# DISTRIBUTION AND MOVEMENT PATTERNS OF INDIVIDUAL CRESTED CARACARAS IN CALIFORNIA

KRISTIE N. NELSON, P. O. Box 402, Lee Vining, California 93541; knelson@prbo.org

PETER PYLE, The Institute for Bird Populations, P. O. Box 1346, Point Reyes Station, California 94956

ABSTRACT: There are now numerous records of the Crested Caracara (*Caracara cheriway*) from California and elsewhere well north of its breeding range, but whether or not they represent wild birds or escapees from zoos or falconers has been debated. Through 2011, the California Bird Records Committee (CBRC) had accepted 49 records that they considered to represent naturally occurring vagrants, but decisions concerning the number of individuals involved in these records were haphazard. Therefore, we assessed the date, location, age, molt status, and appearance of caracaras representing 60 observations specific to date and location in California and propose that these records involve only 11 individuals, recorded between 1 and 34 times throughout the state; a twelfth individual was recorded from December 2011 to April 2012. Our 11-bird scenario was proposed and accepted by the CBRC in January 2012. This synthesis clarifies the species' pattern of occurrence in California: ten of the 11 individuals were first detected in fall or winter, eight individuals were first detected in their first or second years, four of these eight were later detected at appropriate ages elsewhere in California, and six individuals moved north within the state. These patterns are consistent with birds moving north as wild vagrants and so support the CBRC's decision to accept the Crested Caracara as a naturally occurring species. We hope that our analysis will help other records committees evaluate the status of this species in other regions, perhaps revealing a similar pattern of natural vagrancy throughout North America.

The Crested Caracara (*Caracara cheriway*) has a long and perplexing history of vagrancy and occurrence in North America far north of its typical breeding range in Florida, Texas, Arizona, and Mexico. The earliest extralimital reports are from Monterey, California in 1837 (Prévost and des Murs 1855) and from Ontario, Canada, in 1892 (Brewster 1893), followed by scattered reports throughout the 20th century of individuals from across the continent (American Ornithologists' Union [AOU] 1998, California Bird Records Committee [CBRC] 2007). Several factors resulted in opinions (e.g., AOU 1998) that these North American records could represent escapees from zoos or falconers. The species was not known to make significant migrations (Morrison 1996), the birds were not detected in greater numbers closer to their natural range as is typical of vagrants, and many extralimital records failed to match the seasonal or regional distribution patterns expected for naturally occurring vagrants. Additionally, some Crested Caracara records have involved known or suspected escapees (Potter et al. 1980, AOU 1998). However, Grinnell and Miller (1944) believed that early California records likely pertained to wild vagrants.

The CBRC (2007) was initially reluctant to add the species to its list of California birds because of concerns that the 12 reports prior to 2000 may have represented escapees, but eight more records from 2001 to 2003, coinciding with a spate of records elsewhere in North America (Brinkley

and Lehman 2003), resulted in the addition of the Crested Caracara to California's main list of naturally occurring species in 2004 (San Miguel and McGrath 2005) and acceptance of 49 records between September 1987 and October 2011 (Table 1). Of these 49, the CBRC concluded that 18 involved the same bird as in other records, resulting in 31 accepted individuals, but these decisions were haphazard, and a thorough vetting of this issue was needed (Pyle et al. 2011). We therefore assessed the date, location, age, molt status, and appearance of Crested Caracaras documented in California and found that these 49 accepted records could be confidently assigned to just 11 individuals. Our analysis not only resulted in a more conservative assessment of vagrancy to California, it greatly clarified the species' patterns of occurrence and movement within the state.

## METHODS

We examined photographs and written documentation for 60 date/location-specific observations of the Crested Caracara in California and southern Oregon between 1987 and 2011 (Table 1). We considered the date, location, age, molt pattern, worn/broken remiges, and cere shape to identify individuals whenever possible. Initially, we grouped the records by a conservative approach, favoring an assumption that they represent fewer individuals. For example, if two or more birds were of the correct age and molt status, did not differ in any feature we could evaluate, had no overlapping dates, and were present at locations between which one individual could have reasonably traveled, we considered them likely the same individual. This assumption was supported in some cases where uniquely marked individuals were confirmed on different dates at different locations, sometimes quite far apart (Pyle and Sullivan 2010; Figures 1, 2). Once all records were assessed in this manner some patterns emerged that added confidence to our decisions at the level of the individual. We assigned identification (ID) numbers to records to track individuals, those we assumed were of the same bird receiving the same ID number in Table 1.

Age determination was based on a comparison of descriptions and photographs from each record to information presented in Pyle (2008). We categorize individuals as in their first cycle (fledging to beginning of second prebasic molt), second cycle (start of second to start of third prebasic molt), third cycle (start of third to start of fourth prebasic molt), or definitive cycle (individuals in definitive or "adult" plumage); we considered a bird's age unknown when documentation was insufficient to determine its plumage cycle. In the first plumage cycle, Crested Caracaras are washed brown or buff overall, have pale streaks or tips to the upperpart feathers, lack distinct blackish bars on the nape and breast, and have thinner whitish rectrices that are more heavily barred brownish basally (Figure 3). During the first cycle most individuals undergo a limited preformative molt of scattered body feathers in their first winter and spring (Pyle 2005a), but this does not alter their appearance substantially. In definitive plumage, caracaras are blackish and white, lack pale streaks on the upperparts, have bold black and white bars on the nape and breast, and have broader rectrices with darker bars that diminish basally (Figure 3). In their second and third cycles the birds are variably intermediate in appearance between those in the first and

**Table 1** Records of the Crested Caracara in California between September 1987 and April 2012 Representing 12 Individuals

| ID#[a] | CBRC record | Location | Dates | Age[b] |
|---|---|---|---|---|
| 1 | 1987-267 | Mono Lake, Mono Co. | 13 Sep–16 Oct 1987 | 2C |
| 1 | 1989-045 | Shasta Valley, Siskiyou Co. | 21 Oct 1988–26 Mar 1989 | 3C |
| 1 | 1989-096 | Smith River, Del Norte Co. | 28–30 Apr 1989 | 3C or DC |
| 1 | NAB 44:490 | Gold Beach, Oregon | fall 1989–Apr 1990 | DC |
| 2 | 1993-196 | Westmoreland, Imperial Co. | 14 Dec 1993 | 1C |
| 3 | 1995-021 | Chula Vista, San Diego Co. | 9 Feb 1995 | DC |
| 4 | 2005-026 | Santa Barbara, Santa Barbara Co. | 9 Oct 2001 | U |
| 4 | 2002-164 | Long Beach, Los Angeles Co. | 20 Oct 2001 | U |
| 4 | Report | near Gaviota, Santa Barbara Co. | 24 Jan 2002 | U |
| 4 | 2002-147 | Goleta, Santa Barbara Co. | 30 Apr 2002 | 2C |
| 4 | Report | Ventura, Ventura Co. | 5 May 2002 | U |
| 4 | 2002-130 | near Lakeview, Riverside Co. | 4 Jul 2002 | 2C |
| 4 | 2002-148 | Vandenberg Air Force Base, Santa Barbara Co. | 14–23 Jul 2002 | 2C |
| 4 | 2002-192 | Point Mugu, Ventura Co. | 8 Aug 2002 | 2C |
| 4 | 2002-154 | near Marina, Monterey Co. | 11–13 Aug 2002 | 2C |
| 4 | NAB 57:113 | Santa Cruz, Santa Cruz Co. | 16 Sep 2002 | 2C |
| 4 | 2002-161 | near Davenport, Santa Cruz Co. | 21–27 Sep 2002 | 2C |
| 4 | NAB 57:113 | Pescadero, San Mateo Co. | 28 Sep 2002 | U |
| 4 | NAB 57:113 | Half Moon Bay, San Mateo Co. | 21 Oct–6 Nov 2002 | U |
| 4 | 2002-209 | Saticoy, Ventura Co. | 9 Dec 2002–5 Jan 2003 | 2C |
| 4 | 2004-118 | near Petaluma, Sonoma Co. | 16 Jul–1 Aug 2004 | DC |
| 4 | 2004-124 | Manchester State Park, Mendocino Co. | 20–24 Aug 2004 | DC |
| 4 | 2004-133 | Jacoby Creek, Humboldt Co. | 4–6 Sep 2004 | DC |
| 4 | NAB 59:319 | Eel River, Humboldt Co. | Nov 2004–Jan 2005 | DC |
| 4 | NAB 59:485 | Curry County, Oregon | Late Apr 2005 | DC |
| 4 | 2005-057 | near Casper, Mendocino Co. | 2 May 2005 | DC |
| 4 | 2005-070 | Point Reyes National Seashore, Marin Co. | 3–6 May 2005 | DC |
| 4 | NAB 59:490 | Rodeo Lagoon, Marin Co. | 7 May 2005 | DC |
| 4 | 2005-071 | Morro Bay, San Luis Obispo Co. | 1–2 Jun 2005 | DC |
| 4 | 2005-086 | Fort Dick, Del Norte Co. | 13 Jun–12 Jul 2005 | DC |
| 4 | 2005-089 | near Alton, Humboldt Co. | 19 Jul 2005 | DC |
| 4 | 2005-097 | Rodeo Lagoon, Marin Co. | 2–3 Aug 2005 | DC |
| 4 | 2005-100 | near Davenport, Santa Cruz Co. | 14 Aug 2005–10 Apr 2006 | DC |
| 4 | 2006-129 | Occidental, etc., Sonoma Co. | 23 Apr–9 May 2006 | DC |
| 4 | 2006-078 | Point Reyes National Seashore, Marin Co. | 17–20 Jun 2006 | DC |
| 4 | 2006-084 | S Humboldt Bay, Humboldt Co. | 13–14 Jul 2006 | DC |
| 4 | 2007-076 | near Ferndale, Humboldt Co. | 8 Dec 2006–28 Mar 2007 | DC |

(*continued*)

**Table 1** (*Continued*)

| ID#[a] | CBRC record | Location | Dates | Age[b] |
|---|---|---|---|---|
| 4 | NAB 62:298 | Ferndale, Humboldt Co. | 30 Dec 2007 | DC |
| 4 | 2008-027 | near Fort Dick, Del Norte Co. | 31 Jan 2008–12 Sep 2009 | DC |
| 4 | NAB 64:317 | near Fort Dick, Del Norte Co. | 29 Jan 2010–26 Feb 2012 | DC |
| 5 | 2004-074 | Owen's Lake, Inyo Co. | 9 May 2004 | U |
| 6 | 2005-017 | Finney Lake, Imperial Co. | 1 Jan 2005 | 1C |
| 7 | 2006-004 | McGrath State Beach, Ventura Co. | 5 Jan 2006 | DC |
| 7 | 2006-047 | Point Sur, Monterey Co. | 28–29 Mar 2006 | DC |
| 7 | 2006-051 | Carmel Beach, Monterey Co. | 10 Apr 2006–13 May 2007 | DC |
| 8 | 2006-042 | Bixby Beach, Santa Barbara Co. | 10 Jan 2006 | 1C |
| 9 | 2006-127 | Tijuana R Valley, San Diego Co. | 9 Sep 2006–12 Feb 2007 | 2C |
| 9 | 2007-144 | Tijuana R Valley, San Diego Co. | 22 Jun 2007–6 Jun 2008 | 3C |
| 9 | 2008-093 | Tijuana R Valley, San Diego Co. | 15 Jul–21 Nov 2008 | DC |
| 9 | 2009-076 | Tijuana R Valley, San Diego Co. | 25 Apr–14 Nov 2009 | DC |
| 9 | 2011-139 | Tijuana R Valley, San Diego Co. | 25 Sep–1 Oct 2011 | DC |
| 10 | 2007-027 | Hansen Dam, Los Angeles Co. | 29 Jan–1 Feb 2007 | 1C |
| 10 | 2007-083 | near Goleta, Santa Barbara Co. | 2–3 Feb 2007 | 1C |
| 10 | 2007-101 | Carmel, etc., Monterey Co. | 25 Feb–1 Mar 2007 | 1C |
| 10 | 2008-043 | Año Nuevo State Park, San Mateo Co. | 14 Feb 2008 | 2C |
| 10 | 2011-187 | Santa Cruz, Santa Cruz Co. | 27 Feb 2008 | 2C |
| 10 | 2008-041 | Morgan Hill, Santa Clara Co. | 7 Mar 2008 | 2C |
| 10 | 2008-080 | Santa Barbara, Santa Barbara Co. | 21 Mar 2008 | 2C |
| 10 | 2009-082 | Marina, Monterey Co. | 4–23 Jul 2008 | 3C |
| 11 | 2008-039 | near Victorville, San Bernardino Co. | 18–29 Feb 2008 | 2C |
| 11 | 2008-047 | near Weldon, Kern Co. | 25–27 Mar 2008 | 2C |
| 12 | 2011-239 | Vandenberg AFB, Ventura Co. | 19 Dec 2011–6 Jan 2012 | DC |
| 12 | 2012-005 | Ballona Wetlands, Los Angeles Co. | 13 Jan 2012 | DC |
| 12 | 2012-019 | Piedras Blancas, San Luis Obispo Co. | 10–21 Feb 2012 | DC |
| 12 | 2012-069 | Pt. Sur, Monterey Co. | 30 Mar 2012 | DC |
| 12 | 2012-052 | near Davis, Yolo Co. | 16–20 Apr 2012 | DC |

[a]Identifying number of individual.

[b]1C, first cycle; 2C, second cycle; 3C, third cycle; DC, definitive cycle; U, unknown.

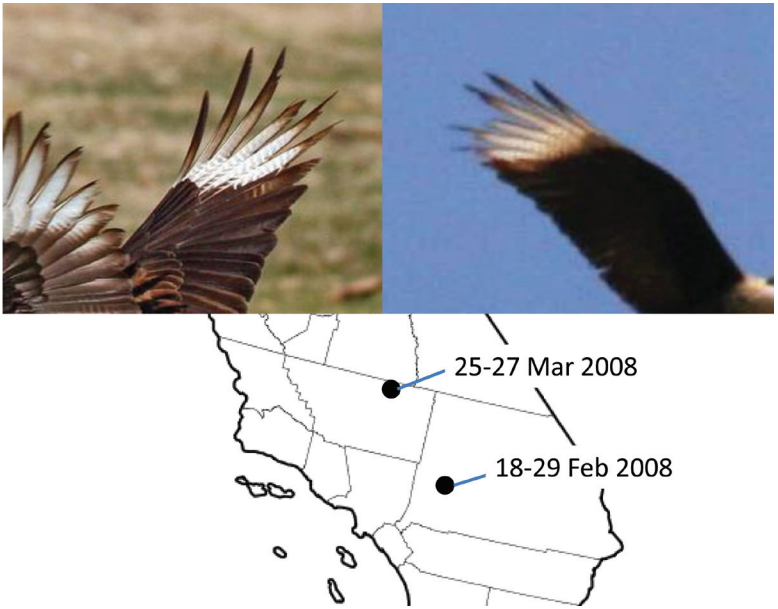



Figure 1. The notched P8, broken tip of P7, and the spiky P6 on the right wing confirmed the same individual in its second cycle (Table 1, ID #11) was photographed at Victorville, San Bernardino County, on 28 February 2008 (left) and then at the Kern River Preserve, Kern County, on 27 March 2008 (right).

*Photos by Stephen J. Myers (left) and Alison Sheehey (right)*

definitive cycles (Pyle 2008; Figure 3). Most in their second cycle but few in their third cycle, after completion of the third prebasic molt, are distinguishable from those in definitive plumage. The second, third, and definitive prebasic molts are complete; replacement of primaries and secondaries commences in the middle of each tract (at p4–p5 and s5, respectively), in western North America usually from February to April, and proceeds both distally and proximally from these molt centers until completed, usually from September to November (Pyle 2005b, 2008; Howell 2010). Within a cycle, the dark body feathering becomes increasingly bleached and brownish with wear in spring and summer, preceding replacement of body feathers from July through October.

## RESULTS

We conclude that the most appropriate scenario accounting for the 60 caracara reports in California from September 1987 to October 2011 consists of 11 individuals, as outlined in Table 1 and accepted by the CBRC in January 2012 (Johnson et al. 2012). Clear patterns of vagrancy emerged when records were grouped according to this scenario. Eight of these 11 Crested Caracaras were first detected in their first or second cycle in the

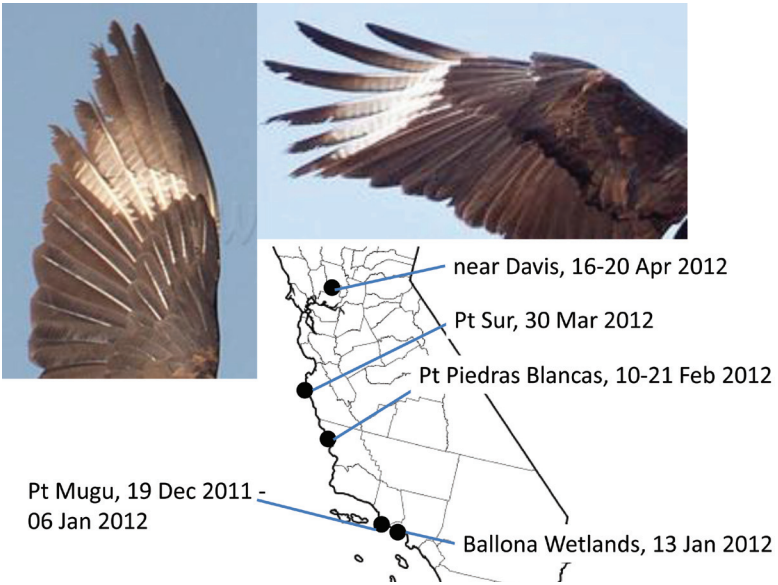



Figure 2. Adult Crested Caracara at the Ballona Wetlands, Los Angeles County, 13 January 2012 (left), and Piedras Blancas, San Luis Obispo County, 10 February 2012 (right). Note the large notch in the longest primary (P8), the fringed P7, and broken tip of P6 on the left wing in both images. These and other features indicated that this individual was first detected in Ventura County and subsequently observed and photographed in Monterey and Yolo counties (Table 1, ID #12), traveling north well over 800 km within 94 days.

*Photos by Christopher Taylor (left) and William Bouton (right)*

fall and winter, and four of these were later detected in later plumages at expected ages in subsequent years, adding confidence to our determinations of age and individual status. Two were first detected in definitive plumage in the winter, and one bird was of uncertain age when first detected in spring. Under this scenario, six individuals remained in the state for periods ranging from 5 weeks to multiple years, including 11 years and counting in the case of one individual (ID #4; Table 1). This individual accounted for over half of all California reports as it traveled from Santa Barbara County in October 2001 to southern Oregon, back south to Marin and San Luis Obispo counties, then back north, finally settling in Del Norte County, California, from 2008 through 2012 (Figure 4). Most reports of adults, the age least expected to wander so far north naturally, pertained to birds (mainly ID #4) first detected in California in their first or second cycle, which then remained in the state to molt into definitive plumage (Table 1). Following the decision by the CBRC to accept 11 individuals, five additional records from December 2011 to April 2012 have been accepted which we conclude represent one additional individual (ID #12; Table 1, Figure 2).

At least six individuals (ID #1, 4, 9, 10, 11, and 12) moved north, usually

Figure 3. Crested Caracaras in California showing plumage variation used to identify molt cycle. The bird on the left was photographed 10 September 2006 (CBRC 2006-127) and has begun the second prebasic molt (so is technically in its second cycle) but still retains most of the plumage of the first cycle. The bird in the center, in its second cycle, was photographed 28 February 2008 (CBRC 2008-039). The bird on the right, photographed 17 September 2005, is in definitive plumage (CBRC 2005-100). Note the progression from browner plumage with indistinct buff breast streaks to intermediate plumage to blacker plumage with white and black bars on the breast.

*Photos by Vic Murayama (left), Stephen J. Myers (middle), and Larry Selman (www.mostlybirds.com, right)*

during their first or second years, after which some moved south in the fall and north in the spring, at times returning to the same location in successive years. For example, in the winter of 2005–2006 ID #4 returned to the same field, using the exact same perches in Santa Cruz County as it had used in September 2002 when it was in its second cycle (D. Suddjian pers. comm.). It also returned to or near other coastal locations in Marin, Sonoma, Mendocino, Humboldt, and Del Norte counties on different dates as it traveled up and down the coast. ID #10 tended to spend summer and fall in the same area of San Diego, disappeared in winter, perhaps to Mexico, and returned to the same spot in San Diego the following spring or summer. Similarly, along the south coast of Oregon an adult Crested Caracara was seen near Floras Lake on approximately the same date for three consecutive springs (Mlodinow et al. 2007), suggesting one bird retracing a similar route annually.

## DISCUSSION

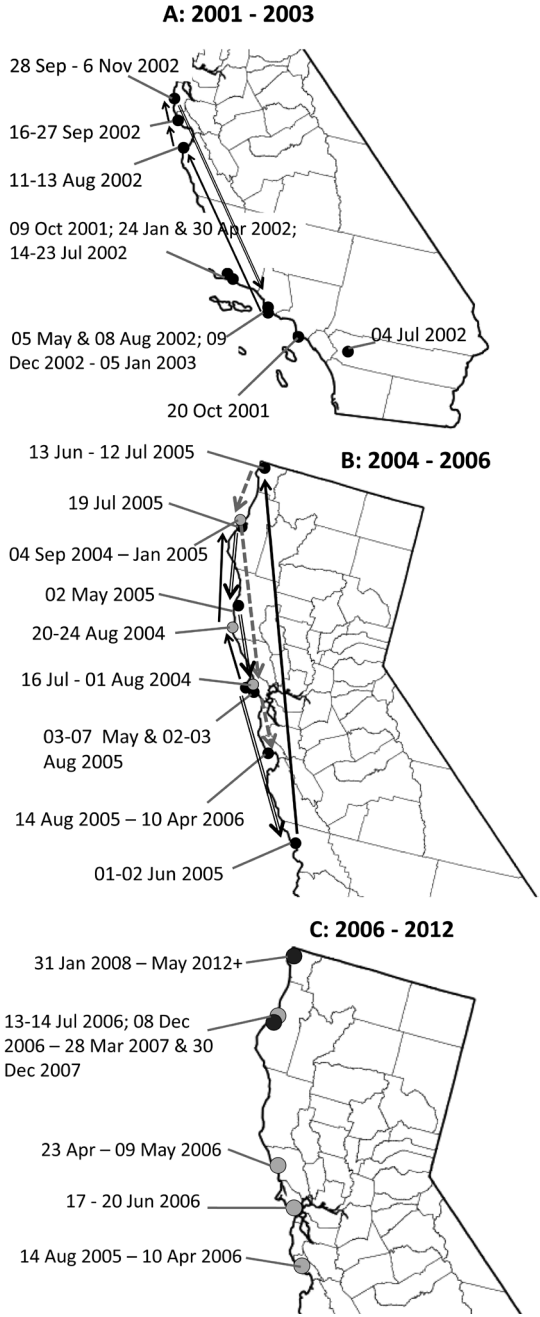
Our scenario greatly alters our interpretation of the patterns of occurrence and movement of the Crested Caracara in California, not only by reducing the total number of accepted individuals through April 2012 from 36 to 12, but by showing that most birds first arrive in California during their first or second fall or winter (as expected of wild vagrants) and subsequently may repeat their paths of migration. Three individuals were first detected in California in fall, eight during winter, and only one bird was first detected in remote Inyo County in spring; all birds previously thought to have shown

up in summer can be linked to previous arrivals. This is consistent with the caracara's pattern of wandering elsewhere outside its core range (M.J. Iliff in litt.; see also Brinkley 2006, CBRC 2007). In Arizona, for example, its dispersal north and west of its breeding range during fall and winter has long been known (Phillips et al. 1964, Monson and Phillips 1981) and has increased notably in recent years (Stevenson and Rosenberg 2007, G. Rosenberg pers. comm.).

In California, initial detections generally cluster during periods when vagrant Crested Caracaras were reported elsewhere in North America, providing evidence of periodic pulses of northward dispersal on a fairly large scale. One such event occurred in 2001 and 2002 when, in addition to the bird that was first detected in California (ID #4, Table 1), at least seven other vagrant caracaras were reported across the continent (Brinkley and Lehman 2003, San Miguel and McGrath 2005). A second, even larger pulse of Crested Caracaras dispersing north occurred during a roughly 4-year period beginning in 2005. From 2006 to 2008, when California experienced the largest influx of new arrivals (5), Oregon, Washington, British Columbia, New Mexico, Arizona, and Nevada also recorded vagrant Crested Caracaras in above-average numbers, as did the Great Plains and northeastern states (Brinkley 2006, CBRC 2007, Lehman and Brinkley 2009).

Although the records may suggest increasing dispersal of Crested Caracaras into California, it is difficult to remove the effects of increased observer effort and documentation capability from this pattern, and we suspect that natural dispersal and vagrancy has long been occurring, an opinion shared by Grinnell and Miller (1944). Nevertheless, in the first report of the caracara in California, in 1837, Prévost and des Murs (1855) wrote, "M. le docteur Néboux l'a rencontré à Monterey (Haute-Californie), d'où il en a rapporté plusieurs exemplaires ; en sorte que l'habitat de cet oiseau se trouve reculé par le fait au nord, de près de 10 degrés" [Dr. Néboux encountered it at Monterey (Upper California), from where he reported several examples of it; by which fact the range of this bird is pushed back to the north, by nearly 10 degrees]. "Several" caracaras at Monterey seem unlikely, and the ship on which Néboux was the physician and naturalist stopped at Magdalena Bay in Baja California and Mazatlan, San Blas, and Acapulco in western mainland Mexico after it left Monterey (Palmer 1918), a possible source of confusion. Alternatively, it is quite possible that expanding or retracting population sizes can explain the species' irregularity of vagrancy throughout North America. The population of Florida may not be as prone to vagrancy as that farther west (Morrison and Dwyer 2012).

Figure 4. Locations and dates of observation for one Crested Caracara remaining in California over 11 years (Table 1, ID #4). This individual was first detected in its first plumage cycle in Santa Barbara County in October 2001, moved between Riverside and San Mateo counties in 2002 and 2003 (A), traveled extensively between central California and southern Oregon from 2004 to 2006 (B), then moved north to settle in Humboldt and Del Norte counties from 2007 through 2012 (C). Gray dots represent reports from the earlier year(s) of each period, and different arrow types show major travel routes. Between migrations, this individual often returned to the same areas and, subsequent to 2003, was consistently documented in definitive plumage with the same cere/nostril shape, leading us to conclude that it was the same individual.


A: 2001 - 2003
28 Sep - 6 Nov 2002
16-27 Sep 2002
11-13 Aug 2002
09 Oct 2001; 24 Jan & 30 Apr 2002;
14-23 Jul 2002
05 May & 08 Aug 2002; 09
Dec 2002 - 05 Jan 2003
04 Jul 2002
20 Oct 2001
B: 2004 - 2006
13 Jun - 12 Jul 2005
19 Jul 2005
04 Sep 2004 – Jan 2005
02 May 2005
20-24 Aug 2004
16 Jul - 01 Aug 2004
03-07 May & 02-03
Aug 2005
14 Aug 2005 – 10 Apr 2006
01-02 Jun 2005
C: 2006 - 2012
31 Jan 2008 – May 2012+
13-14 Jul 2006; 08 Dec
2006 – 28 Mar 2007 & 30
Dec 2007
23 Apr – 09 May 2006
17 - 20 Jun 2006
14 Aug 2005 – 10 Apr 2006

Under our scenario there are over 12 instances of 6 individuals moving substantial distances to the north, often in short periods of time (Figures 1, 2, 4); Pyle and Sullivan (2010) documented that ID #10 dispersed north well over 450 km in 25 days, including over 125 km covered within 24 hours (Table 1). ID #4 traveled extensively in California over 8 years, making one northward flight of over 800 km within 11 days in 2005 (Figure 4, Table 1). ID #12 traveled north at least 800 km in early 2012 (Figure 2). These movements provide additional evidence that these birds are naturally occurring vagrants arriving from Mexico or Arizona, having dispersed north or northwest into California before continuing moving in those directions. Even the relatively stationary bird in San Diego County (ID #9) could have first reached this locale through a significant northward dispersal in its first cycle. In addition, records from the northern tier of the United States and southern Canada represent distances of 3000 km or more from the species' typical range. As many states in the intervening region across the continent have also documented the Crested Caracara, it seems reasonable to infer that some or most of these records represent genuine vagrants.

Although occurrence along the coast might seem illogical for a vagrant from mainland Mexico, it is clearly the pattern for the Crested Caracara in the West (e.g., Figures 2, 4). Most California records, both historic and modern, are for the immediate coast, as they are for Oregon, Washington, and British Columbia. A concentration along the coast might be expected if these birds tend to wander northwest. A similar trend in fall or winter coastal vagrancy is seen in other southern or Mexican vagrants to California (CBRC 2007), including the Broad-billed Hummingbird (*Cynanthus latirostris*), Greater Pewee (*Contopus pertinax*), Tropical Kingbird (*Tyrannus melancholicus*), Dusky-capped Flycatcher (*Myiarchus tuberculifer*), Sulphur-bellied Flycatcher (*Myiodynastes luteiventris*), and Streak-backed Oriole (*Icterus pustulatus*). That observation effort along the coasts is greater than in interior regions is well known and likely has contributed to the coastal trend in Crested Caracara records as well.

We hope that our analysis will help other records committees evaluate the status of the Crested Caracara in their regions, perhaps contributing to a similar overall pattern of natural vagrancy throughout North America.

## ACKNOWLEDGMENTS

We are grateful to the photographers and observers who wrote detailed descriptions; without their contributions this analysis would not be possible. We also thank the Western Foundation of Vertebrate Zoology, especially Adam Searcy. Thanks to the CBRC for reviewing records and providing guidance. The manuscript greatly benefited from comments by Joan Morrison, Gary Rosenberg, Bob Gill, and Kimball Garrett. We thank Philip Unitt for help with the manuscript and for alerting us to the history and literature pertaining to the 1837 record. Finally we thank county bird records compilers and others who contributed information, including Alan Barron, David Suddjian, David Compton, John Sterling, and Oscar Johnson.

## LITERATURE CITED

American Ornithologists' Union (AOU). 1998. Check-list of North American Birds, 7th ed. Am. Ornithol. Union, Washington, D.C.

Brewster, W. 1893. Capture of another *Ardetta neoxena* at Toronto, Ontario. Auk 10:363–364.
Brinkley, E. S. 2006. The changing seasons: Far fetched. N. Am. Birds 60:332–339.
Brinkley, E. S., and Lehman, P. E. 2003. Changing seasons: Unabashed bonanza. N. Am. Birds. 57:14–21.
California Bird Records Committee (R. A. Hamilton, M. A. Pattern, and R. A. Erickson, eds.). 2007. Rare Birds of California Western Field Ornithologists, Camarillo, CA.
Grinnell, J., and Miller, A. H. 1944. The distribution of the birds of California. Pacific Coast Avifauna 27.
Howell, S. N. G. 2010. Molt in North American Birds. Houghton Mifflin Harcourt, New York.
Johnson, O., Sullivan, B. L., and McCaskie, G. 2012. The 36th annul report of the California Bird Records Committee: 2010 records. W. Birds 43:164–188.
Lehman, P. L., and Brinkley, E. S. 2009. The changing seasons: Cornucopia. N. Am. Birds. 63:16–32
Mlodinow, S., Irons, D., and Tweit, B. 2007. The spring season: Oregon/Washington region. N. Am. Birds. 61:499–504.
Monson, G., and Phillips, A. R. 1981. Annotated checklist of the birds of Arizona. Univ. of Ariz. Press, Tucson.
Morrison, J. L.1996. Crested Caracara (*Caracara cheriway*), in The Birds of North America (A. Poole and F. Gill, eds.), no. 249. Acad. Nat. Sci., Philadelphia.
Morrison, J. L., and J. Dwyer. 2012. Crested Caracara (*Caracara cheriway*), in The Birds of North America Online (A. Poole, ed.), no. 249. Cornell Lab Ornithol., Ithaca, NY; http://bna.birds.cornell.edu/bna/species/249.
Palmer, T. S. 1918. Costa's Hummingbird—its early history, type locality and name. Condor 20: 114–116.
Phillips, A. R.,. Marshall, J., and Monson, G. 1964. The Birds of Arizona. Univ. of Ariz. Press, Tucson.
Potter, E. F., Parnell, J. F., and Teulings, R. P. 1980. The Birds of the Carolinas. Univ. of North Carolina Press, Chapel Hill.
Prévost, F., and des Murs, O. 1855. Oiseaux, in Voyage autour du Monde sur la Frégate la *Vénus*, Commandée par Abel du Petit-Thouars. Zoologie: Mammifères, Oiseaux, Reptiles, et Poissons, pp. 177–284. Gide et J. Baudry, Paris.
Pyle, P. 2005a. Preformative molts in North American Falconiformes. Raptor Research 39:378–385.
Pyle, P. 2005b. Remigial molt patterns in North American Falconiformes as related to age, sex, breeding status, and life-history strategies. Condor 107:823–834.
Pyle, P. 2008. Identification Guide to North American Birds. Part 2. Slate Creek Press, Point Reyes Station, CA.
Pyle, P., and Sullivan, B. 2010. Documenting repeated occurrences of individual birds with digital images. W. Birds 41:261–265
Pyle, P., Tietz, J., and McCaskie, G. 2011. Thirty-fifth report of the California Bird Records Committee: 2009 records. W. Birds: 42:134–163.
Roberson, D. R. 1993. Fourteenth report of the California Bird Records Committee. W. Birds 24:113–166.
San Miguel, M., and McGrath, T. 2005. Report of the California Bird Records Committee: 2003 records. W. Birds 36:78–113.
Stevenson, M., and Rosenberg, G. 2007. The fall season: Arizona. N. Am. Birds 62:121.
Tweit, B., and Fix, D. 1990. The spring season: Oregon/Washington region. Am. Birds 44:490.

*Accepted 6 August 2012*