

California Condor Activity in the Tejon Ranch Region

A summary of California condor habitat use patterns in conjunction with designated critical habitat and proposed developments on Tejon Ranch, CA

Christopher B. Cogan, PhD

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Front Cover:

Adult condor “AC-6” on Tejon Ranch

Photograph by Christopher B. Cogan, 18 March 1986



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Introduction

To determine the significance of the Tejon Ranch as habitat for California condors, this report combines and analyzes all available condor data from multiple datasets over the period from the late 1800's to the present. Data sources include:

Visual condor sightings from the McBee records: 1890 – 1984

Visual condor sightings from USFWS and Audubon researchers: 1982 – 1987

Visual flightlines from USFWS/Audubon pilots: 1982 – 1987

Condor Nest location records. 111 records from pre-1900 – 1986

USFWS (Ventana):

CACO_VWS_GPSDATA_1-65535.xls

CACO_VWS_GPSDATA_65536-77250.xls

➤ VentGPS03_06_Merge

➤ 77,250 records (Only includes: Date, Time, Lat, Lon. Condor ID's were not provided) from 17 July 2003 – 3 June 2006

USFWS non-visual point locations from Satellite radio transmitters (select Fix = 3)

XY_MergeFix3_WGS84

29,595 records from: Dec 23, 2001 – June 17, 2008

USFWS non-visual point locations from Satellite radio transmitters

XYSatelliteDataTable

3,923 records from: 1 Jan 2007 – 19 June 2008

USFWS non-visual GPS tag point data:

XYGPSDataTable

37,521 records from 1 Jan 2007 – 19 June 2008

USFWS non-visual GPS tag point data:

XYGPSDataTable

38,405 records from 1 May 2008 – 31 Dec 2008

World Wildlife Fund terrestrial ecoregions

Tejon Ranch proposed development boundaries from the Center for Biological Diversity (CBD)

Tejon Ranch property boundaries (from CBD)

Condor ESA critical habitat designation from <http://criticalhabitat.fws.gov/> (10 polygons).

Spatial Analysis of Tejon Ranch as California Condor Habitat

A series of 15 geographic information system (GIS) maps (Figures 1-15 below) summarize and illustrate the various types of condor activity in the Tejon Ranch area. Each of these map figures are presented in color. Black and white copies of this report will not provide sufficient information.

Figure 1. Locator Map. Historic California condor range, ESA designated critical habitat zones, Tejon Ranch property, and proposed Tejon Ranch development area.

This map identifies the position of Tejon Ranch and the Tejon Ranch proposed development areas within the historic condor range. The condor range boundaries were drafted in consultation with USFWS and National Audubon condor biologists in the 1980's providing a generalized outline of condor habitat areas. Of particular interest is the Tejon Ranch location at a four-fold ecoregion "choke point" between the transverse range and the Sierra Nevada Mountains.

Figure 2. WWF Ecoregions. The original condor range map from Figure 1 was drafted as a general consensus by condor researchers. Figure 2 brings in an independent data set, the World Wildlife Fund for Nature terrestrial ecoregions (see also Hickman 1993, for the Jepson ecoregion version). Condors tend (with some exceptions) to avoid the California Central Valley and the Mojave Desert. This map provides further explanation for the constriction of the condor range in the Tejon Area, and highlights the uniqueness and importance of the region.

Another habitat property illustrated in Figure 2 is the division of the Tejon Ranch Proposed Development area into four major ecoregions, in particular the California interior chaparral and woodlands vs. the California montane chaparral and woodland types (yellow and purple in the map). Following general ecological principles, any consideration of habitat impacts or endangered species impact needs to treat each ecoregion separately. This is particularly important when considering how condors use habitats in multiple ecoregions and how a species such as the condor can act as an umbrella species.

Figure 3. McBee Records. The historic McBee records reflect visual condor sightings, with a total of 7,341 records included in the data base. The records run from 1890 until 1984. Approximately 1,342 sightings are from the Tejon Ranch area, with records from the 1930's through 1984. These Tejon area data include 1178 Airborne records, 102 perched records, and 51 feeding records. The McBee data are an important record of past condor habitat. What is particularly striking is the consistency of condor use in this area from our earliest records through present times. Recent condor captures, releases, or feeding programs have not significantly attracted nor deterred condors from the Tejon Ranch area. Pastoria Creek and Winters Ridge are prime examples of long-standing condor habitat areas.

Figure 4. Visual Records. The visual sighting data represented in Figure 4 are based on data collected by field researchers. From 1982 through 1987 there were 10,294 records collected, with approximately 1,800 in the Tejon Ranch area. Corresponding condor ID's (CID) include 11 individuals (0, 1, 2, 3, 4, 5, 6, 7, 8, 9, and 97). CID code 97 indicates "unknown adult condor". Note how the spatial patterns of habitat use are consistent with the earlier McBee records.

Figure 5. Flight Lines. From the period 1982 – 1986 condor biologists in light aircraft used radio telemetry to locate tagged condors, then observe the birds visually and follow them in flight. While flying, the pilots drafted their course on county-scale maps, which were later digitized and compiled in GIS format. The flight data are unique, because they provide a consistent visual record of bird movements over large areas for a five-year period. Though the wild population was very small in these years, the Tejon area data include records from six individual birds (condor ID's 1, 2, 5, 6, 8, and 9). Please note that these data are intended as a general indication of flight routes, not as spatially precise as other data types such as the GPS data. In spite of the spatially coarse nature of the maps, the flight data add yet another important form of evidence identifying Tejon Ranch as critical condor habitat.

Figure 6. GPS Records. The GPS satellite telemetry data on condor locations represents a true breakthrough in data collection technology. The massive data volumes and quality of data offer critical insights to condor habitat use. The GPS locations plotted in figure 6 are from three USFWS data sets:

- 1) GPS data collected from 17 July 2003 – 3 June 2006 77,250 records with approximately 400 in the Tejon Ranch area. Approximately 80% of the records from this data set were located in the Ventana / Pinnacles region. Condor ID's were not provided with this data so a summary of the number of individual birds in the Tejon area is not presented here.
- 2) GPS data collected from 1 January 2007 – 19 June 2008 37,521 records, with approximately 1,300 in the Tejon Ranch area. All of the 17 birds from this data set have recorded locations in the Tejon area.
- 3) GPS data collected from 1 May 2008 – 31 Dec 2008 38,405 records, with approximately 1,500 in the Tejon Ranch area. Of the 17 birds represented in this data set, 14 have recorded locations in the Tejon area.

Of particular note with all of the Figure 6 records is the spatial correlation of the high accuracy GPS data with the older visual data sets, including the flight line data.

Figure 7. Pastoria Creek Map. Figure 7 is an enlargement of Figure 6, providing detail for key condor activity areas along Bear Trap Canyon and Pastoria Creek within the Tejon Ranch, and specifically within the proposed "Tejon Mountain Village" development area.

Figure 8. Perched Activity. To determine different types of condor activity within the Tejon Ranch area, the 1982 – 1987 visual data (10,294 records) were reduced to show perched activity only (2,901 records). These data included approximately 600 records in the Tejon Ranch area. Many of the perched records occur in the upland areas above Bear Trap and Tunis Creeks, and in the Winters Ridge area.

Figure 9. Feeding Activity. Of the 1982 – 1987 visual data records, 777 were coded as feeding records. This figure includes approximately 200 records of feeding condors within Tejon Ranch. Note how most of the feeding locations are well apart from the 5 kilometer buffers around nest locations. Also note how the flight lines that pass over the proposed development areas identify critical habitat which acts to connect the feeding areas with nesting areas. Based on the ecoregion patterns in Figure 2, this figure highlights multiple activities (nesting, flying, and feeding) within the California montane chaparral and woodland ecoregion. This figure also suggests how impacts in the Tejon area could also impact (for example) nesting areas 40 km to the south.

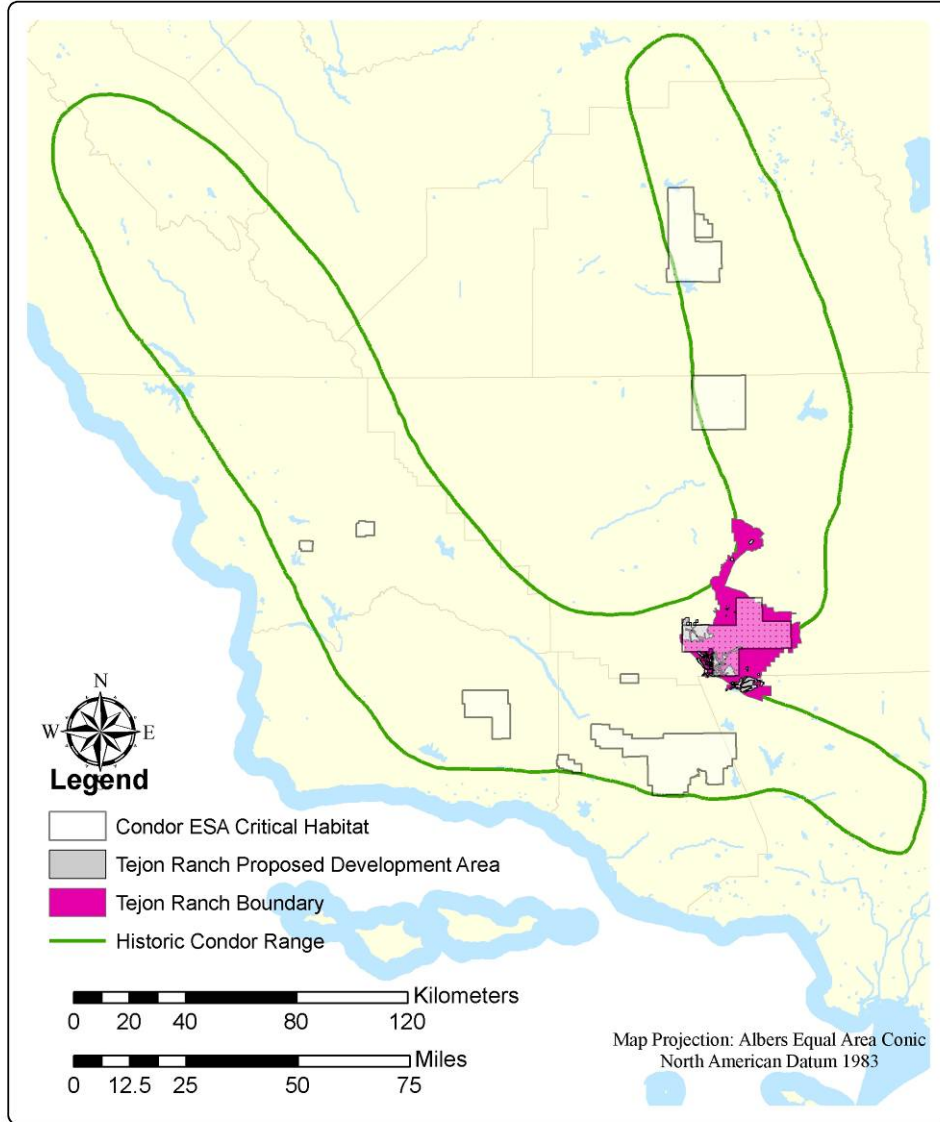
Figures 10 – 12. Perspective views of selected condor data within the proposed Tejon Ranch development areas. Please see figure legends for more information.

Figure 13. Koford Map. Historic 1953 map from Carl Koford with transition routes from Ventura to Tejon.

Figure 14. GPS-measured Condor Positions with ½ mile buffer. See figure legend for additional description and discussion.

Figure 15. Proposed Tejon Ranch development areas with 400 meter (1/2 mile, shown in blue) and 800 meter (1 mile, in green) buffer extensions. See figure legend for additional description and discussion.

Locator Map with Historic Condor Range and Designated Critical Habitat Zones

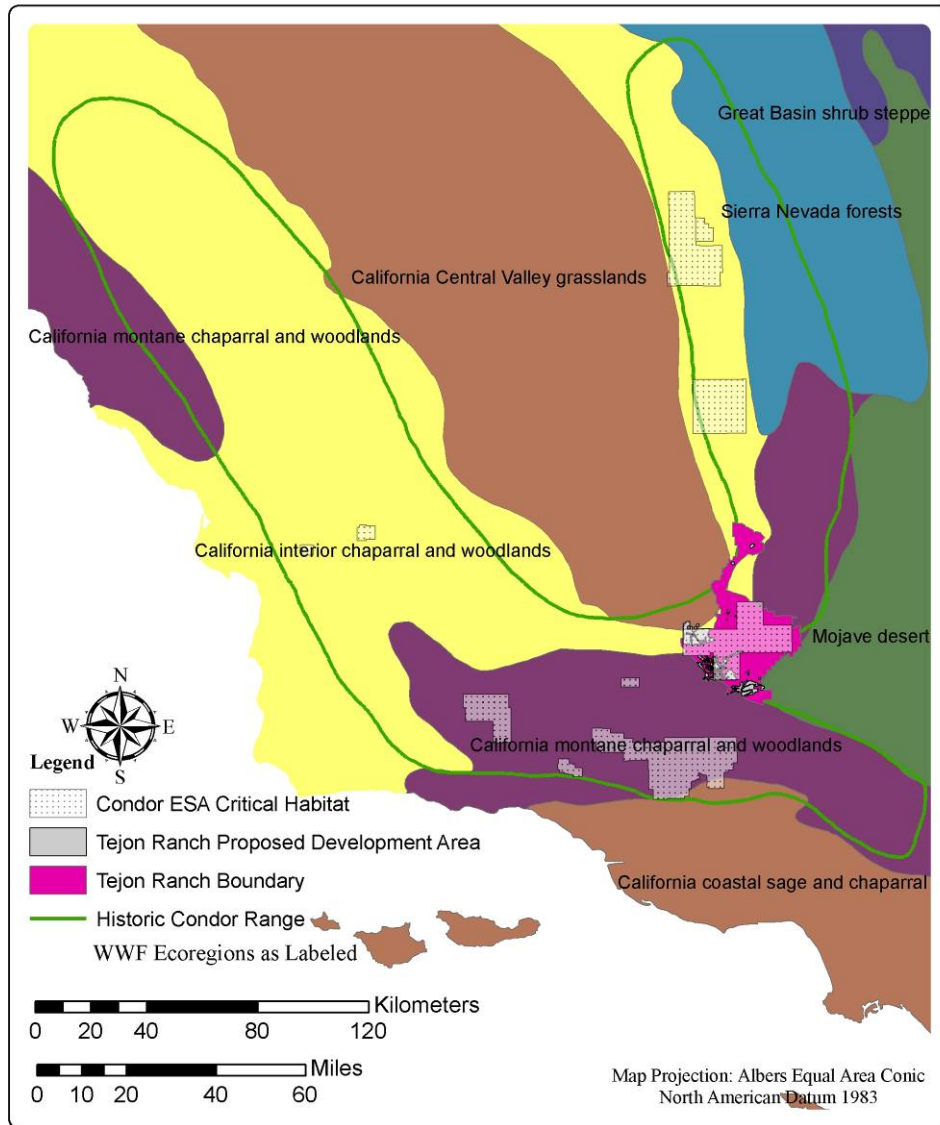


Historic California condor range, ESA designated critical habitat zones, Tejon Ranch property, and proposed Tejon Ranch development area.

GIS Analysis:
Center for Biological Diversity
1 May 2009

Figure 1. Locator.

Locator Map with World Wildlife Fund Terrestrial Ecoregions and Proposed Tejon Ranch Development Zones

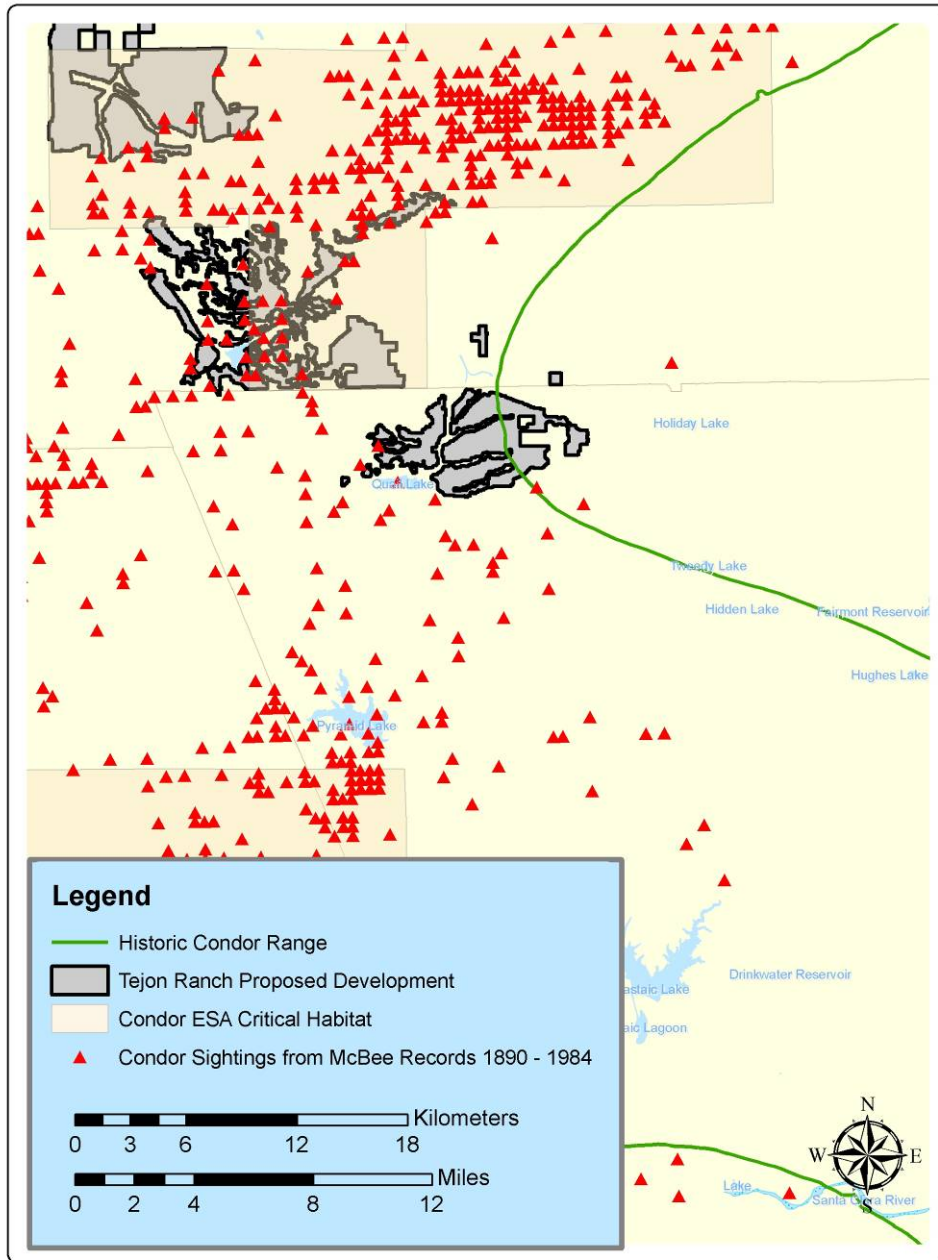


Historic California condor range with proposed Tejon Ranch development area and World Wildlife Fund terrestrial ecoregions.

GIS Analysis:
Center for Biological Diversity, 1 May 2009

Figure 2. WWF.

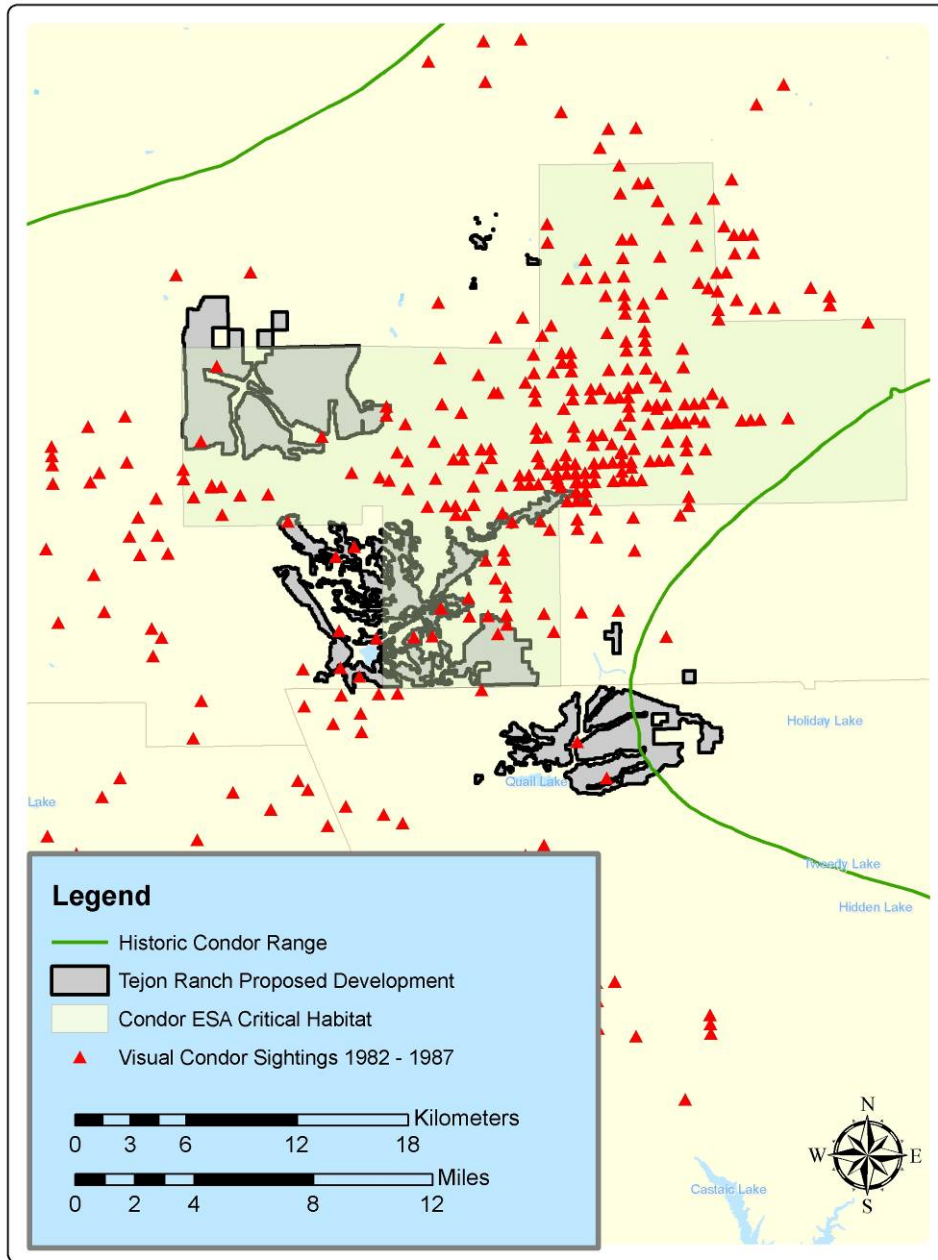
Condor Sightings from McBee Records 1890 - 1984



GIS Analysis:
Center for Biological Diversity, 1 May 2009

Figure 3. McBee.

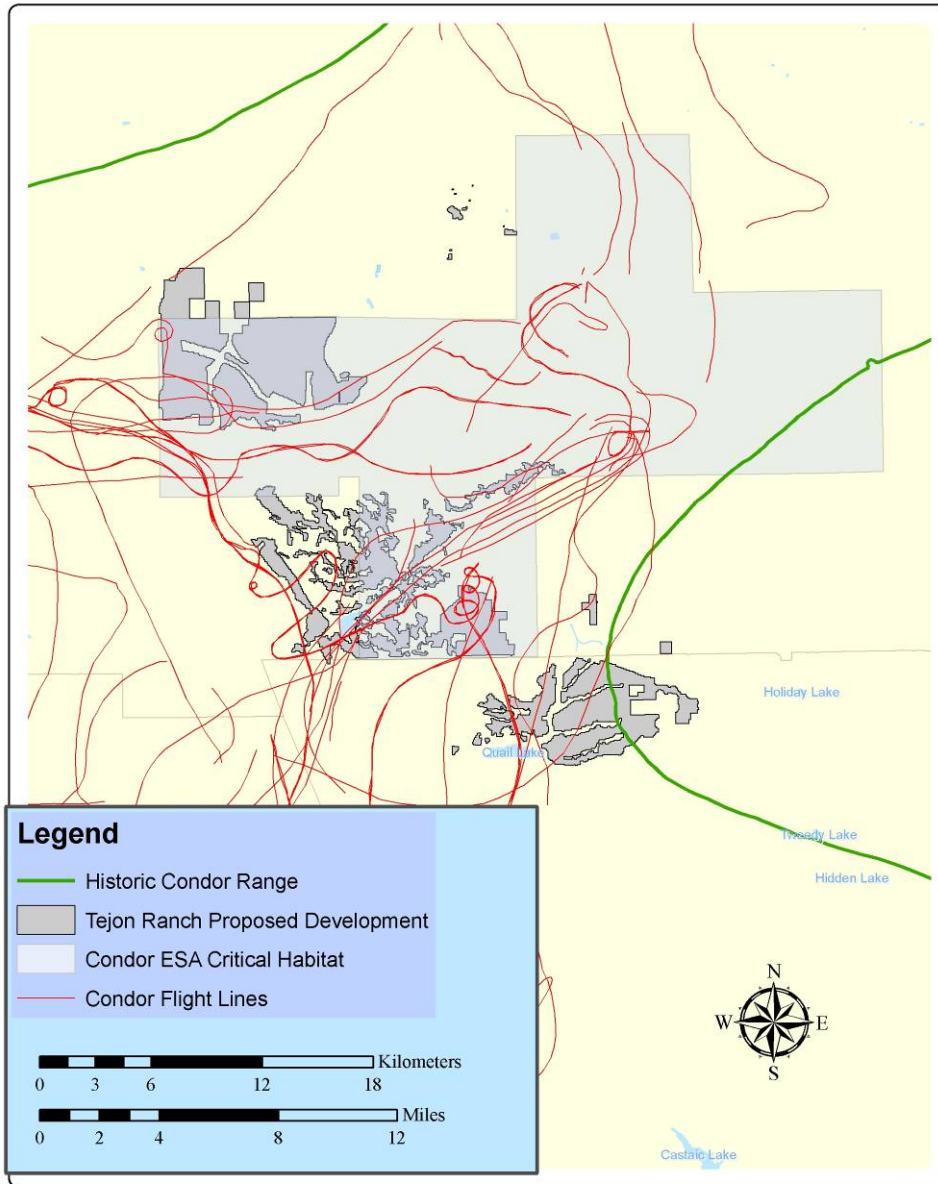
Visual Condor Sightings, 1982 - 1987



GIS Analysis:
Center for Biological Diversity, 1 May 2009

Figure 4. Visual.

Condor Flight Lines Over Tejon Ranch



GIS Analysis:
Center for Biological Diversity, 1 May 2009

Data Source: USFWS
Visual Condor Flight Lines 1982 - 1987

Map Projection:
Albers Equal Area Conic NAD83

Figure 5. Flight lines.

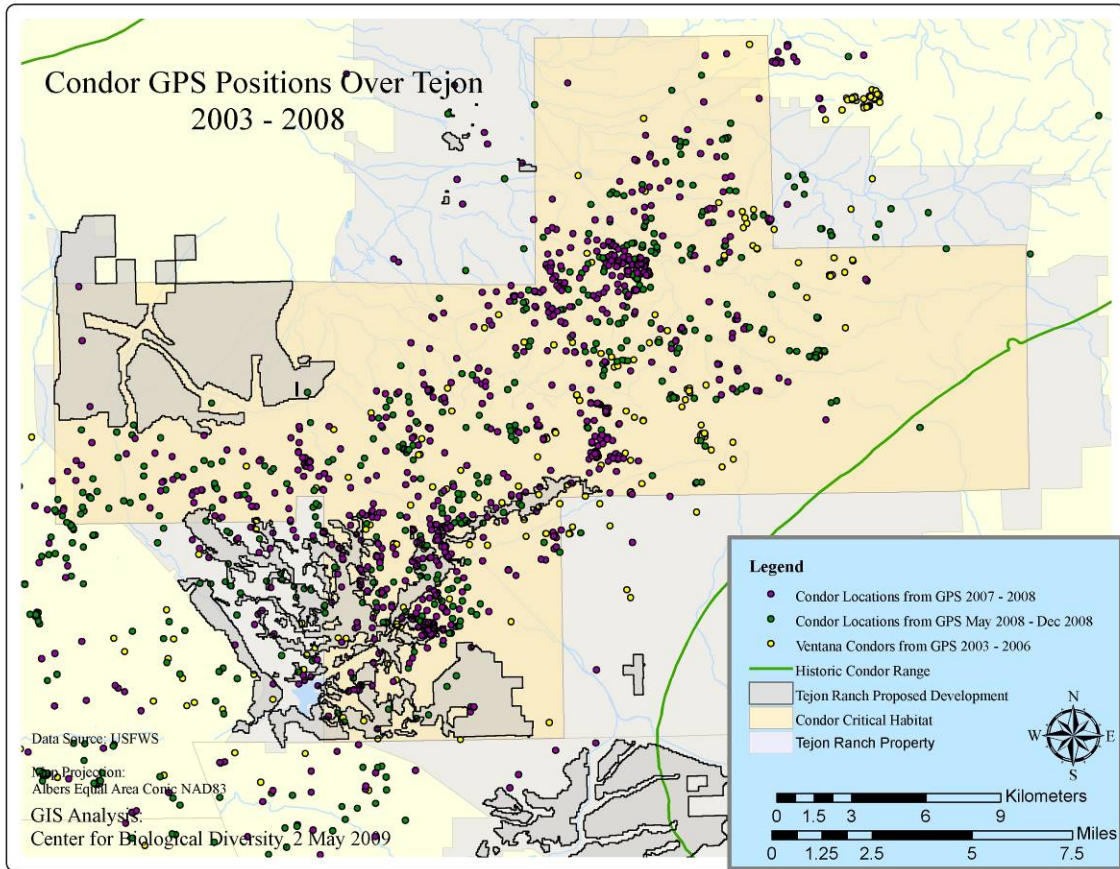
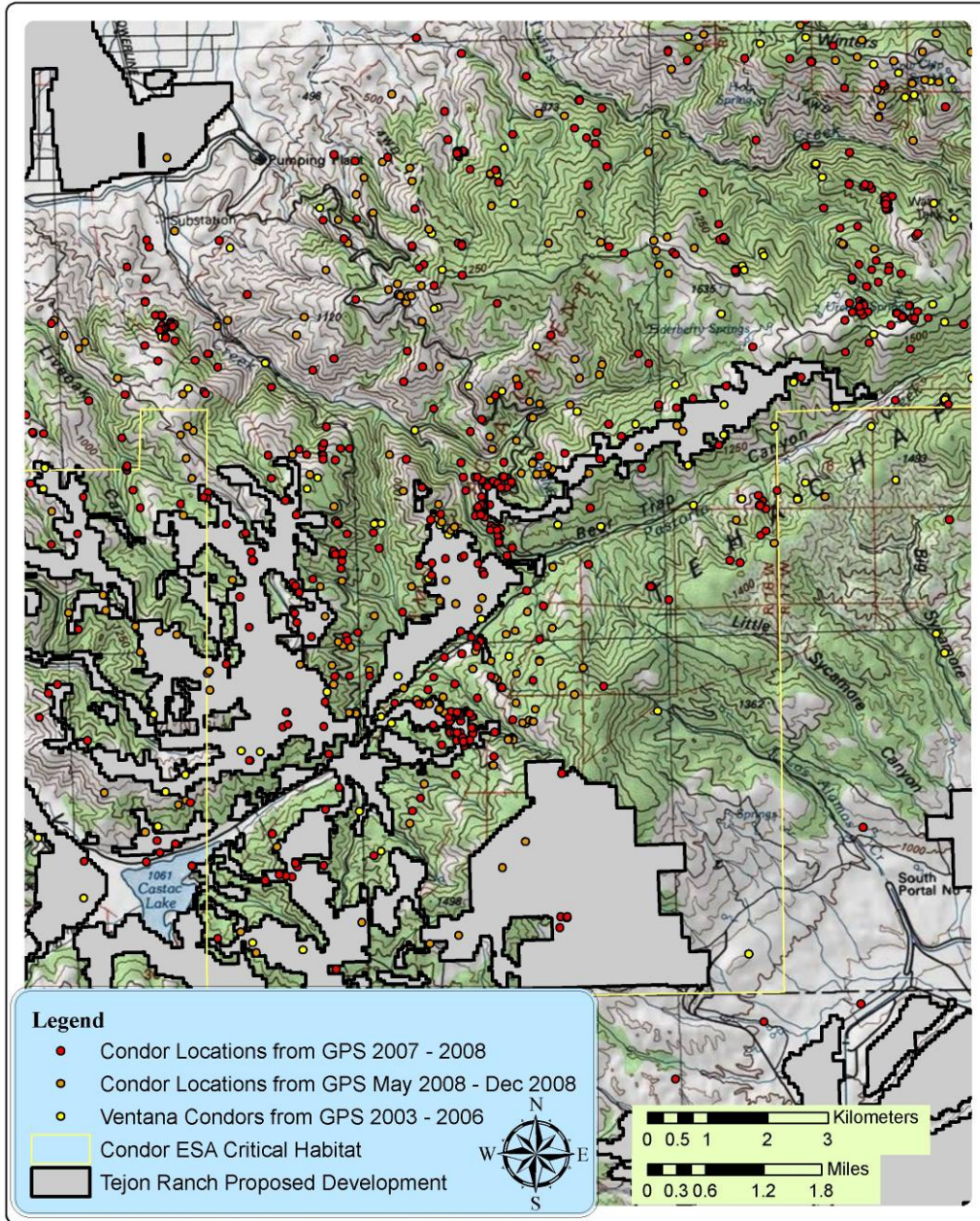


Figure 6. GPS.

Condor GPS Positions Over Tejon 2003 - 2008 Pastoria Creek Region

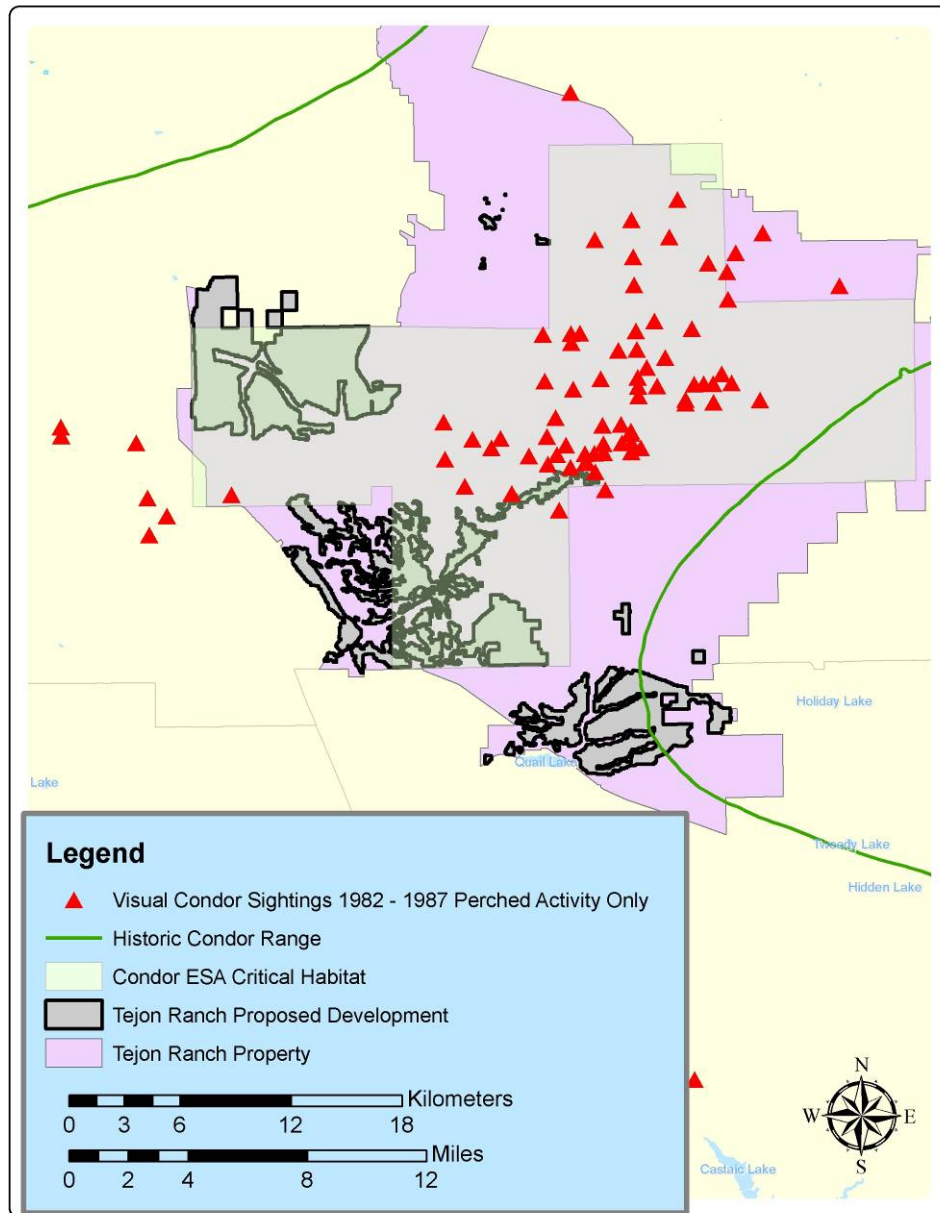


GIS Analysis:
Center for Biological Diversity, 2 May 2009

Source Data: USFWS
Map Projection: Albers Equal Area Conic NAD83

Figure 7. Pastoria Creek.

Visual Condor Sightings, 1982 - 1987 Perched Activity Only



GIS Analysis:
Center for Biological Diversity, 2 May 2009

Data Source: USFWS
Map Projection: Albers Equal Area Conic NAD83

Figure 8. Perched.

Visual Condor Sightings, 1982 - 1987 Feeding Activity Only with Condor Flight Lines and 5km Buffer Nesting Areas

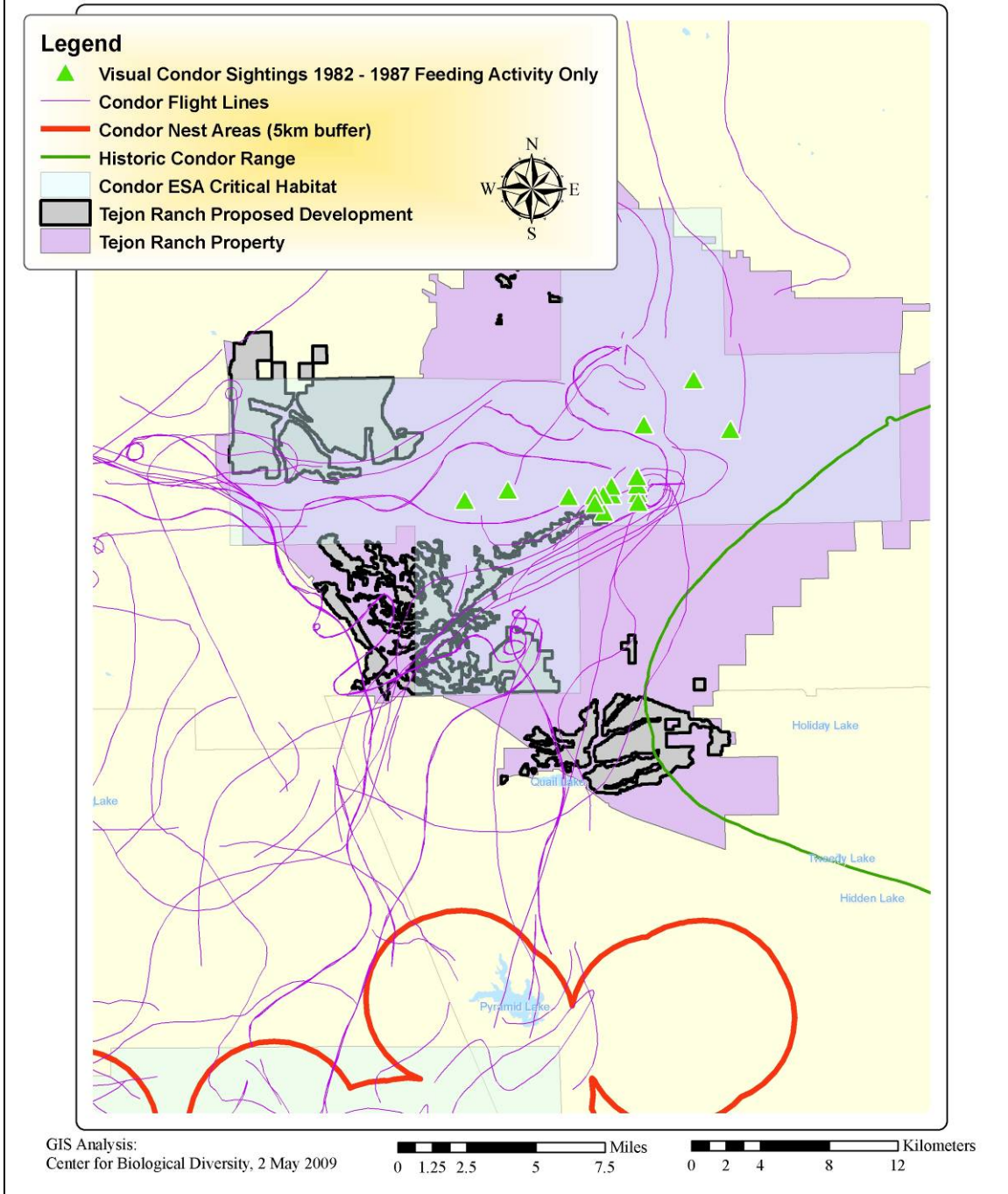


Figure 9. Feeding.

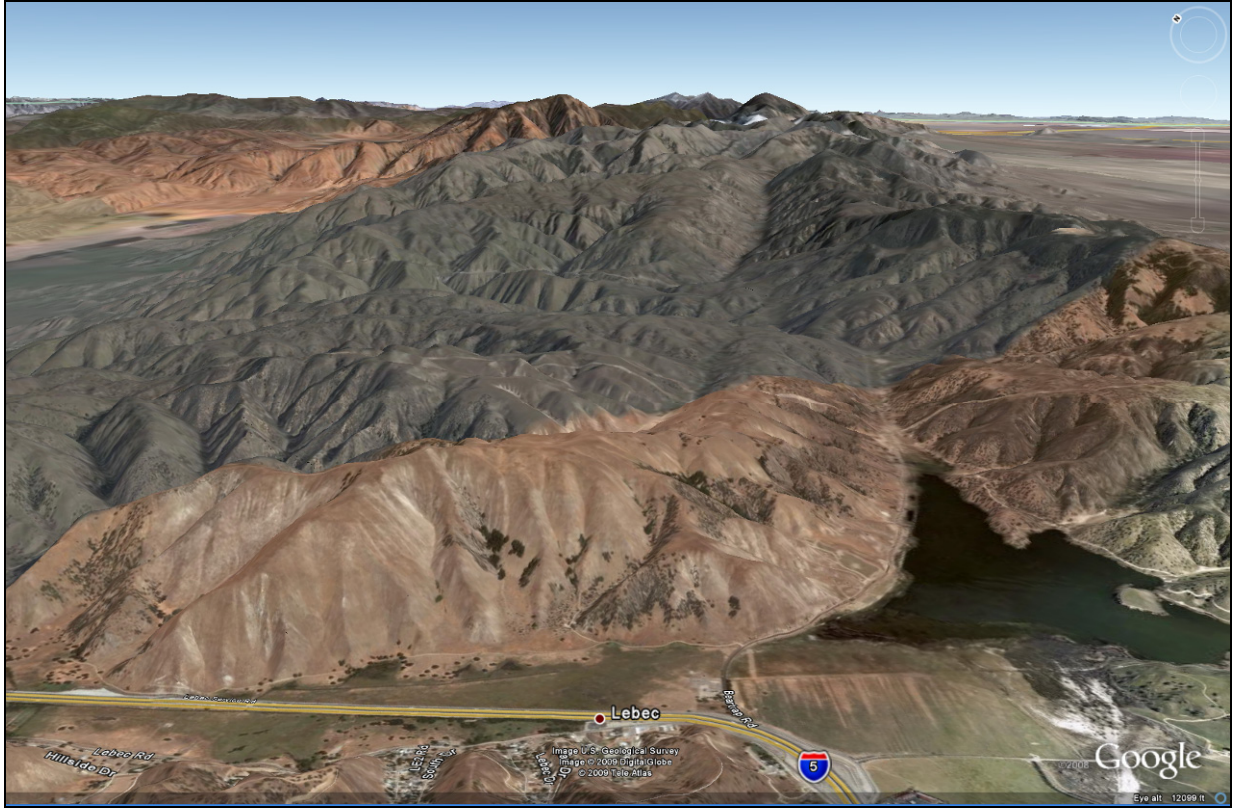


Figure 10. Perspective view looking north-east up Bear Trap Canyon from Castac Lake and Lebec.

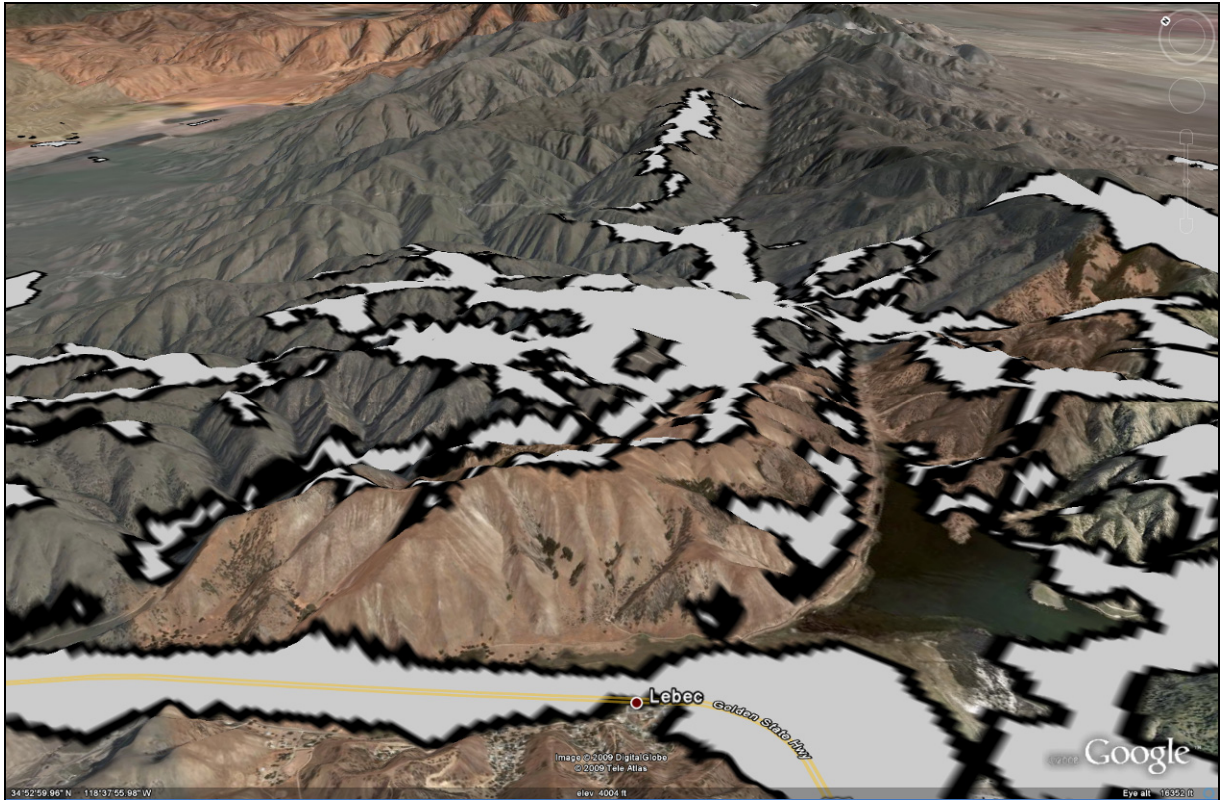


Figure 11. Perspective view looking north-east up Bear Trap Canyon from Castac Lake and Lebec with proposed Tejon Developments indicated by the grey overlay. From this perspective, the combined proposals for the “Grapevine Development”, the “Tejon Mountain Village”, and the “Centennial Development” present a significant intrusion and connectivity barrier to this habitat area and transition zone flyway.

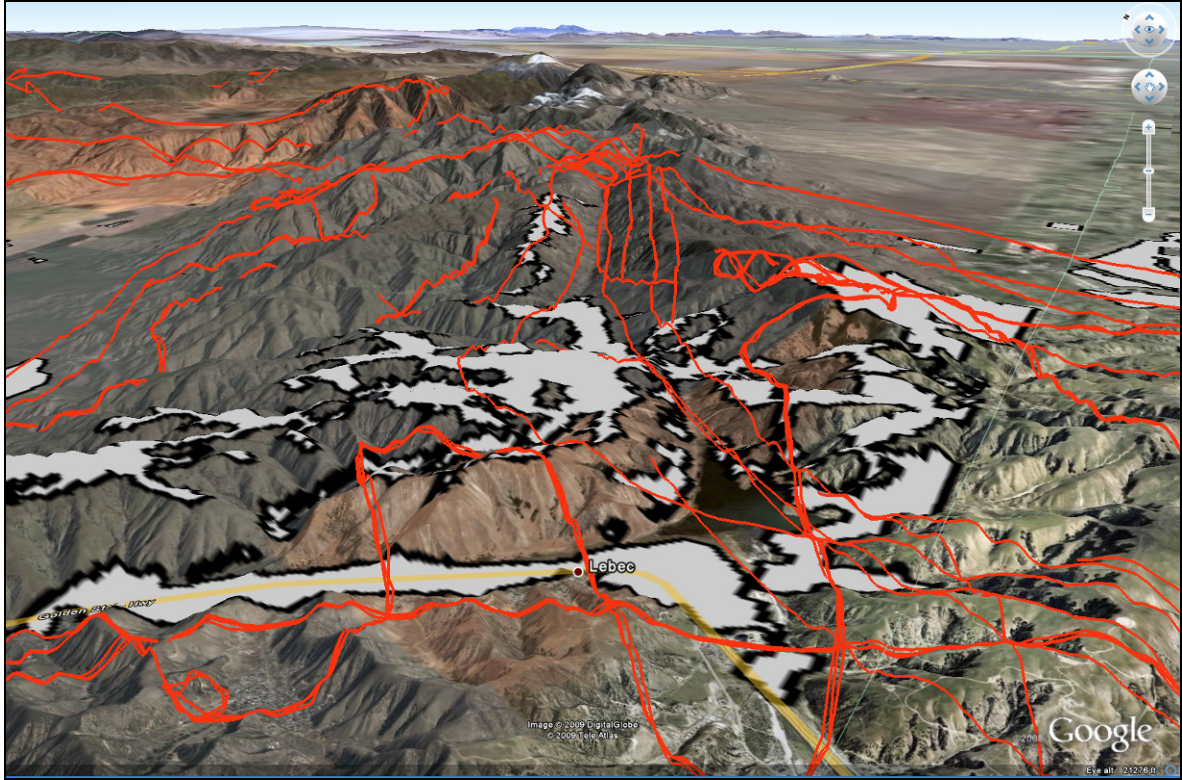


Figure 12. Perspective view looking north-east up Bear Trap Canyon from Castac Lake and Lebec with proposed Tejon Developments in grey and condor flight lines in red. As noted in the accompanying text for Figure 5, the red flight lines are general indications of flight routes, not precise locations. More precise location data is represented in Figure 7, GPS positions over Tejon.

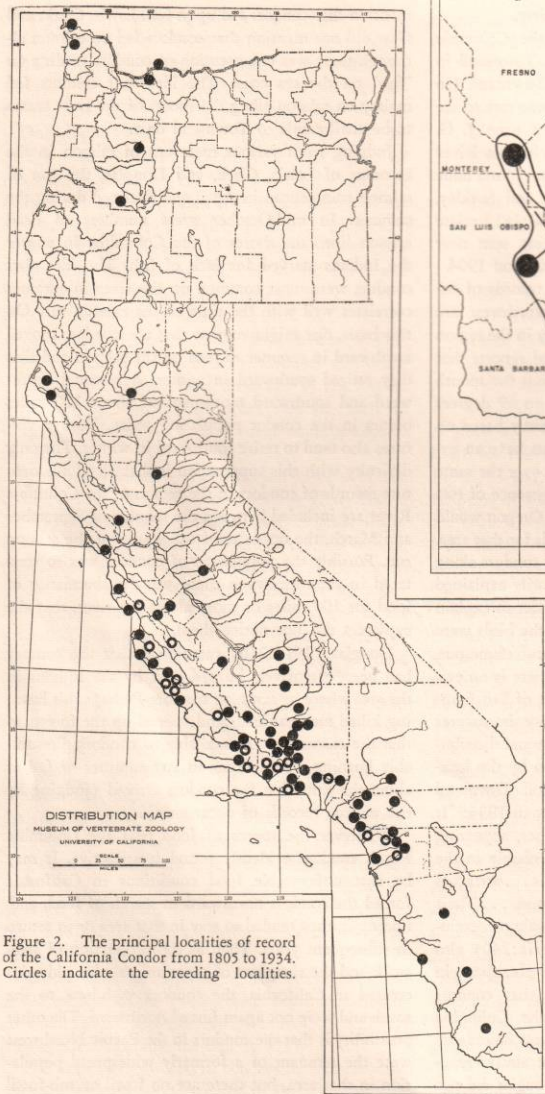


Figure 2. The principal localities of record of the California Condor from 1805 to 1934. Circles indicate the breeding localities.

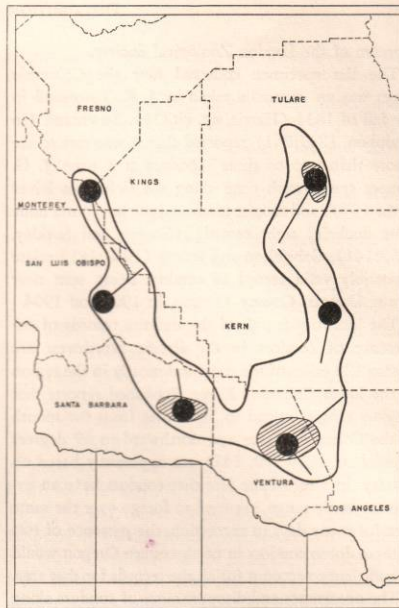


Figure 3. The principal range of the California Condor at present (1935 to 1950). Groups of ten or more Condors occur in the area enclosed by the heavy line. Cross-hatching indicates breeding areas; spots, major roosts; radiating lines, major routes of flight.

Figure 13. Condor map from Carl Koford's notes (1953, page 10). Note the general trend for flight lines to extend north-east from the Ventura nesting area to the Tejon feeding and roosting area shown in the inset map. The Tejon area flight patterns and habitat use is consistent with the flight line data (Figure 5) and the most recent GPS data (Figure 6).

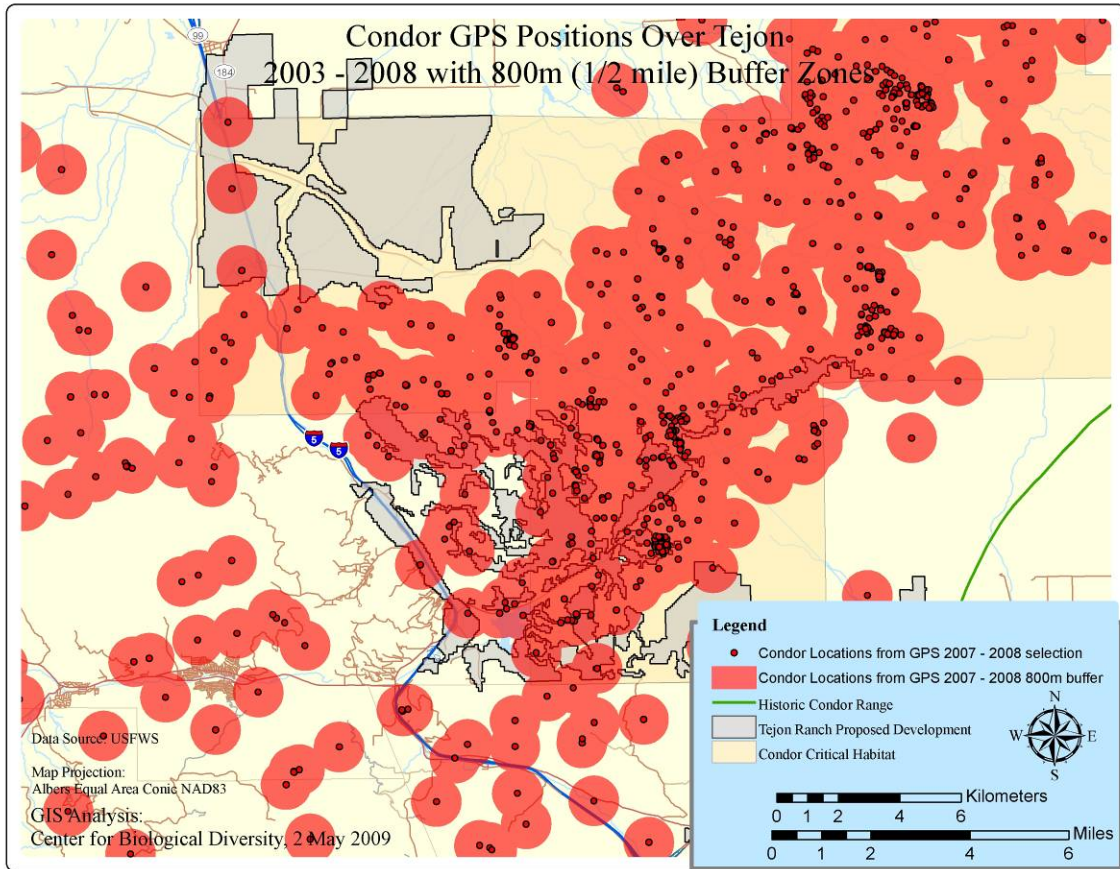


Figure 14. Condor Positions with 1/2 mile buffer. The high-accuracy GPS positions have been buffered with an 800 meter (1/2 mile) radius in this figure. There is longstanding precedence to protect nesting and other condor activity areas by areas ranging from 500 yards (0.28 miles) to 2.3 miles (see Text Box 1 for citations). While the exact buffer distances required in this case will require further study, the importance of the buffer concept is well documented.

Text Box 1. Human Disturbance and Protective Buffer Distances for California Condors as Recommended by Various Researchers and Agencies

Koford's statements on closures to protect nesting and roosting sites are found on pp 136-137 of his Audubon Research Report #4. 1953.

His most famous statement about the effects of disturbance by humans on nesting condors is found on p. 109.

"One man can keep a pair of condors from the egg all night or prevent the feeding of a chick for an entire day merely by exposing himself within 500 yards of a nest for a few minutes at one or two critical times of the day. Loud noises can alarm condors at distances of over one mile. Individuals or groups of persons moving about must keep at least one-half mile from condor nests in order to void disturbance of the parent birds."

Some of the documents relating to Forest Service closures in the Condor Information System:

00893CON

CARRIER, W.D. 1971.

HABITAT MANAGEMENT PLAN FOR THE CALIFORNIA CONDOR.

U.S. FOREST SERVICE, LOS PADRES NATIONAL FOREST, GOLETA, CALIFORNIA. 53 PP.

Procedures mentioned: Eliminate human activity within ½ mile of roosting and bathing sites.

01827CON

MULDOWNNEY, B.K. 1977.

FOREST SERVICE PARTICIPATION IN SAVING THE CONDOR HABITAT.

IN: CALIFORNIA CONDOR--1977. P.P. SCHAEFFER AND S.M. EHLERS (EDS.). NATIONAL AUDUBON SOCIETY, TIBURON, CALIFORNIA. PP. 13-19.

Mentions closing or relocating 36 miles of trails or roads to protect condor habitat. No oil field activities within 1 ½ miles of a condor nest site. Mentions earlier ½ mile closure. Reports that was inadequate.

03080CON

U.S. FOREST SERVICE. 1976.

FOREST SERVICE ROAD USE REGULATIONS [CLOSING THE SLIDE MOUNTAIN ROAD TO ALL PUBLIC MOTOR VEHICLE TRAFFIC.]

DECLARATION NO. 53-1, DATED MARCH 25, 1976. 1 P.

One reason given for closure is "the necessity to protect Condor nesting sites from disturbance"

03083CON

U.S. FOREST SERVICE. 1977.

CONDOR SANCTUARY CLOSURES, LOS PADRES NATIONAL FOREST.

03101CON

U.S. FOREST SERVICE. 1980.

ORDER NO. 01-80-1. WILDLIFE HABITAT AREA CLOSURE. ANGELES NATIONAL FOREST [CONDOR NEST SITE].

SIGNED BY W.T. DRESSER, FOREST SUPERVISOR, ANGELES NATIONAL FOREST, AND DATED APRIL 6, 1980. PASADENA, CALIFORNIA. 2 PP.

This refers to the trail closure for the Red Rock nest site.

Sibley and Wilbur on Disturbance as found in:

03352CON

WILBUR, S.R. 1978.

CALIFORNIA CONDOR, 1966-76: A LOOK AT ITS PAST AND FUTURE.

N. AMER. FAUNA, NO. 72. U.S. FISH AND WILDLIFE SERVICE, WASHINGTON, D.C. 136 PP.

Notes on disturbance by humans are found on pp. 34-39. Topics covered are: Flying condors; Roosting Birds; Feeding Birds; Nesting Condors.

Sibley's plotting of the location of active condor nest sites in relation to roads, trails and oil field activity and came up with (condensed) the following minimum distances:

0.8 miles from lightly used dirt roads; 1.2 miles from regularly used dirt roads; 2.2 miles from paved roads; 1.2 miles from oil wells shielded by sight and sound; 2.3 miles from oil wells in view.

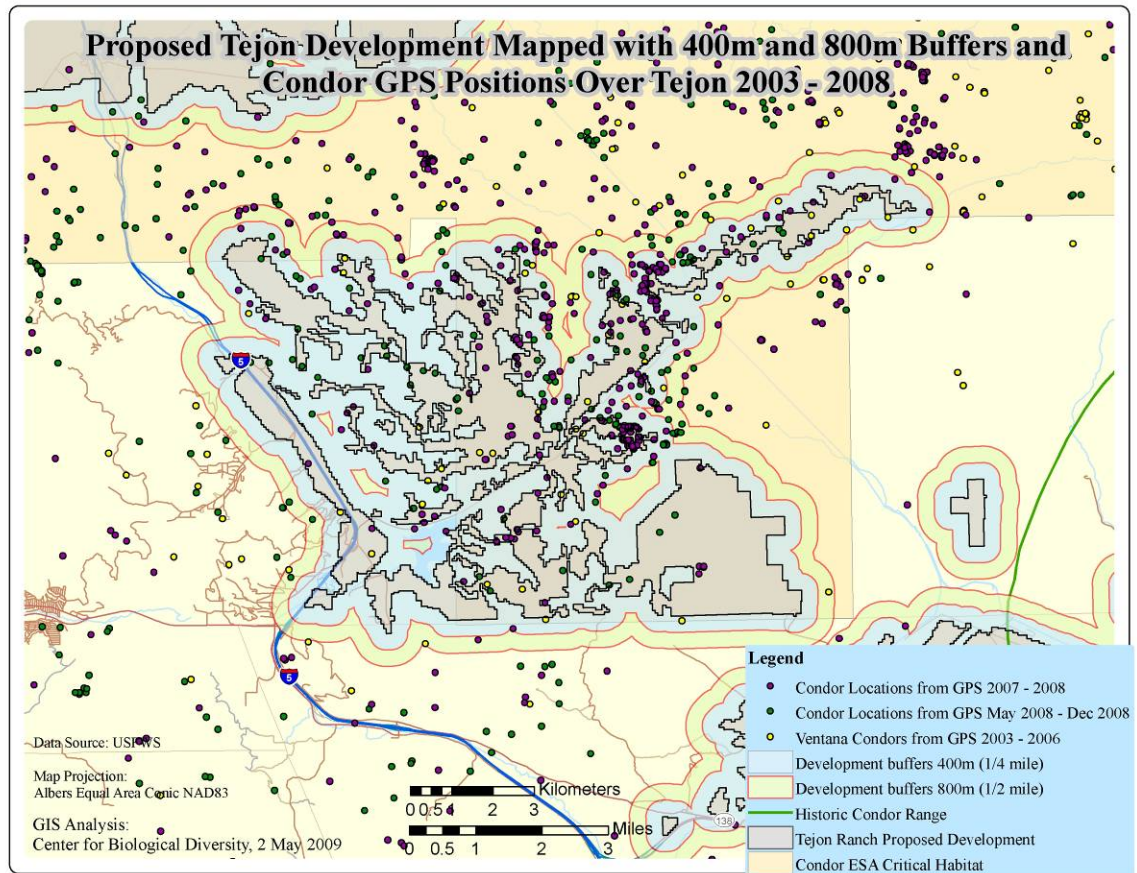


Figure 15. Proposed Tejon Ranch development areas with 400 meter (1/2 mile, shown in blue) and 800 meter (1 mile, in green) buffer extensions. The basic premise represented is the effect that a house and garden patch has a much larger ecological footprint than would be measured from the property lines alone.

Notes:

1) Far more of the condor ESA critical habitat is impacted when buffers are taken into account. The fragmented design of the proposed developments (i.e. linear areas with intermediate “open space”) results in a deceptively low impact when measured by area alone. In such cases, proposed development perimeter length may also be a good indicator of habitat impact.

2) The three proposed Tejon development areas begin to merge when buffers are taken into account, forming a more complete barrier across the WWF ecoregions, the transverse range, and the habitat corridor between nesting and feeding/roosting areas.

3) The number of conflicts between designated critical habitat and condor data points is increased when environmental buffers are taken into account. In this figure the condor data points are represented as simple points for visual clarity, however these points should also be buffered into circles (as in Figure 14) to more accurately quantify impacts associated with development in critical habitat.