

**YEAR 2:
SEPTEMBER 2014 THROUGH AUGUST 2015
RAMONA GRASSLANDS PRESERVE RAPTOR SURVEYS
SUMMARY REPORT
FOR THE
COUNTY OF SAN DIEGO
DEPARTMENT OF PARKS AND RECREATION**

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CHAPTER 1

INTRODUCTION

The Ramona Grasslands Preserve (Preserve) has been documented as a viable raptor foraging and breeding site (CBI 2007; County of San Diego 2010; WRI 2007). Golden eagles (*Aquila chrysaetos*) use the grasslands for foraging and have established nesting territories in the vicinity (e.g., Bandy Canyon and Kimball Valley) (CBI 2007). In 2013, a bald eagle (*Haliaeetus leucocephalus*) pair established a nest on the Preserve for the first time and successfully fledged young.

A 3-year raptor study was initiated by the County of San Diego (County) Department of Parks and Recreation (DPR) to collect baseline information on eagle and other raptor activity at the Preserve. Raptor foraging surveys and golden eagle nest monitoring were conducted by AECOM at the Preserve from September 2013 through August 2014 on behalf of the County DPR. AECOM worked in partnership with the U.S. Fish and Wildlife Service (USFWS) for several months to complete these surveys. This report summarizes the results of Year 2 (September 2014 through August 2015) of the 3-year study. This report will also compare the results of Year 2 to Year 1 (September 2013 through August 2014). AECOM will continue surveys for Year 3.

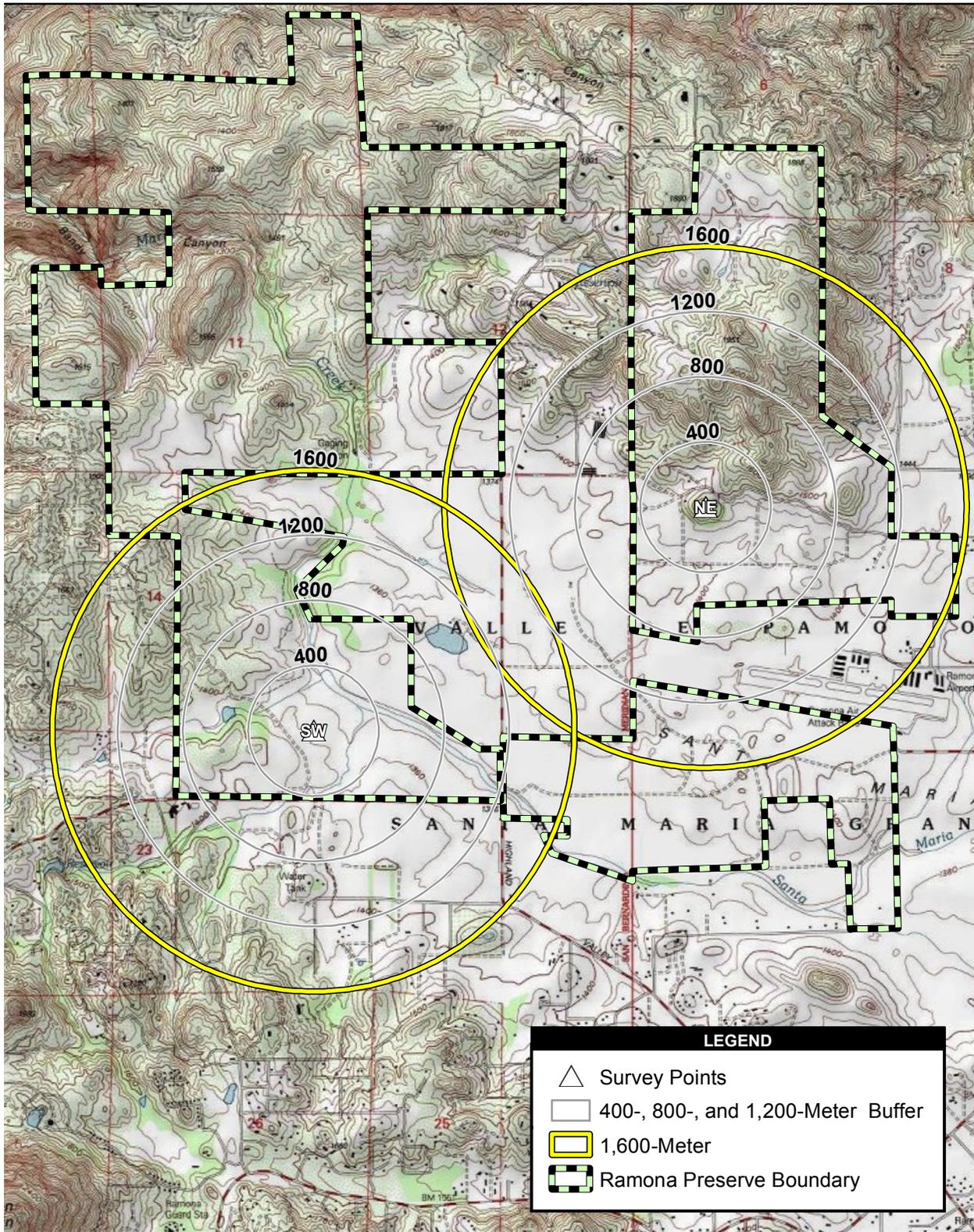
1.1 PURPOSE OF STUDY

The purpose of this study is to conduct an eagle/raptor foraging study (study) for the Preserve and golden eagle nest monitoring in Bandy Canyon. Baseline information will provide a better understanding of species abundance and distribution within the Preserve, will be useful in informing management decisions (e.g., trail feasibility and alignments, seasonal closures), and will provide a reference point for any future studies or assessments pertaining to public use. Although a multiuse trail system is open to the public in the southwestern portion of the Preserve (Oak Country Trails II), the remainder of the Preserve is currently closed to public use.

1.2 STUDY LOCATION

The Preserve is located in the Santa Maria Valley, situated between the coastal mesas and the mountains of the Peninsular Ranges in west-central San Diego County near the town of Ramona, California (Figure 1). The Preserve is bordered by rural residential development to the south and the town of Ramona to the east, and is bisected by the Ramona Airport and Ramona Municipal

Water District land (Figure 2). Medium-density development is planned for areas southeast, northeast, and west of the Preserve. The northern and western boundaries of the Preserve are mainly characterized by open space and agricultural uses (grazing). The grasslands have been historically used for commercial grazing. Under County ownership, managed grazing is still used for vegetation control.



Source: USGS 7.5' Topographic Quadrangle Valley Center, CA 1978, Rodriguez Mountain, CA 1985



Figure 2
Vicinity

Ramona Grasslands Preserve Raptor Surveys Summary Report - Year 2

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CHAPTER 2

METHODOLOGY

Raptor point count surveys occurred within the Preserve and were conducted by biologists from AECOM and USFWS. AECOM also conducted golden eagle nest monitoring at locations outside of the Preserve. Survey and monitoring methodologies are described below.

2.1 RAPTOR POINT COUNT FIELD SURVEYS

Prior to initiating surveys, two locations with an optimal viewshed were chosen to conduct 4-hour point counts to observe raptor foraging behaviors. These locations are found in the northeast quadrant and the southwest quadrant of the Preserve. The locations were visited and confirmed in Year 1, September 2013 during a reconnaissance site visit with County DPR, AECOM, and USFWS staff, and are known as the northeast (NE) and southwest (SW) point count stations. The locations of these point count stations are depicted in Figure 2.

One point count station is located at a high point (a hill feature known as the “look out” or “house on the hill”) in the northeast quadrant of the Preserve. This location, herein referred to as the NE point count station, provides unlimited sky visibility for the entire Preserve, including visibility toward the southeast, southwest, and northwest. A mountain ridge occurs to the north and northeast. Certain raptor behavior, such as prey diving, may not be visible from this vantage point toward the northern boundary of the northeast quadrant. However, this vantage provides good visibility of the rocky outcrops used by raptors for perching.

The SW point count location, herein referred to as SW point count station, is located at a rocky outcrop to the north of the staging area located off Highland Valley Road, in the southwest quadrant of the Preserve. This point count station provides unlimited sky visibility for the entire Preserve in all cardinal directions. Photos taken in cardinal directions from each point count station are depicted in Appendix A.

Surveys for Year 2 were initiated on September 18, 2014, and the final survey for Year 2 was completed on August 31, 2015. Biologists surveyed from the two point count stations described above in a single day. Three surveys occurred in each season: spring (March, April, and May), summer (June, July, and August), fall (September, October, and November), and winter (December, January, and February). Each station was surveyed for a 4-hour period, typically between 7:30 a.m. and 5:30 p.m. The starting point count station generally rotated each month

(i.e., begin morning survey at northeastern quadrant during a month, and the following month begin the morning survey at the southwestern quadrant). AECOM surveyed once per month for an entire calendar year, and USFWS surveyed once per month from September 2014 through March 2015. USFWS conducted surveys on separate days than AECOM to accrue more data and collect a more robust data set. USFWS typically conducted surveys during the second week of each month, and AECOM typically conducted surveys during the last week of each month. The month of March 2015 (Year 2) was the last month that USFWS participated in the surveys. Beginning in April 2015, AECOM conducted the surveys twice a month. The additional survey was conducted near the second week of the month, consistent with the schedule of the USFWS biologist during the previous portion of this study.

Raptor-adapted avian point count surveys generally followed the protocol established in the USFWS *Eagle Conservation Plan Guidance, Module 1 – Land-based Wind Energy Version 2* (USFWS 2013). Although this guidance document is geared toward fatality studies for wind energy projects, it contains useful updated survey protocols that were adapted for this study.

The entire Preserve is the study area; however, for accuracy in making positive identifications of raptor species, the survey area focused on a 1,600-meter radius from the two point count stations within the Preserve. Surveys were focused specifically on observing and recording spatial use and behaviors of raptors within and adjacent to the Preserve. Precedence when recording data was given first to eagles, then to other special-status raptors, and finally to other non-special-status raptors. However, data were collected on all raptor species when feasible. Data were collected at greater distances than 1,600 meters both in the Preserve and on adjacent land for eagles and other special-status raptors when identified as a special-status species. Data were collected at greater distances than 1,600 meters only to give a general idea of how each raptor is using the Preserve, since accuracy in data collection deteriorates as the subject grows more distant.

Prior to beginning surveys, the biologists used a range-finder with aerial maps to establish distance references for mapping raptors. After the survey began, the biologists systematically scanned a 360-degree view of the horizon, overhead, and below their location with the unaided eye, binoculars, and a spotting scope at an unlimited distance for the duration of the 4-hour survey. Raptor detections were recorded on electronic data forms/hard-copy datasheets, and flight paths were recorded on hard-copy aerial maps. Pendragon software installed on HP Travel Companions was used to create electronic data forms. The electronic forms included data validation checks for data collected in the field to minimize errors in user data entry. However, on the occasions when hard-copy datasheets were used to collect data (USFWS), these data were

entered into the electronic forms immediately after the survey was completed. General data, including start and end times and date, were taken at the beginning and end of each survey. Weather data were taken at the start and end of each survey, and every hour during the survey. Survey dates, personnel, and weather conditions are depicted in Appendix B.

When a raptor was detected within or near the Preserve boundary, the biologist began data collection by recording the following:

- Date and time of observation.
- Identification tag (i.e., a unique value assigned to an individual raptor to allow biologists to take data on multiple observations of the same individual and to allow data to be distinguished between multiple individuals that may be present in the Preserve).
- Identification of the raptor species.
- The initial distance, direction/bearing, and direction-of-flight of the raptor observation.
- Raptor's behavior within the Preserve (e.g., direct flight, circle soaring, meandering, kiting, hovering, stooping/prey diving, perched). Definitions of these behaviors are as follows:
 - Direct flight – Continuous flapping of wings in a directional flight
 - Circle-soaring – Rising in a circular motion with wings outstretched (often associated when raptors catch thermals, a column of rising air in the lower altitudes of the earth's atmosphere)
 - Meandering – A wandering flight with no directional course
 - Kiting– Remain in a fixed place in moving air on motionless wings
 - Hovering – Remain in a fixed place into the wind by flapping
 - Stooping/prey diving – To dive from above with wings folded, usually in pursuit of prey
 - Perched – Stationary on an object (e.g., tree, rock, ground, utility pole)
- Time observed within or adjacent to the Preserve (0–2 minutes, 3–5 minutes, 6–10 minutes, greater than 10 minutes). If only a single raptor was in view for an extended period of time (i.e., greater than 10 minutes) or exhibited several styles of foraging techniques, more data on behavior were noted.

-
- Number of individuals.
 - Detection type (i.e., visual or auditory).
 - Raptor flight paths were mapped in the field for all raptors (precedence given to eagles and other special-status raptors) on hard-copy aerial maps.
 - Mapped flight paths depicted where the raptor displayed foraging behaviors.

Data collected (with the exception of flight paths) are provided in Appendix C. Flight paths of raptors were mapped on hard-copy aerial maps. One of two maps was used for this component depending on the distance the raptor was observed. One map was a “zoomed-in” view of the point count station with a 1-mile (1,600-meter) radius from the center of the point count station. This map was used to more accurately map the raptor’s flight path within the survey area. The next map was a “zoomed-out” view of the point count station with a 3-mile (4,800-meter) radius from the center of the point count station. This map was used when raptors were detected at greater distances than the 1-mile (1,600-meter) survey area, and provided an opportunity to map raptors using the Preserve and adjacent land to help understand how raptors are using other parts of the surrounding landscape.

Although not a special-status raptor, per a request from USFWS, ferruginous hawk (*Buteo regalis*) was mapped with a higher priority than other non-special-status raptors. For purposes of this study, special-status is defined as federally (USFWS) or state (California Department of Fish and Wildlife) listed as threatened or endangered, as a state fully protected species, or as a species of special concern.

Flight paths of eagles, special-status raptors, and non-special-status raptors that were recorded by AECOM and USFWS are depicted in Appendix D.

2.2 GOLDEN EAGLE NEST MONITORING

The purpose of golden eagle nest monitoring was to determine if golden eagles were present and if the nesting site was active or inactive in 2015. On September 11, 2013, County DPR staff, along with USFWS and AECOM biologists, visited a known historical nesting area for golden eagles off-site of the Preserve in Bandy Canyon. This visit was to determine a proper observation point (OP) to observe golden eagles during their nesting season. As recommended by Pagel et al. (2010), observation points were no closer than 300 meters and generally no farther than 700 meters away, where terrain allowed. USFWS biologist Joel Pagel was present during this visit and assisted with determining the appropriate location for the monitoring efforts. The OP

selected was approximately 780 meters (approximately 0.5 mile) north of the cliff face where eagles have nested. This location was approved by Mr. Pagel that day in the field.

The cliff face of Bandy Canyon where the eagles have nested faces north, and the OP was situated on the north side of Bandy Canyon. Biologists were able to look southwest across the canyon and observe golden eagle nesting behaviors and determine nest success, if applicable. The locations of the OP and the nesting site cliff face are depicted in Figure 3.

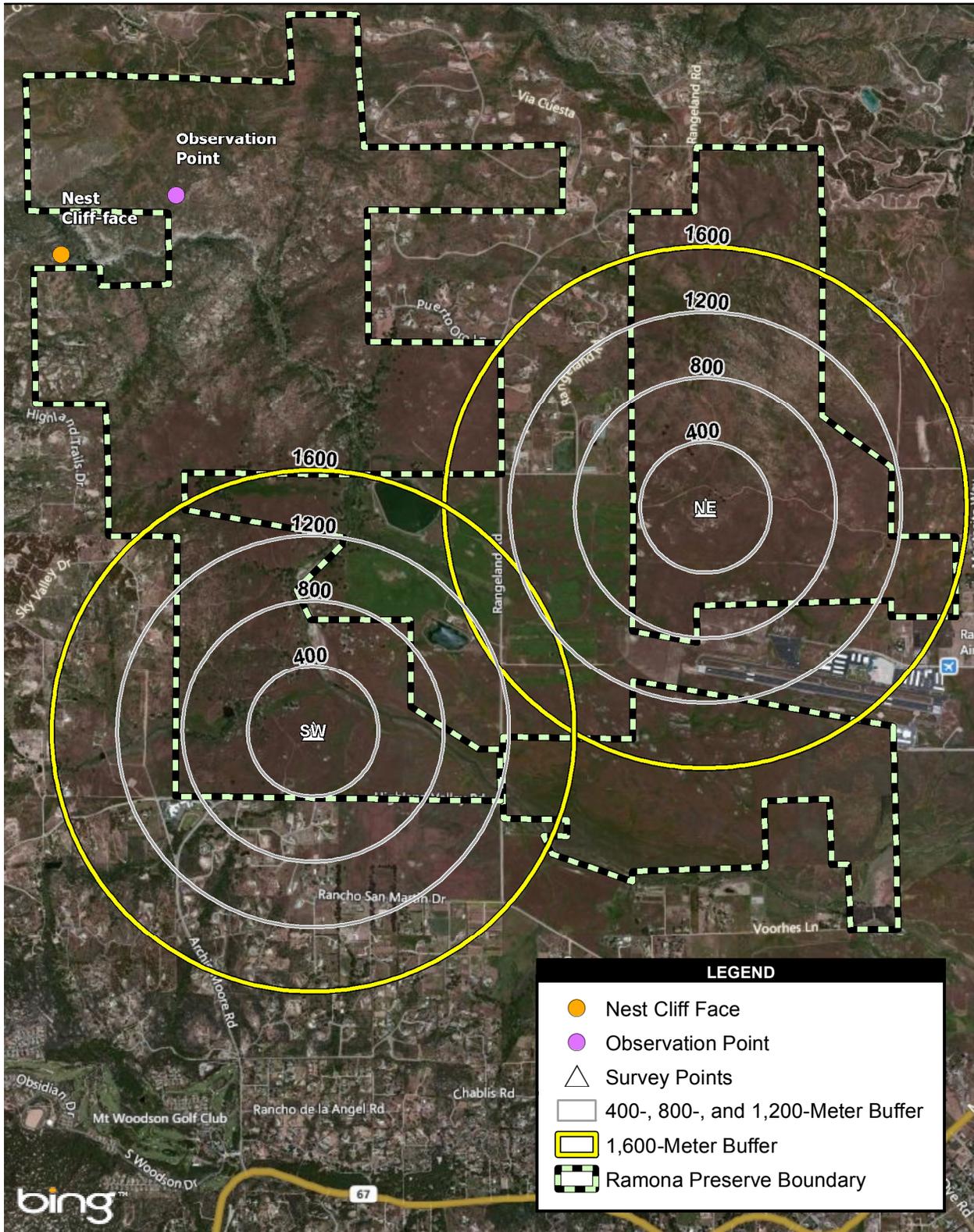
Two 4-hour monitoring sessions were conducted: the first on January 15, 2015, and the second on March 21, 2015. Both surveys were conducted between 8 a.m. and 1 p.m. A spotting scope was used so biologists could view the nest from a greater distance than with binoculars and gather necessary data to conclude if a nest was active or inactive. The information collected is based on recommendations by Pagel et al. (2010). General data, including start and end times, date, and weather, were taken at the beginning and end of each survey. The date, time, and duration of each golden eagle observation at the nest site were recorded. In the event that eagles did nest, for each observation, the biologist recorded eagle nesting behaviors, which may include the following:

- Nest building
- Incubating
- Feeding young
- No activity

Additional observational data, such fledgling observations/behaviors, prey items, and territory interactions, were noted when possible. The primary focus was determining golden eagle nest status (i.e., active or inactive).

2.3 ANALYSIS

Species richness, relative frequency of observation, the duration of observations, and an abundance estimate were calculated to better understand raptor activity and use at each point count station. Analysis involved all observations that were detected at a point count station. Metrics were quantified for each season and for the calendar year from September 2014 through August 2015.



Source: USGS 7.5' Topographic Quadrangle Valley Center, CA 1978, Rodriguez Mountain, CA 1985

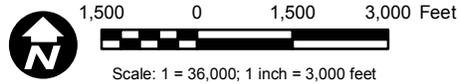


Figure 3
Golden Eagle Nest
Monitoring Location

Species richness is a measure of the species diversity of an area. This was calculated by tallying all raptor species observed at a survey point for each season and for the calendar year. The relative frequency of raptor observations was quantified by summing the number of raptor observations, including repeat observations of the same individual, in a given season and dividing by the number of surveys in a given season.

Raptor use of an area was quantified by calculating the minutes of observation per survey. This metric is the sum of all minutes a raptor species was observed over all surveys in a season divided by the number of surveys that occurred in that season. The minutes each species was observed included both perched and flight observations. The minutes of observations per survey station for eagles during all seasons is presented as a graph in Figure 4.

To avoid overestimating the abundance of raptors, a minimum number of individuals of each raptor species detected per season was calculated as a metric of abundance of individual raptor species. Without observing tagged/marked raptors or uniquely plumaged individuals, it is not possible to know how many unique individuals of each species were actually observed. Minimum numbers of unique individuals of a given raptor species for Year 2 were determined as follows: multiple individuals observed during a single scan; differences in age or plumage characteristics (e.g., molt, color morph, aberrant/leucism); and/or observing tagged/marked individuals. This metric (minimum number of individuals) is a better representation of species abundance than summing up all observations across the survey effort.

Flight paths of eagles and other special-status raptor species were also digitized and analyzed for areas of concentrated usage using geographic information system (GIS) technology, specifically GIS software ArcGIS 10.2.1 with the Spatial Analyst Extension. The density of the flight paths was derived using the linear density tool within the Spatial Analyst toolset. The tool's process resulted in a raster dataset where each cell within the raster was assigned a value based on the total linear feet within a given radius of the cell, divided by the search area. A raster graphics image is a dot matrix data structure representing a generally rectangular grid of pixels, or points of color, viewable via a monitor, paper, or other display medium. For this analysis, the linear feet measured was the digitized flight path of the various bird species. The search radius was set at 250 feet (76.2 meters), giving a total search area for each cell of approximately 196,349 square feet (18,241 square meters). The search radius of 250 feet (76.2 meters) was chosen to generalize patterns in near, but not overlapping, flight paths, but still allowing for enough detail to identify many individual flight paths.

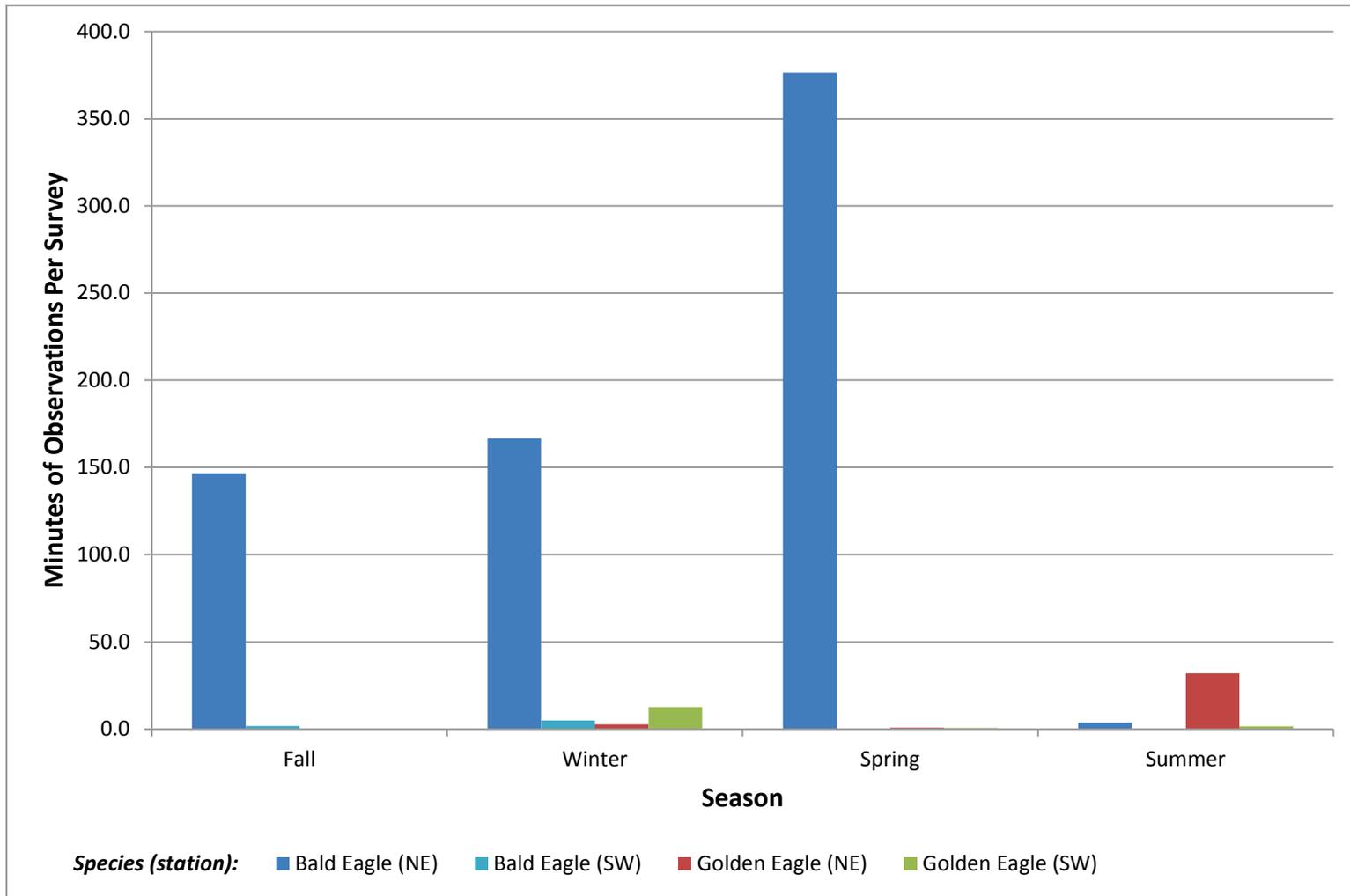


Figure 4. Eagle Activity within the Vicinity of Each Point Count Station (September 2014 – August 2015)

CHAPTER 3

RESULTS AND DISCUSSION

Various raptors use the Preserve as year-round residents or seasonal visitors that migrate to (and from) or through the region. The Preserve is actively used by raptors to forage and nest. Below, spatial use, including areas of preference (if any), and how special-status raptors detected within Year 2 of the study typically used the Preserve are described. All raptor species detected on and off the Preserve, regardless of distance from observer, for each season and within the calendar year from September 2014 through August 2015 are included in Appendix E.

Results from golden eagle nesting monitoring and a comparison between Year 1 and Year 2 data are also included in this chapter.

3.1 RESULTS AND DISCUSSION OF RAPTOR FORAGING ACTIVITY

A total of 24 surveys were completed within the Preserve by AECOM and USFWS biologists during Year 2 of this study (Table 1). On May 14, 2015, the afternoon portion of the survey (NE point count station) was terminated early by 1 hour and 45 minutes due to rain that affected the ability to observe raptor species. The biologist determined that the amount of time surveyed was sufficient and a survey was not rescheduled to account for the remaining 1 hour and 45 minutes not surveyed. On June 30, 2015, the afternoon portion of the survey (SW point count station) was terminated after approximately 1 hour due to thunderstorms and intense lightening. A survey was rescheduled on July 6, 2015, to make up for the remaining 3 hours that were not surveyed at the SW point count station on June 30, 2015. A total of 13 raptor species were detected between both the NE and SW point count stations (Table 1). At the NE point count station, 12 species were identified, and at the SW point count station, 10 species were identified (Table 1). As depicted in Table 1, the number of unique raptor species was highest during the fall and winter seasons at the NE point count station, and during winter and spring seasons at the SW point count station. A list of all raptor species detected from each point count station per season is depicted in Table 2.

Of the 13 raptor species detected, five were identified as having special status by either USFWS (federally sensitive species) or the California Department of Fish and Wildlife (state sensitive species), or both: bald eagle (state endangered and fully protected; federal Bald and Golden Eagle Protection Act), golden eagle (state fully protected; federal Bald and Golden Eagle Protection Act), American peregrine falcon (*Falco peregrinus anatum*; state fully protected),

Swainson’s hawk (*Buteo swainsonii*), and northern harrier (*Circus cyaneus*; state species of special concern). Bald eagles were observed for the longest duration per survey (i.e., minutes per survey) of all raptor species (Table 2).

Table 1
Number of Surveys and Species Richness
(September 2014–August 2015)

Season	Number of Surveys ¹	Number of Distinct Species Identified	Number of Raptor Observations per Survey ²
<i>Northeast Point Count Station</i>			
Fall	6	10	4.3
Winter	6	8	5.8
Spring	5.5625	5	4.0
Summer	6	5	1.7
<i>Northeast Subtotal</i>	<i>23.5625</i>	<i>12</i>	<i>4.0</i>
<i>Southwest Point Count Station</i>			
Fall	6	4	2.5
Winter	6	7	6.7
Spring	6	7	3.2
Summer	6	6	2.7
<i>Southwest Subtotal</i>	<i>24</i>	<i>10</i>	<i>3.8</i>
Total	47.5625	13	3.9

¹Each survey was 4 hours in length with the exception of May 14, 2015, at the NE point count station when survey time was 2 hours and 15 minutes; 0.5625 represents this approximate half survey and was used for analysis calculations).

²Includes repeat observations of the same individual.

Non-special-status raptor species observed were American kestrel (*Falco sparverius*), merlin (*Falco columbarius*), prairie falcon (*Falco mexicanus*), sharp-shinned hawk (*Accipiter striatus*), Cooper’s hawk (*Accipiter cooperii*), red-shouldered hawk (*Buteo lineatus*), red-tailed hawk (*Buteo jamaicensis*), and ferruginous hawk. Red-tailed hawks were the most abundant raptor species within and adjacent to the Preserve. As such, not all observations of this species were recorded so observers could focus on recording special-status species observations. Table 2 summarizes the number of minutes each of these species was observed per survey for each point count station and season, and the minimum number of unique individuals detected of each species at each point count station and season. Non-special-status raptor species will not be discussed further in this report.

Table 2
Raptor Species Observed at Each Point Count Station (September 2014—August 2015)

Common Name	Scientific Name	Fall		Winter		Spring		Summer		Total (All Seasons)	
		Minutes of Observation per Survey ¹	Minimum Number of Individuals ²	Minutes of Observation per Survey ¹	Minimum Number of Individuals ²	Minutes of Observation per Survey ¹	Minimum Number of Individuals ²	Minutes of Observation per Survey ¹	Minimum Number of Individuals ²	Minutes of Observation per Survey ¹	Minimum Number of Individuals ²
Northeast Point Count Station											
American Kestrel	<i>Falco sparverius</i>	0.3	2	-	-	4.1	2	1.0	2	1.3	2
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	0.3	1	0.2	1	-	-	0.2	1	0.2	1
Bald Eagle	<i>Haliaeetus leucocephalus</i>	146.7	2	166.7	2	376.3	2	3.7	1	169.5	2
Ferruginous Hawk	<i>Buteo regalis</i>	14.3	3	46.8	5	-	-	-	-	15.6	5
Golden Eagle	<i>Aquila chrysaetos</i>	-	-	2.7	2	0.7	1	32.0	2	9.0	2
Merlin	<i>Falco columbarius</i>	2.5	1	-	-	-	-	-	-	0.6	1
Northern Harrier	<i>Circus cyaneus</i>	0.8	1	0.8	1	-	-	-	-	0.4	1
Prairie Falcon	<i>Falco mexicanus</i>	10.3	1	0.3	2	-	-	-	-	2.7	2
Red-shouldered Hawk	<i>Buteo lineatus</i>	5.0	1	0.2	1	-	-	-	-	1.3	1
Red-tailed Hawk	<i>Buteo jamaicensis</i>	0.2	1	0.3	2	0.5	4	1.0	1	0.5	4
Sharp-shinned Hawk	<i>Accipiter striatus</i>	0.3	1	-	-	-	-	-	-	0.1	1
Swainson's Hawk	<i>Buteo swainsoni</i>	-	-	-	-	2.7	1	-	-	0.6	1
Northeast Subtotal		180.8	Not Applicable	218.0	Not Applicable	384.4	Not Applicable	37.8	Not Applicable	201.9	Not Applicable
Southwest Point Count Station											
American Kestrel	<i>Falco sparverius</i>	10.2	1	-	-	7.5	4	42.7	4	15.1	4
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	-	-	0.5	1	-	0	1.8	1	0.6	1
Bald Eagle	<i>Haliaeetus leucocephalus</i>	1.7	2	5.0	1	-	0	-	-	1.7	2
Cooper's Hawk	<i>Accipiter cooperii</i>	-	-	-	-	0.2	1	0.7	1	0.2	1
Ferruginous Hawk	<i>Buteo regalis</i>	6.3	4	41.8	15	5.0	2	-	-	13.3	15
Golden Eagle	<i>Aquila chrysaetos</i>	-	-	12.7	3	0.7	1	1.5	1	3.7	3
Merlin	<i>Falco columbarius</i>	-	-	1.3	2	1.3	1	-	-	0.7	2
Red-shouldered Hawk	<i>Buteo lineatus</i>	-	-	0.2	1	0.3	1	-	-	0.1	1
Red-tailed Hawk	<i>Buteo jamaicensis</i>	2.5	4	0.5	5	0.2	1	1.0	2	1.0	5
Sharp-shinned Hawk	<i>Accipiter striatus</i>	-	-	-	-	-	-	0.8	1	0.2	1
Southwest Subtotal		20.7	Not Applicable	62.0	Not Applicable	15.2	Not Applicable	48.5	Not Applicable	36.6	Not Applicable
Total		100.8	Not Applicable	140.0	Not Applicable	192.8	Not Applicable	43.2	Not Applicable	118.5	Not Applicable

¹Number of minutes a raptor species was observed over all surveys in a season divided by the number of surveys that occurred in that season.

²Minimum number of individuals known to occur or use the area.

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A detailed discussion of each of the five special-status species detected on-site is provided below.

Bald Eagle

Bald eagles were detected during every season, but not every survey. Two adults (a pair) appeared present from September through May (Table 2; Figure 4). During the summer season, a non-adult bald eagle aged to be approximately 3 years old was observed during one survey flying into the Preserve and landing immediately next to the nest, and then flying off and out of the Preserve. This observation occurred once the resident adults had presumably abandoned the Preserve and the nest. There was speculation that the bald eagle pair abandoned the Preserve since they were not detected after May 28, 2015, and it was unclear if this different individual was a dispersing individual from another local bald eagle nesting location, or a wandering individual. The majority of bald eagle observations occurred at the NE point count station (Table 2; Figure 4). As depicted in Table 2 and Figure 4, bald eagles were detected every season from the NE point count station, with combined observations ranging from an average of 376 minutes per survey in the spring season to 4 minutes in the summer. At the SW point count station, bald eagles were detected only during the fall and winter seasons. Combined observations from the SW point count station ranged from 2 minutes per survey in the fall season to 5 minutes per survey in the winter season.

Approximately 0.33 mile (500 meters) southwest of the northeast survey station is a row of three eucalyptus (*Eucalyptus* sp.) trees. According to the County DPR, and surveys conducted in Year 1 of the study, this location is where bald eagles had nested the previous years (2013 and 2014), and they again successfully nested in 2015, raising two nestlings that presumably fledged. AECOM biologist Jimmy McMorran observed the nestlings on the rim of the nest stretching and exercising their wings prior to fledging; however, the adults and nestlings were not seen on subsequent surveys and successful fledging was not confirmed. On June 2, 2015, Jimmy McMorran was authorized by Joel Pagel under Mr. Pagel's Migratory Bird Permit to conduct a brief visit under the bald eagle nest and surrounding area to search for deceased or emaciated fledglings. There was no evidence of any eagles or sign of predation on the ground within this search area. The search was completed in 8 minutes. Immediately south is one lone eucalyptus tree. This tree is where both adult bald eagles spent much of the time perched during the nesting season and the remainder of the year, with the exception of the summer season.

During observations from the NE point count station, these eagles were seen several times, mainly preying on California ground squirrels (*Otospermophilus beecheyi*), and on one occasion preying on a Canada goose (*Branta canadensis*), or stealing prey from other raptors. The

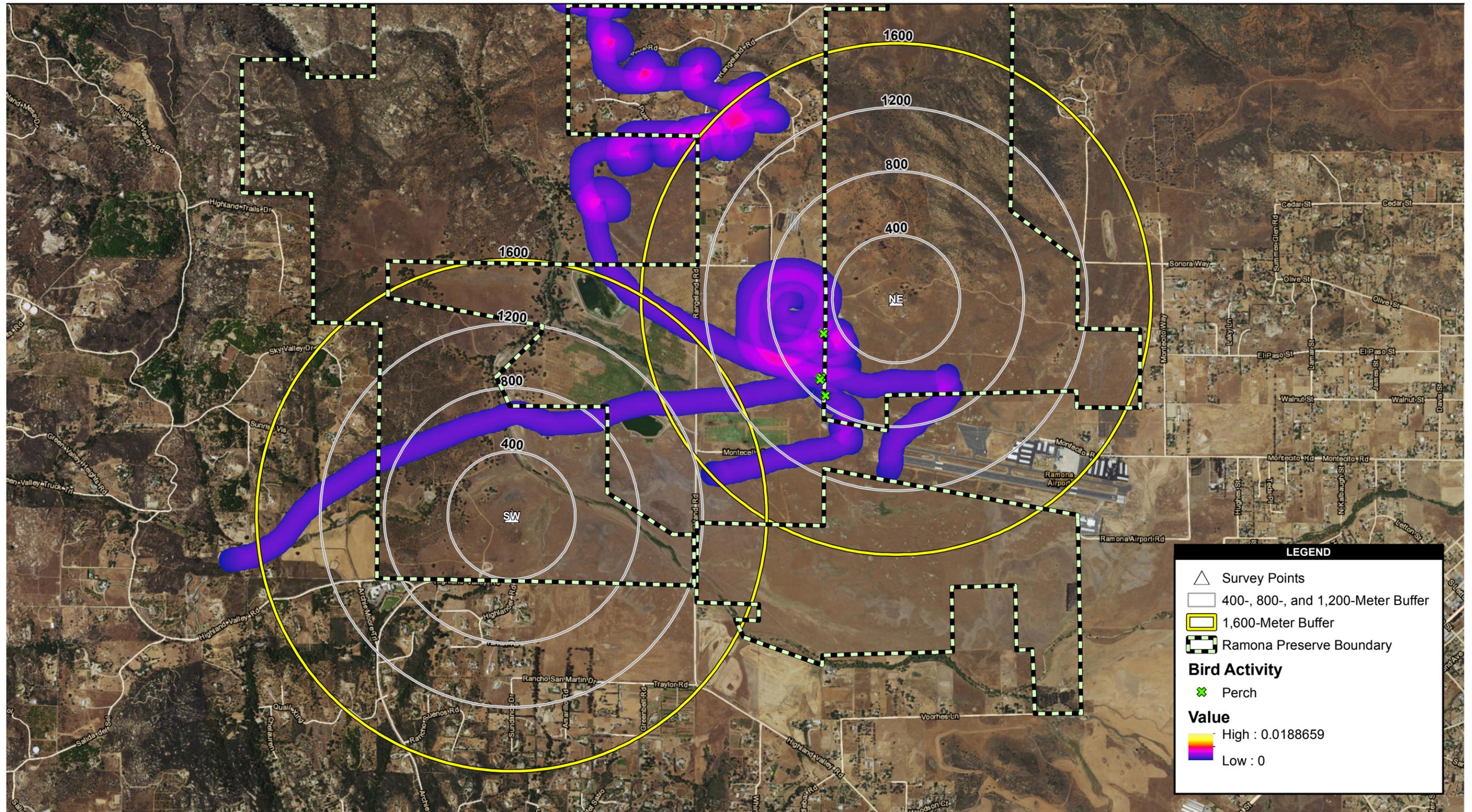
eucalyptus trees described above provided optimal perches for the eagles to scan the majority of the grasslands within the Preserve, and also nearby small reservoirs/cattle ponds where the bald eagles likely prey on waterfowl. The eagles sometimes stayed perched for the entire survey, but would also take off from the trees and ride a thermal, circle-soaring over the Preserve and adjacent lands, likely looking for prey items. The eagles were also observed perching on rocky outcrops on the mountain ridge along the north side of the NE point count station. Observations from the SW point count station were generally of the eagles in flight, or very distant near the nest, outside of the southwest survey area.

Seasonal use of the Preserve by bald eagles and an annual overview of bald eagle use of the Preserve are depicted in Figures 5a through 5e. The highest density and spatial use of the Preserve were observed from the NE point count station. The areas depicted as having high density use as observed from the SW point count station was typically when eagles were circle-soaring. Lesser density areas were observed as meandering or direct flights while bald eagles were looking for prey items. Photographs of bald eagles tending two nestlings and the non-adult, third-year bald eagle observed within the Preserve are found in Appendix F.

Golden Eagle

Golden eagles were detected every season within the Preserve with the exception of fall but were not observed during every survey (Table 2; Figure 4). The golden eagles observed were not abundant, nor did they spend much time within the Preserve. It was unknown if these golden eagle observations were of year-round residents or were migrant or wandering individuals. However, on a few occasions, a golden eagle was observed showing a tail coloration pattern consistent with one of the golden eagles known to occupy nearby Bandy Canyon. A minimum of three unique golden eagles were observed. This was determined by age and seeing more than one individual simultaneously.

As depicted in Table 2 and Figure 4, golden eagles were not detected every season from both the NE and SW point count stations. From the NE point count station, combined observations ranged from an average of 3 minutes per survey in the winter season to an average of 32 minutes per survey in the summer season. At the SW point count station, combined golden eagle observations ranged from an average of 13 minutes per survey in the winter season to an average of 2 minutes per survey in the summer season.



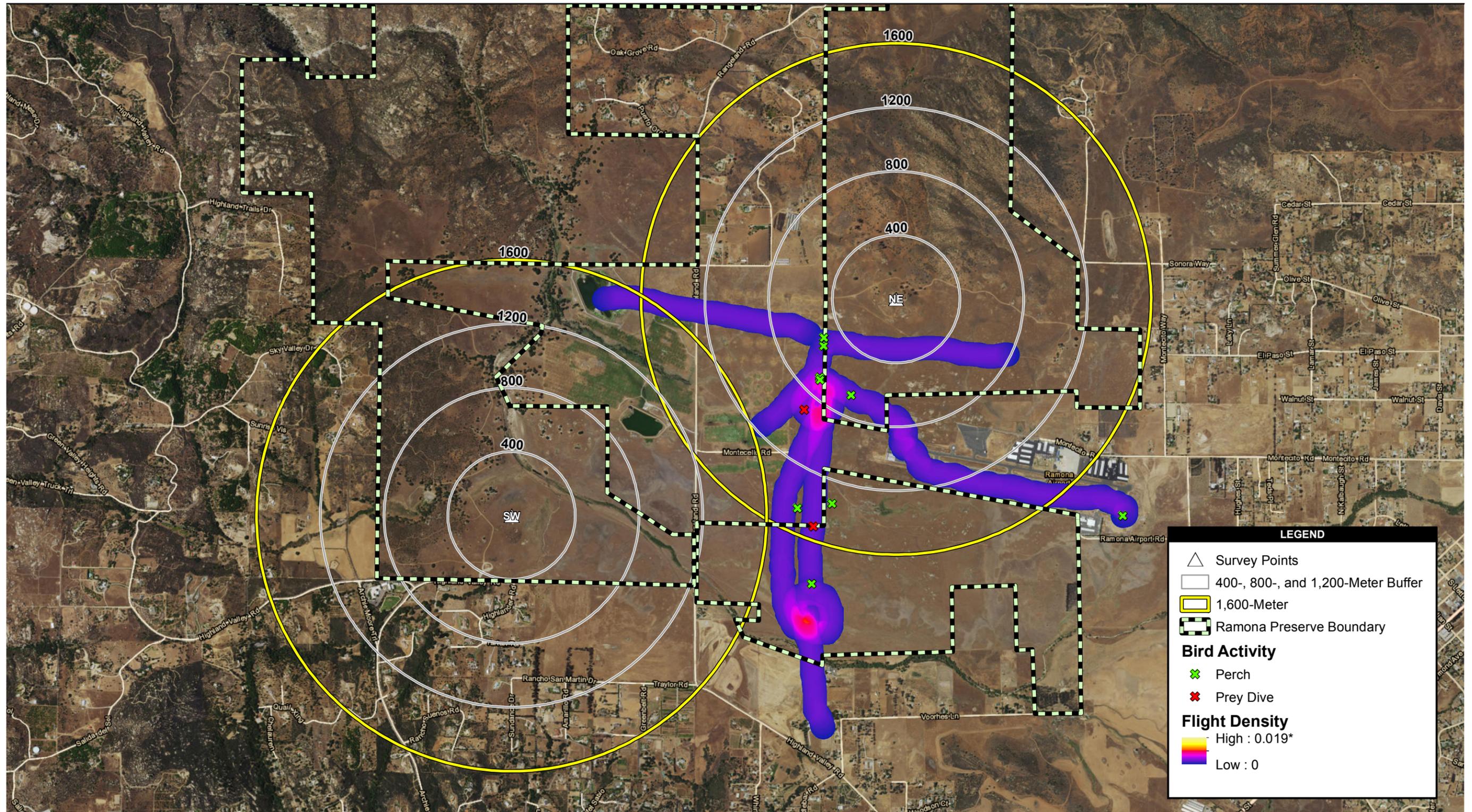
Source: Microsoft 2010



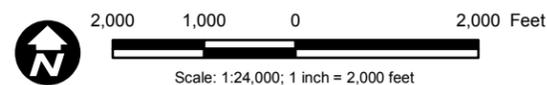
*Density units measured as linear feet per square feet within a search radius of 250 feet

Figure 5a
Fall Bald Eagle Flight Density Map

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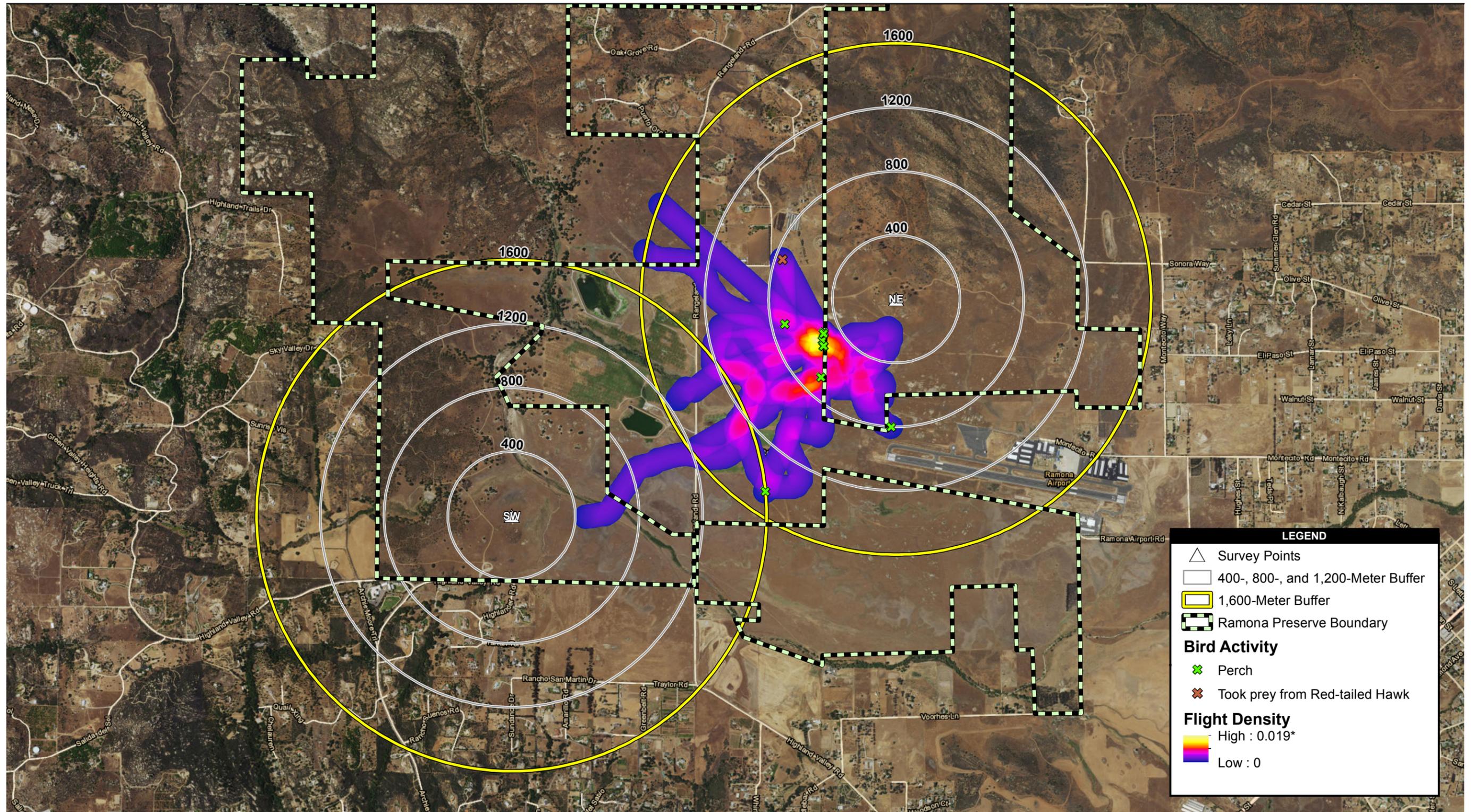
Source: Microsoft 2010



*Density units measured as linear feet per square feet within a search radius of 250 feet

Figure 5b
Winter Bald Eagle Flight Density Map

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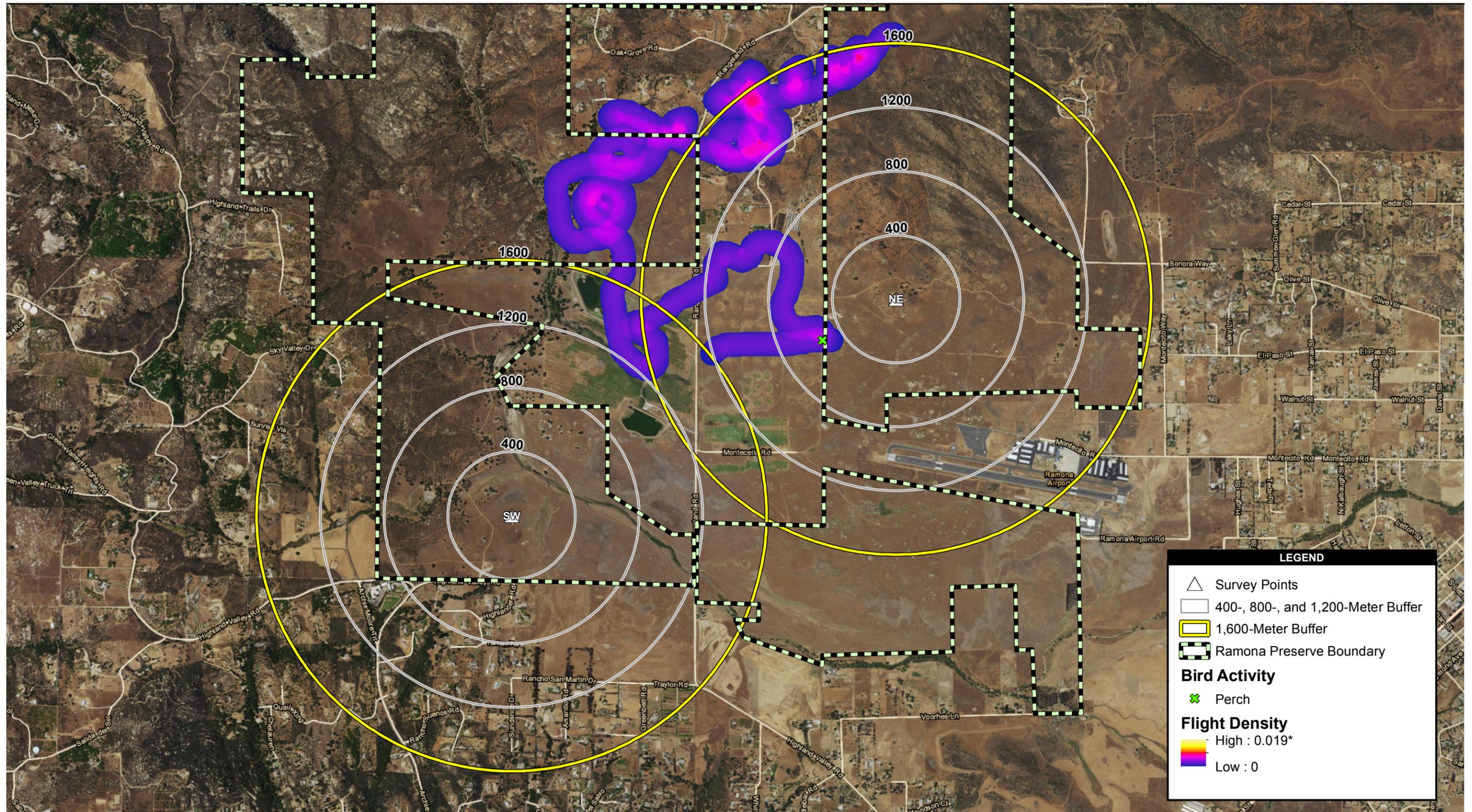


Source: Microsoft 2010
 2,000 1,000 0 2,000 Feet
 Scale: 1:24,000; 1 inch = 2,000 feet

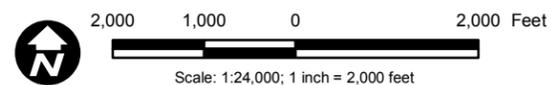
*Density units measured as linear feet per square feet within a search radius of 250 feet

Figure 5c
Spring Bald Eagle Flight Density Map

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Source: Microsoft 2010



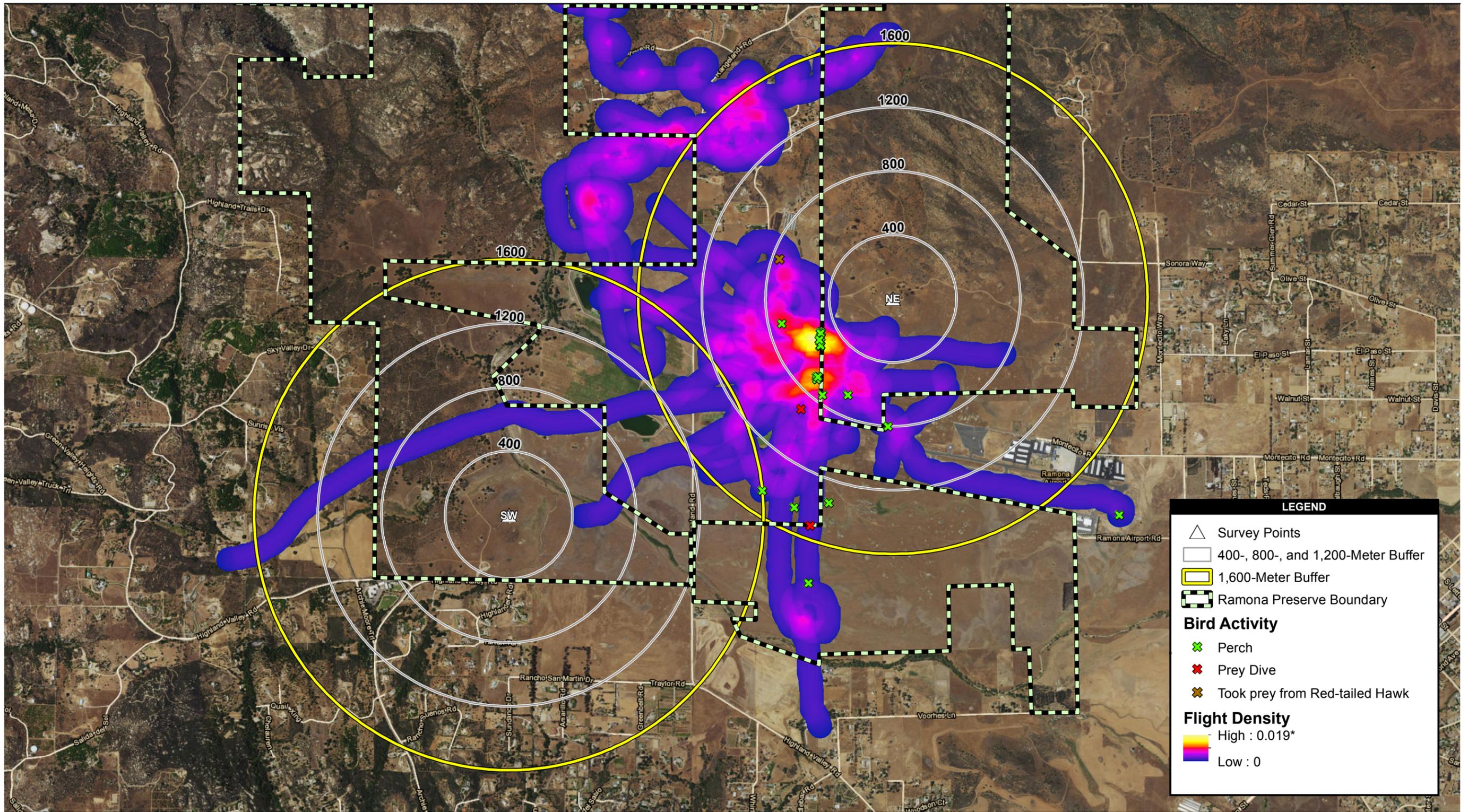
*Density units measured as linear feet per square feet within a search radius of 250 feet

LEGEND

- △ Survey Points
- 400-, 800-, and 1,200-Meter Buffer
- 1,600-Meter Buffer
- ▭ Ramona Preserve Boundary
- Bird Activity**
- ✕ Perch
- Flight Density**
- High : 0.019*
- Low : 0

Figure 5d
Summer Bald Eagle Flight Density Map

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Source: Microsoft 2010



*Density units measured as linear feet per square feet within a search radius of 250 feet

Figure 5e
Annual Bald Eagle Flight Density Map

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Golden eagles were observed perched on a couple of occasions, but observations were typically made while golden eagles were in flight as they meandered and circle-soared looking for prey throughout the grasslands and mountains within the Preserve. Occasionally, observations involved interactions between multiple golden eagles. There is no clear area of the Preserve that the golden eagles appear to favor seasonally. The seasonal use of the Preserve by golden eagles and an annual overview of golden eagle use of the Preserve are depicted in Figures 6a through 6d. As depicted, there is no clear higher density/spatial use area that the golden eagles preferred within the Preserve. The annual overview (Figure 6d) illustrates that the entire Preserve is patrolled by golden eagles that forage. Although the golden eagles are not nesting within the Preserve, there is a nest site in Bandy Canyon adjacent to the Preserve, and these golden eagles are likely using the Preserve for foraging purposes only (see also Section 3.2).

After completing Year 2 surveys, it is clear that golden eagles use the entire Preserve to forage. Obtaining more data in Year 3 of this study may help to further clarify where golden eagles prefer to forage seasonally.

With the ongoing drought conditions in California, the Preserve may not have been as active with raptor activity due to the lesser quantities of prey items. Therefore, accurate recommendations cannot be made until future surveys are completed. Of note, periodic winter and spring weather events did provide much needed rain, and it was visually clear that prey abundance increased and stabilized throughout the remainder of Year 2. However, this prey abundance increase was not evident during fall and winter when many migratory/dispersing raptors would have passed through the Preserve in search of prey abundance to regularly forage, and therefore passing by or using a wider area to forage rather than concentrating within the Preserve.

American Peregrine Falcon

American peregrine falcons were detected during all seasons within the Preserve except spring but were not observed during every survey (Table 2). The number of unique individuals observed is unknown; however, at least three individuals were present. These individuals were determined to be unique individuals by age. Considering peregrine falcons were observed during three of the four seasons, some observations were likely of year-round residents breeding nearby in San Diego County, and other observations could have included migrating individuals. Peregrine falcon was observed from the NE point count station in all seasons with the exception of the spring season. These observations ranged from less than 1 minute and no greater than 2 minutes from the NE point count station. Peregrine falcon was observed from the SW point

count station only in winter and summer. At the SW point count station, peregrine falcon observations ranged from 1-minute observations in the fall season to less than 1-minute observations during the winter and summer.

Observations of this species were generally brief, as they typically flew with a direct, powerful flight. Peregrine falcons were also observed catching thermals and circle-soaring high into the sky. This is an approach used to locate prey items and then swoop down at very high speeds. Peregrine falcons generally prey on a wide variety of avian species, including waterfowl, seabirds, pigeons, and songbirds. The Preserve has reservoir/cattle ponds that attract a variety of waterfowl, and the remainder of the Preserve has an abundance of other preferred prey items. An adult peregrine falcon was observed unsuccessfully hunting killdeer (*Charadrius vociferus*) from the NE point count station. A juvenile peregrine falcon was observed unsuccessfully hunting tricolored blackbirds (*Agelaius tricolor*; CDFW species of special concern) and Brewer's blackbirds (*Euphagus cyanocephalus*) from the NE point count station.

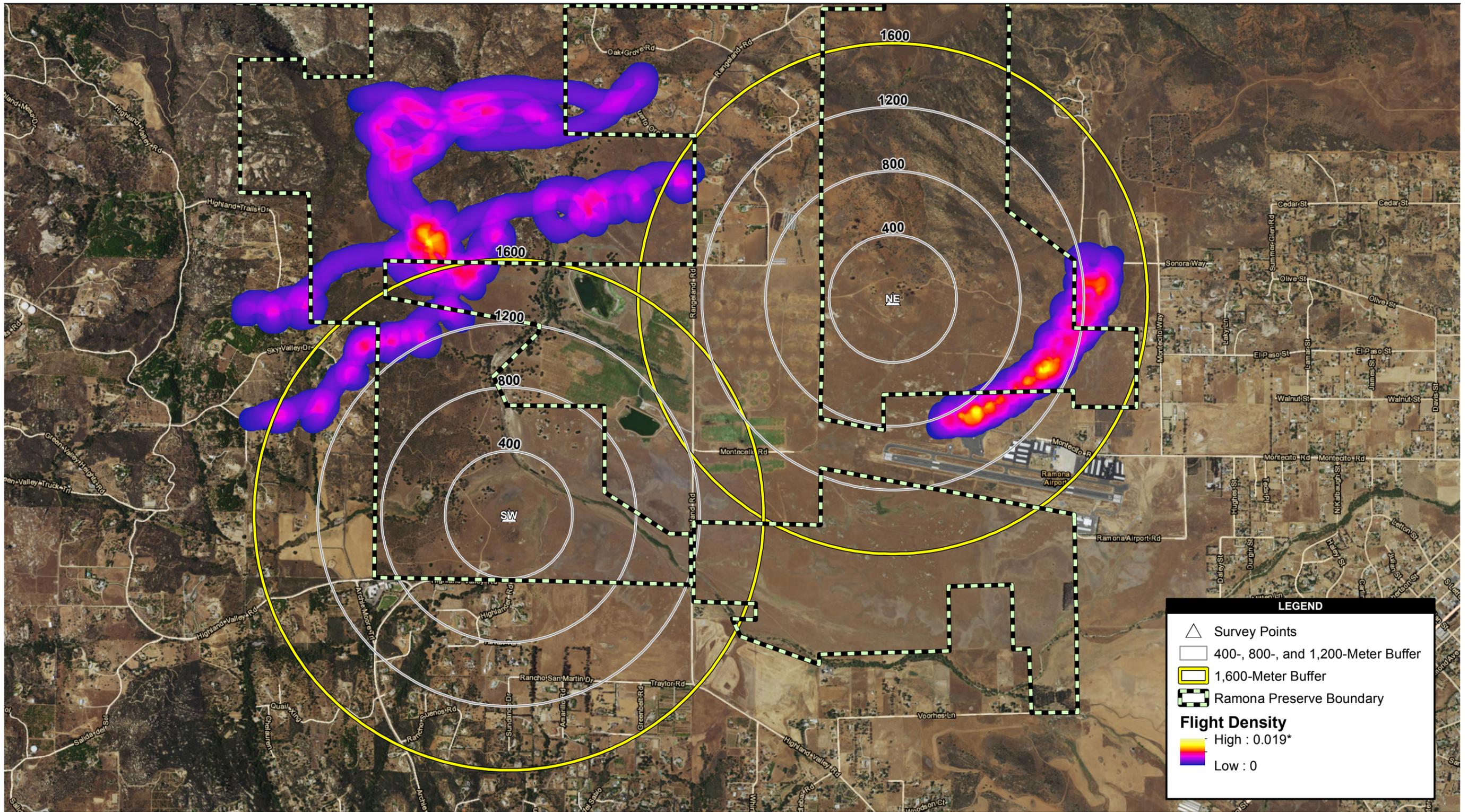
The seasonal use and an annual overview of use of the Preserve by peregrine falcons are depicted in Figures 7a through 7d. As depicted, there is no clear higher density/spatial use area that the falcons preferred within the Preserve.

After completing Year 2 surveys, due to the lack of a robust dataset on peregrine falcon within the Preserve, there are no recommendations for areas to avoid within the Preserve. Although the current and ongoing drought conditions in California may have an effect on prey abundance such as rabbits, squirrels, and rodents, grassland birds remain abundant and provide a great quantity of prey for peregrine falcon to pursue.

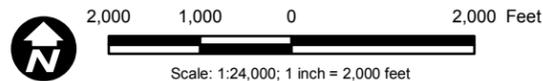
Swainson's Hawk

Swainson's hawk, once a common breeder in San Diego County in the early 20th century, no longer breeds in southern California. Over most of San Diego County, Swainson's hawk is now a rare migrant, but the Borrego Valley is an important staging site in spring (Unitt 2004)..

Swainson's hawk was detected only one time during the spring season (Table 2). The individual Swainson's hawk was observed from the NE point count station and appeared to be an immature (intermediate morph) hawk that was using the Preserve as stopover habitat during its migration. The observation time of this Swainson's hawk was approximately 15 minutes This Swainson's



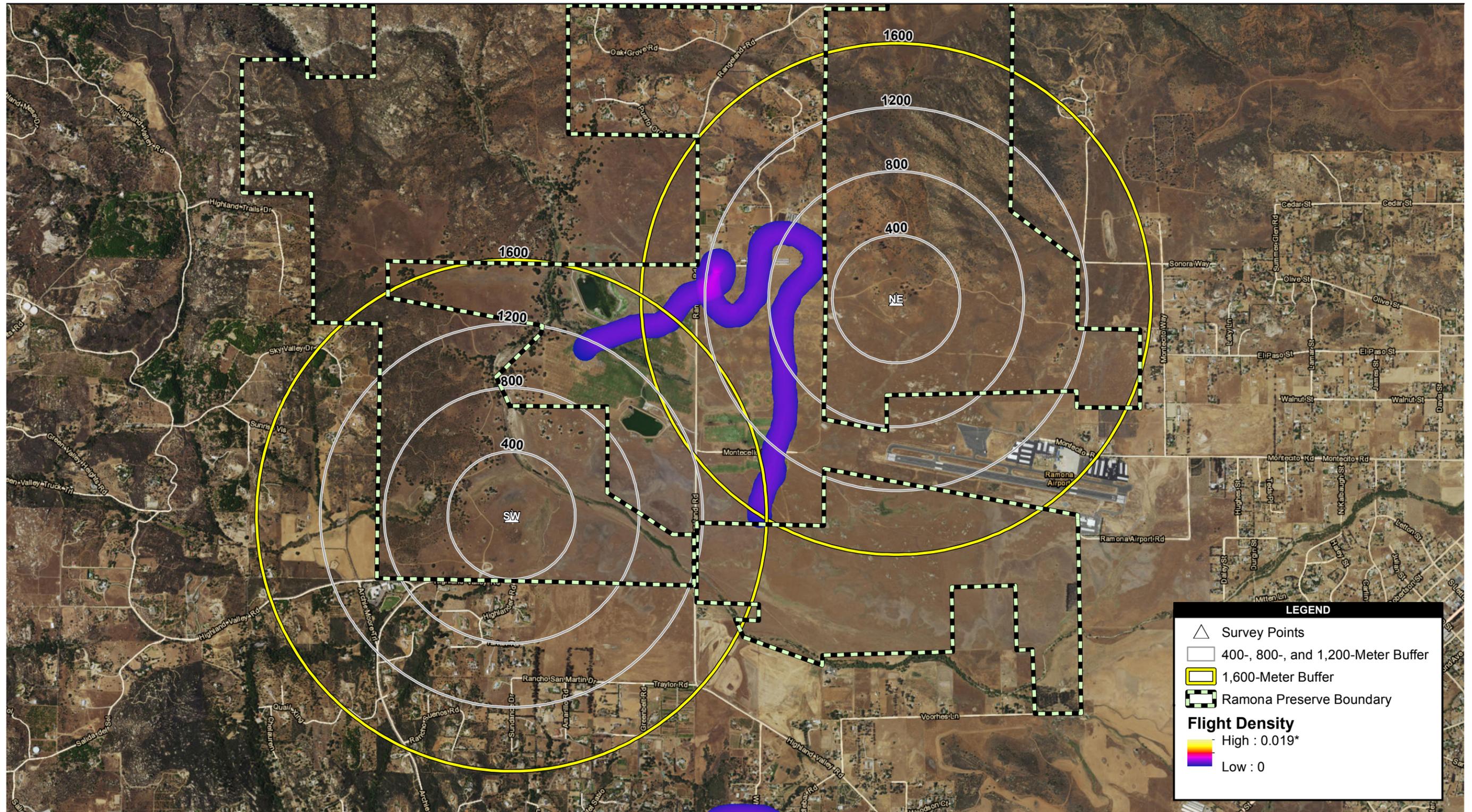
Source: Microsoft 2010



*Density units measured as linear feet per square feet within a search radius of 250 feet

Figure 6a
Winter Golden Eagle Flight Density Map

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LEGEND

- △ Survey Points
- 400-, 800-, and 1,200-Meter Buffer
- 1,600-Meter Buffer
- ▬ Ramona Preserve Boundary
- Flight Density**
- High : 0.019*
- Low : 0

Source: Microsoft 2010

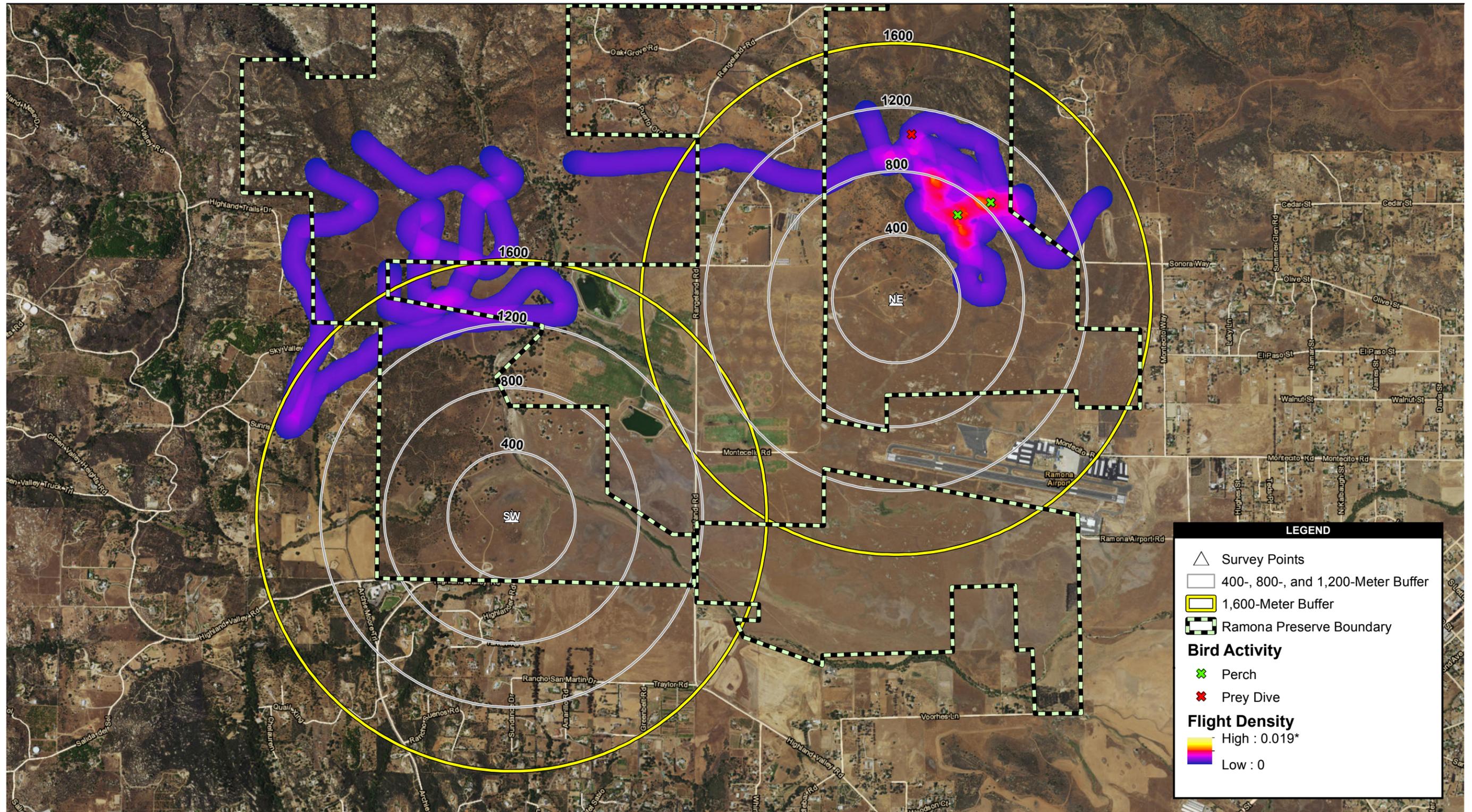
2,000 1,000 0 2,000 Feet

Scale: 1:24,000; 1 inch = 2,000 feet

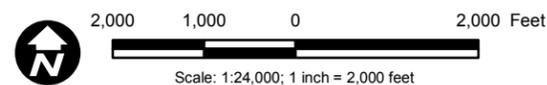
*Density units measured as linear feet per square feet within a search radius of 250 feet

Figure 6b
Spring Golden Eagle Flight Density Map

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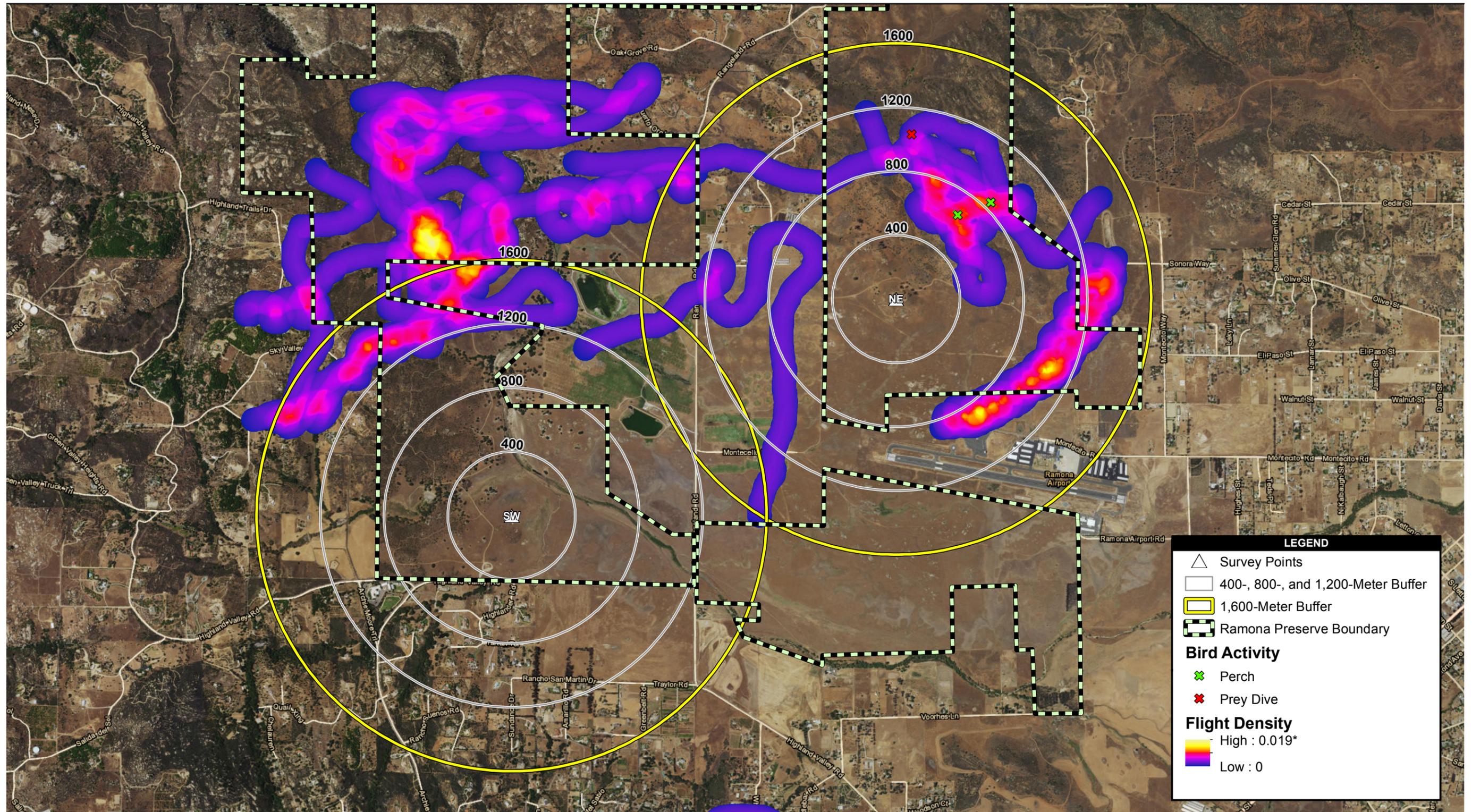
Source: Microsoft 2010



*Density units measured as linear feet per square feet within a search radius of 250 feet

Figure 6c
Summer Golden Eagle Flight Density Map

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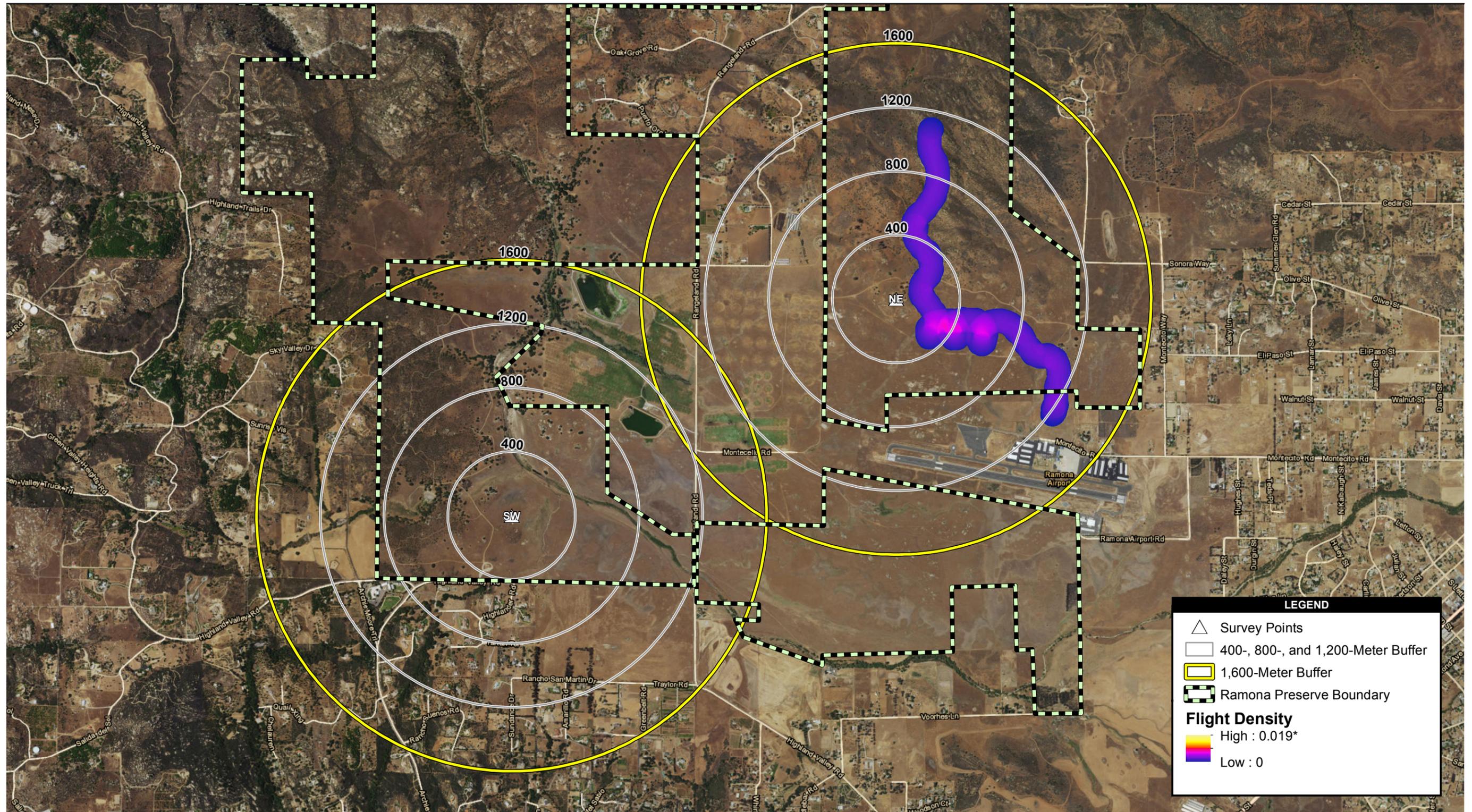
Source: Microsoft 2010



*Density units measured as linear feet per square feet within a search radius of 250 feet

Figure 6d
Annual Golden Eagle Flight Density Map

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LEGEND

- △ Survey Points
- 400-, 800-, and 1,200-Meter Buffer
- 1,600-Meter Buffer
- ▬ Ramona Preserve Boundary

Flight Density

High : 0.019*
 Low : 0

Source: Microsoft 2010

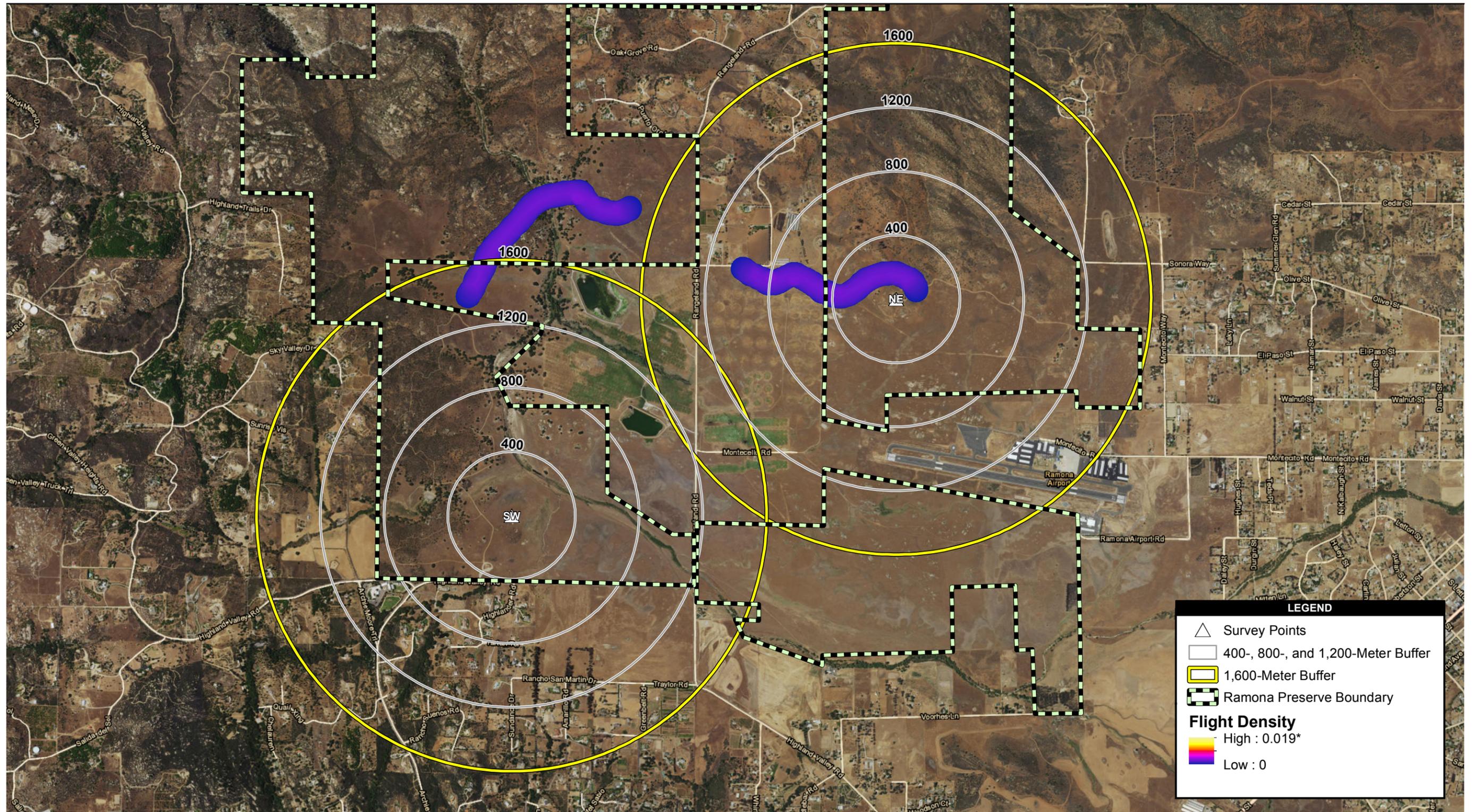
2,000 1,000 0 2,000 Feet

Scale: 1:24,000; 1 inch = 2,000 feet

*Density units measured as linear feet per square feet within a search radius of 250 feet

Figure 7a
Fall American Peregrine Falcon Flight Density Map

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LEGEND

- △ Survey Points
- 400-, 800-, and 1,200-Meter Buffer
- 1,600-Meter Buffer
- ▬ Ramona Preserve Boundary

Flight Density

High : 0.019*

Low : 0

Source: Microsoft 2010

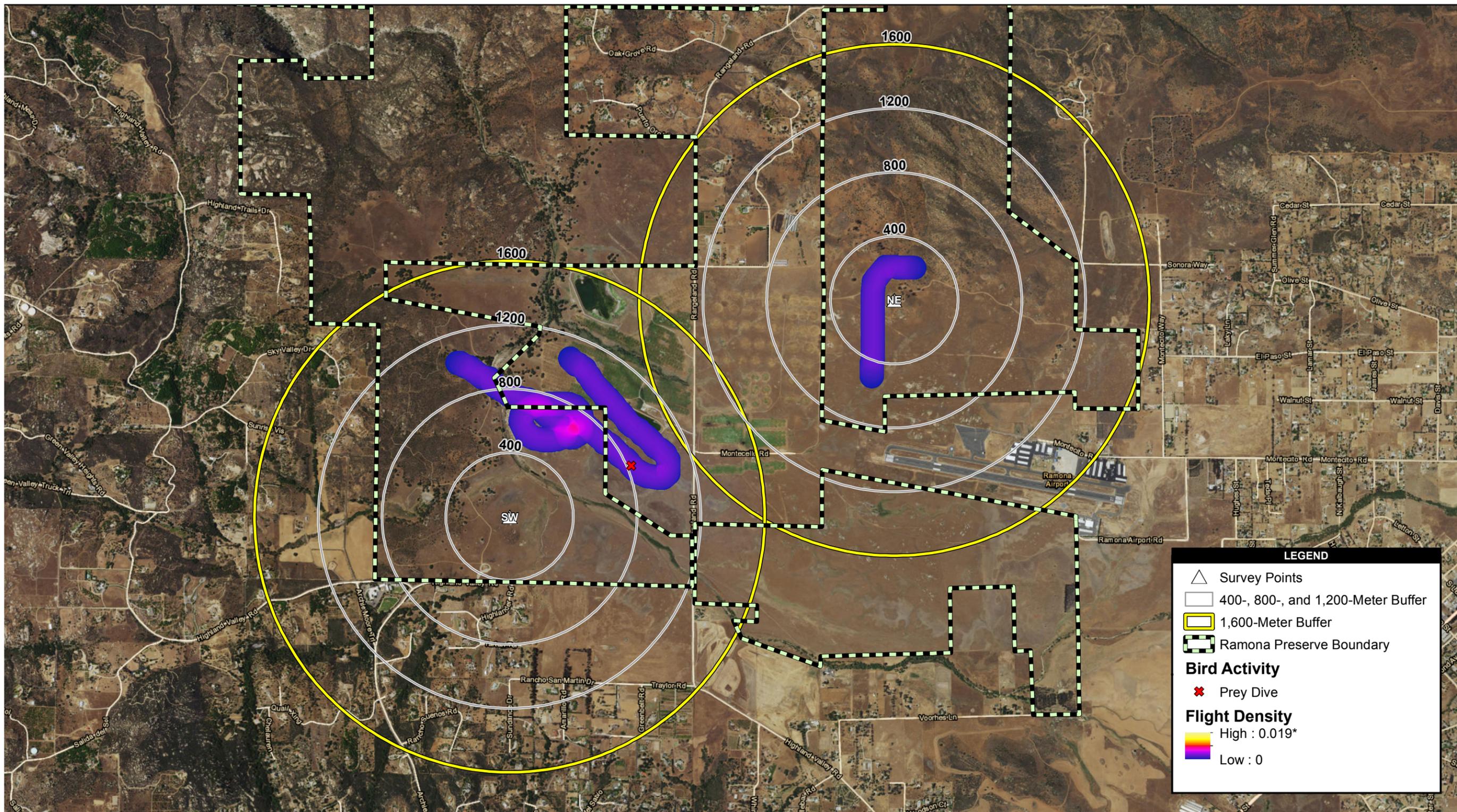
2,000 1,000 0 2,000 Feet

Scale: 1:24,000; 1 inch = 2,000 feet

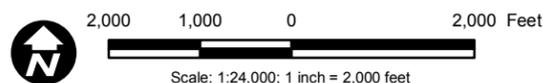
*Density units measured as linear feet per square feet within a search radius of 250 feet

Figure 7b
Winter American Peregrine Falcon Flight Density Map

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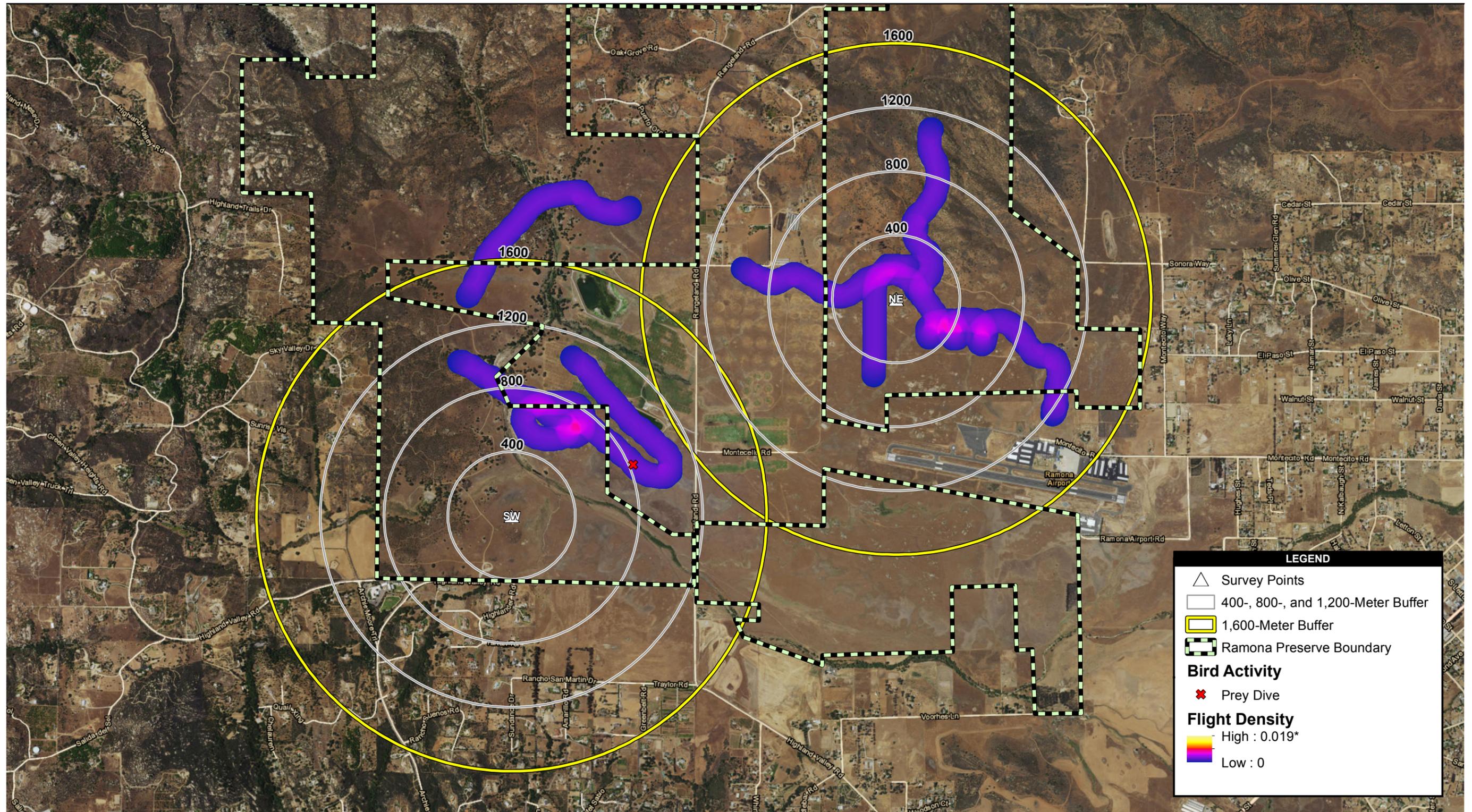
Source: Microsoft 2010



*Density units measured as linear feet per square feet within a search radius of 250 feet

Figure 7c
Summer American Peregrine Falcon Flight Density Map

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*Density units measured as linear feet per square feet within a search radius of 250 feet

Figure 7d
Annual American Peregrine Falcon Flight Density Map

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hawk was first observed flying up toward the NE point count station, flying directly by the observer and perching in a eucalyptus tree approximately 0.2 mile north of the point count station. Minutes later, the hawk flew directly toward the point count station catching a thermal off of the hillside and eventually gaining altitude and flying north continuing its migration. The seasonal use and an annual overview of use of the Preserve by Swainson's hawk are depicted in Figures 8a and 8b. As depicted, there is no clear higher density/spatial use area that the hawk preferred within the Preserve.

After completing Year 2 surveys, and due to the rarity of this species, there are no recommendations for areas to avoid within the Preserve for this species.

Northern Harrier

Northern harriers were detected two times, once during the fall season and once during the winter season (Table 2). Northern harrier was detected only from the NE point count station, for approximately 5 minutes on both observations.

Northern harriers typically favor grassland and marsh habitats. Generally, they are seen flying low over the habitat; however, they do circle-soar and meander higher in the sky. Observations within the Preserve were of northern harriers flying low over the grasslands and also gaining altitude while circle-soaring. These northern harriers were actively foraging when observed, but no successful attempts to capture prey items were observed. The Preserve has extensive grasslands for northern harriers to forage and nest. However, northern harriers are ground-nesters, and the cattle roaming and grazing throughout the Preserve may hinder the chances of successful nesting. With the general absence of this species throughout Year 2, northern harrier was a rare observation, and the lack of any detections during the spring and summer seasons indicates that this species did not nest within the Preserve in 2015. It is possible that the extreme drought in California has affected and limited prey availability for northern harrier within the Preserve.

The seasonal use of northern harrier and an annual overview of northern harrier usage of the Preserve are depicted in Figures 9a through 9c. As depicted, there is no clear higher density/spatial use area that northern harriers preferred within the Preserve.

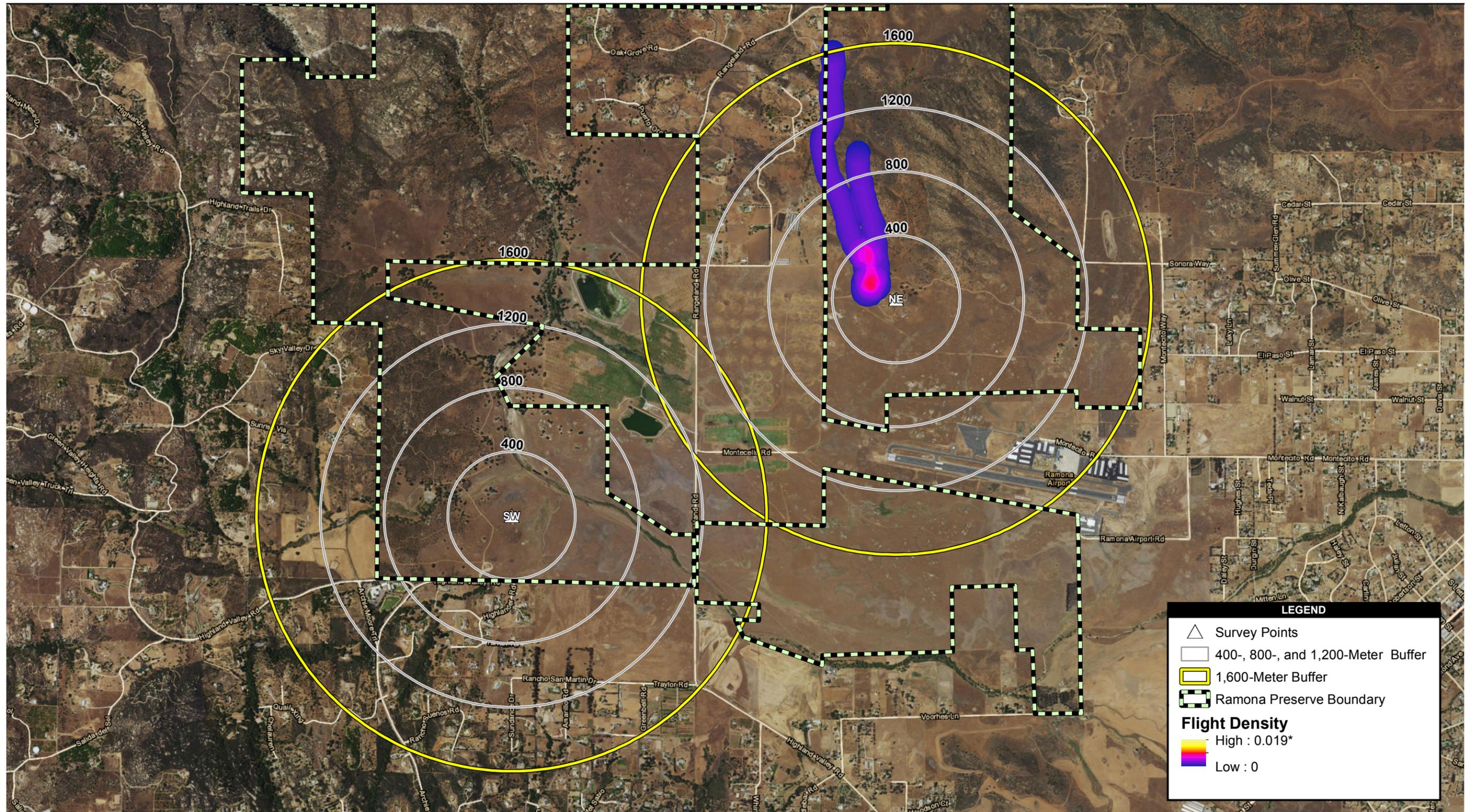
After completing Year 2 surveys, due the lack of a robust dataset on northern harrier, there are no recommendations for areas to avoid within the Preserve. The Preserve has extensive suitable habitat for northern harrier, but drought conditions may have limited raptor activity due to lesser

quantities of prey. Therefore, accurate recommendations cannot be made until future surveys are completed.

3.2 GOLDEN EAGLE NEST MONITORING RESULTS AND DISCUSSION

Two separate monitoring surveys were conducted by AECOM in Bandy Canyon. The first monitoring survey occurred on January 15, 2015, from 9:00 a.m. to 1:00 p.m. During this survey, a single subadult/adult golden eagle was observed at 11:30 a.m. flying toward the canyon from the east. It perched on a large rocky outcrop on the southeastern edge of the canyon. At 11:42 a.m., the golden eagle took flight circling several times over the area where it had perched and eventually landed back on the same rocky outcrop. The golden eagle appeared to have a crop (an expanded, muscular pouch near the gullet or throat used to store food prior to digestion) indicating it had recently fed on a prey item. The golden eagle remained stationary for the remainder of the survey. Several old nests were dispersed throughout this cliff face, so it was unclear which, if any, of the nests were currently active. No confirmed active nesting activity was observed.

The second monitoring survey occurred on March 21, 2015, from 9:15 a.m. to 12:15 p.m. USFWS biologist Joel Pagel assisted AECOM biologist Jimmy McMorran on the survey. During this survey, the biologists scanned the entire north-facing cliff face (where visible) and all of the older nests on the cliff face. No golden eagles were detected. At 11:58 a.m., a subadult golden eagle was observed flying in the canyon from the west, then circling in front of the cliff face and landing on a grassy ledge on the cliff in shade. At 12:05 p.m., the golden eagle flew from the perch, stooping northeast down into the canyon and out of view for the remainder of the survey. Several old nests were dispersed throughout this cliff face, so it was unclear which, if any of the nests were currently active. No confirmed active nesting activity was observed.

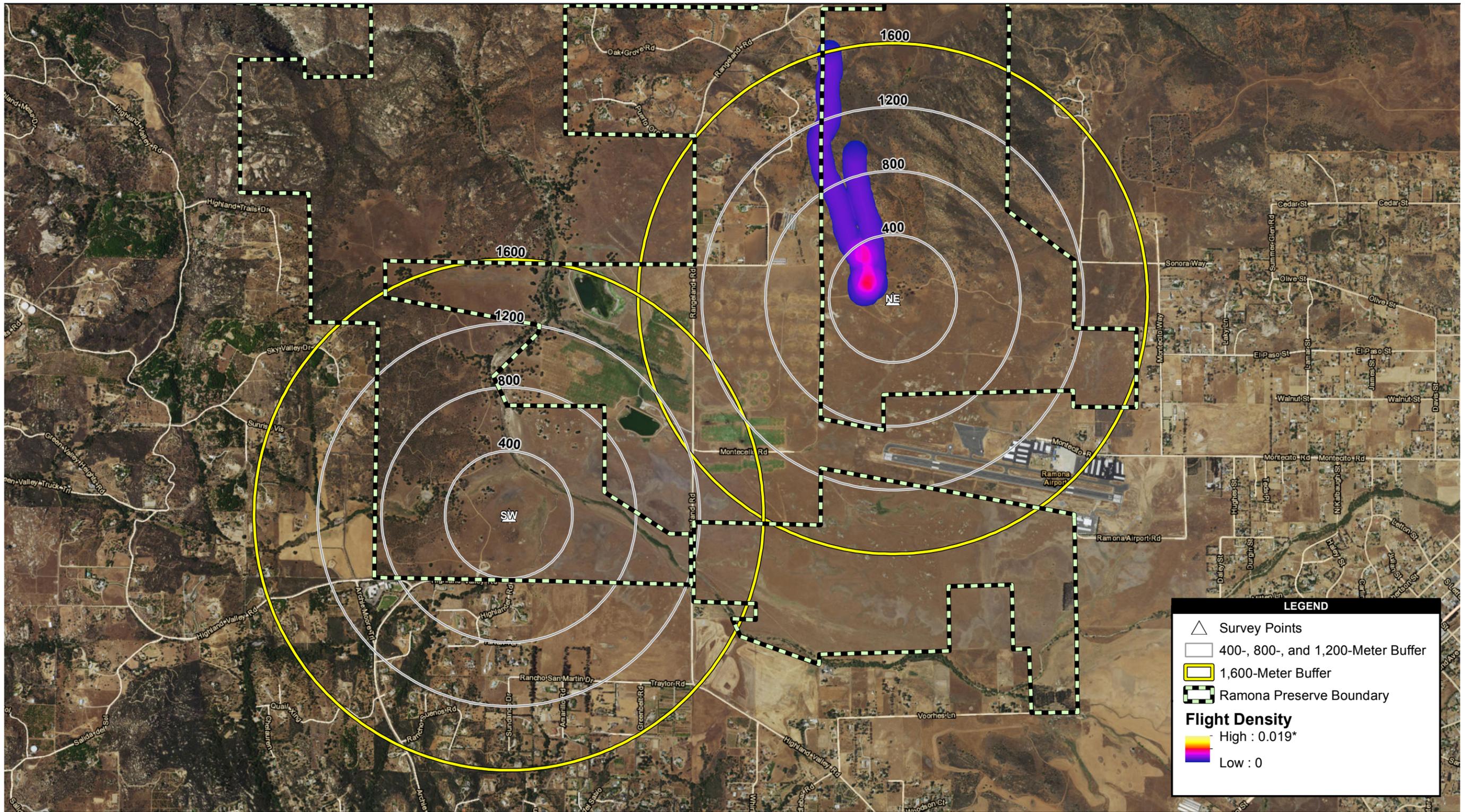


Source: Microsoft 2010
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 Scale: 1:24,000; 1 inch = 2,000 feet

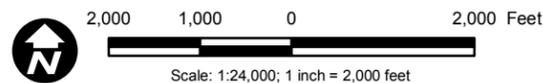
*Density units measured as linear feet per square feet within a search radius of 250 feet

Figure 8a
 Spring Swainson's Hawk Flight Density Map

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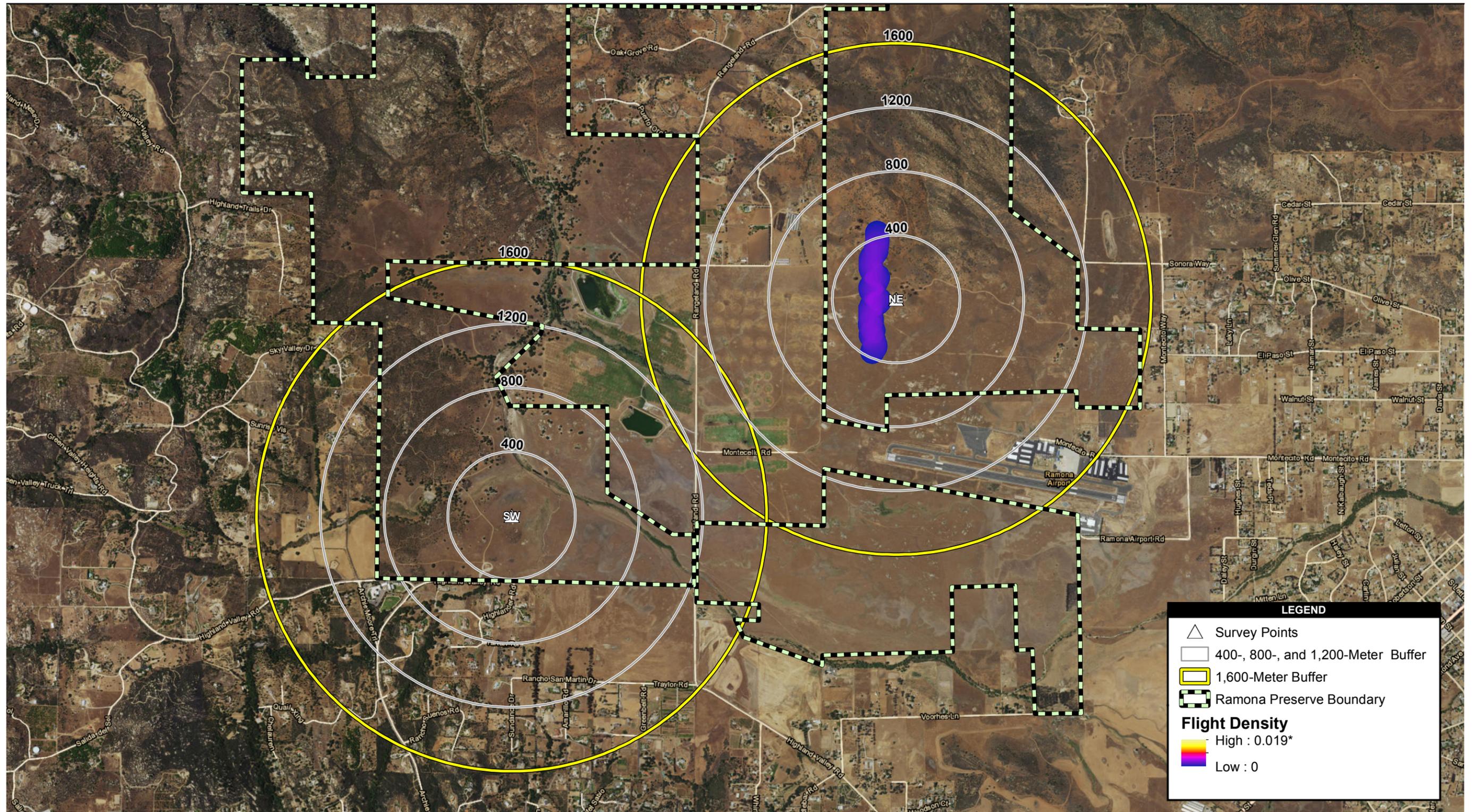
Source: Microsoft 2010



*Density units measured as linear feet per square feet within a search radius of 250 feet

Figure 8b
Annual Swainson's Hawk Flight Density Map

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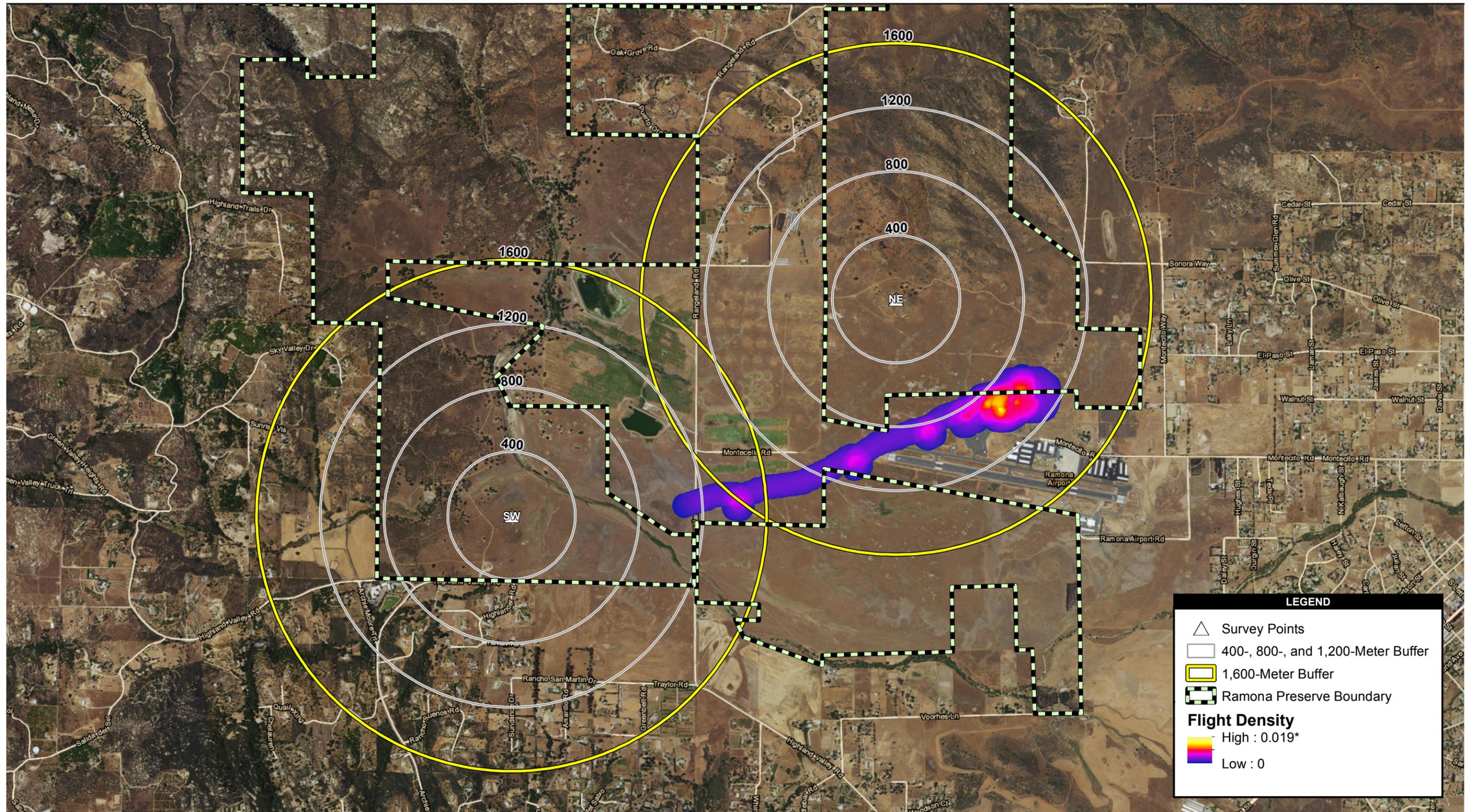
Source: Microsoft 2010



*Density units measured as linear feet per square feet within a search radius of 250 feet

Figure 9a
Fall Northern Harrier Flight Density Map

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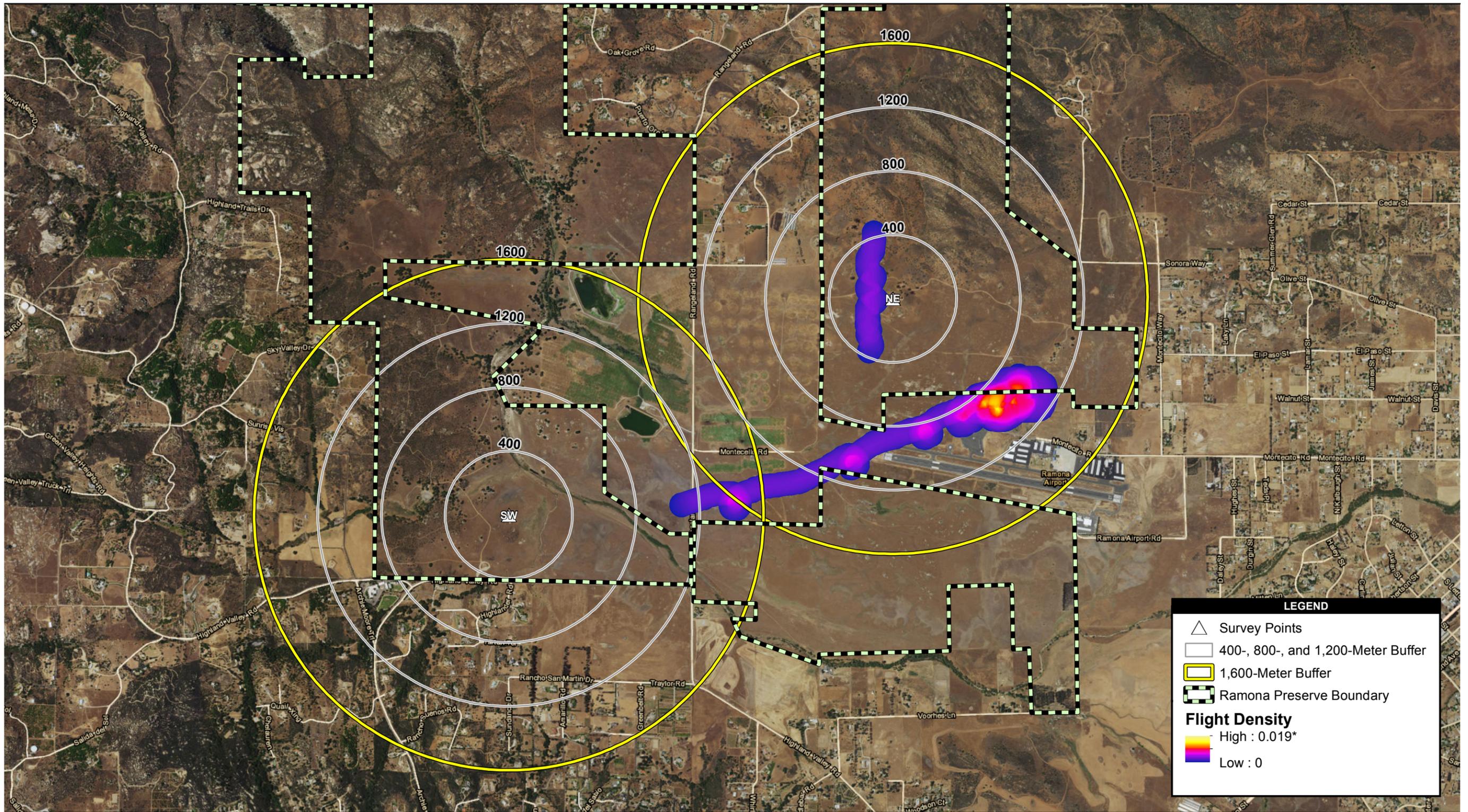
Source: Microsoft 2010



*Density units measured as linear feet per square feet within a search radius of 250 feet

Figure 9b
Winter Northern Harrier Flight Density Map

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Source: Microsoft 2010



*Density units measured as linear feet per square feet within a search radius of 250 feet

Figure 9c
Annual Northern Harrier Flight Density Map

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Therefore, it is only known that golden eagle individuals occupy this area for roosting and foraging. No other nest monitoring surveys were conducted by AECOM. Photographs of the OP are depicted in Appendix G.

With the current drought conditions in California, the golden eagles at Bandy Canyon may not have chosen to nest in 2015 due to the lesser quantities of prey items. Obtaining more data in Year 3 of this study may help to clarify whether Bandy Canyon will continue to be an active nest site. The results of the monitoring surveys indicate that Bandy Canyon is occupied by golden eagles and is a sensitive area for the species and nesting.

3.3 COMPARISON OF YEAR 1 AND YEAR 2 DATA

With Year 2 of the 3-Year Study complete, Tables 3 and 4 provide a comparison of data collected from Year 1 and 2, from September 2013 through August 2015. Unique raptor species observed at each point count station, and the average time observed per season for Years 1 and 2 are included in Table 3. The number of surveys completed per season; species richness, including the number of distinct raptor species identified; and number of raptor observations per survey for Year 1 and Year 2 are included in Table 4. In general, the results varied minimally between the 2 years with the exception of bald eagle. This may be indicative of the ongoing drought season California is currently experiencing. It is expected to be an El Nino year and a wet winter in late 2015 and in early 2016. If this occurs, survey results and data analysis from Year 3 may provide noticeable differences due to prey abundance and availability.

As described and illustrated earlier in Chapter 3, bald and golden eagles are present within the Preserve. The minutes of observations of both species from both point count survey stations, per season, for both years are depicted in Figure 10. The most notable change occurred in the summer season of Year 2. During that season is when the bald eagles were no longer consistently occupying the Preserve, and golden eagles began to reoccupy the Preserve with more frequency and duration. Observation minutes in Year 2 were also higher in fall, winter, and spring. This is most likely because, in Year 2, bald eagles were observed together for extended periods of time.

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Table 3
Raptor Species Observed at Each Point Count Station (September 2013–August 2015)

Common Name	Scientific Name	Fall		Winter		Spring		Summer		Total (All Seasons)	
		Year 1 - Minutes of Observation per Survey ¹	Year 2 - Minutes of Observation per Survey ¹	Year 1 - Minutes of Observation per Survey ¹	Year 2 - Minutes of Observation per Survey ¹	Year 1 - Minutes of Observation per Survey ¹	Year 2 - Minutes of Observation per Survey ¹	Year 1 - Minutes of Observation per Survey ¹	Year 2 - Minutes of Observation per Survey ¹	Year 1 - Minutes of Observation per Survey ¹	Year 2 - Minutes of Observation per Survey ¹
Northeast Point Count Station											
American Kestrel	<i>Falco sparverius</i>	0.5	0.3	1.2	-	0.3	4.1	2.6	1.0	1.1	1.3
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	0.3	0.3	-	0.2	-	-	-	0.2	-	0.2
Bald Eagle	<i>Haliaeetus leucocephalus</i>	66.0	146.7	116.0	166.7	128.0	376.3	209.6	3.7	132.2	169.5
Cooper's Hawk	<i>Accipiter cooperii</i>	1.3		-		0.2		0.4		0.4	
Ferruginous Hawk	<i>Buteo regalis</i>	28.8	14.3	12.5	46.8	0.2	-	-	-	9.1	15.6
Golden Eagle	<i>Aquila chrysaetos</i>	8.8	-	0.3	2.7	0.2	0.7	4.0	32.0	2.8	9.0
Merlin	<i>Falco columbarius</i>	-	2.5	0.2	-	0.8	-	-	-	0.3	0.6
Northern Harrier	<i>Circus cyaneus</i>	0.3	0.8	0.7	0.8	-	-	-	-	0.2	0.4
Prairie Falcon	<i>Falco mexicanus</i>	5.3	10.3	3.0	0.3	0.2	-	0.2	-	2.0	2.7
Red-Shouldered Hawk	<i>Buteo lineatus</i>	-	5.0	-	0.2	-	-	0.2	-	-	1.3
Red-Tailed Hawk	<i>Buteo jamaicensis</i>	15.0	0.2	0.5	0.3	0.2	0.5	-	1.0	3.0	0.5
Rough-Legged Hawk	<i>Buteo lagopus</i>	-		0.3		-		-		0.1	
Sharp-Shinned Hawk	<i>Accipiter striatus</i>	1.5	0.3	-	-	-	-	-	-	0.3	0.1
Swainson's Hawk	<i>Buteo swainsoni</i>		-		-		2.7		-		0.6
Northeast Subtotal		127.5	180.8	134.7	218.0	130.0	384.4	217.0	37.8	151.6	201.9
Southwest Point Count Station											
American Kestrel	<i>Falco sparverius</i>	7.8	10.2	1.8	-	20.3	7.5	-	42.7	7.8	15.1
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	1.3	-	0.3	0.5	-	-	0.6	1.8	0.5	0.6
Bald Eagle	<i>Haliaeetus leucocephalus</i>	3.8	1.7	17.2	5.0	18.3	-	-	-	12.0	1.7
Cooper's Hawk	<i>Accipiter cooperii</i>	0.8	-	-	-	0.3	0.2	-	0.7	0.2	0.2
Ferruginous Hawk	<i>Buteo regalis</i>	4.8	6.3	6.7	41.8	-	5.0	-	-	2.8	13.3
Golden Eagle	<i>Aquila chrysaetos</i>	45.3	-	1.7	12.7	1.3	0.7	4.0	1.5	10.4	3.7
Merlin	<i>Falco columbarius</i>	-	-	0.3	1.3	-	1.3	-	-	0.1	0.7
Northern Harrier	<i>Circus cyaneus</i>	0.3		-		-		-		-	
Prairie Falcon	<i>Falco mexicanus</i>	1.3		0.3		0.2		1.6		0.8	
Red-Shouldered Hawk	<i>Buteo lineatus</i>	0.3	-	-	0.2	2.0	0.3	0.2	-	0.7	0.1
Red-Tailed Hawk	<i>Buteo jamaicensis</i>	8.0	2.5	28.8	0.5	0.3	0.2	2.0	1.0	10.3	1.0
Sharp-Shinned Hawk	<i>Accipiter striatus</i>		-		-		-		0.8		0.2
Southwest Subtotal		79.3	20.7	57.2	62.0	42.8	15.2	8.4	48.5	45.7	36.6
Total		103.4	100.8	95.9	140.0	86.4	192.8	112.7	43.2	98.6	118.5

¹ Number of minutes a raptor species was observed over all surveys in a season divided by the number of surveys that occurred in that season.

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Table 4
Number of Surveys and Species Richness
(September 2013–August 2015)

Season	Number of Surveys ¹	Number of Distinct Species Identified	Number of Raptor Observations per Survey ²
<i>Northeast Point Count Station</i>			
Year 1 – Fall	4	10	8.3
Year 1 –Winter	6	9	6.7
Year 1 –Spring	6	8	3.0
Year 1 –Summer	5	6	4.4
<i>Year 1– Northeast Subtotal</i>	<i>21</i>	<i>13</i>	<i>5.4</i>
Year 2 – Fall	6	10	4.3
Year 2 –Winter	6	8	5.8
Year 2 –Spring	5.5625	5	4.0
Year 2 –Summer	6	5	1.7
<i>Year 2 – Northeast Subtotal</i>	<i>23.5625</i>	<i>12</i>	<i>4.0</i>
<i>Southwest Point Count Station</i>			
Year 1 – Fall	4	10	9.5
Year 1 –Winter	6	8	3.8
Year 1 –Spring	6	7	2.3
Year 1 –Summer	5	5	1.6
<i>Year 1– Southwest Subtotal</i>	<i>21</i>	<i>11</i>	<i>4.0</i>
Year 2 – Fall	6	4	2.5
Year 2 –Winter	6	7	6.7
Year 2 –Spring	6	7	3.2
Year 2 –Summer	6	6	2.7
<i>Year 2 – Southwest Subtotal</i>	<i>24</i>	<i>10</i>	<i>3.8</i>
Year 1 – Total	42	13	4.7
Year 2 – Total	47.5625	13	3.9

¹Each survey was 4 hours in length with the exception of May 14, 2015, at the NE point count station when survey time was 2 hours and 15 minutes (0.5625 represents this approximate half survey and was used for analysis calculations).

²Includes repeat observations of the same individual.

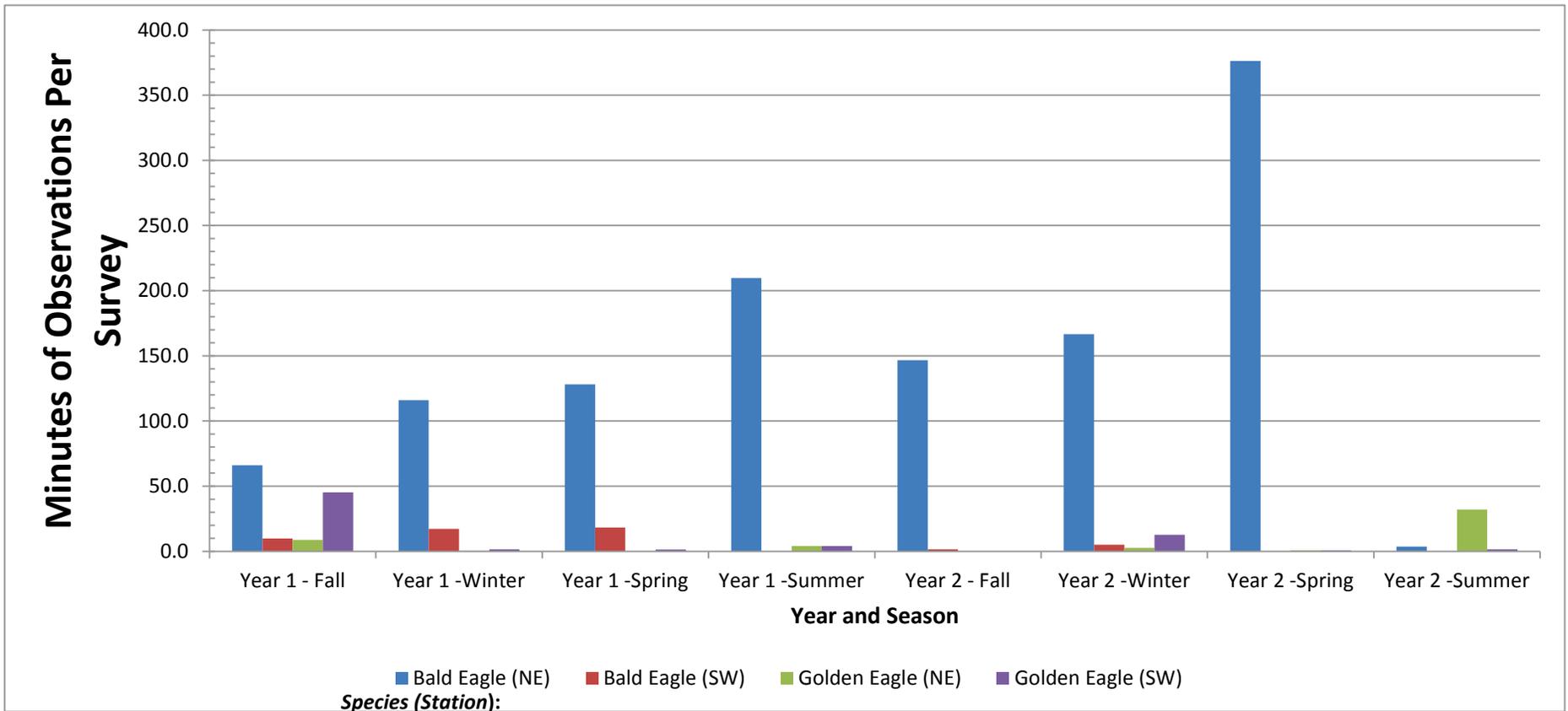


Figure 10. Eagle Activity within the Vicinity of Each Point Count Stations (September 2013–August 2015)

CHAPTER 4
RECOMMENDATIONS FOR SURVEY METHODOLOGY
FOR REMAINING YEARS 2 AND 3

There are no recommendations to modify the survey methodology for the remaining year of the study. The survey methodology conducted was successful in meeting the goal of this study, which is to collect baseline information on raptor species abundance and distribution within the Preserve and golden eagle nest use within Bandy Canyon.

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CHAPTER 5

REFERENCES

- Conservation Biology Institute (CBI). 2007. *Area-Specific Management Directives and Baseline Conditions Report for the Ramona Grasslands*. Prepared for the County of San Diego Department of Parks and Recreation. January.
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APPENDIX A

**POINT COUNT STATION
SITE PHOTOS**

Appendix A
Point Count Location Photos



Northeast Point Count Location - Looking North



Northeast Point Count Location - Looking East



Northeast Point Count Location - Looking South



Northeast Point Count Location - Looking West



Southwest Point Count Location - Looking North



Southwest Point Count Location - Looking East



Southwest Point Count Location - Looking South



Southwest Point Count Location - Looking West

APPENDIX B

SURVEY DATES, PERSONNEL, AND WEATHER CONDITIONS

APPENDIX B
SURVEY DATES, PERSONNEL, AND WEATHER CONDITIONS

SW	09/18/2014	JEEP	08:30	Temp: 75 °F, 10% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 0 mph, Wind Direction: N/A
SW	09/18/2014	JEEP	09:26	Temp: 78 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 4 mph, Wind Direction: S
SW	09/18/2014	JEEP	10:31	Temp: 80 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 5 mph, Wind Direction: S
SW	09/18/2014	JEEP	11:28	Temp: 84 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 1 mph, Wind Direction: SW
SW	09/18/2014	JEEP	12:35	Temp: 86 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 3 mph, Wind Direction: SW
NE	09/18/2014	JEEP	12:45	Temp: 85 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 12 mph, Wind Direction: N
NE	09/18/2014	JEEP	13:42	Temp: 89 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 13 mph, Wind Direction: NW
NE	09/18/2014	JEEP	14:44	Temp: 81 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 12 mph, Wind Direction: W
NE	09/18/2014	JEEP	15:51	Temp: 79 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 13 mph, Wind Direction: W
NE	09/18/2014	JEEP	16:45	Temp: 81 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 11 mph, Wind Direction: W
NW	09/30/2014	James McMorran	08:47	Temp: 68 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 0 mph, Wind Direction: E
NW	09/30/2014	James McMorran	09:32	Temp: 74 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 1 mph, Wind Direction: E
NW	09/30/2014	James McMorran	10:34	Temp: 81 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 2 mph, Wind Direction: W

NW	09/30/2014	James McMorran	11:43	Temp: 85 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 4 mph, Wind Direction: W
NW	09/30/2014	James McMorran	12:29	Temp: 87 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 6 mph, Wind Direction: SW
NE	09/30/2014	James McMorran	12:54	Temp: 87 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 4 mph, Wind Direction: SW
NE	09/30/2014	James McMorran	13:54	Temp: 88 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 6 mph, Wind Direction: SW
NE	09/30/2014	James McMorran	14:51	Temp: 85 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 5 mph, Wind Direction: W
NE	09/30/2014	James McMorran	15:49	Temp: 81 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 4 mph, Wind Direction: W
NE	09/30/2014	James McMorran	16:52	Temp: 81 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 3 mph, Wind Direction: SW
SW	10/20/2014	Jeep Pagel	09:00	Temp: 63 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 0 mph, Wind Direction: N/A
SW	10/20/2014	Jeep Pagel	09:51	Temp: 69 °F, 99% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 0 mph, Wind Direction: N/A
SW	10/20/2014	Jeep Pagel	10:55	Temp: 74 °F, 70% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 2 mph, Wind Direction: W
SW	10/20/2014	Jeep Pagel	12:05	Temp: 75 °F, 5% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 3 mph, Wind Direction: W
SW	10/20/2014	Jeep Pagel	13:00	Temp: 75 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 1 mph, Wind Direction: W
NE	10/20/2014	Jeep Pagel	13:15	Temp: 75 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 1 mph, Wind Direction: W

NE	10/20/2014	Jeep Pagel	14:09	Temp: 75 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 7 mph, Wind Direction: W
NE	10/20/2014	Jeep Pagel	15:23	Temp: 75 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 5 mph, Wind Direction: W
NE	10/20/2014	Jeep Pagel	16:22	Temp: 75 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 1 mph, Wind Direction: W
NE	10/20/2014	Jeep Pagel	17:15	Temp: 73 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 10 mph, Wind Direction: W
NE	10/31/2014	James McMorran	09:25	Temp: 66 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 1 mph, Wind Direction: SW
NE	10/31/2014	James McMorran	10:29	Temp: 64 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 1 mph, Wind Direction: S
NE	10/31/2014	James McMorran	11:28	Temp: 66 °F, 90% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 3 mph, Wind Direction: S
NE	10/31/2014	James McMorran	12:31	Temp: 70 °F, 80% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 2 mph, Wind Direction: S
NE	10/31/2014	James McMorran	13:23	Temp: 68 °F, 95% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 3 mph, Wind Direction: W
SW	10/31/2014	James McMorran	14:08	Temp: 68 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 3 mph, Wind Direction: SW
SW	10/31/2014	James McMorran	14:48	Temp: 67 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 5 mph, Wind Direction: SW
SW	10/31/2014	James McMorran	15:48	Temp: 65 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 4 mph, Wind Direction: SW
SW	10/31/2014	James McMorran	16:58	Temp: 63 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 5 mph, Wind Direction: SW

SW	10/31/2014	James McMorran	17:37	Temp: 62 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 6 mph, Wind Direction: SW
SW	11/13/2015	JEEP	07:10	Temp: 63 °F, 95% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 0 mph, Wind Direction: N/A
SW	11/13/2015	JEEP	08:10	Temp: 59 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 4 mph, Wind Direction: NW
SW	11/13/2015	JEEP	09:12	Temp: 61 °F, 95% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 3 mph, Wind Direction: NW
SW	11/13/2015	JEEP	10:15	Temp: 65 °F, 50% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 1 mph, Wind Direction: N/A
SW	11/13/2015	JEEP	11:15	Temp: 73 °F, 40% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 1 mph, Wind Direction: NW
NE	11/13/2015	JEEP	11:35	Temp: 64 °F, 40% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 5 mph, Wind Direction: NW
NE	11/13/2015	JEEP	12:35	Temp: 67 °F, 40% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 3 mph, Wind Direction: NW
NE	11/13/2015	JEEP	13:41	Temp: 65 °F, 50% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 7 mph, Wind Direction: NW
NE	11/13/2015	JEEP	14:45	Temp: 69 °F, 50% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 6 mph, Wind Direction: W
NE	11/13/2015	JEEP	15:35	Temp: 63 °F, 80% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 7 mph, Wind Direction: W
SW	11/28/2014	James McMorran	08:53	Temp: 63 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 0 mph, Wind Direction: N/A
SW	11/28/2014	James McMorran	09:32	Temp: 73 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 0 mph, Wind Direction: N/A

SW	11/28/2014	James McMorran	10:32	Temp: 76 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 3 mph, Wind Direction: N
SW	11/28/2014	James McMorran	11:31	Temp: 81 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 3 mph, Wind Direction: W
SW	11/28/2014	James McMorran	12:30	Temp: 84 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 4 mph, Wind Direction: NW
NE	11/28/2014	James McMorran	12:54	Temp: 85 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 4 mph, Wind Direction: NW
NE	11/28/2014	James McMorran	13:48	Temp: 84 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 4 mph, Wind Direction: NW
NE	11/28/2014	James McMorran	14:49	Temp: 83 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 3 mph, Wind Direction: NW
NE	11/28/2014	James McMorran	15:51	Temp: 78 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 5 mph, Wind Direction: NW
NE	11/28/2014	James McMorran	16:52	Temp: 74 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 3 mph, Wind Direction: W
SW	12/15/2014	Joel Pagel	08:30	Temp: 57 °F, 90% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 0 mph, Wind Direction: N/A
SW	12/15/2014	Joel Pagel	09:31	Temp: 59 °F, 95% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 0 mph, Wind Direction: N/A
SW	12/15/2014	Joel Pagel	10:30	Temp: 64 °F, 80% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 0 mph, Wind Direction: N/A
SW	12/15/2014	Joel Pagel	11:34	Temp: 60 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 4 mph, Wind Direction: NW
SW	12/15/2014	Joel Pagel	12:29	Temp: 65 °F, 80% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 1 mph, Wind Direction: NW

NE	12/15/2014	Joel Pagel	12:45	Temp: 60 °F, 80% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 4 mph, Wind Direction: NW
NE	12/15/2014	Joel Pagel	13:45	Temp: 64 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 1 mph, Wind Direction: NW
NE	12/15/2014	Joel Pagel	14:40	Temp: 60 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 4 mph, Wind Direction: NW
NE	12/15/2014	Joel Pagel	15:44	Temp: 56 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 2 mph, Wind Direction: NW
NE	12/15/2014	Joel Pagel	16:45	Temp: 55 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 1 mph, Wind Direction: SE
NE	12/26/2014	James McMorran	08:21	Temp: 46 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 3 mph, Wind Direction: N
NE	12/26/2014	James McMorran	09:31	Temp: 49 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 0 mph, Wind Direction: N
NE	12/26/2014	James McMorran	10:27	Temp: 54 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 2 mph, Wind Direction: SE
NE	12/26/2014	James McMorran	11:24	Temp: 58 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 3 mph, Wind Direction: SE
NE	12/26/2014	James McMorran	12:28	Temp: 59 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 3 mph, Wind Direction: S
SW	12/26/2014	James McMorran	12:55	Temp: 60 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 3 mph, Wind Direction: S
SW	12/26/2014	James McMorran	14:11	Temp: 59 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 4 mph, Wind Direction: SW
SW	12/26/2014	James McMorran	15:06	Temp: 56 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 4 mph, Wind Direction: SW

SW	12/26/2014	James McMorran	16:00	Temp: 51 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 5 mph, Wind Direction: SW
SW	01/22/2015	Joel Pagel	08:30	Temp: 64 °F, 20% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 4 mph, Wind Direction: SE
SW	01/22/2015	Joel Pagel	09:30	Temp: 63 °F, 20% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 9 mph, Wind Direction: E
SW	01/22/2015	Joel Pagel	10:31	Temp: 66 °F, 25% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 6 mph, Wind Direction: E
SW	01/22/2015	Joel Pagel	11:35	Temp: 67 °F, 35% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 5 mph, Wind Direction: E
SW	01/22/2015	Joel Pagel	12:30	Temp: 64 °F, 45% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 2 mph, Wind Direction: E
NE	01/22/2015	Joel Pagel	12:45	Temp: 71 °F, 35% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 1 mph, Wind Direction: E
NE	01/22/2015	Joel Pagel	13:38	Temp: 71 °F, 30% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 7 mph, Wind Direction: E
NE	01/22/2015	Joel Pagel	15:50	Temp: 66 °F, 10% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 6 mph, Wind Direction: E
NE	01/22/2015	Joel Pagel	16:44	Temp: 68 °F, 30% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 10 mph, Wind Direction: E
NE	01/22/2015	Joel Pagel	16:45	Temp: 64 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 5 mph, Wind Direction: E
SW	01/29/2015	James McMorran	08:48	Temp: 65 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 0 mph, Wind Direction: N/A
SW	01/29/2015	James McMorran	09:43	Temp: 68 °F, 95% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 0 mph, Wind Direction: N/A

SW	01/29/2015	James McMorran	10:45	Temp: 64 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 3 mph, Wind Direction: W
SW	01/29/2015	James McMorran	11:49	Temp: 68 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 3 mph, Wind Direction: W
SW	01/29/2015	James McMorran	12:42	Temp: 70 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 2 mph, Wind Direction: NW
NE	01/29/2015	James McMorran	13:06	Temp: 69 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 3 mph, Wind Direction: SW
NE	01/29/2015	James McMorran	13:57	Temp: 70 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 1 mph, Wind Direction: SW
NE	01/29/2015	James McMorran	15:02	Temp: 70 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 1 mph, Wind Direction: N/A
NE	01/29/2015	James McMorran	16:06	Temp: 67 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 1 mph, Wind Direction: SW
NE	01/29/2015	James McMorran	18:13	Temp: 65 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 3 mph, Wind Direction: SW
SW	02/13/2015	Joel Pagel	08:25	Temp: 73 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 1 mph, Wind Direction: E
SW	02/13/2015	Joel Pagel	09:25	Temp: 76 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 9 mph, Wind Direction: E
SW	02/13/2015	Joel Pagel	10:22	Temp: 78 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 12 mph, Wind Direction: E
SW	02/13/2015	Joel Pagel	11:26	Temp: 80 °F, 0% Cloud Cover, Visibility: good, Precipitation: light rain, Avg. Wind Speed: 8 mph, Wind Direction: E
SW	02/13/2015	Joel Pagel	12:28	Temp: 81 °F, 5% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 4 mph, Wind Direction: E

NE	02/13/2015	Joel Pagel	12:41	Temp: 82 °F, 1% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 7 mph, Wind Direction: E
NE	02/13/2015	Joel Pagel	13:37	Temp: 82 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 10 mph, Wind Direction: E
NE	02/13/2015	Joel Pagel	14:47	Temp: 81 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 12 mph, Wind Direction: E
NE	02/13/2015	Joel Pagel	15:44	Temp: 78 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 13 mph, Wind Direction: E
NE	02/13/2015	Joel Pagel	16:42	Temp: 75 °F, 3% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 13 mph, Wind Direction: E
NE	02/26/2015	James McMorran	08:16	Temp: 46 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 0 mph, Wind Direction: N/A
NE	02/26/2015	James McMorran	09:14	Temp: 62 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 0 mph, Wind Direction: SW
NE	02/26/2015	James McMorran	10:15	Temp: 67 °F, 10% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 1 mph, Wind Direction: SW
NE	02/26/2015	James McMorran	11:10	Temp: 78 °F, 15% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 3 mph, Wind Direction: SW
NE	02/26/2015	James McMorran	12:10	Temp: 78 °F, 40% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 4 mph, Wind Direction: SW
SW	02/26/2015	James McMorran	12:41	Temp: 80 °F, 40% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 2 mph, Wind Direction: S
SW	02/26/2015	James McMorran	13:39	Temp: 78 °F, 50% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 5 mph, Wind Direction: SW
SW	02/26/2015	James McMorran	14:39	Temp: 78 °F, 50% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 5 mph, Wind Direction: SE

SW	02/26/2015	James McMorran	15:38	Temp: 68 °F, 50% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 3 mph, Wind Direction: SE
SW	02/26/2015	James McMorran	16:39	Temp: 65 °F, 80% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 4 mph, Wind Direction: SW
SW	03/11/2015	JOEL PAGEL	08:30	Temp: 67 °F, 80% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 0 mph, Wind Direction: N/A
SW	03/11/2015	JOEL PAGEL	09:31	Temp: 66 °F, 95% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 0 mph, Wind Direction: W
SW	03/11/2015	JOEL PAGEL	10:29	Temp: 76 °F, 90% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 0 mph, Wind Direction: N/A
SW	03/11/2015	JOEL PAGEL	11:28	Temp: 71 °F, 95% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 0 mph, Wind Direction: E
SW	03/11/2015	JOEL PAGEL	12:30	Temp: 74 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 1 mph, Wind Direction: W
NE	03/11/2015	JEEP PAGEL	12:45	Temp: 73 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 4 mph, Wind Direction: W
NE	03/11/2015	JEEP PAGEL	13:54	Temp: 74 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 6 mph, Wind Direction: W
NE	03/11/2015	JEEP PAGEL	14:44	Temp: 76 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 5 mph, Wind Direction: W
NE	03/11/2015	JEEP PAGEL	15:47	Temp: 73 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 9 mph, Wind Direction: W
NE	03/11/2015	JEEP PAGEL	16:45	Temp: 67 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 9 mph, Wind Direction: W
SW	03/30/2015	James McMorran	07:54	Temp: 47 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 0 mph, Wind Direction: N/A

SW	03/30/2015	James McMorran	09:05	Temp: 68 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 0 mph, Wind Direction: N/A
SW	03/30/2015	James McMorran	10:03	Temp: 70 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 0 mph, Wind Direction: N/A
SW	03/30/2015	James McMorran	11:01	Temp: 79 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 4 mph, Wind Direction: W
SW	03/30/2015	James McMorran	11:57	Temp: 81 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 4 mph, Wind Direction: W
NE	03/30/2015	James McMorran	12:24	Temp: 78 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 4 mph, Wind Direction: W
NE	03/30/2015	James McMorran	13:15	Temp: 82 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 7 mph, Wind Direction: W
NE	03/30/2015	James McMorran	14:26	Temp: 82 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 7 mph, Wind Direction: SW
NE	03/30/2015	James McMorran	15:24	Temp: 80 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 7 mph, Wind Direction: SW
NE	03/30/2015	James McMorran	16:25	Temp: 78 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 6 mph, Wind Direction: W
SW	04/09/2015	James McMorran	07:42	Temp: 46 °F, 5% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 0 mph, Wind Direction: N/A
SW	04/09/2015	James McMorran	08:49	Temp: 59 °F, 5% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 1 mph, Wind Direction: N/A
SW	04/09/2015	James McMorran	09:50	Temp: 61 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 3 mph, Wind Direction: SW
SW	04/09/2015	James McMorran	10:50	Temp: 66 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 4 mph, Wind Direction: SW

SW	04/09/2015	James McMorran	11:56	Temp: 72 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 4 mph, Wind Direction: SW
NE	04/09/2015	James McMorran	12:18	Temp: 73 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 3 mph, Wind Direction: SW
NE	04/09/2015	James McMorran	13:17	Temp: 71 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 6 mph, Wind Direction: SW
NE	04/09/2015	James McMorran	14:17	Temp: 71 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 8 mph, Wind Direction: SW
NE	04/09/2015	James McMorran	15:19	Temp: 71 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 8 mph, Wind Direction: W
NE	04/09/2015	James McMorran	16:20	Temp: 67 °F, 5% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 11 mph, Wind Direction: W
NE	04/30/2015	James McMorran	08:03	Temp: 60 °F, 30% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 0 mph, Wind Direction: N/A
NE	04/30/2015	James McMorran	09:05	Temp: 72 °F, 20% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 0 mph, Wind Direction: N/A
NE	04/30/2015	James McMorran	10:17	Temp: 86 °F, 30% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 2 mph, Wind Direction: W
NE	04/30/2015	James McMorran	11:07	Temp: 87 °F, 25% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 3 mph, Wind Direction: NW
NE	04/30/2015	James McMorran	12:02	Temp: 89 °F, 20% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 8 mph, Wind Direction: NW
SW	04/30/2015	James McMorran	12:36	Temp: 92 °F, 20% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 7 mph, Wind Direction: NW
SW	04/30/2015	James McMorran	13:31	Temp: 95 °F, 10% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 10 mph, Wind Direction: NW

SW	04/30/2015	James McMorran	15:02	Temp: 92 °F, 10% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 8 mph, Wind Direction: W
SW	04/30/2015	James McMorran	15:31	Temp: 89 °F, 10% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 8 mph, Wind Direction: W
SW	04/30/2015	James McMorran	16:39	Temp: 86 °F, 10% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 7 mph, Wind Direction: W
SW	05/14/2015	James McMorran	08:22	Temp: 51 °F, 80% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 3 mph, Wind Direction: SW
SW	05/14/2015	James McMorran	09:07	Temp: 55 °F, 90% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 6 mph, Wind Direction: SW
SW	05/14/2015	James McMorran	10:16	Temp: 52 °F, 90% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 4 mph, Wind Direction: SW
SW	05/14/2015	James McMorran	11:05	Temp: 61 °F, 80% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 5 mph, Wind Direction: SW
SW	05/14/2015	James McMorran	12:06	Temp: 63 °F, 90% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 5 mph, Wind Direction: SW
NE	05/14/2015	James McMorran	12:29	Temp: 62 °F, 80% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 7 mph, Wind Direction: SW
NE	05/14/2015	James McMorran	13:31	Temp: 62 °F, 95% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 10 mph, Wind Direction: SW
NE	05/14/2015	James McMorran	14:45	Temp: 60 °F, 100% Cloud Cover, Visibility: fair, Precipitation: light rain, Avg. Wind Speed: 8 mph, Wind Direction: SW
NE	05/27/2015	James McMorran	08:15	Temp: 52 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 0 mph, Wind Direction: N/A
NE	05/27/2015	James McMorran	09:05	Temp: 57 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 2 mph, Wind Direction: S

NE	05/27/2015	James McMorran	10:07	Temp: 60 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 5 mph, Wind Direction: W
NE	05/27/2015	James McMorran	11:09	Temp: 60 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 4 mph, Wind Direction: W
NE	05/27/2015	James McMorran	12:00	Temp: 62 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 5 mph, Wind Direction: W
SW	05/27/2015	James McMorran	12:37	Temp: 65 °F, 90% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 6 mph, Wind Direction: W
SW	05/27/2015	James McMorran	13:39	Temp: 66 °F, 30% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 3 mph, Wind Direction: W
SW	05/27/2015	James McMorran	14:14	Temp: 73 °F, 10% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 3 mph, Wind Direction: W
SW	05/27/2015	James McMorran	15:42	Temp: 75 °F, 20% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 5 mph, Wind Direction: W
SW	05/28/2015	James McMorran	09:02	Temp: 71 °F, 10% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 5 mph, Wind Direction: W
SW	06/02/2015	James McMorran	08:02	Temp: 62 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 0 mph, Wind Direction: N/A
SW	06/02/2015	James McMorran	09:07	Temp: 69 °F, 20% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 1 mph, Wind Direction: S
SW	06/02/2015	James McMorran	10:09	Temp: 72 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 4 mph, Wind Direction: W
SW	06/02/2015	James McMorran	11:11	Temp: 77 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 4 mph, Wind Direction: W
SW	06/02/2015	James McMorran	12:08	Temp: 77 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 8 mph, Wind Direction: W

NE	06/02/2015	James McMorran	12:48	Temp: 78 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 6 mph, Wind Direction: W
NE	06/02/2015	James McMorran	13:53	Temp: 78 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 8 mph, Wind Direction: W
NE	06/02/2015	James McMorran	14:54	Temp: 81 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 8 mph, Wind Direction: W
NE	06/02/2015	James McMorran	15:57	Temp: 80 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 8 mph, Wind Direction: W
NE	06/02/2015	James McMorran	17:00	Temp: 76 °F, 5% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 6 mph, Wind Direction: W
NE	06/30/2015	James McMorran	09:18	Temp: 84 °F, 40% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 0 mph, Wind Direction: N/A
NE	06/30/2015	James McMorran	10:01	Temp: 87 °F, 30% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 5 mph, Wind Direction: W
NE	06/30/2015	James McMorran	11:01	Temp: 90 °F, 20% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 11 mph, Wind Direction: W
NE	06/30/2015	James McMorran	12:00	Temp: 95 °F, 20% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 12 mph, Wind Direction: NW
NE	06/30/2015	James McMorran	13:00	Temp: 87 °F, 80% Cloud Cover, Visibility: good, Precipitation: rain, Avg. Wind Speed: 12 mph, Wind Direction: SW
SW	06/30/2015	James McMorran	13:29	Temp: 83 °F, 80% Cloud Cover, Visibility: good, Precipitation: light rain, Avg. Wind Speed: 12 mph, Wind Direction: SW
SW	06/30/2015	James McMorran	14:38	Temp: 73 °F, 100% Cloud Cover, Visibility: fair, Precipitation: rain, Avg. Wind Speed: 12 mph, Wind Direction: NW
SW	07/06/2015	James McMorran	12:31	Temp: 73 °F, 15% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 5 mph, Wind Direction: SW

SW	07/06/2015	James McMorran	13:44	Temp: 78 °F, 15% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 5 mph, Wind Direction: W
SW	07/06/2015	James McMorran	14:31	Temp: 81 °F, 10% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 12 mph, Wind Direction: W
SW	07/06/2015	James McMorran	15:40	Temp: 82 °F, 30% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 9 mph, Wind Direction: W
SW	07/10/2015	James McMorran	08:44	Temp: 62 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 0 mph, Wind Direction: N/A
SW	07/10/2015	James McMorran	09:48	Temp: 65 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 3 mph, Wind Direction: W
SW	07/10/2015	James McMorran	10:46	Temp: 67 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 4 mph, Wind Direction: W
SW	07/10/2015	James McMorran	11:46	Temp: 71 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 3 mph, Wind Direction: W
SW	07/10/2015	James McMorran	13:00	Temp: 70 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 6 mph, Wind Direction: W
NE	07/10/2015	James McMorran	13:16	Temp: 72 °F, 80% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 8 mph, Wind Direction: W
NE	07/10/2015	James McMorran	14:15	Temp: 73 °F, 50% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 11 mph, Wind Direction: W
NE	07/10/2015	James McMorran	15:16	Temp: 74 °F, 30% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 12 mph, Wind Direction: W
NE	07/10/2015	James McMorran	16:18	Temp: 73 °F, 50% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 10 mph, Wind Direction: W
NE	07/10/2015	James McMorran	17:18	Temp: 71 °F, 10% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 8 mph, Wind Direction: NW

NE	07/29/2015	James McMorran	08:38	Temp: 68 °F, 30% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 0 mph, Wind Direction: N/A
NE	07/29/2015	James McMorran	09:41	Temp: 69 °F, 10% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 2 mph, Wind Direction: SW
NE	07/29/2015	James McMorran	10:35	Temp: 75 °F, 15% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 4 mph, Wind Direction: NW
NE	07/29/2015	James McMorran	12:08	Temp: 79 °F, 40% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 8 mph, Wind Direction: W
NE	07/29/2015	James McMorran	12:44	Temp: 85 °F, 30% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 9 mph, Wind Direction: W
SW	07/29/2015	James McMorran	13:31	Temp: 87 °F, 10% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 9 mph, Wind Direction: W
SW	07/29/2015	James McMorran	14:20	Temp: 86 °F, 20% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 10 mph, Wind Direction: W
SW	07/29/2015	James McMorran	15:46	Temp: 83 °F, 20% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 6 mph, Wind Direction: NW
SW	07/29/2015	James McMorran	16:19	Temp: 83 °F, 30% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 8 mph, Wind Direction: W
SW	08/10/2015	James McMorran	08:00	Temp: 63 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 0 mph, Wind Direction: N/A
SW	08/10/2015	James McMorran	08:56	Temp: 65 °F, 80% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 0 mph, Wind Direction: N/A
SW	08/10/2015	James McMorran	10:03	Temp: 64 °F, 90% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 2 mph, Wind Direction: W
SW	08/10/2015	James McMorran	10:21	Temp: 65 °F, 50% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 5 mph, Wind Direction: W

SW	08/10/2015	James McMorran	12:02	Temp: 72 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 6 mph, Wind Direction: W
NE	08/10/2015	James McMorran	12:25	Temp: 75 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 6 mph, Wind Direction: W
NE	08/10/2015	James McMorran	13:26	Temp: 77 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 7 mph, Wind Direction: W
NE	08/10/2015	James McMorran	14:24	Temp: 79 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 12 mph, Wind Direction: W
NE	08/10/2015	James McMorran	15:26	Temp: 79 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 10 mph, Wind Direction: W
NE	08/10/2015	James McMorran	16:22	Temp: 78 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 9 mph, Wind Direction: W
SW	08/31/2015	James McMorran	08:32	Temp: 63 °F, 100% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 0 mph, Wind Direction: N/A
SW	08/31/2015	James McMorran	09:34	Temp: 66 °F, 50% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 2 mph, Wind Direction: N
SW	08/31/2015	James McMorran	10:35	Temp: 74 °F, 20% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 3 mph, Wind Direction: N
SW	08/31/2015	James McMorran	11:31	Temp: 80 °F, 10% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 5 mph, Wind Direction: W
SW	08/31/2015	James McMorran	12:32	Temp: 86 °F, 10% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 8 mph, Wind Direction: W
NE	08/31/2015	James McMorran	12:50	Temp: 87 °F, 5% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 9 mph, Wind Direction: W
NE	08/31/2015	James McMorran	14:02	Temp: 87 °F, 5% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 11 mph, Wind Direction: W

NE	08/31/2015	James McMorran	14:46	Temp: 87 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 14 mph, Wind Direction: W
NE	08/31/2015	James McMorran	15:57	Temp: 88 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 12 mph, Wind Direction: W
NE	08/31/2015	James McMorran	17:32	Temp: 84 °F, 0% Cloud Cover, Visibility: good, Precipitation: none, Avg. Wind Speed: 8 mph, Wind Direction: W

APPENDIX C

FIELD DATA

**APPENDIX C
FIELD DATA**

Observer	Date	Point Count Station	Common Name	Scientific Name	Age	Sex	Number	Additional Notes
Joel Pagel	9/18/2014	NE	Prairie Falcon	<i>Falco mexicanus</i>	Adult	Unknown	1	
Joel Pagel	9/18/2014	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Female	1	DID NOT SEE FLY IN
Joel Pagel	9/18/2014	NE	American Peregrine Falcon	<i>Falco peregrinus anatum</i>	Sub-Adult	Unknown	1	HUNTING PASSERINES
Joel Pagel	9/18/2014	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Male	1	
Joel Pagel	9/18/2014	SW	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Female	1	CATCHING THERMAL WITH CORVIDS
Joel Pagel	9/18/2014	SW	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Male	1	
James McMorran	9/30/2014	NE	American Kestrel	<i>Falco sparverius</i>	Unknown	Female	2	
James McMorran	9/30/2014	SW	Red-tailed Hawk	<i>Buteo jamaicensis</i>	Adult	Unknown	1	
James McMorran	9/30/2014	SW	Red-tailed Hawk	<i>Buteo jamaicensis</i>	Adult	Unknown	1	
James McMorran	9/30/2014	SW	Red-tailed Hawk	<i>Buteo jamaicensis</i>	Adult/Juvenile	Unknown	2	CATCHING THERMAL
Joel Pagel	10/20/2014	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Male	1	
Joel Pagel	10/20/2014	NE	Sharp-shinned Hawk	<i>Accipiter striatus</i>	Unknown	Unknown	1	
Joel Pagel	10/20/2014	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Female	1	
Joel Pagel	10/20/2014	NE	Prairie Falcon	<i>Falco mexicanus</i>	Unknown	Unknown	1	FLEW OUT FROM TREE THEN WENT BACK TOTREE TO PERCH
James McMorran	10/31/2014	NE	Ferruginous Hawk	<i>Buteo regalis</i>	Adult	Unknown	1	
James McMorran	10/31/2014	NE	Ferruginous Hawk	<i>Buteo regalis</i>	Adult	Unknown	1	
James McMorran	10/31/2014	NE	Merlin	<i>Falco columbarius</i>	Unknown	Unknown	1	
James McMorran	10/31/2014	NE	Sharp-shinned Hawk	<i>Accipiter striatus</i>	Unknown	Unknown	1	ID PHOTO
James McMorran	10/31/2014	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Unknown	1	THE PAIR TOOK FLIGHT TOGETHER
James McMorran	10/31/2014	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Unknown	1	
James McMorran	10/31/2014	NE	Ferruginous Hawk	<i>Buteo regalis</i>	Unknown	Unknown	1	VERY DISTANT: NOT MAPPED
James McMorran	10/31/2014	NE	American Kestrel	<i>Falco sparverius</i>	Unknown	Male	1	NOT MAPPED
James McMorran	10/31/2014	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Unknown	1	A AND B: PAIR
James McMorran	10/31/2014	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Unknown	1	ON PERCH TREE
James McMorran	10/31/2014	NE	Red-tailed Hawk	<i>Buteo jamaicensis</i>	Unknown	Unknown	1	NOT MAPPED
James McMorran	10/31/2014	SW	American Kestrel	<i>Falco sparverius</i>	Adult	Male	1	
James McMorran	10/31/2014	SW	Red-tailed Hawk	<i>Buteo jamaicensis</i>	Adult	Unknown	1	HAD SMALL PREY ITEM IN TALON
Joel Pagel	11/13/2014	NE	Northern Harrier	<i>Circus cyaneus</i>	Unknown	Female	1	
Joel Pagel	11/13/2014	NE	Red-shouldered Hawk	<i>Buteo lineatus</i>	Unknown	Unknown	1	IN FURTHEST NORTH EUCS
Joel Pagel	11/13/2014	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Unknown	1	PERCHED AT NORMAL PERCH
Joel Pagel	11/13/2014	NE	Prairie Falcon	<i>Falco mexicanus</i>	Unknown	Unknown	1	PERCHED ABOVE BAEA NEST
James McMorran	11/28/2014	NE	Ferruginous Hawk	<i>Buteo regalis</i>	Unknown	Unknown	1	
James McMorran	11/28/2014	SW	Ferruginous Hawk	<i>Buteo regalis</i>	Juvenile	Unknown	1	
James McMorran	11/28/2014	SW	Ferruginous Hawk	<i>Buteo regalis</i>	Unknown	Unknown	1	
James McMorran	11/28/2014	SW	Ferruginous Hawk	<i>Buteo regalis</i>	Adult	Unknown	2	2 INDVS__VERY DISTANT NOT MAPPED
James McMorran	11/28/2014	SW	Red-tailed Hawk	<i>Buteo jamaicensis</i>	Juvenile	Unknown	1	NOT MAPPED

Observer	Date	Point Count Station	Common Name	Scientific Name	Age	Sex	Number	Additional Notes
James McMorran	11/28/2014	SW	American Kestrel	<i>Falco sparverius</i>	Adult	Female	1	NOT MAPPED
James McMorran	11/28/2014	SW	Red-tailed Hawk	<i>Buteo jamaicensis</i>	Adult	Unknown	1	NOT MAPPED
Joel Pagel	12/15/2014	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Unknown	1	VOCALIZING~ONCE AT NEST FEMALE BEGGING TO MALE TO GIVE HER SQUIRREL
Joel Pagel	12/15/2014	NE	Ferruginous Hawk	<i>Buteo regalis</i>	Unknown	Unknown	1	ON POWER POLE
Joel Pagel	12/15/2014	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Unknown	1	FLEW TO NEST WITH GROUND SQUIRELL
Joel Pagel	12/15/2014	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Unknown	1	
Joel Pagel	12/15/2014	NE	Golden Eagle	<i>Aquila chrysaetos</i>	Unknown	Unknown	1	PERCHED~HUNTING BASIN TO ITS SW~FLEW BETWEEN 2 PERCHES~PROBABLY ADULT~DEFINITELY UNBANDED
Joel Pagel	12/15/2014	NE	Northern Harrier	<i>Circus cyaneus</i>	Unknown	Female	1	
Joel Pagel	12/15/2014	NE	Golden Eagle	<i>Aquila chrysaetos</i>	Adult	Unknown	1	UP WITH RAVENS AND NOHA: NOHA SPLIT OFF AND FLEW SW
Joel Pagel	12/15/2014	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Unknown	1	
Joel Pagel	12/15/2014	SW	Merlin	<i>Falco columbarius</i>	Adult	Unknown	1	
Joel Pagel	12/15/2014	SW	Merlin	<i>Falco columbarius</i>	Adult	Unknown	1	
Joel Pagel	12/15/2014	SW	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Unknown	1	FLAPPING and SOARING OFF TO SOUTH
Joel Pagel	12/15/2014	SW	Ferruginous Hawk	<i>Buteo regalis</i>	Unknown	Unknown	1	
Joel Pagel	12/15/2014	SW	Ferruginous Hawk	<i>Buteo regalis</i>	Adult	Unknown	1	ON POLE ABOVE ROAD
James McMorran	12/26/2014	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Unknown	1	
James McMorran	12/26/2014	NE	Ferruginous Hawk	<i>Buteo regalis</i>	Adult	Unknown	1	DARK MORPH
James McMorran	12/26/2014	NE	Ferruginous Hawk	<i>Buteo regalis</i>	Adult	Unknown	2	
James McMorran	12/26/2014	NE	Red-tailed Hawk	<i>Buteo jamaicensis</i>	Adult	Unknown	2	
James McMorran	12/26/2014	NE	Ferruginous Hawk	<i>Buteo regalis</i>	Unknown	Unknown	1	
James McMorran	12/26/2014	SW	Red-shouldered Hawk	<i>Buteo lineatus</i>	Unknown	Unknown	1	
James McMorran	12/26/2014	SW	Red-tailed Hawk	<i>Buteo jamaicensis</i>	Unknown	Unknown	5	
Joel Pagel	1/22/2015	NE	Ferruginous Hawk	<i>Buteo regalis</i>	Adult	Unknown	1	
Joel Pagel	1/22/2015	NE	Ferruginous Hawk	<i>Buteo regalis</i>	Adult	Unknown	1	
Joel Pagel	1/22/2015	NE	Prairie Falcon	<i>Falco mexicanus</i>	Adult	Unknown	2	
Joel Pagel	1/22/2015	NE	Ferruginous Hawk	<i>Buteo regalis</i>	Adult	Unknown	1	
Joel Pagel	1/22/2015	NE	Ferruginous Hawk	<i>Buteo regalis</i>	Unknown	Unknown	1	
Joel Pagel	1/22/2015	NE	Ferruginous Hawk	<i>Buteo regalis</i>	Unknown	Unknown	1	
Joel Pagel	1/22/2015	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Sub-Adult	Unknown	1	FLEW FROM PERCH LANDED ON GROUND THEN FLEW PARRALELL TO RUNWAY AND PERCHED AGAIN
Joel Pagel	1/22/2015	SW	Ferruginous Hawk	<i>Buteo regalis</i>	Unknown	Unknown	1	
Joel Pagel	1/22/2015	SW	Ferruginous Hawk	<i>Buteo regalis</i>	Adult	Unknown	1	
Joel Pagel	1/22/2015	SW	American Peregrine Falcon	<i>Falco peregrinus anatum</i>	Adult	Female	1	BUMPED UP BY BOTH GOEA
Joel Pagel	1/22/2015	SW	Golden Eagle	<i>Aquila chrysaetos</i>	Sub-Adult	Unknown	1	
Joel Pagel	1/22/2015	SW	Golden Eagle	<i>Aquila chrysaetos</i>	Adult	Unknown	1	PERCHED WITH SUBADULT ID TAG "B" THEN DID UNDULATING FLIGHT EAST THEN WEST THEN LOST SIGHT OF ADULT~ SUBADULT ID TAG"B" STILL PERCHED
James McMorran	1/29/2015	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Unknown	1	
James McMorran	1/29/2015	NE	Prairie Falcon	<i>Falco mexicanus</i>	Unknown	Unknown	1	

Observer	Date	Point Count Station	Common Name	Scientific Name	Age	Sex	Number	Additional Notes
James McMorran	1/29/2015	NE	American Peregrine Falcon	<i>Falco peregrinus anatum</i>	Adult	Unknown	1	PHOTO: HARRASING KILLDEER
James McMorran	1/29/2015	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Unknown	1	
James McMorran	1/29/2015	SW	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Unknown	1	FLEW FROM PERCH AND CAUGHT WHAT APPEARED TO BE SQUIRREL THEN FLEW TO ROCK AND CONSUMED
James McMorran	1/29/2015	SW	Ferruginous Hawk	<i>Buteo regalis</i>	Unknown	Unknown	1	
James McMorran	1/29/2015	SW	Ferruginous Hawk	<i>Buteo regalis</i>	Sub-Adult	Unknown	1	
James McMorran	1/29/2015	SW	Ferruginous Hawk	<i>Buteo regalis</i>	Adult	Unknown	1	DARK MORPH
Joel Pagel	2/13/2015	NE	Ferruginous Hawk	<i>Buteo regalis</i>	Adult	Unknown	2	DARK AND LIGHT MORPH BIRDS~BOTH HUNTING ANDTAIL CHASING
Joel Pagel	2/13/2015	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Unknown	1	FLEW AT FLOCK OF GEESE~SUCCESSFUL CAPTURE OF GOOSE
Joel Pagel	2/13/2015	NE	Ferruginous Hawk	<i>Buteo regalis</i>	Adult	Unknown	2	
Joel Pagel	2/13/2015	SW	Golden Eagle	<i>Aquila chrysaetos</i>	Adult	Unknown	1	3 GOEA TOGETHER~2 SUBADULT~1 ADULT: RISING UP 300 FEET TH EN FLEW OFF WSW~~NO RADIOS ORPATAGIAL TAGS
Joel Pagel	2/13/2015	SW	Golden Eagle	<i>Aquila chrysaetos</i>	Sub-Adult	Unknown	2	
Joel Pagel	2/13/2015	SW	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Unknown	1	OVER POND~FLEW TO NEST~NO PREY
Joel Pagel	2/13/2015	SW	Ferruginous Hawk	<i>Buteo regalis</i>	Adult	Unknown	15	LIGHT MORPH RISING UP WITH RTHA
James McMorran	2/26/2015	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Female	1	ON NEST
James McMorran	2/26/2015	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Male	1	
James McMorran	2/26/2015	NE	Red-shouldered Hawk	<i>Buteo lineatus</i>	Adult	Unknown	1	
James McMorran	2/26/2015	SW	Ferruginous Hawk	<i>Buteo regalis</i>	Sub-Adult	Unknown	1	
Joel Pagel PAGEL	3/11/2015	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Male	1	MISSED GROUND SQUIRREL
Joel Pagel PAGEL	3/11/2015	SW	Merlin	<i>Falco columbarius</i>	Adult/Juvenile	Unknown	1	
Joel Pagel PAGEL	3/11/2015	SW	Ferruginous Hawk	<i>Buteo regalis</i>	Unknown	Unknown	1	
Joel Pagel PAGEL	3/11/2015	SW	Ferruginous Hawk	<i>Buteo regalis</i>	Unknown	Unknown	1	
Joel Pagel PAGEL	3/11/2015	SW	Ferruginous Hawk	<i>Buteo regalis</i>	Unknown	Unknown	1	
Joel Pagel PAGEL	3/11/2015	SW	Ferruginous Hawk	<i>Buteo regalis</i>	Unknown	Unknown	1	
Joel Pagel PAGEL	3/11/2015	SW	Golden Eagle	<i>Aquila chrysaetos</i>	Adult/Juvenile	Unknown	1	
James McMorran	3/30/2015	NE	Golden Eagle	<i>Aquila chrysaetos</i>	Sub-Adult	Unknown	1	
James McMorran	3/30/2015	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Male and Female	1	ON NEST
James McMorran	3/30/2015	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Male	1	ON TREE NEXT TO NEST TREE: TOOK FLIGHT 2 HOURS AFTER INITIAL DETECTION
James McMorran	3/30/2015	SW	Red-tailed Hawk	<i>Buteo jamaicensis</i>	Adult	Unknown	1	NOT MAPPED
James McMorran	3/30/2015	SW	American Kestrel	<i>Falco sparverius</i>	Adult	Unknown	1	
James McMorran	4/9/2015	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Male	1	FLEW IN AND LANDED IN TREE NEXT TO NEST TREE
James McMorran	4/9/2015	NE	American Kestrel	<i>Falco sparverius</i>	Adult	Male	1	
James McMorran	4/9/2015	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Female	1	ON NEST
James McMorran	4/9/2015	NE	Swainson's Hawk	<i>Buteo swainsoni</i>	Not Applicable	Unknown	1	FIRST PERCHED THEN FLEW TOWARDS OP AND CAUGHT THERMAL AND TOOK OFF
James McMorran	4/9/2015	SW	American Kestrel	<i>Falco sparverius</i>	Adult	Male	1	FLEW BY WITH PREY
James McMorran	4/9/2015	SW	American Kestrel	<i>Falco sparverius</i>	Adult	Male	1	SAME INDV "C"
James McMorran	4/9/2015	SW	Red-shouldered Hawk	<i>Buteo lineatus</i>	Not Applicable	Unknown	1	HEARD ONLY

Observer	Date	Point Count Station	Common Name	Scientific Name	Age	Sex	Number	Additional Notes
James McMorran	4/9/2015	SW	Cooper's Hawk	<i>Accipiter cooperii</i>	Adult	Unknown	1	NOT MAPPED
James McMorran	4/30/2015	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Male	1	FLEW BACK TO NEST WITH PREY ITEM: FEMALE FEEDING 2 NESTLINGS!!!
James McMorran	4/30/2015	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Male	1	FLEW FROM PERCH: DIRECT FLIGHT LOW TO GROUND
James McMorran	4/30/2015	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Male	1	Flew from nest then perched out on boulder in grasslands.
James McMorran	4/30/2015	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult/Juvenile	Unknown	1	ON NEST: APPEARS TO BE SHADING NESTLINGS
James McMorran	5/14/2015	NE	American Kestrel	<i>Falco sparverius</i>	Adult	Male	1	
James McMorran	5/14/2015	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Unknown	1	DIRECT FLIGHT THEN STOLE PREY FROM RTHAs. IT PROCEEDED TO EAT PREY. DID NOT TAKE PREY TO NEST
James McMorran	5/14/2015	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Unknown	1	FLEW DIRECTLY TO NEST
James McMorran	5/14/2015	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Unknown	1	CHICK{S} IN NEST__ADULT STARTED ON NEST THEN TOOK FLIGHT FOR 10 minutes, then perched on tree next to nest tree
James McMorran	5/14/2015	NE	Red-tailed Hawk	<i>Buteo jamaicensis</i>	Adult	Male and Female	4	
James McMorran	5/14/2015	SW	Red-shouldered Hawk	<i>Buteo lineatus</i>	Adult	Unknown	1	
James McMorran	5/14/2015	SW	American Kestrel	<i>Falco sparverius</i>	Adult	Female	1	NOT MAPPED
James McMorran	5/27/2015	NE	American Kestrel	<i>Falco sparverius</i>	Unknown	Female	1	
James McMorran	5/27/2015	NE	American Kestrel	<i>Falco sparverius</i>	Unknown	Male	1	PERCHED ON TREE AT OP THEN FLEW AWAY__NO FORAGING BEHAVIOR OBSERVED
James McMorran	5/27/2015	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Juvenile	Unknown	1	ON NEST:::ONLY ONE JUV CONFIRMED AT THIS TIME
James McMorran	5/27/2015	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Adult	Unknown	1	PERCHED IN TREE NEXT TO NEST TREE
James McMorran	5/27/2015	SW	American Kestrel	<i>Falco sparverius</i>	Adult/Juvenile	Male and Female	4	ADULTS BRINGING IN FOOD TO FLEDGLINDS__NO REASON TO MAP
James McMorran	6/2/2015	NE	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Sub-Adult	Unknown	1	FLEW IN AND PERCHED ON NEST TREE: THIS IS NOT A LOCAL BIRD: IT THEN TOOK OFF AND MEANDERED AND THEN CAUGHT THERMAL AND DISAPPEARED INTO BLUE SKY
James McMorran	6/2/2015	SW	Red-tailed Hawk	<i>Buteo jamaicensis</i>	Adult	Unknown	2	
James McMorran	6/2/2015	SW	Golden Eagle	<i>Aquila chrysaetos</i>	Unknown	Unknown	1	PRETTY DISTANT: LIKELY SUBADULT OR ADULT: CHASED BY RTHA
James McMorran	6/2/2015	SW	American Kestrel	<i>Falco sparverius</i>	Adult/Juvenile	Male and Female	4	ADULTS FEEDING YOUNG
James McMorran	6/30/2015	NE	Red-tailed Hawk	<i>Buteo jamaicensis</i>	Juvenile	Unknown	1	
James McMorran	7/6/2015	SW	Golden Eagle	<i>Aquila chrysaetos</i>	Sub-Adult	Unknown	1	
James McMorran	7/10/2015	NE	American Peregrine Falcon	<i>Falco peregrinus anatum</i>	Unknown	Unknown	1	FLEW BY VERY FAST CHASING TRI-COLORED AND BREWERS BLACKBIRDS: PHOTOS
James McMorran	7/10/2015	SW	American Kestrel	<i>Falco sparverius</i>	Unknown	Female	1	
James McMorran	7/10/2015	SW	Red-tailed Hawk	<i>Buteo jamaicensis</i>	Sub-Adult	Unknown	1	RUFOUS-MORPH IMM
James McMorran	7/29/2015	NE	Red-tailed Hawk	<i>Buteo jamaicensis</i>	Adult	Unknown	1	DOVE ON RABBIT BUT MISSES
James McMorran	7/29/2015	NE	Golden Eagle	<i>Aquila chrysaetos</i>	Adult/Juvenile	Unknown	1	
James McMorran	7/29/2015	NE	Golden Eagle	<i>Aquila chrysaetos</i>	Adult	Unknown	1	
James McMorran	7/29/2015	SW	American Kestrel	<i>Falco sparverius</i>	Adult/Juvenile	Male and Female	1	
James McMorran	8/10/2015	NE	American Kestrel	<i>Falco sparverius</i>	Unknown	Male	1	PERCHED THEN TOOK SHORT FLIGHT TO EUC GROVE EAST OF HOUSE
James McMorran	8/10/2015	SW	American Kestrel	<i>Falco sparverius</i>	Unknown	Female	1	

Observer	Date	Point Count Station	Common Name	Scientific Name	Age	Sex	Number	Additional Notes
James McMorran	8/31/2015	NE	American Kestrel	<i>Falco sparverius</i>	Juvenile	Male	2	CHASING EACH OTHER~ONE CAUGHT INSECT AND ATE IN FLIGHT~NOT MAPPED
James McMorran	8/31/2015	NE	Golden Eagle	<i>Aquila chrysaetos</i>	Adult	Unknown	1	PERCHED ON BOULDER FOR 41MINUTES~THEN TOOK FLIGHT WORKING THE RIDGE AND HILLSIDE LOOKING FOR PREY~EVENTUALLY CHASED OFF BY RTHA
James McMorran	8/31/2015	SW	American Peregrine Falcon	<i>Falco peregrinus anatum</i>	Juvenile	Unknown	1	SAME INDV AS EARLIER
James McMorran	8/31/2015	SW	American Peregrine Falcon	<i>Falco peregrinus anatum</i>	Juvenile	Unknown	1	FLEW IN~THEN CIRCLE SOARED~THEN FAST DIRECT FLIGHT PREY SWOOP
James McMorran	8/31/2015	SW	Cooper's Hawk	<i>Accipiter cooperii</i>	Unknown	Unknown	1	
James McMorran	8/31/2015	SW	Sharp-shinned Hawk	<i>Accipiter striatus</i>	Unknown	Male	1	CRAZY EARLY MIGRANT~INITIALLY THOUGHT IT WAS AMKE~IT WAS SIZE OF AMKE VERY QUICK SNAPPY WINGBEATS AS IT CIRCLE SOARED UP~RELATIVLY LONG TAIL~ROUND WINGS WITH LITTLE TO NO HEAD PROJECTION WHILE CIRCLE SOARING AND MORESO WHEN IT GLIDED SOUTH APPEARING HEADING SOUTH

APPENDIX D

FLIGHT PATHS OF EAGLES AND SPECIAL-STATUS RAPTORS, AND NON-SPECIAL-STATUS RAPTORS

AECOM

I: FETA

C = FETA

B = FETA

A = BAEH

Northeast Survey Point

Survey Section **NE**

Surveyor Name **SMC**

Survey # **2**

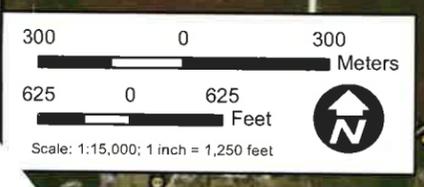
Date **10/31/14**

GPS Unit # _____ Map # _____



Legend

- Survey Points
- 400; 800; 1200 Meter Buffer
- 1600 Meter Buffer
- World Transportation



Northeast Survey Point
 Survey Section NE
 Surveyor Name JWC
 Survey # 2
 Date 10/31/14
 GPS Unit # _____ Map # _____

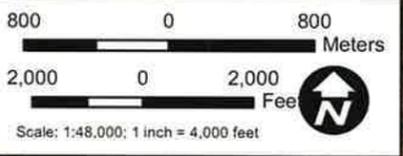
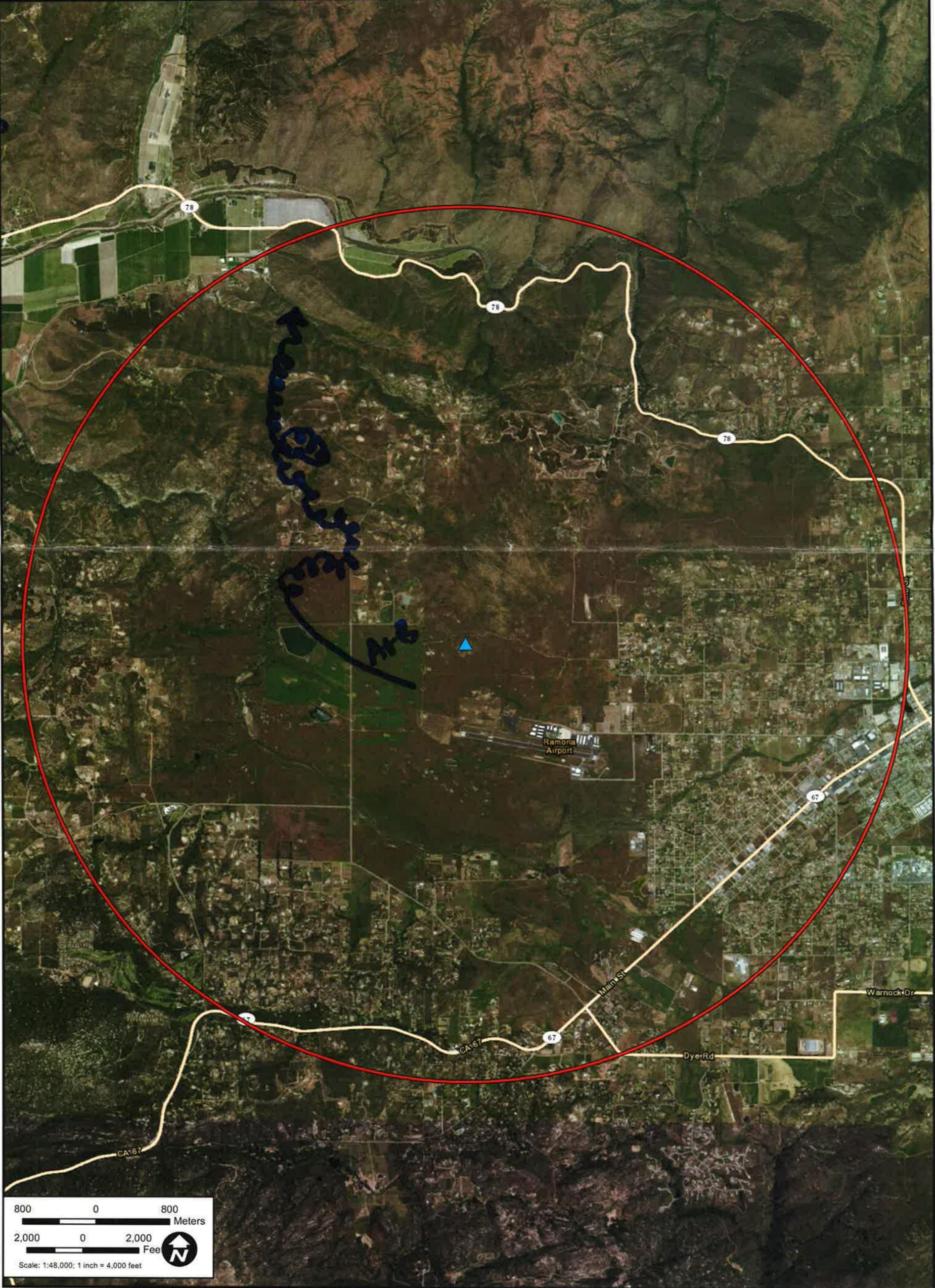


Legend

-  Survey Points
-  3 mile buffers
-  World Transportation

Projection: California State Plane Zone VI (Feet)
 Datum: North American Datum of 1983
 Disclaimer: This map is for field use purposes only.

A+B = BAEVA Park = 15 minute flight



NON-SPECIAL STATUS

Northeast Survey Point
 Survey Section **NE**
 Surveyor Name **JMC**
 Survey # **2**
 Date **10/31/14**
 GPS Unit # _____ Map # _____

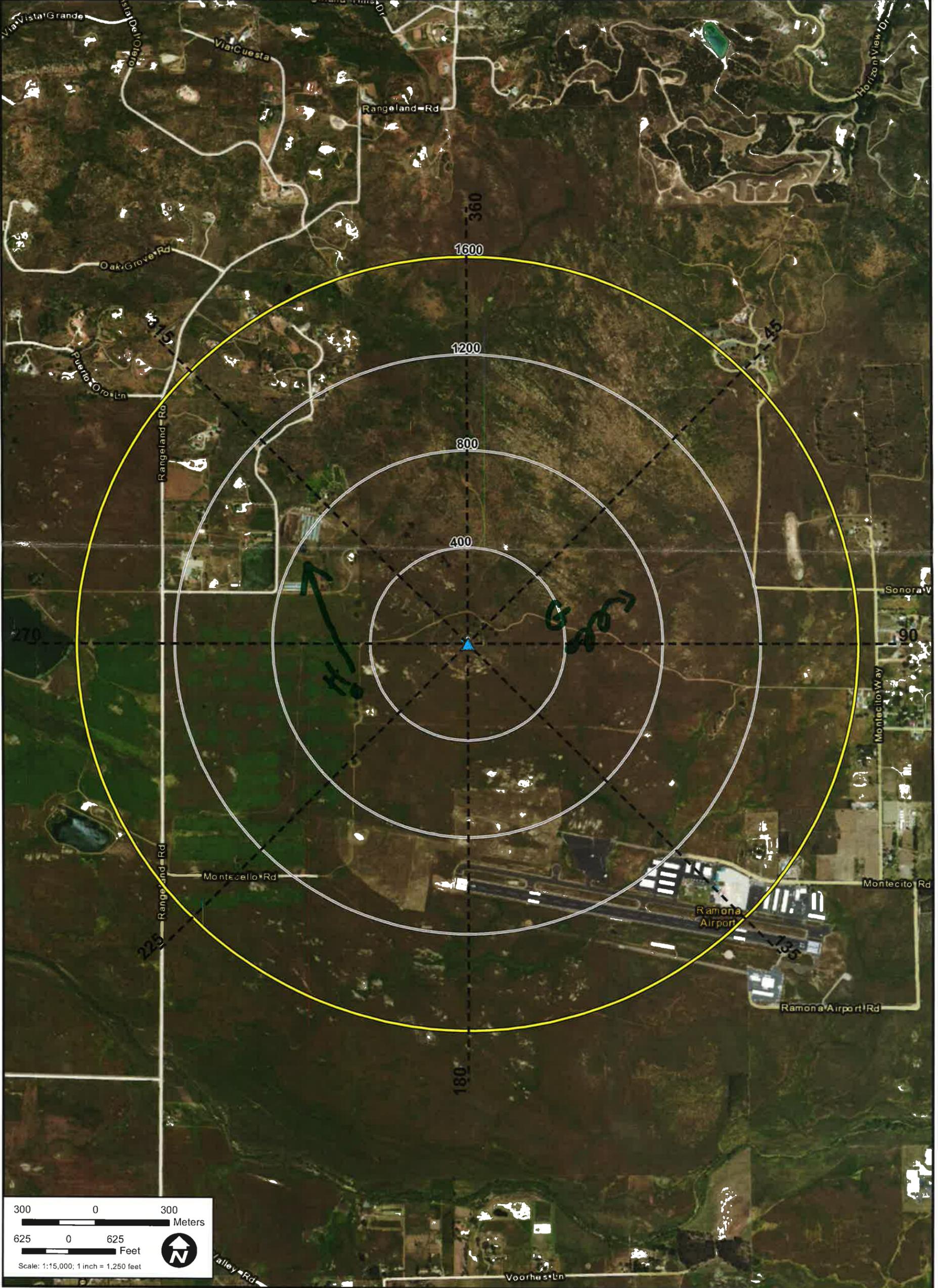


Legend

- Survey Points
- 400; 800; 1200 Meter Buffer
- 1600 Meter Buffer
- World Transportation

Projection: California State Plane Zone VI (Feet)
 Datum: North American Datum of 1983
 Disclaimer: This map is for field use purposes only.

H=MERL
G=SSHA



A: FEHA

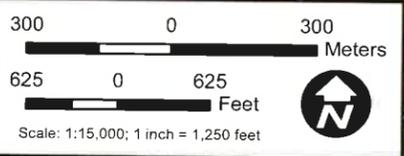
North East Survey Point

Survey Section **NE JMC**
Surveyor Name
Survey # **307 FGH**
Date
GPS Unit # **11/28/14** Map #



Legend

- Survey Points
- 400; 800; 1200 Meter Buffer
- 1600 Meter Buffer
- World Transportation



A = FEHA B = FEHA

Northeast Survey Point

Survey Section **SW**
Surveyor Name **JMC**
Survey # **3 of R11**
Date **11/28/14**
GPS Unit # _____ Map # _____

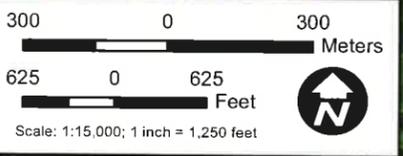
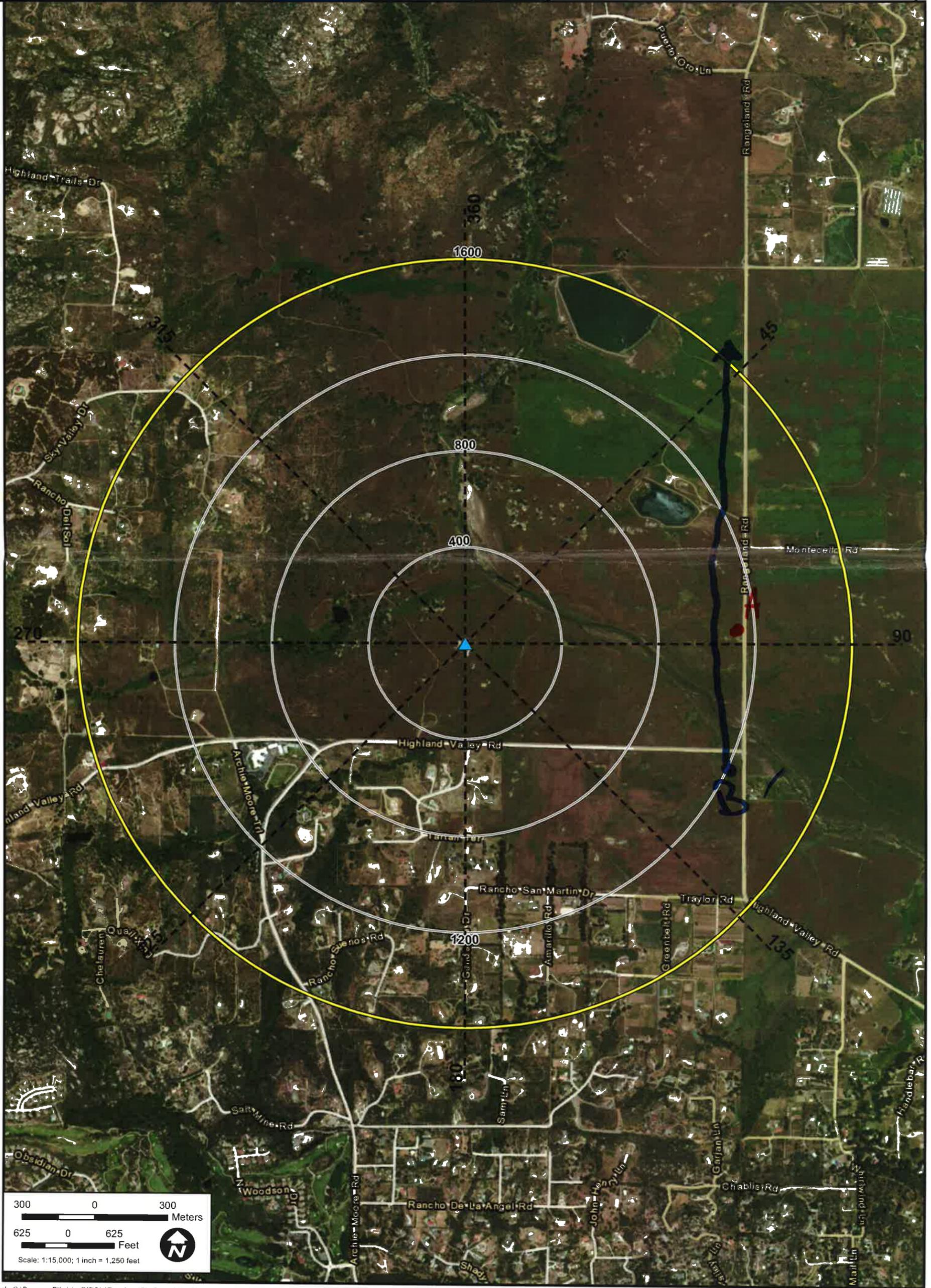


Legend

- Survey Points
- 400; 800; 1200 Meter Buffer
- 1600 Meter Buffer
- World Transportation

Projection: California State Plane Zone VI (Feet)
Datum: North American Datum of 1983

Disclaimer: This map is for field use purposes only.



Year 2

A = BAETA C B = FETTA B = FETTA

E = FETTA (Dax map H)

Northeast Survey Point

Survey Section **NE**

Surveyor Name **TMC**

Survey # **1st on site**

Date **12/26/14**

GPS Unit # **Map #**



Legend

- Survey Points
- 400; 800; 1200 Meter Buffer
- 1600 Meter Buffer
- World Transportation



A = BAEA B = PEFA C = PEFA D = BAEA

Northeast Survey Point
 Survey Section NE
 Surveyor Name JMC
 Survey # 5
 Date 1/29/15
 GPS Unit # _____ Map # _____



Projection: California State Plane Zone VI (Feet)
 Datum: North American Datum of 1983
 Disclaimer: This map is for field use purposes only.

Legend

- ▲ Survey Points
- 400; 800; 1200 Meter Buffer
- 1600 Meter Buffer
- World Transportation



A = FEHA, B = FEHA "DARK" C = FEHA D = BAFA

Northwest Survey Point

Survey Section SW
 Surveyor Name JMC
 Survey # 5
 Date 1/29/15
 GPS Unit # _____ Map # _____

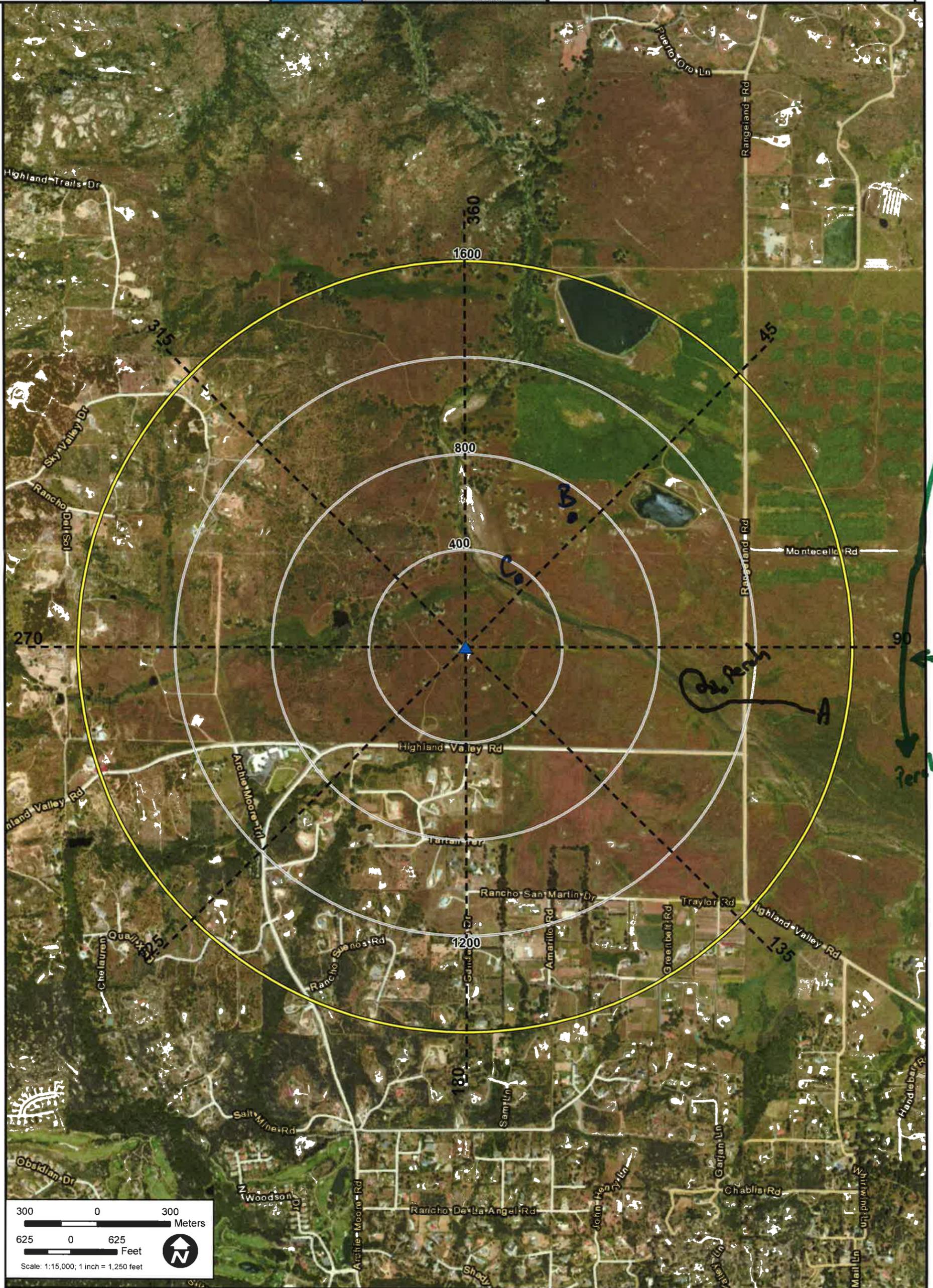
Projection: California State Plane Zone VI (Feet)
 Datum: North American Datum of 1983

Disclaimer: This map is for field use purposes only.



Legend

- ▲ Survey Points
- 400; 800; 1200 Meter Buffer
- 1600 Meter Buffer
- World Transportation



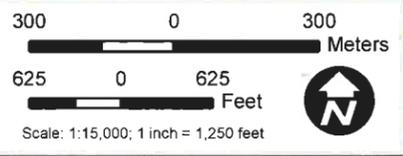
A = FETA (10M) = 15 MINUTES OF 0B

SW
 Northeast Survey Point
 Survey Section SW
 Surveyor Name J. McMoran
 Survey # 307 WINDR
 Date _____
 GPS Unit # 2126/15 Map # _____
 Projection: California State Plane Zone VI (Feet)
 Datum: North American Datum of 1983
 Disclaimer: This map is for field use purposes only.



Legend

- ▲ Survey Points
- 400; 800; 1200 Meter Buffer
- 1600 Meter Buffer
- World Transportation



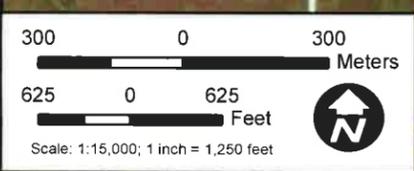
A = BAEH B = BAEH C = FEHA

Northeast Survey Point
 Survey Section NE
 Surveyor Name JMC
 Survey # 3 of WINTER
 Date 2/26/15
 GPS Unit # _____ Map # _____



Legend

- ▲ Survey Points
- 400; 800; 1200 Meter Buffer
- 1600 Meter Buffer
- World Transportation



A + B = BA EA

C = GO EA

Northeast Survey Point

Survey Section **NE**
Surveyor Name **ST. MORENO**
Survey # **Lot Spring 3/30/15**
Date
GPS Unit # _____ Map # _____



4-MINUTE DURATION

Legend

- Survey Points
- 400; 800; 1200 Meter Buffer
- 1600 Meter Buffer
- World Transportation

Projection: California State Plane Zone VI (Feet)
Datum: North American Datum of 1983

Disclaimer: This map is for field use purposes only.



Northeast Survey Point

Survey Section NE

Surveyor Name JML

Survey # 204 Springs

Date 4/9/15

GPS Unit # 9797 Map #

Projection: California State Plane Zone VI (Feet)

Datum: North American Datum of 1983

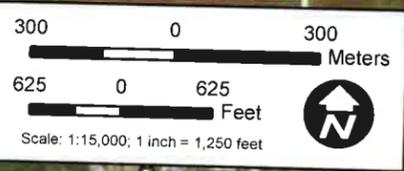
Disclaimer: This map is for field use purposes only.



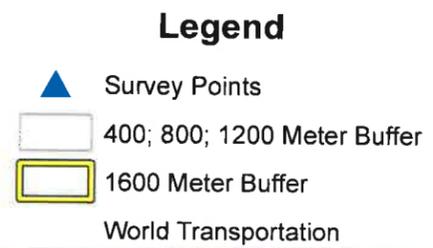
Legend

- ▲ Survey Points
- 400; 800; 1200 Meter Buffer
- 1600 Meter Buffer
- World Transportation

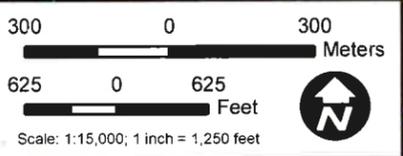
A = ISABA on west - B = DABA C = SWHA



Northeast Survey Point
 Survey Section NE JMC
 Surveyor Name _____
 Survey # _____
 Date 4/30/15
 GPS Unit # _____ Map # _____



A+B = RACE



A + B = BAEA

Northeast Survey Point

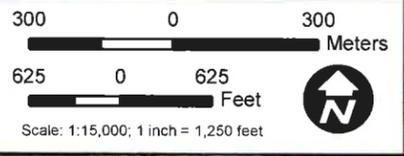
Survey Section NE
Surveyor Name JMC
Survey # 60257
Date 5/14/15
GPS Unit # _____ Map # _____



Legend

-  Survey Points
-  400; 800; 1200 Meter Buffer
-  1600 Meter Buffer
-  World Transportation

Projection: California State Plane Zone VI (Feet)
Datum: North American Datum of 1983
Disclaimer: This map is for field use purposes only.



Northeast Survey Point

Survey Section _____
Surveyor Name JMC
Survey # 6/2/15
Date _____
GPS Unit # _____ Map # _____
Survey 1 of Summer

Projection: California State Plane Zone VI (Feet)
Datum: North American Datum of 1983

Disclaimer: This map is for field use purposes only.



Legend

-  Survey Points
-  400; 800; 1200 Meter Buffer
-  1600 Meter Buffer
-  World Transportation



The RARE 3rd year Bird -

Northeast Survey Point

Survey Section SW
Surveyor Name J. McMorran
Survey # 1 of Summer
Date _____
GPS Unit # 6/2/15 Map # _____

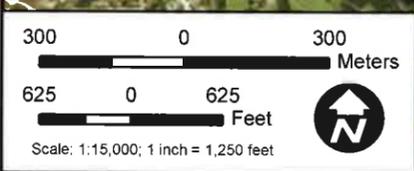
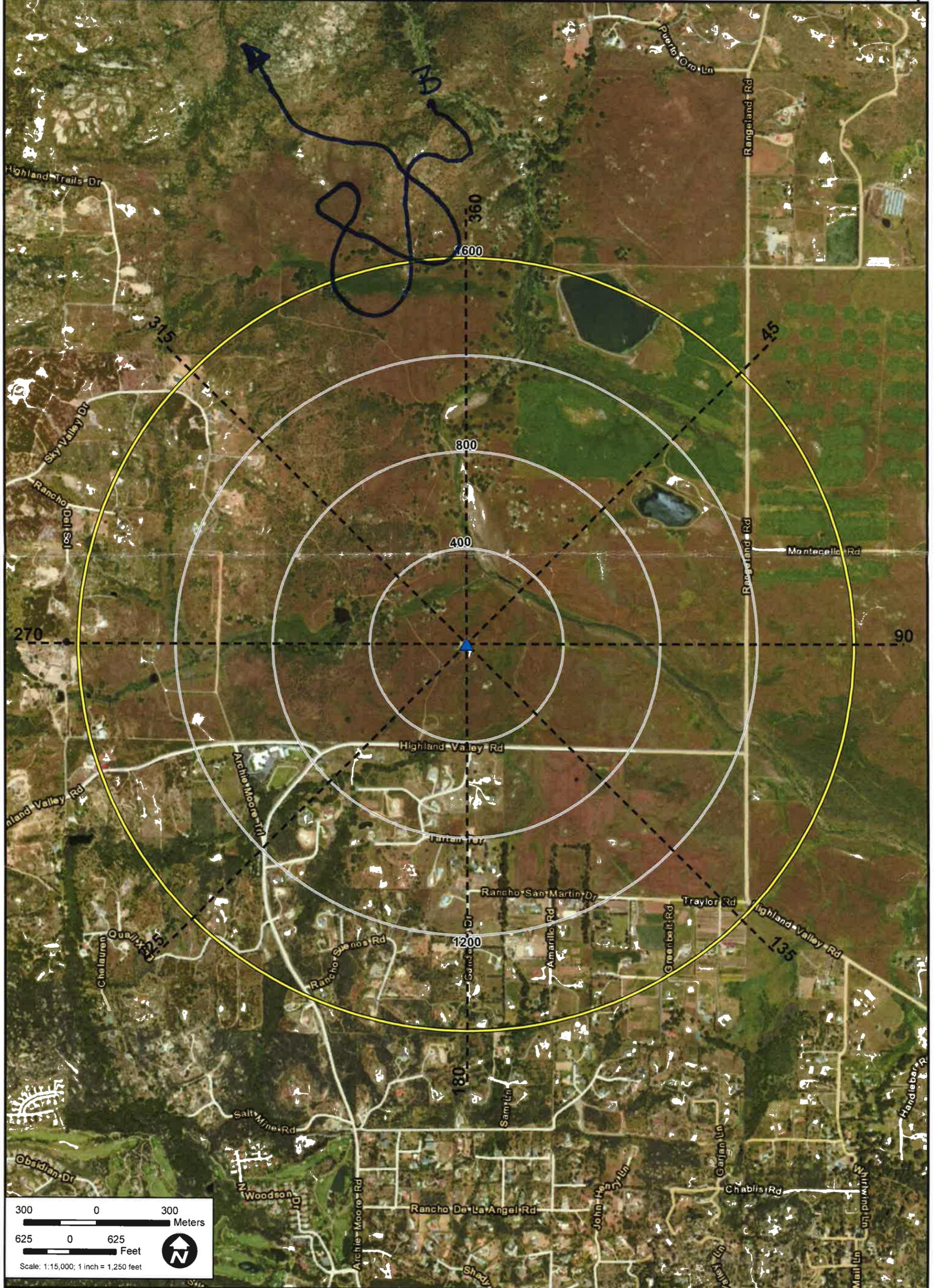
Projection: California State Plane Zone VI (Feet)
Datum: North American Datum of 1983

Disclaimer: This map is for field use purposes only.



B = GOEA
(age unknown)
Legend

- Survey Points
- 400; 800; 1200 Meter Buffer
- 1600 Meter Buffer
- World Transportation



*** MAKE-UP SURVEY for weather cancelled survey on 6/30.**

Northeast Survey Point
 Survey Section NE SW
 Surveyor Name J. MORENO
 Survey # 1117
 Date 7/6/15
 GPS Unit # _____ Map # _____

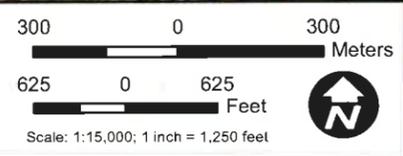
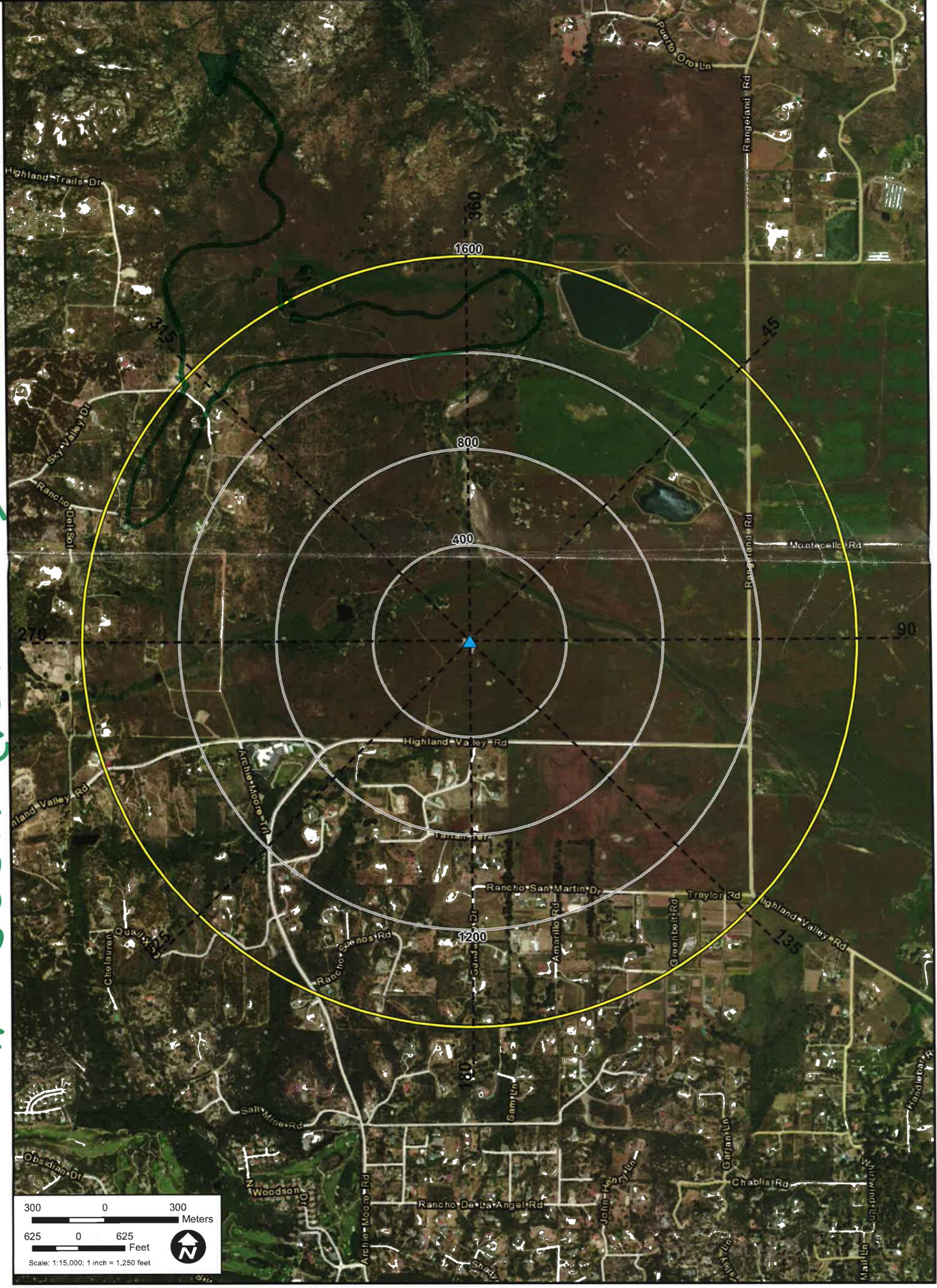
Projection: California State Plane Zone VI (Feet)
 Datum: North American Datum of 1983
 Disclaimer: This map is for field use purposes only.



Legend

- Survey Points
- 400; 800; 1200 Meter Buffer
- 1600 Meter Buffer
- World Transportation

A = GOENA (9.5 MIN obs)



Northeast Survey Point
 Survey Section **NE**
 Surveyor Name **J. McMorran**
 Survey # **3 of Summer**
 Date **7/10/15**
 GPS Unit # _____ Map # _____



Projection: California State Plane Zone VI (Feet)
 Datum: North American Datum of 1983
 Disclaimer: This map is for field use purposes only.

Legend

- Survey Points
- 400; 800; 1200 Meter Buffer
- 1600 Meter Buffer
- World Transportation

A = PEFA [Imm. Photo]



B = GOEA

~~BEVERA~~ C = GOEA - SEE NOTES ON BACK -

Northeast Survey Point
 Survey Section **NE**
 Surveyor Name **J. McMoran**
 Survey # **4 of summer**
 Date _____
 GPS Unit # _____ Map # _____
7/29/15



Legend

- ▲ Survey Points
- 400; 800; 1200 Meter Buffer
- 1600 Meter Buffer
- World Transportation



A = PTHA - PREY DIVE ON PASSIT - MISS SA

Northeast Survey Point

Survey Section **NE**
Surveyor Name **JMC**
Survey # **6 of Summer**
Date **8/31/15**
GPS Unit # _____ Map # _____

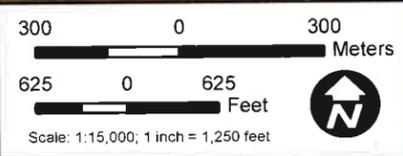
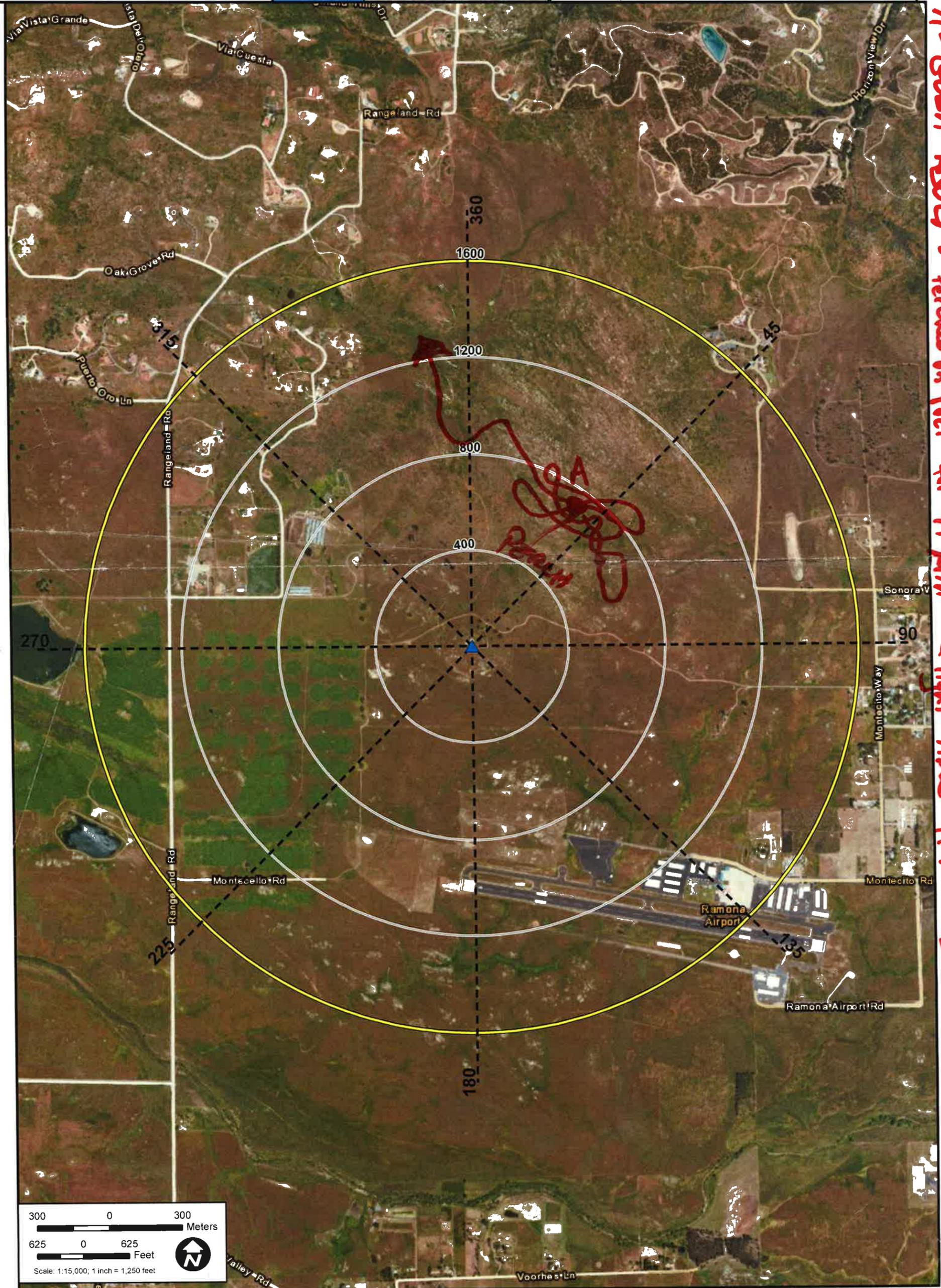
Projection: California State Plane Zone VI (Feet)
Datum: North American Datum of 1983

Disclaimer: This map is for field use purposes only.



Legend

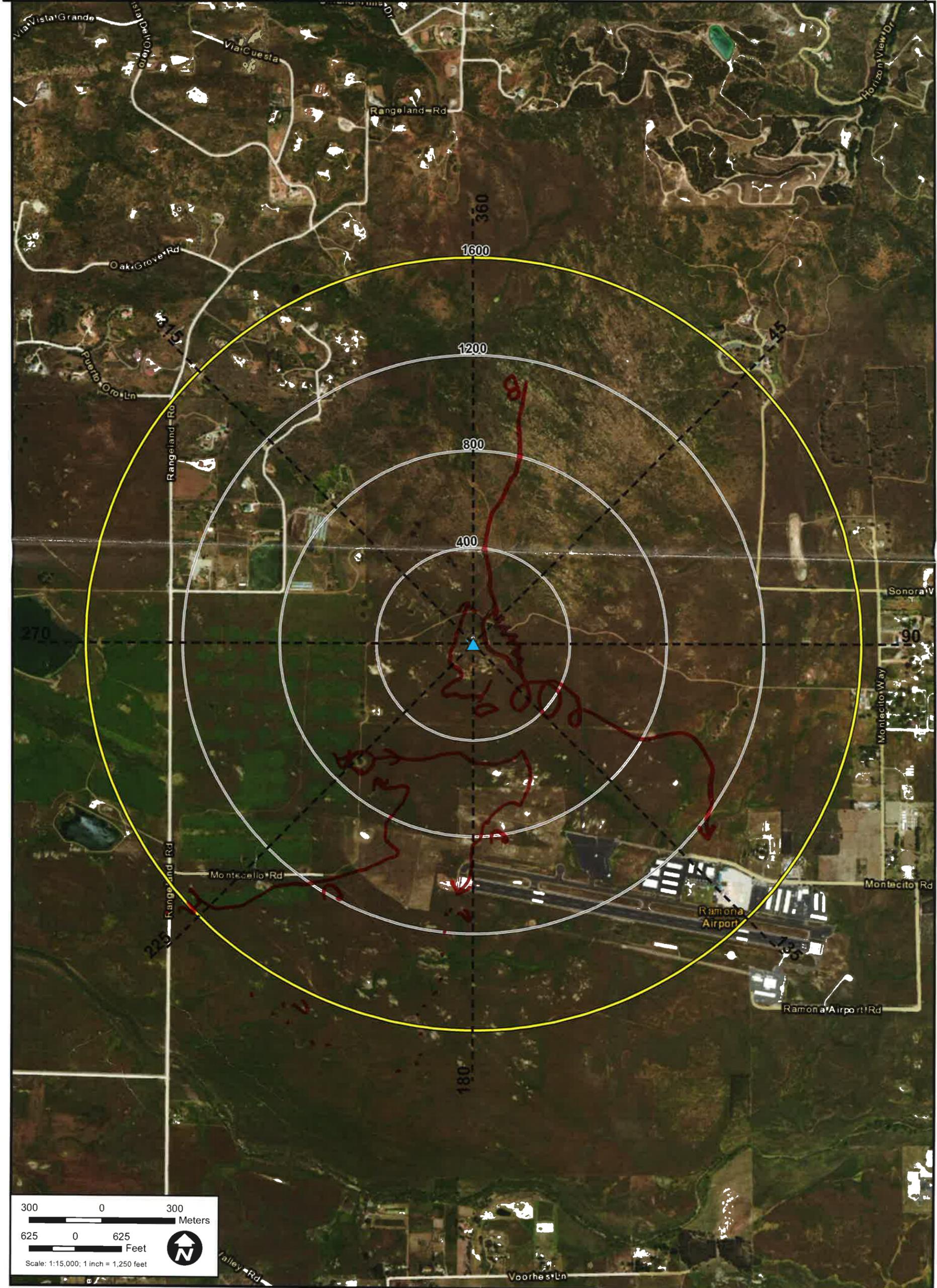
-  Survey Points
-  400; 800; 1200 Meter Buffer
-  1600 Meter Buffer
-  World Transportation



USFWS

A = BAFA B = PEFA C = BAFA flight D = PRFA

<p>Northeast Survey Point</p> <p>Survey Section <u>NE</u></p> <p>Surveyor Name <u>Jeep Page</u></p> <p>Survey # _____</p> <p>Date <u>18 Sept. 2014</u></p> <p>GPS Unit # _____ Map # _____</p>		<p>Legend</p> <ul style="list-style-type: none"> Survey Points 400; 800; 1200 Meter Buffer 1600 Meter Buffer World Transportation
<p>Projection: California State Plane Zone VI (Feet)</p> <p>Datum: North American Datum of 1983</p> <p><i>Disclaimer: This map is for field use purposes only.</i></p>		



<p>Northeast Survey Point</p> <p>Survey Section <u>NE</u></p> <p>Surveyor Name <u>JEEP AGEL</u></p> <p>Survey # <u>2.1 FALL</u></p> <p>Date <u>10/20/14</u> Map # _____</p> <p>GPS Unit # _____</p>	<p>Orange County Riverside County San Diego County Imperial County Mexico</p>	<h3>Legend</h3> <ul style="list-style-type: none"> Survey Points 400; 800; 1200 Meter Buffer 1600 Meter Buffer World Transportation
<p>Projection: California State Plane Zone VI (Feet) Datum: North American Datum of 1983</p> <p><i>Disclaimer: This map is for field use purposes only.</i></p>		



A = BAE A

B = BAE A

Northeast Survey Point

Survey Section SW
Surveyor Name Jeep Page
Survey # _____
Date 13 Nov 2014
GPS Unit # _____ Map # 1

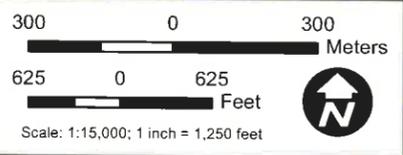
Projection: California State Plane Zone VI (Feet)
Datum: North American Datum of 1983

Disclaimer: This map is for field use purposes only.



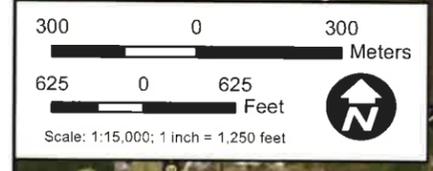
Legend

-  Survey Points
-  400; 800; 1200 Meter Buffer
-  1600 Meter Buffer
-  World Transportation



A = PRFA B = BAFA C = RSHA D = NOHA

Northeast Survey Point Survey Section <u>NE</u> Surveyor Name <u>J. Moore</u> Survey # <u>3</u> Date <u>11/13/19</u> GPS Unit # _____ Map # _____		Orange County Riverside County San Diego County Imperial County Mexico	<h3>Legend</h3> <ul style="list-style-type: none"> Survey Points 400; 800; 1200 Meter Buffer 1600 Meter Buffer World Transportation
Projection: California State Plane Zone VI (Feet) Datum: North American Datum of 1983 Disclaimer: This map is for field use purposes only.			



A = BA EA B = 60 EA C = NO HA D = 60 EA E = BA EA (F = BA EA) (G = FE HA)

Northeast Survey Point

Survey Section _____
 Surveyor Name Jeep Puzet
 Survey # NE
 Date 15 Dec 2014
 GPS Unit # _____ Map # _____

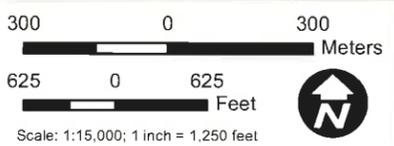
Projection: California State Plane Zone VI (Feet)
 Datum: North American Datum of 1983

Disclaimer: This map is for field use purposes only.



Legend

- Survey Points
- 400; 800; 1200 Meter Buffer
- 1600 Meter Buffer
- World Transportation



A=FEHA B=FEHA C=BAEP D=merlin E=mevlin

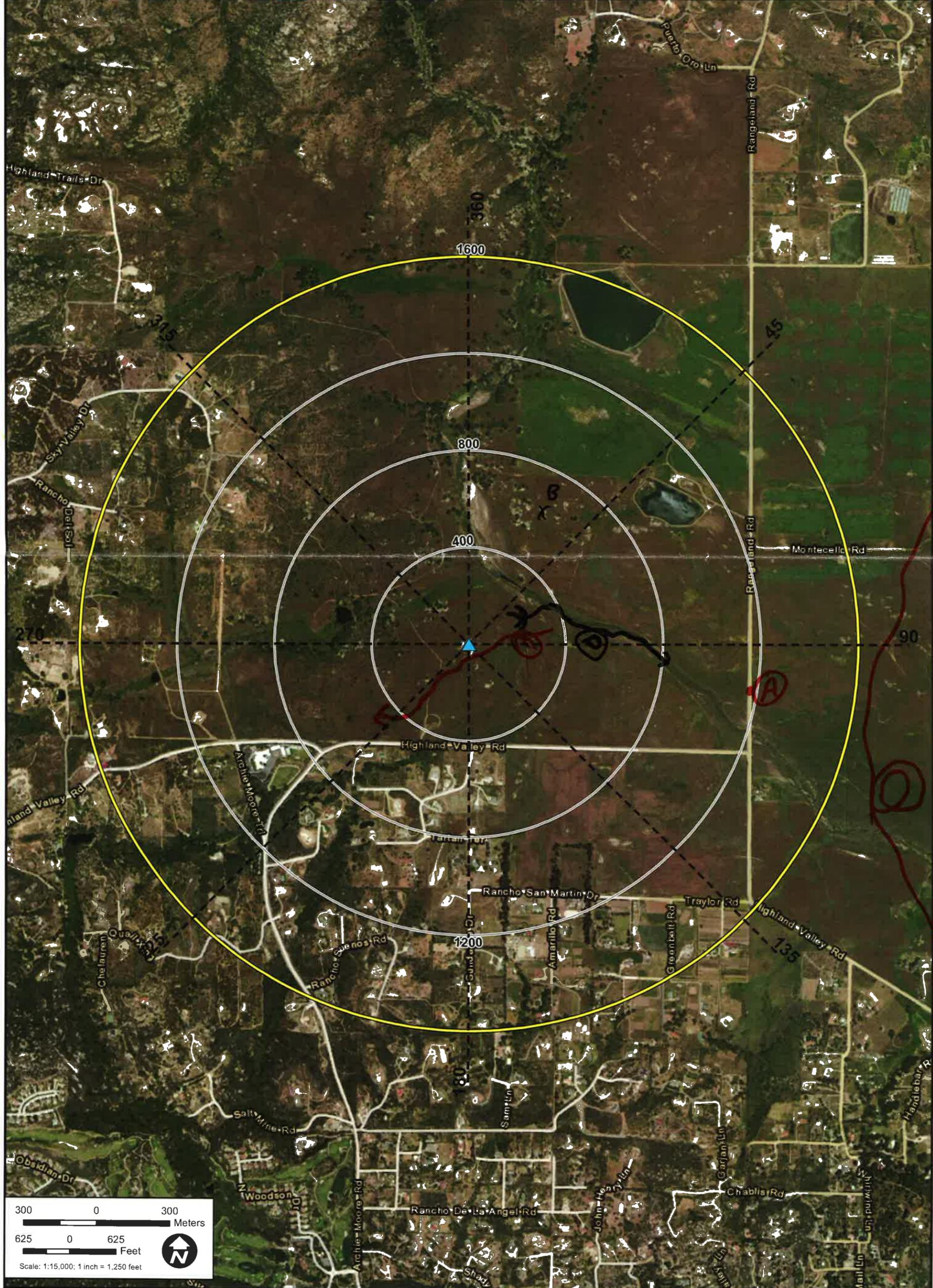
Northeast Survey Point
Survey Section _____
Surveyor Name Jeop Payer
Survey # _____
Date 15 Dec. 2014
GPS Unit # _____ Map # _____



Legend

- Survey Points
- 400; 800; 1200 Meter Buffer
- 1600 Meter Buffer
- World Transportation

Projection: California State Plane Zone VI (Feet)
Datum: North American Datum of 1983
Disclaimer: This map is for field use purposes only.



A = FEHA B = FEHA C = AREA D = FEHA

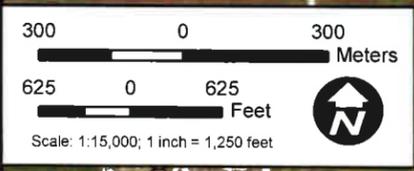
Northeast Survey Point
Survey Section _____
Surveyor Name Jeep Pajol
Survey # _____
Date 22 Jan 2015
GPS Unit # _____ Map # _____



E = BAEA

Legend

- ▲ Survey Points
- 400; 800; 1200 Meter Buffer
- 1600 Meter Buffer
- World Transportation



A = 60EA --- 10x560EA flights (dial) B - PEFA C - FEHA D - FEHA

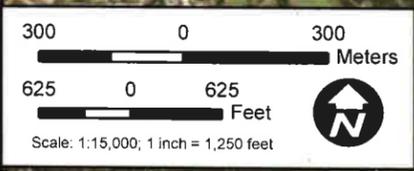
Northeast Survey Point
 S. West
 Survey Section _____
 Surveyor Name Jeep Pajal
 Survey # _____
 Date 22 Dec 2014
 GPS Unit # Trimble Map # 1

Projection: California State Plane Zone VI (Feet)
 Datum: North American Datum of 1983
 Disclaimer: This map is for field use purposes only.



Legend

- ▲ Survey Points
- 400; 800; 1200 Meter Buffer
- 1600 Meter Buffer
- World Transportation



→ 60EA

A = BAFA B = dark phase B = light phase C = light phase C = dark phase

Northeast Survey Point
 Survey Section NE
 Surveyor Name Jeep Pagel
 Survey # _____
 Date 13 Feb 2015
 GPS Unit # _____ Map # _____

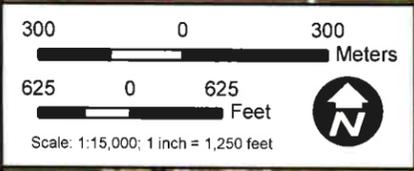
Projection: California State Plane Zone VI (Feet)
 Datum: North American Datum of 1983
 Disclaimer: This map is for field use purposes only.



ALL = FENA

Legend

- ▲ Survey Points
- 400; 800; 1200 Meter Buffer
- 1600 Meter Buffer
- World Transportation



A=FCHA B=BNPA C=BN GOEA N=3!

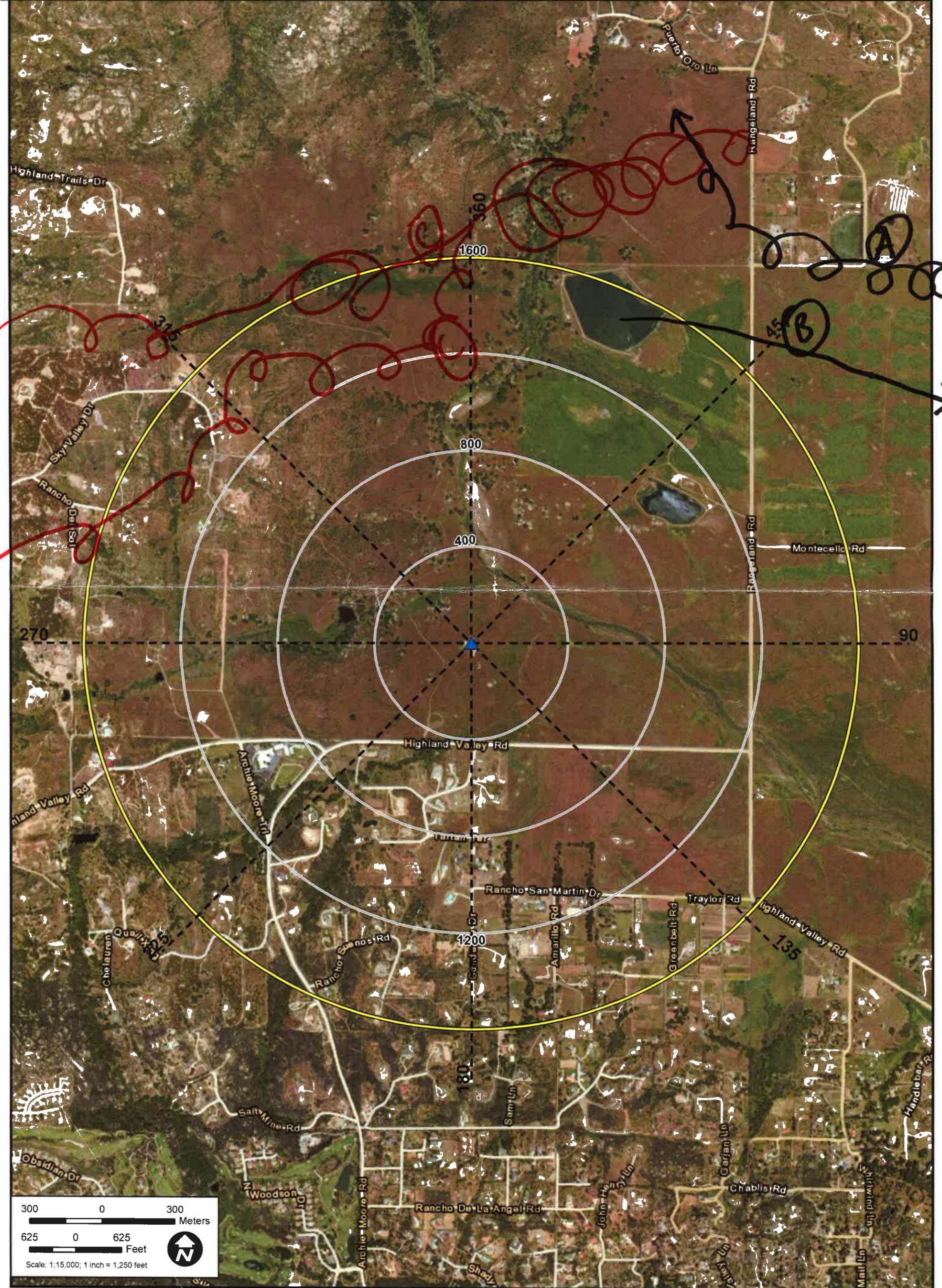
Northeast Survey Point
 S.West
 Survey Section _____
 Surveyor Name _____
 Survey # _____
 Date 3/20/07
 GPS Unit # _____ Map # _____



GOEA dispersed
 2 to North
 7 to South

Legend

- ▲ Survey Points
- 400; 800; 1200 Meter Buffer
- 1600 Meter Buffer
- World Transportation



A = GoEA B = FEHA C = FEHA (2nd bul) D = Merlin

Northeast Survey Point
S. West
Survey Section _____
Surveyor Name *Jeep*
Survey # _____
Date *11 Mar. 2015*
GPS Unit # _____ Map # _____

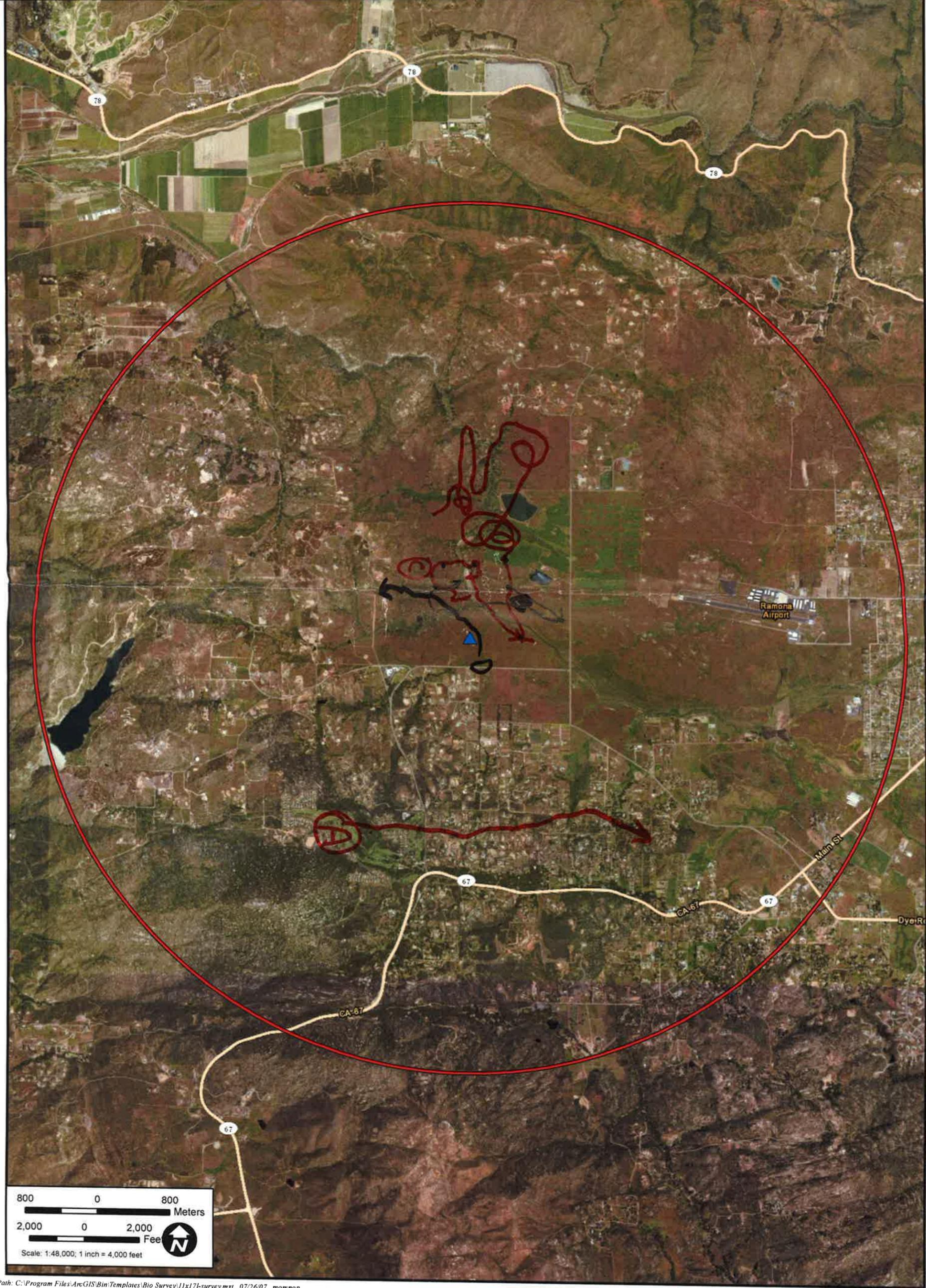


dot = Jeep

Legend

- ▲ Survey Points
- 3 mile buffers
- World Transportation

Projection: California State Plane Zone VI (Feet)
Datum: North American Datum of 1983
Disclaimer: This map is for field use purposes only.



A = BAEEA

↑ = pull lead of arrow

Northeast Survey Point

Survey Section _____
Surveyor Name Jeep Payer
Survey # _____
Date 11 MAR 2015
GPS Unit # _____ Map # _____

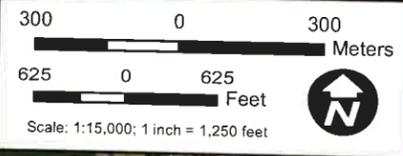
Projection: California State Plane Zone VI (Feet)
Datum: North American Datum of 1983

Disclaimer: This map is for field use purposes only.



Legend

- Survey Points
- 400; 800; 1200 Meter Buffer
- 1600 Meter Buffer
- World Transportation



APPENDIX E

SPECIES LIST BY SEASON

**APPENDIX E
SPECIES LIST BY SEASON**

Common Name	Scientific Name
Fall	
American Kestrel	<i>Falco sparverius</i>
American Peregrine Falcon	<i>Falco peregrinus anatum</i>
Bald Eagle	<i>Haliaeetus leucocephalus</i>
Ferruginous Hawk	<i>Buteo regalis</i>
Merlin	<i>Falco columbarius</i>
Northern Harrier	<i>Circus cyaneus</i>
Prairie Falcon	<i>Falco mexicanus</i>
Red-shouldered Hawk	<i>Buteo lineatus</i>
Red-tailed Hawk	<i>Buteo jamaicensis</i>
Sharp-shinned Hawk	<i>Accipiter striatus</i>
Winter	
American Kestrel	<i>Falco sparverius</i>
American Peregrine Falcon	<i>Falco peregrinus anatum</i>
Bald Eagle	<i>Haliaeetus leucocephalus</i>
Ferruginous Hawk	<i>Buteo regalis</i>
Golden Eagle	<i>Aquila chrysaetos</i>
Merlin	<i>Falco columbarius</i>
Northern Harrier	<i>Circus cyaneus</i>
Prairie Falcon	<i>Falco mexicanus</i>
Red-shouldered Hawk	<i>Buteo lineatus</i>
Red-tailed Hawk	<i>Buteo jamaicensis</i>
Spring	
American Kestrel	<i>Falco sparverius</i>
Bald Eagle	<i>Haliaeetus leucocephalus</i>
Cooper's Hawk	<i>Accipiter cooperii</i>
Ferruginous Hawk	<i>Buteo regalis</i>
Golden Eagle	<i>Aquila chrysaetos</i>
Merlin	<i>Falco columbarius</i>
Red-shouldered Hawk	<i>Buteo lineatus</i>
Red-tailed Hawk	<i>Buteo jamaicensis</i>
Swainson's Hawk	<i>Buteo swainsoni</i>
Summer	
American Kestrel	<i>Falco sparverius</i>
American Peregrine Falcon	<i>Falco peregrinus anatum</i>
Bald Eagle	<i>Haliaeetus leucocephalus</i>
Cooper's Hawk	<i>Accipiter cooperii</i>
Golden Eagle	<i>Aquila chrysaetos</i>
Red-tailed Hawk	<i>Buteo jamaicensis</i>
Sharp-shinned Hawk	<i>Accipiter striatus</i>

APPENDIX F

PHOTOS OF BALD EAGLES

**APPENDIX F
PHOTOS OF BALD EAGLES**



Adult Bald Eagle Tending Nestlings



Sub-Adult Bald Eagle



Sub-Adult Bald Eagle

APPENDIX G

**PHOTOS OF GOLDEN EAGLE
NEST MONITORING**

**APPENDIX G
HISTORIC GOLDEN EAGLE NEST SITE**





Golden Eagle Nest Monitoring Observation Point