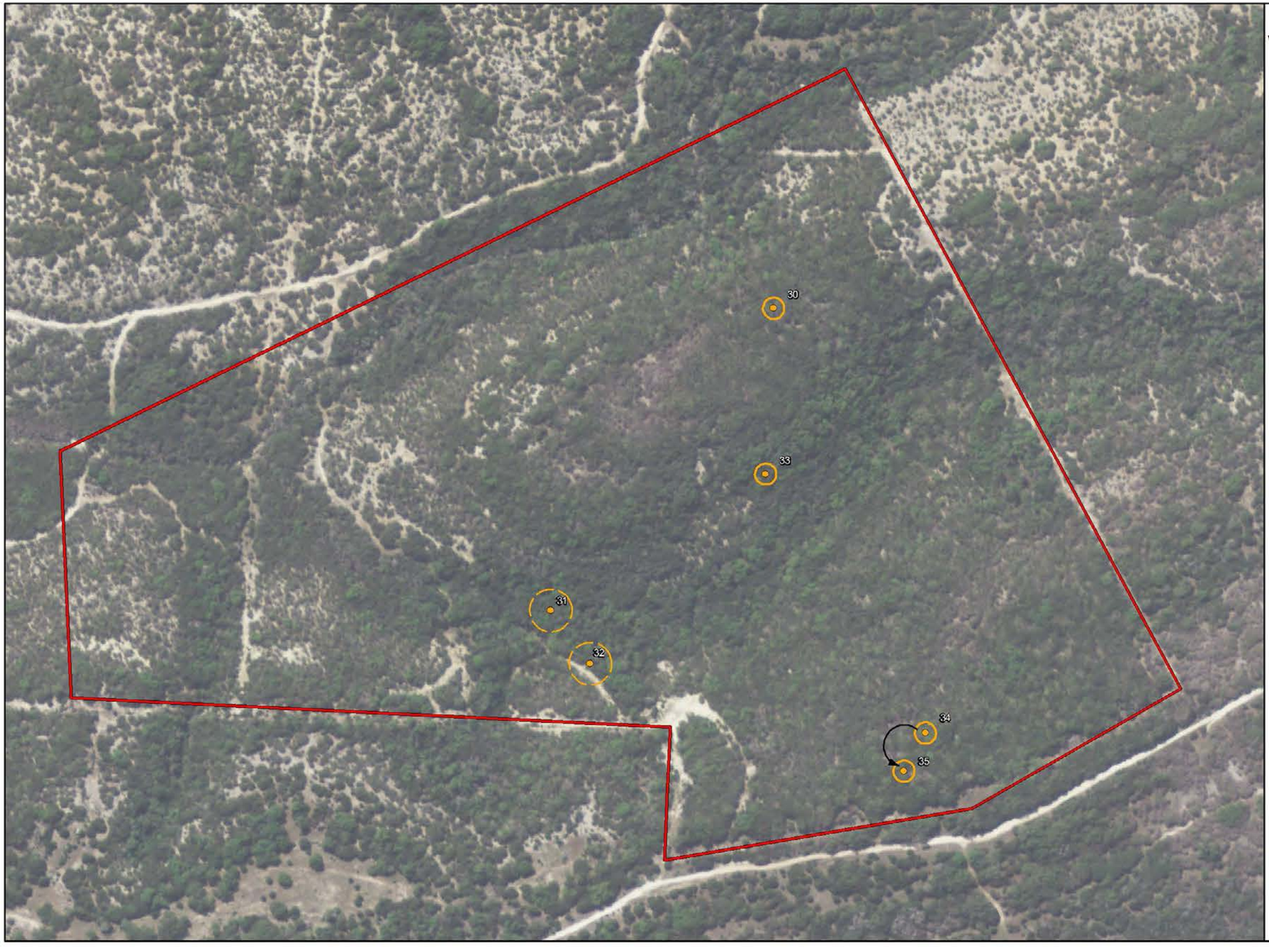


Figure 2.3
Wheless Preserve GCW Territory Mapping
Spring 2014
April 15, 2014 Survey Results
Prime Plot

GCW Observations

Male

Female

Observation Precision
(size denotes estimated accuracy)

Precise

Imprecise

Other Observations

Movement of Individual Bird

Contemporary Contacts (Countersinging)

\# Map ID

Wheless Prime Plot Boundary

1:3,600

Feet

0 75 150 300 450

Base Map: 2012 NAIP Imagery

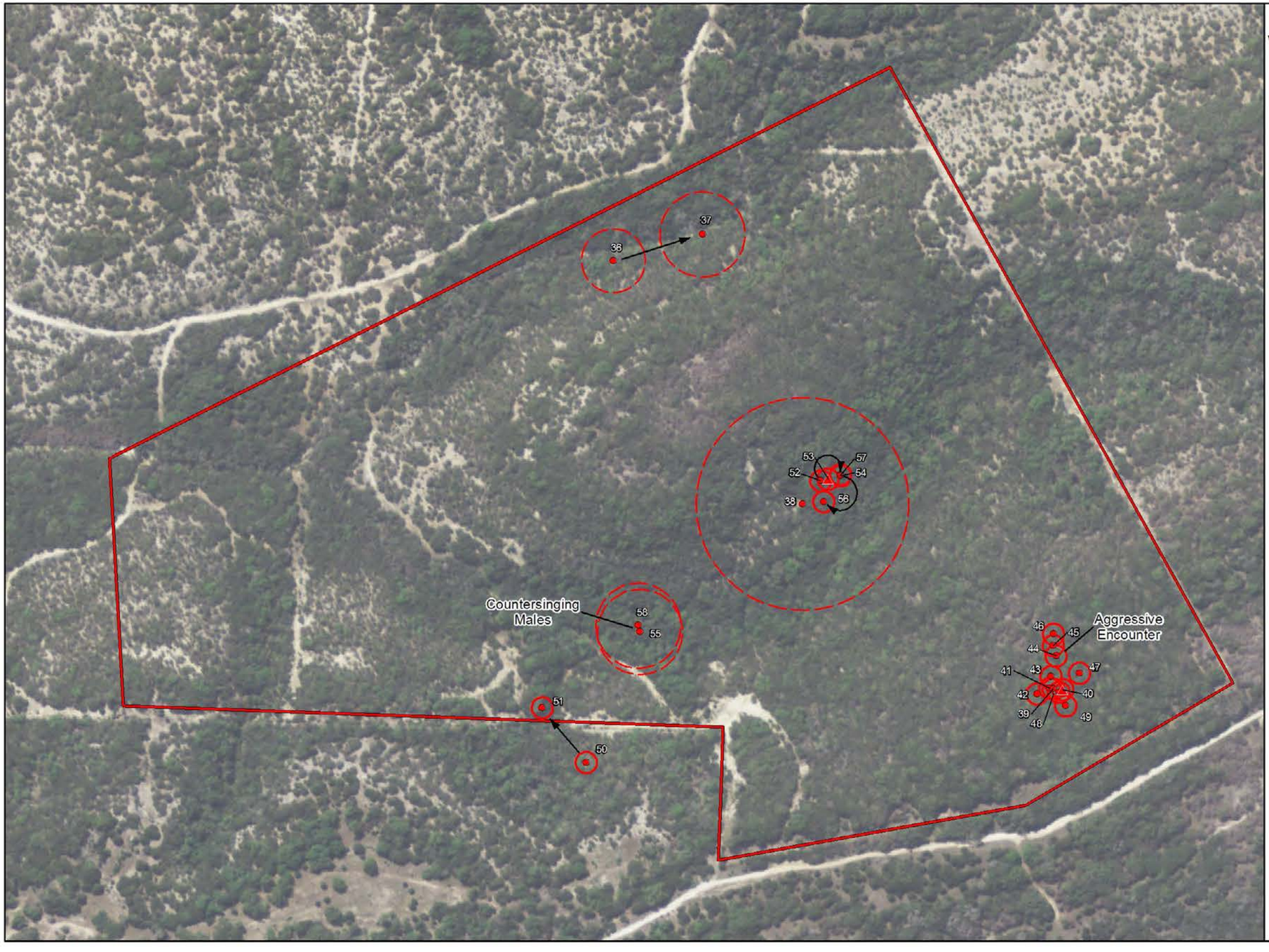


Figure 2.4
Wheless Preserve GCW Territory Mapping
Spring 2014
April 17, 2014 Survey Results
Prime Plot

GCW Observations

- Male
- Female

Observation Precision
(size denotes estimated accuracy)

- Precise
- Imprecise

Other Observations

- Movement of Individual Bird
- Contemporary Contacts (Countersinging)
- # Map ID
- Wheless Prime Plot Boundary

1:3,600

Feet
0 75 150 300 450

Base Map: 2012 NAIP Imagery

Figure 2.5
Wheless Preserve GCW Territory Mapping
Spring 2014
April 22, 2014 Survey Results
Prime Plot



GCW Observations

- Male
- Female

Observation Precision
(size denotes estimated accuracy)

- Precise
- Imprecise

Other Observations

- Movement of Individual Bird
- Contemporary Contacts (Countersinging)
- # Map ID
- Wheless Prime Plot Boundary

1:3,600

Feet
0 75 150 300 450

Base Map: 2012 NAIP Imagery

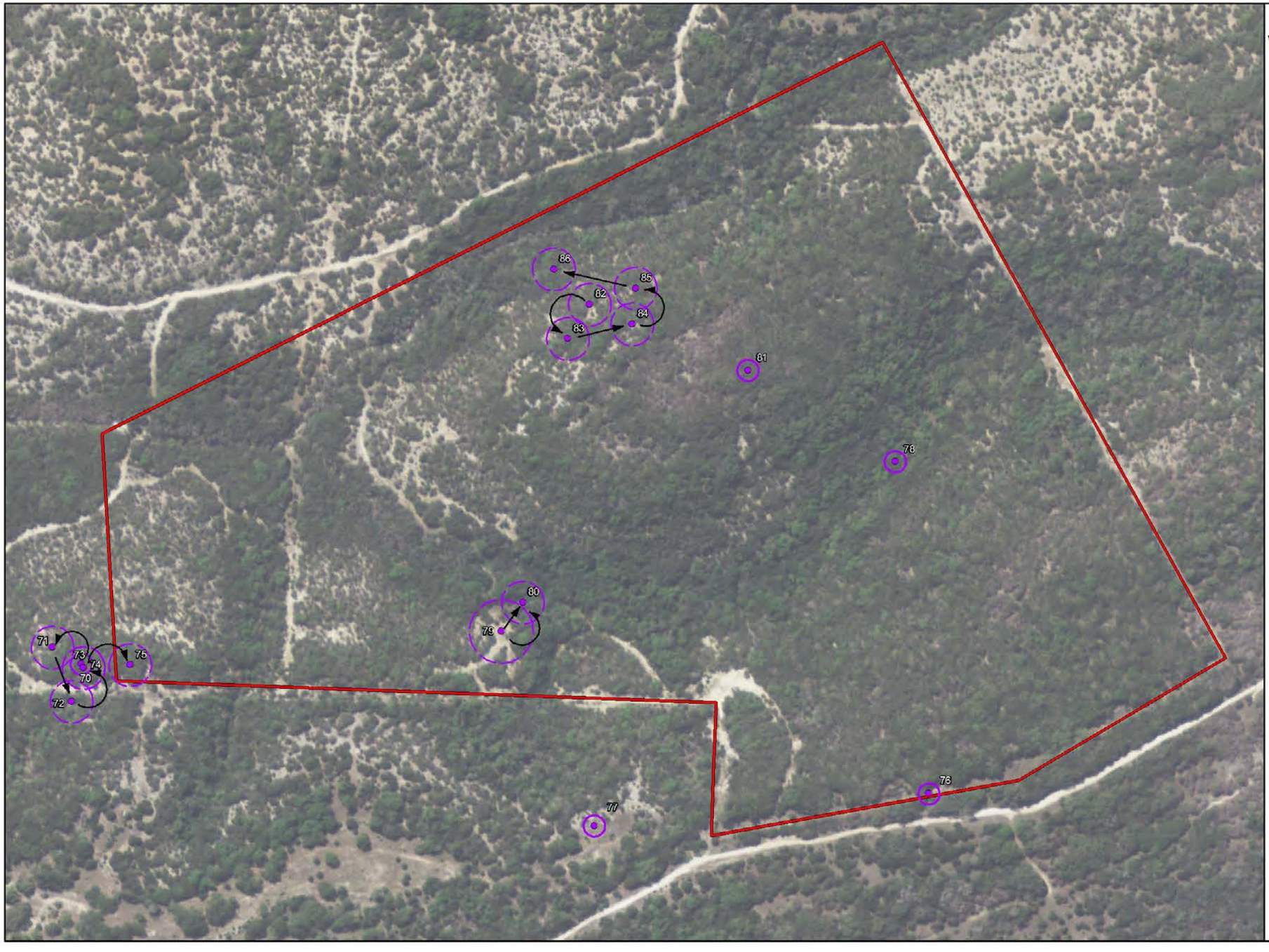


Figure 2.6
Wheless Preserve GCW Territory Mapping
Spring 2014
April 24, 2014 Survey Results
Prime Plot

GCW Observations

- Male
- Female

Observation Precision
(size denotes estimated accuracy)

- Precise
- Imprecise

Other Observations

- Movement of Individual Bird
- Contemporary Contacts (Countersinging)
- # Map ID
- Wheless Prime Plot Boundary

1:3,600

Feet
0 75 150 300 450

Base Map: 2012 NAIP Imagery

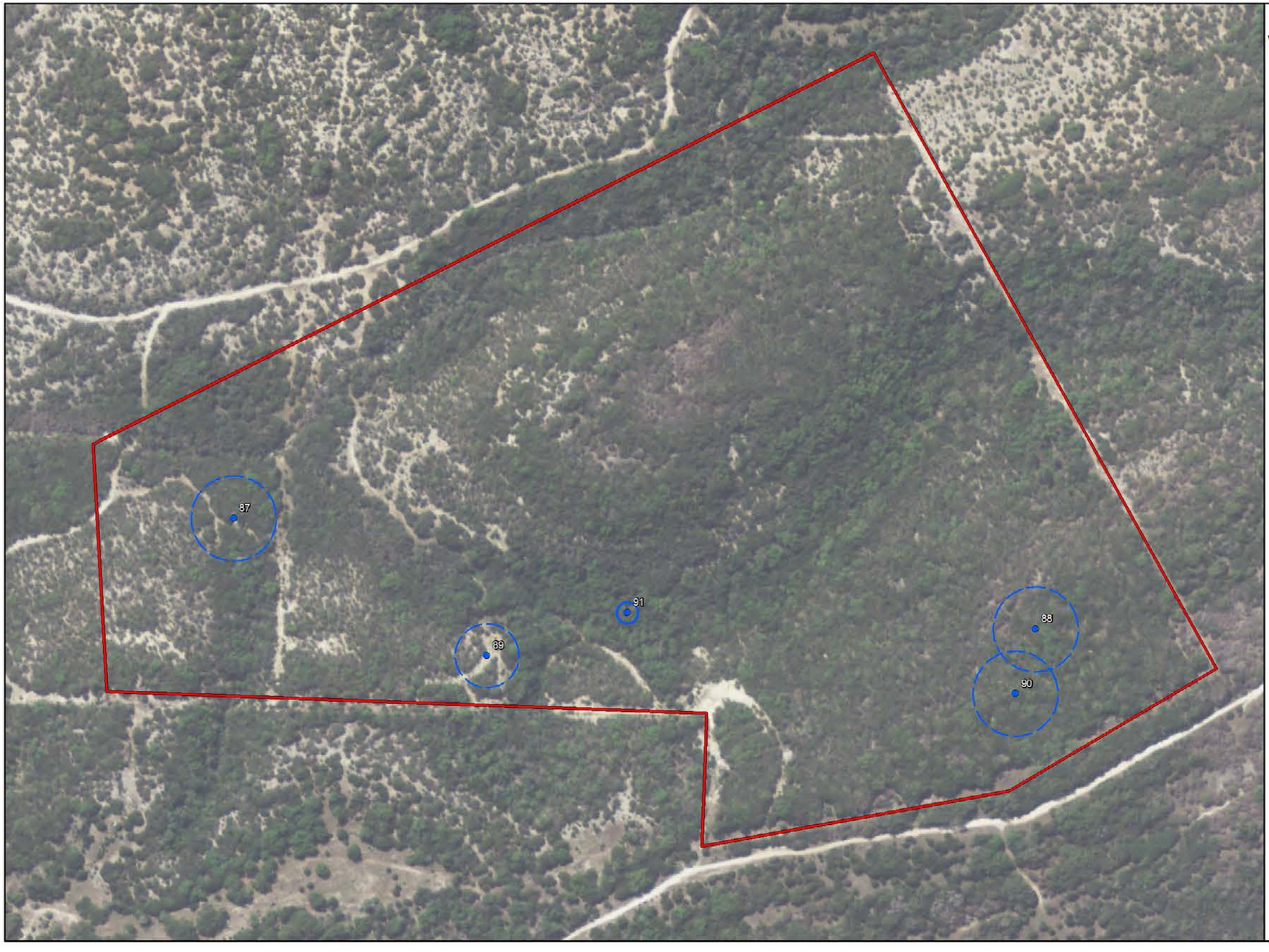


Figure 2.7
Wheless Preserve GCW Territory Mapping
Spring 2014
April 29, 2014 Survey Results
Prime Plot

GCW Observations

Male

Female

Observation Precision
(size denotes estimated accuracy)

Precise

Imprecise

Other Observations

Movement of Individual Bird

Contemporary Contacts (Countersinging)

\# Map ID

Wheless Prime Plot Boundary

1:3,600

Feet

0 75 150 300 450

Base Map: 2012 NAIP Imagery



Figure 2.8
Wheless Preserve GCW Territory Mapping
Spring 2014
May 7, 2014 Survey Results
Prime Plot

GCW Observations

Male

Female

Observation Precision
(size denotes estimated accuracy)

Precise

Imprecise

Other Observations

Movement of Individual Bird

Contemporary Contacts (Countersinging)

\# Map ID

Wheless Prime Plot Boundary

1:3,600

Feet

0 75 150 300 450

Base Map: 2012 NAIP Imagery

Figure 2.9
Wheless Preserve GCW Territory Mapping
Spring 2014
May 15, 2014 Survey Results
Prime Plot



GCW Observations

○ Male

△ Female

Observation Precision
(size denotes estimated accuracy)

Precise

Imprecise

Other Observations

Movement of Individual Bird

Contemporary Contacts (Countersinging)

\# Map ID

Wheless Prime Plot Boundary

1:3,600

Feet

0 75 150 300 450

Base Map: 2012 NAIP Imagery

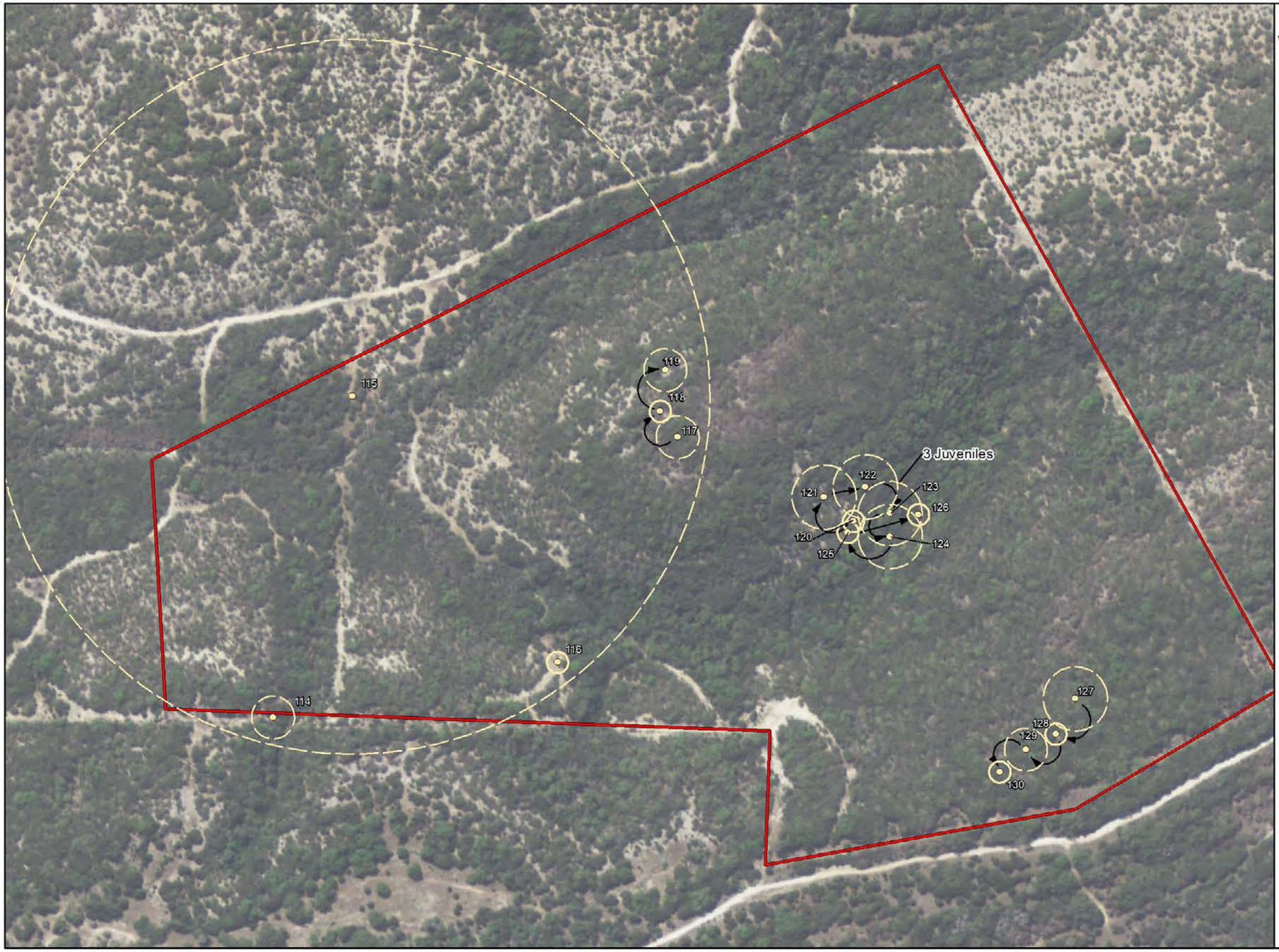


Figure 2.10
Wheless Preserve GCW Territory Mapping
Spring 2014
May 22, 2014 Survey Results
Prime Plot

GCW Observations

Male

Female

Observation Precision
(size denotes estimated accuracy)

Precise

Imprecise

Other Observations

Movement of Individual Bird

Contemporary Contacts (Countersinging)

\# Map ID

Wheless Prime Plot Boundary

1:3,600

Feet

0 75 150 300 450

Base Map: 2012 NAIP Imagery

Figure 3.0
Wheless Preserve GCW Territory Mapping
Spring 2014
Survey and Territory Mapping Results
Transitional Plot

GCW Observations

- Male
- Female

Observation Precision
(size denotes estimated accuracy)

- Precise
- Imprecise

Other Observations

- Movement of Individual Bird
- Contemporary Contacts (Countersinging)
- Estimated GCW Territory Boundary (*A*)
- Cluster of Related GCW Observations

Survey Visits

- April 9, 2014
- April16, 2014
- April 23, 2014

- # Map ID
- Wheless Transitional Plot Boundary

1:4,800
Feet
0 75 150 300 450

Appendix B

Representative Photographs



Photo 1. Overview of habitat, Prime Plot



Photo 2. Overview of habitat, Prime Plot



Photo 3. Typical habitat, Prime Plot



Photo 4. Typical habitat, Prime Plot



Photo 5. Overview of habitat, Transitional Plot



Photo 6. Overview of habitat, Transitional Plot



Photo 7. Typical habitat, Transitional Plot



Photo 8. Typical habitat, Transitional Plot

Appendix C

Birds Observed During the Wheless 2014 Survey of the Prime and Transitional Plots

Appendix C. Birds Observed During the Wheless Survey of the Prime and Transitional Plots

Common name	***Scientific name***	**Prime plot**	**Transitional plot**
Black vulture	*Coragyps atratus*	x	
Turkey vulture	*Cathartes aura*	x	x
Double-crested cormorant	*Phalacrocorax auritus*		x
Red-shouldered hawk	*Buteo lineatus*	x	
Red-tailed hawk	*Buteo jamaicensis*	x	x
Wild turkey	*Meleagris gallopavo*	x	x
White-winged Dove	*Zenaida asiatica*	x	
Mourning dove	*Zenaida macroura*	x	x
Yellow-billed cuckoo	*Coccyzus americanus*	x	
Greater roadrunner	*Geococcyx californianus*	x	x
Great horned owl	*Bubo virginianus*	x	
Chimney swift	*Chaetura pelagica*	x	
Black-chinned hummingbird	*Archilochus alexandri*	x	x
Golden-fronted woodpecker	*Melanerpes aurifrons*		x
Ladder-backed woodpecker	*Picoides scalaris*	x	x
Eastern phoebe	*Sayornis phoebe*	x	
Ash-throated flycatcher	*Myiarchus cinerascens*	x	x
Great Crested flycatcher	*Myiarchus crinitus*	x	
Scissor-tailed flycatcher	*Tyrannus forficatus*		x
White-eyed vireo	*Vireo griseus*	x	
Red-eyed vireo	*Vireo olivaceus*	x	
Blue Jay	*Cyanocitta cristata*	x	
Western scrub-jay	*Aphelocoma californica*	x	x
American crow	*Corvus brachyrhynchos*	x	x
Common raven	*Corvus corax*	x	
Purple martin	*Progne subis*	x	
Barn swallow	*Hirundo rustica*	x	
Carolina chickadee	*Poecile carolinensis*	x	x
Black-crested titmouse	*Baeolophus atricristatus*	x	x
Canyon wren	*Catherpes mexicanus*	x	x
Carolina wren	*Thryothorus ludovicianus*	x	x
Bewick's wren	*Thryomanes bewickii*	x	x
Ruby-crowned kinglet	*Regulus calendula*	x	x
Blue-gray gnatcatcher	*Polioptila caerulea*	x	x
Northern mockingbird	*Mimus polyglottos*	x	x
Cedar waxwing	*Bombycilla cedrorum*	x	x
Orange-crowned warbler	*Oreothlypis celata*	x	
Yellow-rumped warbler	*Setophaga coronata*	x	
Golden-cheeked warbler	*Setophaga chrysoparia*	x	x
Black-and-white warbler	*Mniotilta varia*	x	x
Nashville warbler	*Oreothlypis ruficapilla*	x	x
Yellow-breasted chat	*Icteria virens*	x	x
Summer tanager	*Piranga rubra*	x	
Chipping sparrow	*Spizella passerina*		x
Rufous-crowned sparrow	*Aimophila ruficeps*	x	x
Field Sparrow	*Spizella pusilla*	x	x
Lark sparrow	*Chondestes grammacus*		x
White-crowned sparrow	*Zonotrichia leucophrys*	x	
Northern cardinal	*Cardinalis cardinalis*	x	x
Painted bunting	*Passerina ciris*	x	
Brown-headed cowbird	*Molothrus ater*	x	

Appendix C. Birds Observed During the Wheless Survey of the Prime and Transitional Plots

Common name	*Scientific name*	Prime plot	Transitional plot
Lesser goldfinch	*Carduelis psaltria*	x	x

Avian nomenclature and taxonomy follows the American Ornithologists' Union (AOU 1998), as currently supplemented through 2013.