**Appendix A.** Detailed description of California Condor occurrence data

Detailed descriptions of the California Condor occurrence datasets are provided below and are summarized in Table A1.

Table A1. California condor occurrence datasets and number of data points by activity-type

| | Activity-type | | |
|---|---|---|---|
| Dataset | Nesting[a] | Roosting | Feeding |
| Nest dataset (1960-2011) | 99 | - | - |
| McBee records (1960-1984) | - | 48 | 40 |
| Overnight roosts (1950-1980) | - | 45 | - |
| Telemetry Studies (1982-1987) | - | 43 | 31 |
| Captive Releases (1992-2011) | - | 6 | 210 |

[a] Nests were recorded in several of these datasets, but were already compiled into a single nest dataset. Of the 99 nest occurrences, 9 were in coast redwood (*Sequoia sempervirens*) or giant sequoia (*Sequoiadendron giganteum*) trees.

**Nest Dataset (1960-2011)**

Chris Cogan (University of California Channel Islands), with the assistance of Jan Hamber (Santa Barbara Natural History Museum), compiled information in the Condor Recovery Office files to produce a spatial layer that contained many of the known historical nests (prior to reintroduction efforts in the 1990s) from southern California. They used, among other materials, maps that had been produced by Noel Snyder (U.S. Fish and Wildlife Service, retired) and his team in the 1980s, as well as earlier maps produced by Carl Koford (University of California, Berkeley, deceased), Fred Sibley (U.S. Fish and Wildlife Service, retired), Dean Carrier (U.S. Forest Service, retired), and Sanford Wilbur (U.S. Fish and Wildlife Service, retired). We then refined this dataset as follows:

(1) removed all entries which were not condor nests (e.g., those that included a description as "not clearly a condor nest" or "not a condor nest" or "turkey vulture nest only");
(2) added recent nests in Monterey and San Benito counties from data provided by Joe Burnett at the Ventana Wildlife Society and Daniel George at Pinnacles National Monument; and,
(3) added nest data provided by the California Condor Recovery Office for nests observed since 1992 (i.e., the start of reintroduction efforts).

Only those nests that were in use from 1960-2011 were included in the final dataset used to build Ecological Niche Models (ENMs).

**McBee Records (1960-1984)**

Beginning in the 1960s and continuing through 1984, F. Sibley and S. Wilbur compiled a set of records on condor sightings from individuals familiar with condors (Cogan, 1993). Each observation was given a reliability evaluation of positive, neutral, or negative by condor biologists based on the detailed information in the description and the observer's familiarity with

condors (see Cogan, 1993). All of the records that were given a "positive" evaluation by F. Sibley or S. Wilbur (n = 7,341) were transferred to a condor GIS and are referred to as "McBee Records" (after the name of the type of index cards they were recorded on – McBee Cards). The McBee records included information on activity in a 5 digit code (ACTIVITY) and information on longitudinal and latitudinal accuracy (ACC_X and ACC_Y). We selected records with ACC_X and ACC_Y ≤ 0.1 (accurate within 1 km) for overnight roosts, and (non-proffered) feeding based on the following activity codes (see Cogan, 1993): Roosting = 25000-25999 and Feeding = 32000-32999.

**Overnight Roosts (1950-1980)**

Hardcopy maps with historical roost locations were located in the Condor Recovery Program office in Ventura, California that were part of a 1973 "Roost Report" sent by S. Wilbur to the California Condor Technical Committee on October 19, 1973. J. D'Elia confirmed with S. Wilbur that these maps did represent historical roosts and converted them to GIS shapefiles though heads-up digitizing in Google Earth. J. D'Elia also sent the maps to individuals involved in condor field work from the 1960s to the 1980s (J. Hamber, S. Wilbur, and J. Grantham (U.S. Fish and Wildlife Service, retired)) to ensure that the roost dataset was complete. These individuals identified several additional overnight roosts that were regularly used by condors and those locations that could be mapped with precision of ≤ 1 km were added to the GIS dataset.

**Field Surveys and Telemetry Studies (1982-1987)**

GIS data from the intensive field and telemetry studies in the 1980s (Cogan, 1993) was obtained from C. Cogan. This dataset contains 10,294 condor observations and includes activity codes and accuracy codes similar to the McBee dataset (although the accuracy codes had different meaning, with accuracy ≤ 1 meaning accurate within 1 km). We selected records with ACCX and ACCY ≤ 1 for overnight roosts, and (non-proffered) feeding based on the following activity codes (see Cogan, 1993): Roosting = 25000-25999 and Feeding = 32000-32999.

**Monitoring Data from Captive Release Programs (1992-2011)**

Since the inception of the California condor release program, beginning in 1992, California condors were fitted with radio telemetry transmitters. By 2005, reliable satellite-based telemetry that integrated global positioning systems (GPS) was deployed to track some condors. These tracking devices allow biologists to monitor condor movements, and when combined with field observations, provide information on location and behavior (Cogan et al., 2012). Observations from field monitoring data associated with captive release programs was obtained from Pinnacles National Monument, Ventana Wildlife Society, and the U.S. Fish and Wildlife Service. These data are based on field observations at each of the three current release sites and were provided as separate shapefiles for overnight roosts (not including roosts near release pens) and non-proffered feeding events.

## References

Cogan, C. (1993) Quantitative analysis of habitat use by the California Condor. M.S. Thesis, University of California, Santa Barbara.

Cogan, C., J. D'Elia, K. Convery, J. Brandt & T. Bulgerin (2012) Analysis of California Condor (*Gymnogyps californianus*) activity using satellite telemetry data. *Open Ornithology Journal* **5**, 82-93.