

**RAPTOR SURVEYS
CONDUCTED AT NEAR WEST 2013**

RESOLUTION COPPER MINING

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TABLE OF CONTENTS

EXECUTIVE SUMMARY	ES-1
1. INTRODUCTION	1
2. METHODS	1
3. RESULTS	1
4. REFERENCES.....	4

TABLES

Table 1.	Raptor species observations made from 27 stations located approximately 500 m apart on February 25-27, April 29-30, May 1, and June 19-21 of 2013	2
Table 2.	Raptor species observations during Raptor Survey, Wildlife Camera Monitoring, and Avian Species Survey within the Analysis Area in 2013.....	3

FIGURES

(follow text)

Figure 1.	Vicinity Map
Figure 2.	Raptor Survey Points and Observations

APPENDICES

Appendix A.	Selected Photographs
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EXECUTIVE SUMMARY

WestLand Resources, Inc. (WestLand) was retained by Resolution Copper Mining, LLC (Resolution) to conduct raptor studies within the proposed Near West Tailings alternative area (Analysis Area) to provide baseline biological information to support planning and permitting activities. The Analysis Area includes approximately 3,622 acres (1,466 ha) of federal lands managed by Tonto National Forest (TNF). The Analysis Area is located adjacent to and north of US Highway 60, about 3.5 miles (5.6 km) west of the town of Superior in Township 1 South, Range 11 East, portions of Sections 22 through 27 and 34 through 36, and in Township 1 South, Range 12 East, portions of Sections 19, 30, and 31.

Raptor surveys were conducted during three periods in 2013, timed to coincide with the breeding, nesting, and post-fledging periods for most raptors in the area. These surveys were conducted between February 25 and 27; between April 29 and May 1, and between June 19 and 21, 2013. Twenty-seven survey points were selected. Daytime surveys were conducted for 10 minutes at each survey point between dawn and late morning to coincide with the greatest activity period for diurnal raptors. Nighttime surveys for owls took place in the first three hours after sunset. Surveyors listened for owl calls for 10 minutes at each survey location. At each of the 27 points, each raptor observed visually or heard calling was recorded as a detection. Additionally, WestLand conducted a survey of avian species and wildlife camera monitoring in the Analysis Area in 2013 (WestLand 2014). The results of these studies were reviewed for detection of raptors and are included here.

Eleven raptor species were recorded in the Analysis Area in 2013. None of the species observed are listed by the U.S. Fish & Wildlife Service (USFWS) as threatened or endangered under the Endangered Species Act (USFWS 2013) or by the U.S. Forest Service (USFS) as sensitive or Management Indicator Species (MIS; USFS 2013). Turkey vultures (*Cathartes aura*), red-tailed hawks (*Buteo jamaicensis*), American kestrels (*Falco sparverius*), and merlins (*Falco columbarius*) were observed during daytime raptor surveys. Three owl species—great horned owls (*Bubo virginianus*), Western screech-owls (*Megascops kennicottii*), and elf owls (*Micrathene whitneyi*)—were recorded during nighttime raptor surveys. During raptor surveys, a great horned owl roost and a raptor stick nest were identified. A barn owl (*Tyto alba*) was captured by wildlife cameras at Bear Spring (WestLand in prep.), and Cooper's hawk (*Accipiter cooperii*), Harris hawk (*Parabuteo unicinctus*), and zone-tailed hawk (*Buteo albonotatus*) were observed during general surveys of avian species (WestLand 2013). Probable breeding behavior was observed for red-tailed hawks and great horned owls. No confirmed or probable breeding behavior was observed for any other raptor species.

1. INTRODUCTION

WestLand Resources, Inc. (WestLand) was retained by Resolution Copper Mining, LLC (Resolution) to conduct raptor studies within the proposed Near West Tailings alternative area (Analysis Area; **Figure 1**) to provide baseline biological information to support planning and permitting activities. The Analysis Area includes approximately 3,622 acres (1,466 ha) of federal lands managed by Tonto National Forest (TNF). The Analysis Area is located adjacent to and north of US Highway 60, about 3.5 miles (5.6 km) west of the town of Superior in Township 1 South, Range 11 East, portions of Sections 22 through 27 and 34 through 36, and in Township 1 South, Range 12 East, portions of Sections 19, 30, and 31 (**Figure 1**).

The Analysis Area generally slopes from northeast (approximately 2,800 ft amsl) to the southwest (approximately 2,240 ft amsl) and is dissected by numerous ephemeral washes. Vegetation within the Analysis Area is characteristic of the Arizona Upland Subdivision of Sonoran Desertscrub (Turner and Brown 1982). The Analysis Area is relatively undisturbed but contains several Forest Service roads, historic mining features, and disturbance caused by off-highway vehicle usage.

2. METHODS

WestLand conducted raptor surveys during three periods in 2013, timed to coincide with the breeding, nesting, and post-fledging periods for most raptors in the area. The first round of surveys was conducted on February 25, 26 and 27; the second on April 29, 30, and May 1; and the third on June 19, 20, and 21, 2013. Twenty-seven survey points were selected and spaced roughly 1,640 feet (500 m) apart (**Figure 2**). At each point, surveyors scanned the treetops, large saguaro cactus, rock outcrops, cliff faces, and sky with binoculars for 10 minutes. Surveys were conducted from dawn until late morning to coincide with the greatest activity period for diurnal raptors. Nighttime surveys for owls were conducted in the first three hours after sunset. Equipped with sound-amplifying headphones (Action Ear[®] Sport, Silver Creek Industries), surveyors listened for owl calls for 10 minutes at each of the 27 survey points. When a raptor was detected visually or aurally during any survey, the surveyors recorded the species of the raptor, the cardinal or intercardinal direction and an estimated distance to the raptor from the survey point, and any observed breeding behaviors.

Results of the avian species survey and wildlife camera monitoring conducted by WestLand in the Analysis Area in 2013 were reviewed for raptor detections. Each of the raptor species observed was checked for listing status by the USFWS as threatened or endangered or by the USFS as sensitive or MIS.

3. RESULTS

In this section, we document the results of raptor surveys and include raptor detections from avian species surveys and wildlife camera monitoring conducted by WestLand in the Analysis Area in 2013.

Forty eight individual raptors of seven species were recorded during the formal raptor surveys in the Analysis Area. Turkey vultures (*Cathartes aura*), red-tailed hawks (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), and merlin (*Falco columbarius*) were observed during daytime surveys (**Table 1**; **Figure 2**). Three owl species, great horned owls (*Bubo virginianus*), western screech-owls (*Megascops*

kennicottii), and elf owls (*Micrathene whitneyi*) were recorded during nighttime surveys. (**Table 1**; **Figure 2**). **Table 1** summarizes the number of detections, the number of pairs observed, and the number of individual raptors observed. Turkey vultures observed throughout the Analysis Area are not included in **Figure 2**.

Table 1. Raptor species observations made from 27 stations located approximately 500 m apart on February 25-27, April 29-30, May 1, and June 19-21 of 2013

Common Name/Scientific Name	Number of Detections	Number of Pairs	Number of Individuals
Turkey Vulture (<i>Cathartes aura</i>)	22	0	22
Red-Tailed Hawk (<i>Buteo jamaicensis</i>)	10	1	11
Great Horned Owl (<i>Bubo virginianus</i>)	3	1	4
Western Screech-Owl (<i>Megascops kennicottii</i>)	8	0	8
American Kestrel (<i>Falco sparverius</i>)	1	0	1
Merlin (<i>Falco columbarius</i>)	1	0	1
Elf Owl (<i>Micrathene whitneyi</i>)	1	0	1
Total	46	2	48

Turkey vultures were the most commonly observed raptor during the formal raptor survey, representing almost 46 percent (22 of 48) of all observations (**Table 1**). There is a well-known communal roost of turkey vultures within the mature trees at nearby Boyce Thompson Arboretum, approximately 2 miles southeast of the Analysis Area, where in the past, over 100 individuals have been observed to congregate (Rea 1998).

Red-tailed hawks were the next most common raptor observed with 11 individuals detected. Daytime surveys located an American kestrel on June 21 and a merlin on February 26. The merlin observed was almost certainly a migrant as this raptor is not known to breed in Arizona (Oliphant 1998). During nocturnal surveys, Western screech-owls were heard vocalizing at several stations on February 25 and 26, April 29 and 30, and June 19, three detections of great horned owls were made on June 19 and 20, and a single elf owl was heard on April 29. A great horned owl roost, evidenced by pattern of whitewash (guano), was seen near Survey Point 6 on February 26, 2013. A possible raptor stick nest on a cliff was also documented from this location on February 26, 2013 (**Figure 2**), but this nest was not in use.

The North American Ornithological Atlas Committee (1990) classifies the observation of a pair in suitable habitat during its breeding season as “probable breeding behavior.” Based on this criterion, observations of raptor pairs indicating probable breeding in the Analysis Area included:

- A pair of red-tailed hawks documented in the vicinity of Bear Spring (**Figure 2**), in June.
- A pair of great horned owls detected near Bear Spring on June 20, 2013.

No probable breeding behavior was observed for the five additional raptor species detected during raptor surveys. No confirmed breeding behaviors, occupied nest locations, or young were observed for any of the raptor species in the Analysis Area during the 2013 survey period.

Table 2 summarizes raptor species observed during raptor surveys, wildlife camera monitoring, and avian species surveys within the Analysis Area in 2013. None of the raptor species observed within the Analysis Area in 2013 are listed by the USFWS as threatened or endangered (USFWS 2013), or by the USFS as sensitive or MIS (USFS 2013).

Table 2. Raptor species observations during Raptor Survey, Wildlife Camera Monitoring, and Avian Species Survey within the Analysis Area in 2013

Common Name/Scientific Name	Raptor Survey	Wildlife Camera Monitoring (WestLand 2014)	Avian Species Survey (WestLand 2013)
Turkey Vulture (<i>Cathartes aura</i>)	x	x	x
Red-Tailed Hawk (<i>Buteo jamaicensis</i>)	x	x	x
Great Horned Owl (<i>Bubo virginianus</i>)	x	x	x
Western Screech-Owl (<i>Megascops kennicottii</i>)	x		
American Kestrel (<i>Falco sparverius</i>)	x		x
Merlin (<i>Falco columbarius</i>)	x		
Elf Owl (<i>Micrathene whitneyi</i>)	x		
Barn Owl (<i>Tyto alba</i>)		x	
Cooper's Hawk (<i>Accipiter cooperii</i>)			x
Harris's Hawk (<i>Parabuteo unicinctus</i>)			x
Zone-tailed Hawk (<i>Buteo albonotatus</i>)			x

A single wildlife camera was placed at Bear Springs as part of a separate wildlife camera study (WestLand in prep). During the periods of observation, a single photograph of a barn owl (*Tyto alba*; **Appendix A, Photo 6**), nine photographs of great horned owls, 14 of red-tailed hawks, and 140 images of turkey vultures were recorded. The single image of a barn owl is the only observation of this species made by WestLand within the Analysis Area.

A pair of red-tailed hawks was recorded by the wildlife camera at Bear Spring in early July (**Appendix A, Photo 1**). This pair may be the same pair observed during the formal raptor survey. The Arizona Breeding Bird Atlas reports confirmed evidence of breeding for both the red-tailed hawk and the great horned owl in the Picketpost Mountain Quadrangle, which includes the Analysis Area (Corman and Wise-Gervais 2005).

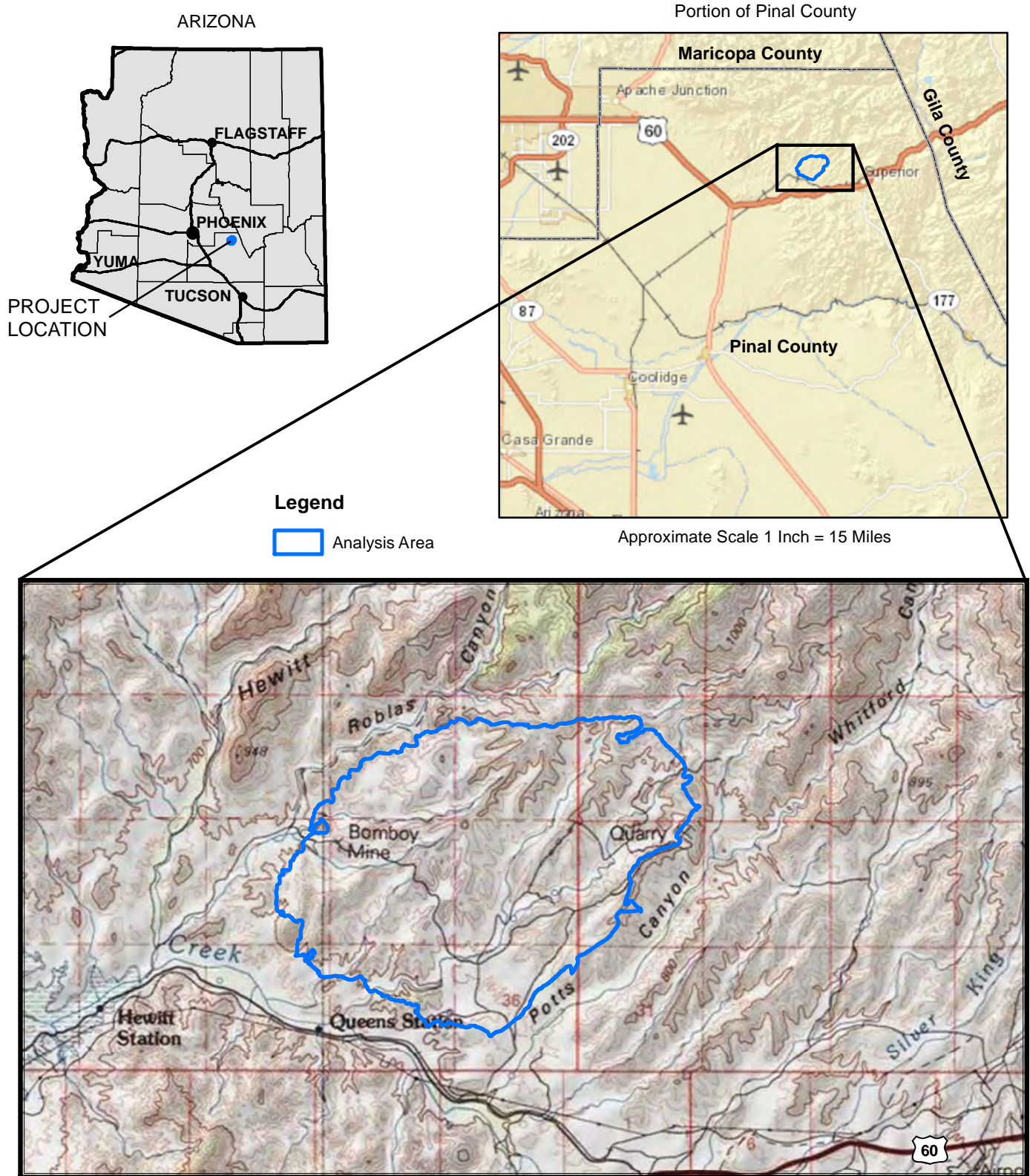
General avian species surveys conducted in the Analysis Area in 2013 (WestLand 2013) also documented red-tailed hawks, American kestrels, turkey vultures, and great horned owls. In addition, these bird surveys documented three species that were not observed during the raptor surveys including Cooper's hawk (*Accipiter cooperii*), Harris's hawk (*Parabuteo unicinctus*), and zone-tailed hawk (*Buteo albonotatus*).

4. REFERENCES

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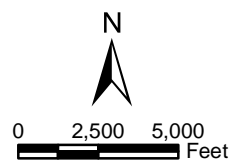


FIGURES



T1S, R11E, Portions of Sections 22-27, and 34-36,
 T1S, R12E, Portions of Sections 19, 30, and 31,
 Mesa 1:100,000 USGS Quadrangle
 Pinal County, Arizona

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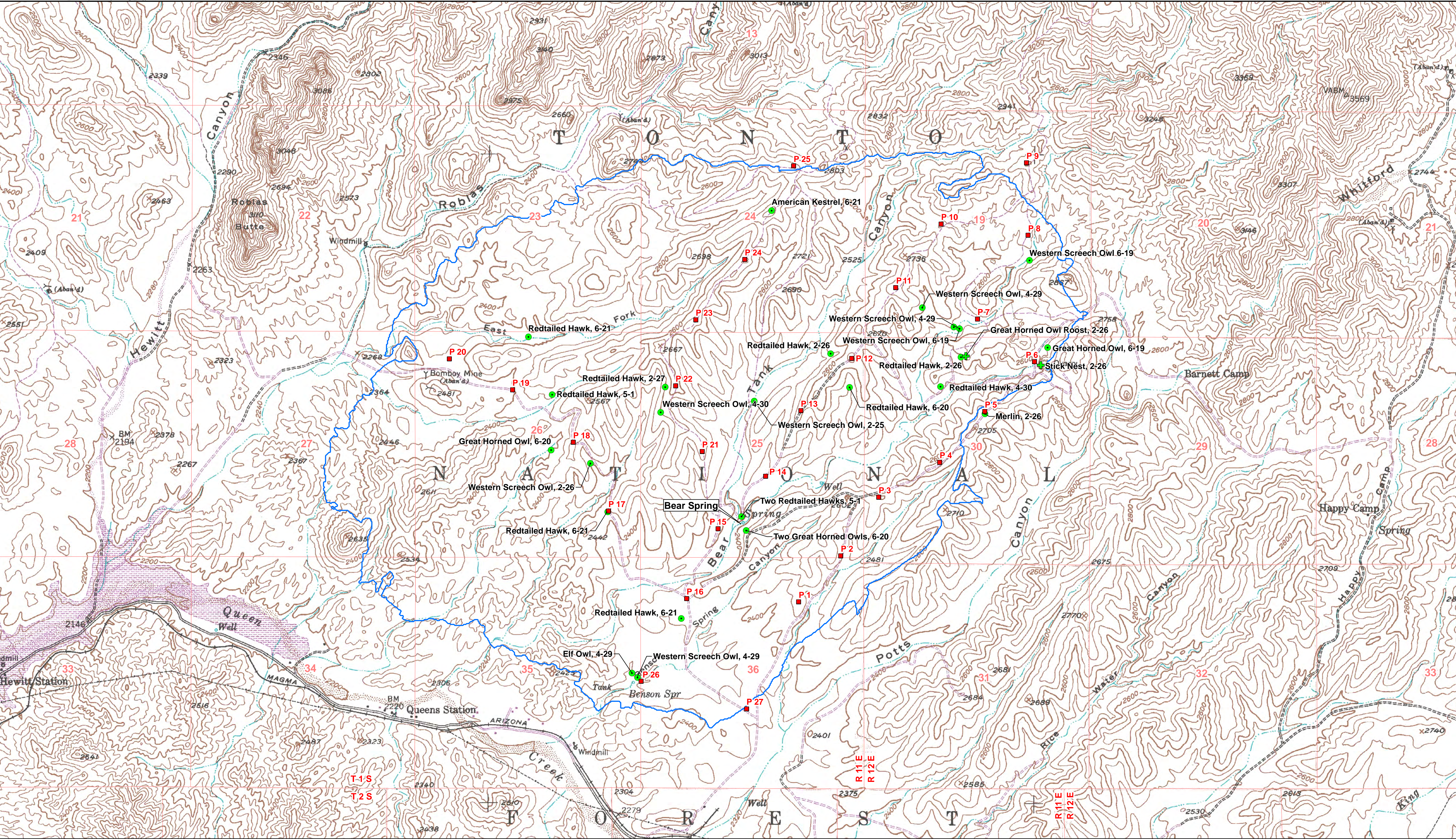


RESOLUTION COPPER MINING

Raptor Surveys Conducted at
 Near West 2013

VICINITY MAP

Figure 1



APPENDIX A

SELECTED PHOTOGRAPHS



Photo 1. A pair of red-tailed hawks at Bear Spring.



Photo 2. Immature red-tailed hawk at Bear Spring.



Photo 3. Turkey vultures at Bear Spring.



Photo 4. A flock of turkey vultures taking flight from Bear Spring.



Photo 5. A mixed flock of turkey vultures and a red-tailed hawk at Bear Spring.



Photo 6. Nighttime observation of a barn owl at Bear Spring.



Photo 7. A great horned owl.



Photo 8. A red-tailed hawk landing at Bear Spring.