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Western Specialty:

Sage Sparrow

Photo by Mike Danzenbaker of Mountain View, California:
Sage Sparrow *(Amphispiza belli nevadensis)*
Mono County, California, June 2000

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NOTES

Front cover photo by © Kenneth Z. Kurland of El Centro, California: Le Conte's Sparrow (*Ammodramus leconteii*), Niland, California, 15 January 2003.

Back cover "Featured Photo" by © Jim Rosso of Arlington, Virginia: Apparent hybrid between American Avocet (*Recurvirostra americana*) and Black-necked Stilt (*Himantopus mexicanus*), Elkhorn Slough, Monterey County, California, 13 March 1994.

Western Birds solicits papers that are both useful to and understandable by amateur field ornithologists and also contribute significantly to scientific literature. The journal welcomes contributions from both professionals and amateurs. Appropriate topics include distribution, migration, status, identification, geographic variation, conservation, behavior, ecology, population dynamics, habitat requirements, the effects of pollution, and techniques for censusing, sound recording, and photographing birds in the field. Papers of general interest will be considered regardless of their geographic origin, but particularly desired are reports of studies done in or bearing on the Rocky Mountain and Pacific states and provinces, including Alaska and Hawaii, western Texas, northwestern Mexico, and the northeastern Pacific Ocean.

Send manuscripts to Kathy Molina, Section of Ornithology, Natural History Museum of Los Angeles County, 900 Exposition Blvd., Los Angeles, CA 90007. For matters of style consult the Suggestions to *Contributors to Western Birds* (8 pages available at www.wfo-cbrc.org/journal.html) and the *Scientific Style and Format: The CBE Manual for Authors, Editors, and Publishers* (available for $60 from Cambridge University Press at 1-800-872-7423).

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Good photographs of rare and unusual birds, unaccompanied by an article but with caption including species, date, locality and other pertinent information, are wanted for publication in Western Birds. Submit photos and captions to Photo Editor. Also needed are black and white pen and ink drawings of western birds. Please send these, with captions, to Graphics Manager.

WESTERN BIRDS

Volume 35, Number 1, 2004

REPORT OF THE CALIFORNIA BIRD RECORDS COMMITTEE: 2002 RECORDS

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ABSTRACT: The California Bird Records Committee reached decisions on 188 records involving 79 species and one species pair reported in 2002, endorsing 139 of them. New to California was the Eurasian Collared-Dove (*Streptopelia decaocto*). Adjusted for this addition, California's bird list stands at 620 species, ten of which, including this addition, are non-native. Potential first state records of the Pink-backed Pelican (*Pelecanus rufescens*) and Demoseille Crane (*Anthropoides virgo*) were not accepted on grounds of questionable natural occurrence, and a potential state first Yellow-breasted Bunting (*Emberiza elegans*) was not accepted on grounds of identification. Other significant records reported here include the return of California's first Common Greenshank (*Tringa nebularia*), the state's second Little Bunting (*Emberiza pusilla*), third Arctic Warbler (*Phylloscopus borealis*), and fourth Glossy Ibis (*Plegadis falcinellus*). In addition to discussing the decisions of the Committee on 2002 records, this report discusses trends in documentation of birds submitted to the Committee.

This 28th report of the California Bird Records Committee (hereafter the CBRC or the Committee) details the evaluation of 188 records involving 292 individuals of 79 species and one species pair. Although most records pertain to birds found in 2002, the period covered by this report spans the 27 years from 1976 through 2002. Four of the reviewed records were not new but reassessments of earlier decisions reached by the Committee. The Committee accepted 139 records involving 241 individuals of 63 species and one species pair, for an acceptance rate of 74.9%. Thirty-eight records of 40 individuals were not accepted because of insufficient documentation or because descriptions were inconsistent with known identification criteria. Eleven additional records were not accepted because of questions concerning the bird's natural occurrence. Counties best represented by accepted records were Humboldt (13 records), Los Angeles (12), Imperial (11), Monterey (10), San Francisco (9, 8 of which were from Southeast Farallon I.), Santa Barbara (9), Ventura (9), Riverside (8) and San Diego (8). Records from 20 other counties were also accepted.

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Highlights of this report include the addition of the Eurasian Collared-Dove (*Streptopelia decaocto*) to the California list, the return of California's first Common Greenshank (*Tringa nebularia*), the state's second Little Bunting (*Emberiza pusilla*), third Arctic Warbler (*Phylloscopus borealis*), fourth Glossy Ibis (*Plegadis falcinellus*) and fifth Ruby-throated Hummingbird (*Archilochus colubris*). Potential first state records of the Pink-backed Pelican (*Pelecanus rufescens*) and a widely seen Demoseille Crane (*Anthropoides virgo*) were judged by the Committee to pertain to birds of uncertain origin. A reported Yellow-breasted Bunting (*Emberiza elegans*), another potential state first, was not accepted because of uncertain identification.

With the addition of the Eurasian Collared-Dove, California's list stands at 620 species, ten of which are not native, and two of which have been extirpated within historical times. The Committee currently is considering potential first state records of Cory's Shearwater (*Calonectris diomedea*), Little Shearwater (*Puffinus assimilis*), Slaty-backed Gull (*Larus schistisagus*), Oriental Turtle-Dove (*Streptopelia orientalis*), and Magnificent Hummingbird (*Eugenes fulgens*). The Committee is also reviewing reports of three species currently on the Supplemental List—the Falcated Duck (*Anas falcata*), Nazca Booby (*Sula granti*), and Crested Caracara (*Caracara cheriway*)—for inclusion on the main list.

Other highlights of this report include the first Sedge Wren (*Cistothorus platensis*) to winter in California and northern California's third Yellow-crowned Night-Heron (*Nyctanassa violacea*). Species recorded in especially high numbers in 2002 included the Ruddy Ground-Dove (*Columbina talpacoti*) with an unprecedented 28 individuals, Streaked Shearwater (*Calonectris leucomelas*) with 3 (these, with another report published here from 2001, increase by 50% the previous total of 8 accepted records for the state; a fourth 2002 record is in review), Manx Shearwater (*Puffinus puffinus*) with 9, Sprague's Pipit (*Anthus spragueii*) with 11, and Thick-billed Murre (*Uria lomvia*) with 4. This report also includes six accepted Painted Buntings from 2000, bringing that year's total to an unprecedented 17 birds.

The acceptance rate of 73.9% was below the overall weighted average of 79.7% but generally consistent with acceptance rates from the mid-1990s on. (The "weighted average" is the actual ratio of reports accepted to reports submitted, as opposed to the "unweighted average," the average of the reported acceptance rates of each report regardless of number of species treated per report.) The Committee's weighted average acceptance rate has dropped consistently over the past ten reports, with the exception of our 27th report (Garrett and Wilson 2003). The current weighted average is the lowest in the history of the Committee, though only slightly lower than the 79.8% weighted average acceptance rate through the 26th report (McKee and Erickson 2002). Rottenborn and Morlan (2000) discussed trends in acceptance rates though the CBRC's history.

The total of 188 records reviewed is below the Committee's average of 213.8 records per report over its first 27 reports. The lower number is the result of three factors: first, the CBRC report is now published annually;

some earlier reports included Committee decisions over multiple years (Binford 1985). Second, several earlier committee reports included the Committee's review of historical records; that review is largely complete, so recent reports have addressed primarily records from a single year. Finally, the list of species the CBRC reviews has changed substantially from its earliest incarnations, which included many birds we now know to occur regularly—even commonly—in California.

The list of species reviewed by the CBRC is posted at the Western Field Ornithologists' web site (www.wfo-cbrc.org). This site also includes the entire California state list, the Committee's bylaws, a reporting form for the direct e-mail submission of records to the CBRC, the addresses of current Committee members, a photo gallery of recent submissions, including several birds published in this report, and other information about the CBRC, WFO, and its journal, *Western Birds*.

All documentation reviewed by the CBRC, including copies of descriptions, photographs, videotapes, audio recordings and Committee comments, is archived at the Western Foundation of Vertebrate Zoology, 439 Calle San Pablo, Camarillo, California 93012, and is available for public review. The CBRC solicits and encourages observers to submit documentation for all species on the review list, as well as species unrecorded in California. Documentation should be sent to Guy McCaskie, CBRC Secretary, P. O. Box 275, Imperial Beach, CA 91933-0275 (e-mail: guymcc@pacbell.net).

A NOTE ON DOCUMENTATION

The Committee has now been in existence 33 years and has evaluated the documentation of thousands of bird records. The 28 published reports of our decisions provide a window into the evolution of the California birding community and the Committee itself. As our bylaws instruct, the Committee was established, in part, to "provide a means by which sight records can gain universal acceptance as valuable scientific data," and it has fulfilled this role well.

The Committee has evolved in both its use of corroborating documentation—such as photographs, sound and video recordings, and specimens—and its reporting of that use. The first report (Winter 1973) made no mention of corroborating documentation at all. The second report (Winter and McCaskie 1975) listed, separately from the main records, three specimen records but did not mention photographs. The third report (Luther et al. 1979) was the first to note which records are supported by photographs; in it, 1% of the accepted records were supported by specimens and 22% by photographs; 19% were multiple-reporter sight records, and the majority—58%—were single-reporter sight records. It was not until the Committee's eighth report (Morlan 1985) that it noted considering a sound recording submitted with a record. In the ninth report, Roberson (1986) inaugurated the use of the dagger (†) to indicate a photograph and the pound sign (#) for a specimen; Committee reports have followed this format since. By the 11th report (Bevier 1990), 1% of the accepted records were supported by audio recordings, 3% by specimens, and 33% by photographs, with the rest being multiple-reporter (20%) and single-reporter (43%) sight records.

Videotapes were mentioned for the first time in the 13th report (Pyle and McCaskie 1992), more than 20 years into the Committee's life; it was not until the 17th report (Patten et al. 1995) that videotapes and sound recordings were received commonly enough to warrant their own symbols, the double dagger (‡) for videotape and the section sign (§) for audio tapes. Sight records continued to make up the large majority of the CBRC's accepted records, except for our review of historical records in the 14th report (Roberson 1993), in which 21% of the accepted records were supported by specimens, 24% by photographs. That report also detailed decisions on the highest number of records (412) and had the lowest acceptance rate (67.0%) of any of our 28 reports.

In the 1990s, the percentage of records with corroborating documentation beyond written notes continued to rise. By the 20th report (Howell and Pyle 1997), it reached close to 53% of the records: 48% with still photographs, just over 2% with videotape and still photographs, just over 2% with specimens, and just under 1% (1 record) with audiotape. In our recent reports, the percentage of records with such evidence has ranged from 40% (McCaskie and San Miguel 1999, Erickson and Hamilton 2001) to 51% (Garrett and Wilson 2003). Of the records detailed in this report, almost 54% were supported by evidence beyond written notes: 47% by photographs, 2% each by specimens, audio recordings, and videotapes, and 1% by a combination of these methods. Of the remainder, 13% are multiple-reporter sight records and 33% are single-reporter sight records.

What may surprise some readers is that a significant percentage of records accepted by the Committee—one third of those reported here and a similar percentage in recent years—are still single-reporter sight records with no other documentation. From this fact we draw two conclusions. First, many of the records involve birds *seen* by multiple observers but *documented* by only a single observer. The Committee strongly urges all who see a reviewed species to document it and submit that documentation. Each observer may see field marks, experience behavior, or hear vocalizations not noted by other observers, important data that factor into the Committee's decisions. Second, a substantial number of the records the Committee accepts are indeed single-observer sight records. We hope that this finding encourages those who observe rare birds in California, if they have doubted that their single-observer sightings can achieve acceptance, to submit their reports to the Committee.

In part, the Committee's 28 reports illustrate the democratization of acceptable documentation for rare birds; the Committee has indeed made sight records scientifically acceptable as "a valuable source of distributional data," as its founders envisioned (Winter 1971). For example, the AOU (1998) relied heavily on the decisions of the CBRC and other records committees in its treatment of local records. The CBRC's reports also show that more corroborating documentation is submitted with records today than in the past. With the improvement of old technology (cameras and tape recorders) and the advent of new technology (video cameras, digital cameras, digital recording devices), more birders in the field have the means to document rarities with equipment other than the human brain. The Committee cautions, however, that reliance on technology *alone* is not a substitute for the time-honored tradition of taking careful and complete field notes, preferably while or shortly after watching the bird in question. Photographs can be ambiguous; different computer monitors display colors differently; voice recordings can be inconclusive. Written details and sketches are critical to establishing subtle differences among confusing species or plumages, for describing behavior that cannot be captured in a still photograph, and for documenting the location, viewing conditions, habitat, and other potentially important details of the record. So, while the rise in physical documentation is to be lauded, members of the California birding community are urged to use it as a complement to, rather than a substitute for, their written field notes. Indeed, several members of the Committee view photo-only records with skepticism.

Although new technologies have proven invaluable in documenting numerous bird records, the new technologies have also posed a challenge to the Committee on the archival front. No one knows how long certain documentary media—videotape, for example—will last, and no one knows how long the technology to gain *access* to certain documentary media—videotape, for example—will remain readily available. Records committed to a computer disk in 1985 are likely inaccessible today; who knows how long records committed to compact disks today will be accessible in the future? As each new generation of technology moves to the fore, previous generations, the victim of industry's "planned obsolescence," move into disuse, obscurity—and the CBRC's file cabinets. Researchers confront the anachronistic archives of the CBRC regularly. The Committee has only begun to address these archival issues; with the help of David Vander Pluym it started transferring records onto CDs for electronic storage during the summer of 2003. Member Todd McGrath is supervising the Committee's archival work. We welcome suggestions from knowledgeable readers as to how to preserve our existing archives and to make them easily available to researchers in the future.

The CBRC is taking one large step toward making the body of knowledge that is the CBRC archives more accessible to the public: the publication of the CBRC's *Rare Birds of California*, edited by Michael A. Patten, Robert A. Hamilton, and Richard A. Erickson. This compendium encompasses the Committee's decisions from its inception through 2001, listing all records of all species the Committee has ever reviewed during that time (including several records published here). *Rare Birds of California* will make it a simple task to determine how many accepted records of a particular species there are, and where and when they were reported, adding immeasurably to our knowledge of the status and distribution of state's avifauna for the 239 of the 610 native species on the California list it discusses, as well as the 82 hypothetical, supplemental, nonnative or extirpated species it also addresses. It is due to be published in 2004. We predict the book will be the most valuable resource for California birders since Grinnell and Miller (1944) and Garrett and Dunn (1981); our only certainty is that it will have more photographs than both.

NEWS AND FORMAT

Committee News. The Committee's voting membership after the 24 January 2004 annual meeting consisted of Luke W. Cole (chair), Jon L. Dunn, Matthew Heindel (vice chair), Marshall Iliff, Todd McGrath, Kristie N. Nelson, Peter Pyle, Michael M. Rogers, Mike San Miguel, and John C. Sterling. Guy McCaskie continued in his role as nonvoting secretary. Recent Committee members who also voted on many of the records in this report include Richard A. Erickson, Kimball L. Garrett, Tristan McKee, Joseph Morlan, Scott B. Terrill, and John C. Wilson. The Committee voted to add the American Golden-Plover (*Pluvialis dominica*) to the review list because of the difficulty of distinguishing it from the Pacific Golden-Plover (*P. fulva*) and because the Committee is not aware of its true status and distribution, the result of many potential misidentications. The Committee will review all records after 1 January 2004. When the Committee achieves a better understanding of the status and distribution of the American Golden-Plover, it may remove the species from the review list. The Committee also removed two species from the review list: the Yellow Rail (*Coturnicops noveboracensis*), after the discovery of possible nesting and the conclusion that the species' patterns of occurrence in the state have remained stable over a long period, and the Ruddy Ground-Dove (*Columbina talpacoti*), because there are more than 100 accepted records and the bird is nesting in the state. The Committee placed the Black-backed Oriole (*Icterus abeillei*) on the supplemental list.

Format and Abbreviations. As in other recent CBRC reports, records are generally listed chronologically by first date of occurrence and/or geographically, from north to south. Included with each record is the location, county abbreviation (see below), and date span. The date span usually follows that published in *North American Birds* (formerly *American Birds* and *Field Notes*) but, if the CBRC accepts a date span that differs from a published source, the differing dates are italicized. Initials of the observer(s) responsible for finding and/or identifying the bird(s)—if known and if they supplied supportive documentation—are followed by a semicolon, then the initials, in alphabetized order by surname, of additional observers submitting supportive documentation, then the CBRC record number consisting of the year of submission and a chronological number assigned by the secretary. All records are sight records unless otherwise indicated: initials followed by a dagger (†) indicate the observer supplied a supportive photograph, (‡) indicates videotape, (§) indicates a voice recording, and (#) indicates a specimen record, followed by the acronym (see below) of the institution housing the specimen and that institution's specimen catalog number. An asterisk (*) prior to a species' name indicates that the species is no longer on the CBRC's review list.

During 2003, in preparation for the publication of *Rare Birds of California*, the Committee changed the way it reports records and individuals, a change in our tradition to bring our reporting into conformity with our bylaws. In this report, the first number in parentheses after the species' name is the number of *individual birds* accepted by the CBRC through this report, not the number of accepted *records*; the number of individual birds may be higher than the number of records. Historically, the Committee has treated groups of individuals appearing together with a single record number (e.g., a flock of Red-throated Pipits, *Anthus cervinus*). The second number is the number of new individuals accepted in this report (because this number excludes records thought to pertain to returning individuals treated in previous reports, it may be zero). Two asterisks (**) after the species' total indicate that the number of accepted records refers only to a restricted review period or includes records accepted for statistical purposes only; see Roberson (1986) for more information.

When individual birds return to a location after a lengthy or seasonal absence, each occurrence is reviewed under a separate record number, and Committee members indicate whether or not they believe the bird is the same as one accepted previously. Such decisions follow the opinion of the majority of members and, if a bird is considered a returning individual, the total number of individuals remains unchanged.

Although the CBRC does not formally review the age, sex, or subspecies of each bird, information on these subjects is often provided during the review process (and in some cases a strong majority or consensus is achieved). We report much of this information; the diagnosis of age, sex or subspecies is the authors' opinion based on the evidence in the files and Committee members' comments. Our terminology for age is based on a system devised for the Committee's use by Peter Pyle, in consultation with Michael A. Patten, Richard A. Erickson, and Robert A. Hamilton, which largely follows the calendar-based terminology of the U.S.G.S. Bird Banding Laboratory, detailed by Pyle (1997). We prefer a calendar-based system because other age-coding systems, including those based on the plumage terminology of Humphrey and Parkes (1959), become imprecise during periods of transition or molt, in North America most frequently in the summer and early fall. In the accounts we use the terms "juvenile" (restricted to a bird in *complete* juvenal plumage), "first-fall," "first-spring," and "first-year" to designate birds less than a year old, "second-fall," etc., for birds between one and two years old, "third-fall," etc., for birds between two and three years old, and "adult" for birds in definitive plumage that may be at least one, two, three or four years old depending on the species. To avoid ambiguity we use the terms "one-year-old," "two-year-old," etc., in lieu of "first-summer," "second-summer," etc., for birds observed from June through August. We also sometimes use age/plumage terms based on Humphrey and Parkes (1959), e.g., "first alternate plumage," when both the age and the plumage state are known and are important information regarding the record.

The CBRC uses standard abbreviations for California counties; those used in this report are DN, Del Norte; FRE, Fresno; HUM, Humboldt; IMP, Imperial; INY, Inyo; KER, Kern; KIN, Kings; LAK, Lake; LA, Los Angeles; MRN, Marin; MEN, Mendocino; MOD, Modoc; MNO, Mono; MTY, Monterey; NAP, Napa; ORA, Orange; RIV, Riverside; SBE, San Bernardino; SD, San Diego; SF, San Francisco; SJ, San Joaquin; SLO, San Luis Obispo; SM, San Mateo; SBA, Santa Barbara; SCL, Santa Clara; SCZ, Santa Cruz; SHA, Shasta; SIS, Siskiyou; SOL, Solano; SUT, Sutter; VEN, Ventura. A list of county abbreviations for all 58 California counties is available on the WFO–CBRC web site and in Langham (1991). Other abbreviations used: I., island; L., lake; Mt., mountain; n. miles, nautical miles; N.W.R., national wildlife refuge; Pt., point; R., river; S.P., state park; W.M.A., wildlife management area.

Museum collections housing specimens cited in this report, allowing access to Committee members for research, or otherwise cited, are the California Academy of Sciences, San Francisco (CAS), Natural History Museum of Los Angeles County, Los Angeles (LACM), University of Michigan Museum of Zoology, Ann Arbor (UMMZ), and the Western Foundation of Vertebrate Zoology, Camarillo (WFVZ).

RECORDS ACCEPTED

EMPEROR GOOSE *Chen canagica* (87,3). One in the Arcata Bottoms, HUM, 7 Jan–28 Mar 2002 (EE; 2002-035) was in coastal NW California where considered casual in winter (Harris 1996). A first-fall bird near Nice on Clear L., LAK, 29 Sep–7 Nov 2002 (DH, JKn; RJK†, RS†, JWh; 2002-190) was inland, where rarer than along the coast, and established California's earliest date for the arrival of a fall migrant. One at Becher's Bay on Santa Rosa I., SBA, 16 Jan–6 Mar 2002 (SMacG†; 2002-048) was exceptionally far south, with two records (six birds) in Orange Co. (Hamilton and Willick 1996) being the only ones farther south in North America, though there are multiple records for Hawaii.

TRUMPETER SWAN *Cygnus buccinator* (52,5). A previously rejected record of three calling adults in flight at Stanton I., SJ, 22 Jan 1999 (DGY; 1999-049A) was reconsidered after receipt of original documentation and unanimously endorsed. In addition, two adults were on Sump 1A at Tule Lake N.W.R., SIS, 26–27 Dec 2002 (KS†; 2003-022).

WHOOPER SWAN *Cygnus cygnus* (11,3). A group of one adult and three first-winter birds at Unit 4 of Lower Klamath N.W.R., SIS, 10 Jan–10 Mar 2001 (DM†, JM, MM; 2001-064) was believed to include the adult that had been there 28 Jan 1998 (1998-026; Erickson and Hamilton 2001). The identification of a smaller adult at adjacent White L. on Lower Klamath N.W.R., SIS, 10 Mar 2001 was questioned and not accepted (although endorsed by a majority), with at least one member suggesting it was a hybrid Whooper × Tundra Swan (*C. columbianus*) from a mixed pair with three young there during the winter of 2000–2001 (Sullivan 2001, *N. Am. Birds* 55:220).

GARGANEY *Anas formosa* (23,1). One was shot by a hunter at the Mendota Wildlife Area, FRE, during the weekend of 26–27 Oct 2002 (GGe; WM†; 2003-030). The wing was collected as part of a project monitoring kills during the waterfowl hunting season and identified by GGe. The upper and under sides of the wing were photographed by WM. The wing is archived at the U.S. Fish & Wildlife Service Office of Migratory Bird Management in Laurel, Maryland, tagged with species name, age, sex, location, date, and source information, but no catalogue number.

YELLOW-BILLED LOON *Gavia adamsii* (70,2). The Committee reconsidered and unanimously endorsed a previously rejected record of one at Grant L., MNO, 8 Dec 1976 (DAG†; 1977-010A), long before this species was known to occur regularly in small numbers on large inland lakes. Gaines (1988) included the record in his list of hypothetical species. One near Westport, MEN, 17 Aug 2002 (JLD, PP; EG†, GMcC, DWN†, MSanM, BLS†; 2002-143) was in basic plumage and suspected to have summered locally.

SHORT-TAILED ALBATROSS *Phoebastria albatrus* (11**,2). Single first- or second-year birds were off the NW corner of Santa Barbara I., SBA, 19 Feb–22 Mar 2002 (JAn, KO†; PM†; 2002-046), and at 40° 40.038' N, 124° 39.788' W, ca. 18 n. miles off False Cape, HUM, 25 Mar 2002 (TP†; 2002-062). The Committee reviews all post-1900 records of the Short-tailed Albatross.

STREAKED SHEARWATER *Calonectris leucomelas* (11, 4). One on Monterey Bay, MTY, 6 Oct 2001 (TMcG†; 2002-150) was in the area where all but one of California's previous Streaked Shearwaters had been recorded. Single birds were 5 miles off Westport, MEN, 17 Aug 2002 (JLD; GE†, RJK, GMcC, DWN†, PP, MSanM, BLS†; 2002-144; Figure 1), at 38° 07.270' N, 123° 18.229' W, ca. 16 n. miles NW of Pt. Reyes, MRN, 29 Sep 2002 (DCD, TMcG; 2002-163), and 4–5 miles S of Sandstone Pt. on Santa Cruz I., SBA, 7 Sep 2002 (JF, DMH†, PK; 2002-156). These, along with another record (2002-204) still under review and a possible Streaked Shearwater off Santa Barbara Co. (see Records Not Accepted, identification not established, below), suggest an influx of this western Pacific species to the waters off California during the fall of 2002.

MANX SHEARWATER *Puffinus puffinus* (75, 9). One 4.5 n. miles NW of the Palos Verdes Peninsula 23 Feb 2002 (TMcG†; DMH, MS†; 2002-041) and one seen from West Cove Point on San Clemente I., 4 Mar 2002 (BLS; 2002-063) were the second and third to be recorded in Los Angeles Co. One off Pigeon Point, SM, 12 May 2002 (AME; 2002-099) was the sixth to be seen from shore at this location. One off Fort Bragg 2 Jun 2002 (PP; RJK, TMcK, DT; 2002-106) and another seen from shore at Fort Bragg 16 Aug 2002 (JLD; GMcC, MSanM; 2002-149) were the first and second for Mendocino Co. One seen from shore at the Santa Maria R. mouth 8 Sep 2002 (BKS; 2002-210) was the first for Santa Barbara Co. Single birds 3 miles W of Point Pinos, MTY, 17 Feb 2002 (TMcG; 2002-151), at 36.396°N, 122.009°W on Monterey Bay, MTY, 9 Aug 2002 (DLSh; 2002-145), and 36° 49.67'N, 122°

Figure 1. This Streaked Shearwater, *Calonectris leucomelas*, 5 miles of Westport, Mendocino Co., 17 August 2002 was one of an unprecedented four of this species reported in 2002.

Photo by Gil Ewing

01.01′W on Monterey Bay, MTY, 17 Dec 2001 (LWC; TMcG; 2002-059) were in the area where most of California's Manx Shearwaters have been recorded.

RED-TAILED TROPICBIRD *Phaethon rubricauda* (20,1). An adult photographed at 32° 20′ N, 120° 20′ W, 75 n. miles SW of San Nicolas I., VEN, 15 Oct 1993 (RRV†; 1994-030) was over waters where this species is probably of regular occurrence but birders rarely venture. Another Red-tailed Tropicbird reported with this one was not accepted by a majority of the Committee because of a lack of documentation.

MASKED BOOBY *Sula dactylatra* (11,1). A second- or third-winter bird caught on a beach in Corona del Mar, ORA, 12 Jan 2002 (*Orange County Register*†, AD†, DL†; 2002-021) was taken to a nearby wildlife rehabilitator and eventually released at Dana Point, ORA, where it remained 25 Feb–24 Mar 2002 (*N. Am. Birds* 56:356), spending much of this time with another Masked Booby of similar age there 11 Feb–28 Apr 2002 (MD†, DL†, CAM, GMcC, JM, MSanM; 2002-038). The Committee, after much consideration, comparing plumage and injuries to the webbing on the feet, believed the latter was probably the same as the Masked Booby at La Jolla, SD, 30 Dec 2001–10 Jan 2002 (2002-001; Garrett and Wilson 2003).

MASKED/NAZCA BOOBY *Sula dactylatra/granti* (7,1). A juvenile in the San Pedro Channel 10 n. miles off Long Beach, LA, 22 Jul 2001 (CHa†; 2001-167) was clearly one of this species pair. Adults may be separated on the basis of bill color, but characters for identifying juveniles with mostly gray bills have yet to be determined conclusively (see Pitman and Jehl 1998, Roberson 1998).

BROWN BOOBY *Sula leucogaster* (74,4). Adult males seen from Point Loma, SD, 8 Apr 2001 (REW; 2001-098) and Capitola Beach, SCZ, 12 Sep 2001 (DLSu; 2002-006) were both believed to be the expected race *brewsteri*. A brown-headed adult on Southeast Farallon I., SF, 26 Oct–9 Nov 2002 (AdB; KNN, PP; 2003-019) was followed by a pale-headed adult there 23 Nov 2002, also apparently *brewsteri* (AdB; 2003-020). Reports of this booby along the coast have increased substantially during the past 15 years; it is now found annually on Los Coronados Is., Baja California (*N. Am. Birds* 55:230, 56:226).

RED-FOOTED BOOBY *Sula sula* (14,1). One caught on the pier at the Scripps Institute of Oceanography, La Jolla, SD, 20 Jul 2002 had a fish hook in its throat and was taken to a nearby wildlife rehabilitator, from whom it escaped 22 Jul 2002 (MF; GMcC†; 2002-138; Figure 2).

TRICOLORED HERON *Egreta tricolor* (38**,4). A juvenile near the Salton Sea N.W.R. headquarters, IMP, 22 Jul 2001 (SSo†; 2001-119) was in an area where the species is a rare spring and summer vagrant (Patten et al. 2003). A one-year-old bird at Los Osos, SLO, 9–11 Aug 2002 (KAH; 2002-214), an adult at the Point Mugu Naval Base, VEN, 25 Jun 2002 (MR†; 2002-146), and an adult in Goleta, SBA, 12–21 May 2002 (DMC†, CC†; 2002-110) were on the coast but all north of Orange County, where few Tricolored Herons are recorded. The Committee reviews Tricolored Heron records only from 1990 onward.

*REDDISH EGRET *Egreta rufescens* (94**,0). A long-staying bird at Mugu Lagoon, VEN, 15 Sep 2001–2 Mar 2003 (DMC, JLD†, WW; 2001-222) was believed by a majority of CBRC members to be the first-fall bird in Santa Barbara Co. 14 Jul–11 Sep 2001 (2001-117; Garrett and Wilson 2003). The Committee reviews records of Reddish Egret through 2001 only.

YELLOW-CROWNED NIGHT-HERON *Nyctanassa violacea* (22,3). A one- or two-year-old bird at San Elijo Lagoon, SD, 11 Jun–24 Aug 2002 (BC†; GMcC, BoM†; 2002-137) was in extreme S coastal California where most of the state's Yellow-

Figure 2. This Red-footed Booby, *Sula sula*, injured with a fish hook in its throat, was picked up at a pier in La Jolla, San Diego County, 20 July 2002. It escaped from a wildlife rehabilitator before the hook could be removed.

Photo by Guy McCaskie

crowned Night-Herons have been recorded. An adult in Ventura 19 Sep 2002–10 Apr 2003 (DDesJ†, DVP†, WW†; 2002-159) was the fourth in Ventura Co., and an adult at Coyote Point Regional Park, SM, 23–24 Jul 2002 (RST; LWC†, RoF, MM, JM, KR, MMR, SR, AW†; 2002-139) was only the third in northern California.

GLOSSY IBIS *Plegadis falcinellus* (4,1). An adult with a group of White-faced Ibis (*P. chihi*) in the Prado Basin 13–16 Sep 2002 (JEP; 2002-222) established the first record for Riverside Co. and the first for California in fall. See also Records Not Accepted, identification not established.

HARRIS'S HAWK *Parabuteo unicinctus* (33**,1). After the record circulated seven times, with no resolution of the question of natural occurrence, the Committee finally agreed on considering an adult in the Antelope Valley, LA, 25 Mar–6 Apr 1996 (KLG; 1996-080HA) as one of the more than 50 Harris's Hawks that arrived naturally in southern California and northern Baja California in the 1990s (Patten and Erickson 2000). The Committee reviews selected records of Harris's Hawk from before 1980 and all records after 1993. See also below under Records Not Accepted, identification accepted but natural occurrence questionable.

YELLOW RAIL *Coturnicops noveboracensis* (76,5). One at Inverness, MRN, 9 Jan 2001 (GMcC; 2001-012) was forced into view by an exceptionally high tide. Two were captured during the trapping and marking of Ring-necked Pheasants (*Phasianus colchicus*) at Grizzly I., SOL, 10 Jan–12 Feb 2002 (CJ; TB†, RL†; 2002-042). The Yellow Rail may prove to be a regular rare winter visitor in both areas. At least two vocalizing at Cowhead Slough in the extreme NE corner of Modoc Co. 27 May–24 Jun 2002 (GK§; MSanM§; 2002-126) were in suitable breeding habitat and possibly nesting. At its 2004 meeting, the Committee voted to remove the Yellow Rail from its review list.

AMERICAN OYSTERCATCHER *Haematopus palliatus* (24,1). One on San Nicolas I., VEN, 21 May 2002 (WW; 2002-102) scored high according to the characters tabulated by Jehl (1985). A high score indicates an American Oystercatcher; a low score indicates a Black Oystercatcher (*H. bachmani*).

COMMON GREENSHANK *Tringa nebularia* (1,0). One at the Arcata Marsh and Wildlife Sanctuary in Arcata, HUM, 18–25 Oct 2001 (EE†, DFx; 2002-174) was believed by a majority of CBRC members to be the same as the one at the nearby Mad R. mouth the previous fall (2001-137; Garrett and Wilson 2003).

UPLAND SANDPIPER *Bartramia longicauda* (21,3). One on Southeast Farallon I., SF, 17 Aug 2002 (KK; 2003-005) was found dead the following morning (#CAS 5901). Two more arrived there 20 Aug 2002 (KK; DG†; 2003-006); one of these remained the following day, the other to 26 Aug 2002.

LITTLE STINT *Calidris minuta* (7,1). An adult was along the Los Angeles R. in Long Beach, 25–26 Aug 2002, a first for Los Angeles Co. (KGL; GMcC, TMcG, DWN†, MSanM; 2002-152).

WHITE-RUMPED SANDPIPER *Calidris fuscicollis* (16,1). An adult at evaporation basins near the intersection of Jersey Ave. and Highway 14, near Stratford, KIN, 12–14 Oct 2001 (JS; 2001-176) established the latest date for a fall migrant in California.

CURLEW SANDPIPER *Calidris ferruginea* (31,1). One at the Tulare Lake Drainage District's Hacienda Evaporation Basin, KIN, 19–20 May 2002 (JS†; 2002-127) was the fourth to be found inland in California in spring.

LITTLE GULL *Larus minutus* (79,1). One in its first spring was at the Santa Ana R. mouth, ORA, 6 Apr 2002 (JEP; 2002-221).

LESSER BLACK-BACKED GULL *Larus fuscus* (20,1). An adult at the San Jose–Santa Clara Water Pollution Control Plant in Alviso, SCL, 9 Mar 2002 (MMR; 2002-098) was the same individual present at this location each of the past seven winters (McKee and Erickson 2002). An adult at Prado Regional Park in Chino 9 Jan 2002 (JEP; 2002-003) was the first to be recorded in San Bernardino Co.

THICK-BILLED MURRE *Uria lomvia* (42,5). The record of one at 36° 57' N, 122° 01' W, 0.6 n. miles off Santa Cruz, SCZ, 4 Oct 1999 (TMcK, SF†; 2000-056) generated much discussion regarding the apparent shape of the bill but was accepted unanimously during the fourth circulation through the Committee. Four were at about 40° 43.67' N, 124° 31.47' W, ca. 10 n. miles NW of the Eel R. mouth, HUM, 12 May 2002 (TMcK, EE†; 2002-180, 2002-181, 2002-182 and 2002-183). The CBRC has endorsed two previous records for this area, but not the same two listed by Harris (1996).

LONG-BILLED MURRELET *Brachyramphus perdix* (14,3). The identification of a headless, decomposed, and partially mummified *Brachyramphus* murrelet picked up by Emilie Strauss and David Shuford on the east shore of Mono Lake, MNO, 29 Jul 1983 (#UMMZ 224,651; 2000-066) could not be confirmed by bill measurements. All Committee members but one, however, agreed that the wing and tarsus measurements support the identification as *perdix* (see Sealy et al. 1991). One in the channel between the north and south jetties at the entrance to Humboldt Bay, HUM, *7–10* Dec 1995 [not 7–9 Dec as published in *Field Notes* 50:330 and Mlodinow 1997] (JT, SMcA†; 2003-031) was one of only two to be found in California in December. One at Patrick's Point, HUM, 13 Aug 2001 (BO'B; 2001-155) was encountered during a survey for the Marbled Murrelet (*B. marmoratus*) and fit the pattern set by the majority of the state's Long-billed Murrelet records—along the coast from Santa Cruz Co. northward between mid-July and mid-October.

EURASIAN COLLARED-DOVE *Streptopelia decaocto* (65, 65). The CBRC believes the increase from one to 50 at Calipatria, IMP, 4 May–28 Dec 2002 (GMcC; JM†; 2002-117A; Figure 3) was the result of birds reaching California from the east of the state, rather than by local introduction and/or escape. The Eurasian Collared-Dove apparently reached Florida in the early 1980s from introduced populations in the Bahamas (Smith 1987), and the species was well established in southern Florida by the end of the 1980s. In the early 1990s the population expanded north and west, as shown by records from numerous localities scattered throughout the southeastern United States (Romagosa and McEneaney 1999). This range expansion continued through the 1990s, and by the end of 2002 the Eurasian Collared-Dove had been placed on the state lists of Arizona (Gary H. Rosenberg pers. comm.), Oregon (Marshall et al. 2003), and Washington (Steven G. Mlodinow pers. comm.). The westward spread of this dove is well illustrated by the maps in National Geographic (2003). By 2002 this dove had been found as close to California as Yuma, Arizona (Henry Detwiler pers. comm.), and Campo Mosqueda in the Rio Colorado delta, Baja California (*N. Am. Birds* 55:360).

A population of Eurasian Collared-Doves in coastal Ventura County since at least 1992 is believed to have originated from locally released birds (Romagosa and McEneaney 1999, Walter Wehtje pers. comm.), and another population in Monterey County is believed to have originated from an intentional release at King City in 1999 (Roberson 2002). Populations now breeding in coastal Santa Barbara (David M. Compton pers. comm..) and San Luis Obispo (Tom M. Edell pers. comm., *Field Notes* 52:257-258) counties are suspected to have originated from the Ventura County population or locally released and/or escaped birds.

Reports of Eurasian Collared-Doves in southeastern California near Lancaster, LA, 15 Mar–25 May 1998 (2001-089) and Brawley, IMP, 18 Jul–25 Aug 1999 (1999-140) and on the coast in Chula Vista, SD, 29 May 2002 (2002-112) were suspected to involve escapees. However, two in Ridgecrest, KER, 13 May 2001–present (LLa†;

Figure 3. Flock of Eurasian Collared-Doves, *Streptopelia decaocto*, at Calipatria, Imperial County, 28 December 2002. The dove's rapid colonization of southeastern California led the Committee to add the species to the California state list.

Photo by Joseph Morlan

2002-121), two near El Centro, IMP, 7 Aug 2001 (GMcC;2002-034), one at Desert Center, RIV, 2 Nov 2001 (CMcG†; 2002-031), one near Bishop, INY, 8 Mar 2002 (DP, JPa; 2002-044), and nine at Blythe, RIV, 19 May 2002 (RH‡; 2002-123) appear to have been the first to arrive by dispersal from the east. As of the end of 2003, populations appeared established at Blythe, RIV (Roger Higson pers. comm.), Desert Center, RIV (Chet McGaugh pers. comm.), and through much of the Imperial Valley, IMP (McCaskie pers. obs.). Individuals have been found as far west as San Clemente I., LA (Brian Sullivan pers. comm.).

Ringed Turtle-Doves (*S. risoria*) and hybrid Eurasian Collared-Dove × Ringed Turtle-Doves occur in California as well. The Eurasian Collared-Dove in Brawley in 1999 was paired with a Ringed Turtle-Dove and fledged two young. Two Ringed Turtle-Doves were in Imperial, IMP, 8 Dec 2001 (Kimball L. Garrett pers. comm.). A *Streptopelia* near Calipatria, IMP, 26 Jan 2002 and two together with a Ringed Turtle-Dove in Calipatria 28 Jun 2002 were apparent hybrids (McCaskie pers. obs.). See also Records Not Accepted, identification not established, below.

Although the Committee added the Eurasian Collared-Dove to the California bird list, it did not add it to the review list and will not review any further records of this species.

RUDDY GROUND-DOVE *Columbina talpacoti* (101,28). Up to five (3 males/2 females) were at Furnace Creek Ranch in Death Valley, INY, 13 Oct 2001–11 May 2002 (JLD; RB, ChH, AEK, JH, TH, JM, LS†, JWi; 2001-199; Figure 4). A female was at Mayflower Park in Blythe, RIV, 3 Nov–8 Dec 2001 (RH‡; HBK, DWN; 2001-201), and up to four (2 males/2 females) were near there 4 Nov 2001–8 Mar 2002 (GMcC; NF, RH‡, KZK†, BLaF, NLaF, MM, BoM†, JM, DWN†, MMR†, MSanM;

Figure 4. This Ruddy Ground-Dove, *Columbina talpacoti*, photographed 4 November 2001, spent the winter of 2001–2002 at Furnace Creek Ranch, Death Valley National Park, Inyo County. The Committee removed the Ruddy Ground-Dove from the review list following the unprecedented 28 birds, including this female, reported in 2002.

Photo by Larry Sansone

2001-189). Also in Blythe were two along Broadway 1 Dec 2001–27 Mar 2002 (RH‡; 2002-124) and up to four along Riviera Drive 26 Oct 2002–30 Mar 2003 (HBK; 2002-178). A male was at L. Perris, RIV, 7–23 Dec 2002 (BED†, DFu†, MJSanM; 2002-208). Two were near the SE corner of El Centro, IMP, 27 Jan–15 Mar 2002 (KZK†; GCH, GMcC; 2002-033). Two were at Laguna Dam, IMP, 20 Dec 2002 (BH; 2003-016). All these were fall vagrants or winter visitors as has been the pattern of records for this species to date, but a female on the Primm Valley Golf Course near Nipton, SBE, 14 May 2002 (JCS; 2002-116) may have been a spring vagrant. Up to six were near Calipatria, IMP, from 8 Dec 2002 to at least 1 Dec 2003 (GMcC; RoF, CAM, JM†; 2002-200). Over 100 individuals have now been recorded in California, and one pair near Calipatria successfully nested in 2003 (McCaskie 2003). At its 2004 meeting, the Committee voted to remove the Ruddy Ground-Dove from the review list.

BLACK-BILLED CUCKOO *Coccyzus erythropthalmus* (16,1). One at Pachalka Springs at the base of Clark Mountain, SBE, 24 Jun 2002 (JA; RJN, SSo; 2002-119) provided California its first record in spring and one of only three in the interior.

BROAD-BILLED HUMMINGBIRD *Cynanthus latirostris* (60,2). A first-fall male near Centerville Beach, HUM, 14 Sep 1997 (SMcA†; 2003-032) was the second to be found around Humboldt Bay (Harris 1996), far north of where expected. There are two records for Oregon, however, including one from Gearhart in extreme northwestern Oregon (Marshall et al. 2003). One at Oak Park Cemetery in Claremont, LA, 8–21 Sep 2002 (MJSanM; 2002-172) was in coastal southern California where most of the state's Broad-billed Hummingbirds have been recorded.

RUBY-THROATED HUMMINGBIRD *Archilochus colubris* (5,1). A first-fall male that frequented a feeder at the Lanphere–Christansen Dunes Preserve near Arcata, HUM, 25–29 Sep 2002 (JT; PAG, SWH†, RLeV†, GMcC, TMcK, MSanM†; 2002-162) was the latest of the four recorded in California in fall and the first one viewable by multiple observers.

GREATER PEWEE *Contopus pertinax* (36,0). A calling bird recorded at Brock Research Center, IMP, 20 Jan 1998 (JRB§; 2001-053) was considered the same bird present there the following winter, 24 Dec 1998–15 Feb 1999 (1999-043; Erickson and Hamilton 2001).

DUSKY-CAPPED FLYCATCHER *Myiarchus tuberculifer* (64,1). One was at Mason Regional Park in Irvine, ORA, 16 Dec 2002–24 May 2003 (KMB, RoF, JM†, SSo, DW; 2002-215).

THICK-BILLED KINGBIRD *Tyrannus crassirostris* (15,0). One at River Ranch in Santa Paula, VEN, 19 Nov–21 Dec 2002 (DDesJ†, WW; 2002-220) was considered the same individual there 23 Feb–3 Mar 1999 (1999-086; Rogers and Jaramillo 2002). Although no documentation has been submitted to the Committee, the bird was reported wintering there in 1999–2000 and 2000–2001, though not found in winter 2001–2002.

WHITE-EYED VIREO *Vireo griseus* (45,1). A singing male was at Lompoc, SBA, 13–15 Jun 2002 (JT†; DMC, BrH†, JCS§; 2002-140).

YELLOW-THROATED VIREO *Vireo flavifrons* (89,5). One at Galileo Hill Park, KER, 13 Apr 2002 (KHL; 2002-114) was the earliest found in California in spring. A male was singing at Andrew Molera S.P., MTY, 8 Jun 2002 (CHo; RHo; 2002-142). One at the University of California Hopland Research and Extension Center, MEN, 23 Aug 2002 (CEV; 2002-153) tied the earliest fall record for California. Individuals were at Banning Park, Wilmington, LA, 2–6 Oct 2002 (TMcG, MSanM; 2002-168) and Point Loma, SD, 19 Oct 2002 (PAG, GMcC, GLR, SES; 2002-175;

Figure 5). The total of five in 2002 was well below the record of 10 reported in 2001 and 1992 (Garrett and Wilson 2003).

YELLOW-GREEN VIREO *Vireo flavoviridis* (74,1). A first-year bird was at Lemon Tank, San Clemente Island, LA, 18 Sep 2002 (JPl†; BLS†; 2002-171).

SEDGE WREN *Cistothorus platensis* (7,1). One at Half Moon Bay State Beach, SM, 7 Dec 2002–15 Mar 2003 (PJM; WGB, KMB, HCo†, MWE, MLF, RoF, JFH, AEK, CAM, TMcG, JM, RR; 2002-201) was the first to overwinter in California. A photograph was published in *N. Am. Birds* 57:255.

ARCTIC WARBLER *Phylloscopus borealis* (3,1). One seen well but briefly along Stevens Creek in Mountain View, SCL, 7 Sep 2000 (MMR; 2000-138) took four rounds to achieve acceptance. Committee members were concerned about the duration of the observation for such a rare bird, and the description of the bird as "brownish" above was questioned by some (but see Sibley 2000, Jonsson 1993, Mullarney et al. 1999).

RUFOUS-BACKED ROBIN *Turdus rufopalliatus* (12,2). Two were with American Robins (*T. migratorius*) at Laguna Dam, IMP, 21–24 Dec 2002 (HDD†, TMcG; 2002-225).

CURVE-BILLED THRASHER *Toxostoma curvirostre* (15,1). One at Otay Mesa, SD, 28 Apr 2002 (PU; 2002-095) is the westernmost recorded in North America. Although the bird was in sight of Tijuana, Mexico, raising concerns about its origin,

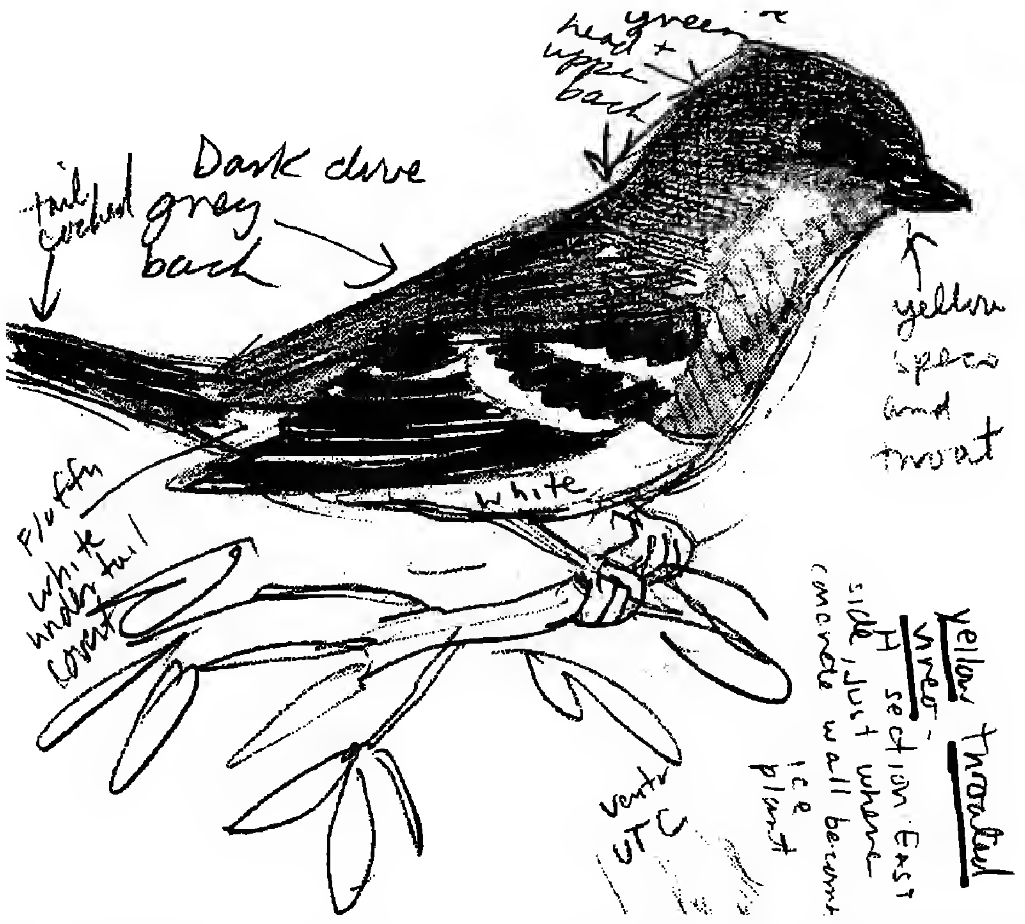

Figure 5. Yellow-throated Vireo, *Vireo flavifrons*, Point Loma, San Diego County, 19 October 2002.

Sketch by Susan E. Smith

the Curve-billed Thrasher is a known long-distance vagrant from its range in the south-central U.S., with records from as far afield as Alberta (*Birders' Journal* 7:274), Manitoba (Manitoba Avian Research Committee 2003), Florida, and Wisconsin (AOU 1998). Furthermore, surveys of cagebirds in Baja California, Mexico, while finding numerous other Mimidae, have not revealed this species (Hamilton 2001).

SPRAGUE'S PIPIT *Anthus spragueii* (49,11). Up to 11 spent the winter near Calipatria, IMP, 17 Dec 2002–8 Apr 2003 (TE; NF, JFH, MM, CAM, GMcC, BoM†, JM†, DEQ, MJSanM, MSanM, AW†; 2002-217; Figure 6). This species may prove to winter annually in the Imperial Valley.

BLUE-WINGED WARBLER *Vermivora pinus* (33,2). A singing male was at the Big Sur R. mouth, Andrew Molera S.P., MTY, 8 Jun 2001 (DR; 2002-131). A first-fall male was near Cantil, KER, 4 Oct 2002 (TMcG; MSanM; 2002-166).

GOLDEN-WINGED WARBLER *Vermivora chrysoptera* (67,1). An adult male was on Point Reyes, MRN, 27 Sep–2 Oct 2002 (EG†, EH†, JM; 2002-167). Its photograph appeared on the cover of *Western Birds* 34 (2).

YELLOW-THROATED WARBLER *Dendroica dominica* (96,3). A male of the expected subspecies *albilora* was on San Clemente I., LA, 3 May 2002 (JBr; 2002-120). Singing males were in Goleta, SBA, 23 May 2002 (NS; GT; 2002-115) and at El Prado Golf Course near Chino, SBE, 30 May 2002 (DPe; 2002-122).

GRACE'S WARBLER *Dendroica graciae* (37,0). A female wintering at Point Loma, SD, 11 Sep 2002–2 Feb 2003 (GMcC, TMcG; 2002-158) was thought to be the same bird that spent the previous winter there (2001-153; Garrett and Wilson 2002).

Figure 6. Sprague's Pipit, *Anthus spragueii*, 6 January 2003, one of a flock of up to 11 spending the winter of 2002–2003 near Calipatria, Imperial County.

Photo by Bob Miller

PINE WARBLER *Dendroica pinus* (63,1). A first-spring male was banded on Point Loma, SD, 3 Apr 2002 (VPJ†; GMcC; 2002-061; Figure 7).

WORM-EATING WARBLER *Helmitheros vermivorus* (94,2). One at the Santa Clara R. estuary, VEN, 21 Oct 1983 (GGi; 1994-068A) was first submitted to the Committee in 1994 and not accepted after four rounds (1994-068; McCaskie and San Miguel 1999). Subsequently the observer submitted additional documentation in the form of his original field sketch and notes and requested reevaluation, after which the record was accepted on the first round. Another Worm-eating Warbler was along Carpinteria Creek, SBA, 26 Sep–31 Oct 2002 (AC, JC; DMC, JEL, MSanM; 2002-179).

*KENTUCKY WARBLER *Oporornis formosus* (109**,1). A male was in Santa Barbara, SBA, 24 May 1994 (PEL; 1994-089). The Kentucky Warbler is no longer on the CBRC's review list, and the Committee reviews records only through 1994.

CONNECTICUT WARBLER *Oporornis agilis* (92,2). One at Mt. Davidson, SF (PS; 2002-197), 10 Sep 2002 provided a long-overdue first record for mainland San Francisco Co.; there are 49 accepted records—more than half the state's total—from the Farallones. In keeping with this pattern, a first-fall individual was banded on Southeast Farallon I., SF, 3 Oct 2002 (RDiG†; PP†; 2003-008).

MOURNING WARBLER *Oporornis philadelphia* (121,7). A male was at Army Springs on San Nicolas I., VEN, 17–18 Jun 2000 (RAH; 2002-141). One at the Arcata Marsh Project, HUM, 5 Oct 2001 (DFx; 2001-168) was seen briefly and required three rounds for passage. A female was at Furnace Creek Ranch, INY, 26 May 2002 (SBT; 2002-108). One was at Mojave, KER, 11 Sep 2002 (MJSanM; TMcG, MSanM, JCW; 2002-157). An adult male was at Fort Rosecrans National Cemetery on Point Loma, SD, 21–25 Sep 2002 (JWo; DFu, PAG, GMcC, TMcG,

Figure 7. First-spring male Pine Warbler, *Dendroica pinus*, banded on Pt. Loma, San Diego County, 2 April 2002.

Photo by Philip Unitt

BiM; 2002-160). Single first-fall birds were banded on Southeast Farallon I., SF, 31 Aug 2002 (KNN†; AdB†; 2003-010) and 26 Sep 2002 (KNN†; AdB†; 2003-009).

SCARLET TANAGER *Piranga olivacea* (119,4). A first-fall male was on San Clemente I., LA, 7 Nov 2001 (HCa; 2002-028). A male in Santa Cruz, SCZ, 7–11 Dec 2001 (KA; 2002-027) made California's third record for December. A male on San Nicolas Island, VEN, 8 Aug 2002 (SH; 2003-015) may have summered; it is only the second accepted in August and the earliest by more than two weeks. A first-fall male at Lemon Heights, ORA, 24–27 Nov 2002 (JEP; 2002-224) fit this species' usual late fall pattern; almost 70% of all accepted records of Scarlet Tanager are from this season.

LE CONTE'S SPARROW *Ammodramus leconteii* (31,2). One was at Furnace Creek Ranch, INY, 6–7 Oct 2002 (RB, ChH†; JLD, TMcG, SSo; 2002-186). One wintered in a damp ditch adjacent to a field of okra (*Abelmoschus esculentus*) at Niland, IMP, 17 Dec 2002–3 Mar 2003 (PAG; JFH, KZK†, AEK, MM, CAM, GMcC, MJSanM, MSanM, AW†, RW†; 2003-002; see cover of this issue).

SNOW BUNTING *Plectrophenax nivalis* (100,3). One was at Mad River Slough Wildlife Area near Arcata, HUM, 30 Oct–28 Nov 2002 (JT; KMB; 2002-191). A first-fall female was at Point Cabrillo, MEN, 10 Nov 2002 (JKl†; 2003-021), and another first-fall female was just 9.5 miles north of there at Laguna Point, MacKerricher S.P., MEN, 11–16 Nov 2002 (ME†, RJK†, MaM†; 2002-196; Figure 8).

LITTLE BUNTING *Emberiza pusilla* (2,1). One on Southeast Farallon I., SF, 27–28 Sep 2002 (KNN†; AdB, PC, PP; 2002-223) was only the second for California, following one 21–24 Oct 1991 at Pt. Loma, SD (1991-145; Patten et al. 1995). The Little Bunting breeds from Finland across northern Eurasia to Anadyr Bay on the Bering Sea; it is casual in Alaska in fall. Two were at Gambell, Alaska, in fall 2002 (Tobish 2003). Bradshaw (1991) provided details on how to distinguish the Little from the Rustic Bunting (*E. rustica*), of which there are four California records.

PYRRHULOXIA *Cardinalis sinuatus* (21,1). A male was near Palo Verde, IMP, 27 May 2002 (KMB; 2002-105). Although the observer heard and reported two birds, he saw, and the Committee endorsed, only one.

PAINTED BUNTING *Passerina ciris* (97,6). The CBRC regards as natural vagrants single green first-fall birds at the Big Sur R. mouth, MTY, 27 Aug–2 Sep 2000 (IS†; DR; 2002-132), 6 Sep 2000 (IS†; 2002-133), 20 Sep 2000 (IS†; 2002-134), and 13 Oct 2000 (RiF; 2002-135), at Bishop, INY, 5–6 Sep 2002 (DPa, JPa; RB†, ChH†; 2002-216), and at Galileo Hill Park, KER, 14 Sep 2002 (TW; 2002-207). With the acceptance of these records, the 2000 total for the Painted Bunting is an unprecedented 17 individuals. See also Records Not Accepted, natural occurrence questionable, below.

COMMON GRACKLE *Quiscalus quiscula* (61,7). Up to four (three females and a male) were in El Dorado Park in Long Beach, LA, 2 Jan–10 Mar 2000 (KSG; JLD, KLG, CAM, GMcC, JM, GP, MJSanM, MSanM†; 2000-033). One female was at Panamint Springs, INY, 3 Nov 2002 (PAG; GMcC; 2002-189). Three males were at the Earvin "Magic" Johnson Recreation Area in Willowbrook, LA, 30 Dec 2002–19 Jan 2003 (KGL†; 2003-034). All Common Grackles reported here were the expected subspecies *Q. q. versicolor*.

BLACK ROSY-FINCH *Leucosticte atrata* (9,1). Following the report of a Black Rosy-Finch with Gray-crowned Rosy-Finches (*L. tephrocotis*) at Montgomery Creek Ranch near Benton, MNO, on 10 Feb 2001, many observers made the trek to this remote corner of the state in an effort to refind this bird. Several reported finding what they believed to be a Black Rosy-Finch, but descriptions of the bird(s) differed and viewing conditions were typically horrible, with strong winds and skittish distant birds.

Ultimately the committee concluded that only the descriptions from *16* Feb 2001 (NBB, MSanM; 2001-057) were acceptable, although the original report from 10 Feb also received strong support (8–2).

COMMON REDPOLL *Carduelis flammea* (62,1). A first-winter male visiting a feeder in Anderson, SHA, 3–17 Feb 2002 (BP†; LWC†, MH, LL‡, JM, DWN†, DEQ, MSanM; 2002-036) was part of a significant irruption of this species in Canada and the western United States in winter 2002. Floyd (2002) described it as "the best invasion ever documented in the Great Basin Region," with multiple flocks in Nevada and Utah; more than 7000 were reported in Washington and Oregon (Mlodinow et al. 2002). A photo of the redpoll at Anderson was published in *N. Am. Birds* 56:220.

RECORDS NOT ACCEPTED, identification not established

YELLOW-BILLED LOON *Gavia adamsii*. One reported at Tule Lake, SIS (2000-057), 21 Feb 2000 went four rounds before falling 8–2 because of two members' concerns about the brevity of the description of a bird seen briefly at a distance. One reported at Crescent City, DN, 12 Jan 2002 (2002-037) received some support (3–7), but the bird's being described as about the size of the nearby Common Loons (*G. immer*) rather than larger, and appearing gray rather than brown on the upperparts, suggested a pale-billed Common Loon. The report of one on L. Perris, RIV, 24 Jan 2002 (2002-045) received no support.

SHORT-TAILED ALBATROSS *Phoebastria albatrus*. Single birds seen from shore at Pebble Beach, MTY, 1 May 1999 (1999-092A) and 10 May 1999 (1999-092C) were originally circulated through the Committee as a single record of a bird staying through these 10 days. Described plumage differences, however, suggested different individuals of different ages, so the Committee divided one record into three and reviewed each sighting as a separate individual, with the option of combining any or all as "the same bird." Another sighting on 9 May is still under review. The sightings on 1 and 10 May were of albatrosses at a great distance, possibly immature Short-tailed Albatrosses, but the documentation was inadequate to eliminate a hybrid Laysan (*P. immutabilis*) x Black-footed (*P. nigripes*) Albatross or an aberrant Black-footed Albatross.

STREAKED SHEARWATER *Calonectris leucomelas*. One reported 6 miles south of Santa Barbara, SBA, 26 Oct 2002 (2002-185) received some support (4–6), but a majority of the Committee found the documentation inadequate for such a significant record.

BLUE-FOOTED BOOBY *Sula nebouxii*. All CBRC members believed an obvious booby in flight at San Clemente I., LA, 26 Jul 2001 (2002-026) to have been either a Blue-footed or an immature Masked/Nazca (*S. dactylatra/granti*). But the documentation was inadequate to eliminate the latter. Observers are cautioned that the Blue-footed Booby is the booby least likely to be encountered along the coast today, and that the first-year Masked, and particularly first-year Nazca, can look similar and must be distinguished carefully.

NEOTROPIC CORMORANT *Phalacrocorax brasilianus*. One in Blythe, RIV, 12 Apr 2002 (2002-109) may have been correctly identified but lacked adequate documentation.

ANHINGA *Anhinga anhinga*. One reported in flight over the San Carlos area of San Diego, SD, 7 Apr 2002 (2002-064) was believed to be a member of the genus *Anhinga*. However, the documentation does not eliminate the Darter (*A. melanogaster*), an Old World species recently reported in the wild in Imperial Co. (Patten et al. 2003, McKee and Erickson 2002), San Diego Co. (Philip Unitt pers. comm.), and northern Baja California (*N. Am. Birds* 56:111).

Figure 8. Snow Bunting, *Plectrophenax nivalis*, at MacKerricher State Park, Mendocino County, 13 November 2002.

Photo by Mark Ellness

Figure 9. This Harris's Hawk, *Parabuteo unicincus*, at Irvine, Orange County, 10–12 December 1994 was judged by the Committee to be outside the range of the incursion into the state that year and thus was not accepted on grounds of questionable natural occurrence.

Photo by Robert A. Hamilton

GLOSSY IBIS *Plegadis falcinellus*. One reported near Calipatria, IMP, on 1 and 15 Jul 2000 (2000-110) was photographed on the first date and was obviously an ibis of the genus *Plegadis*. The record was sent to Bruce Peterjohn after circulating through the Committee one time. Peterjohn stated that the bird was in first alternate plumage rather than adult basic plumage as reported. He noted that in the genus *Plegadis* soft-part coloration is variable at this age; while a red iris and facial skin indicate a White-faced Ibis (*P. chihi*), the absence of these characteristics (as in this bird) is inconclusive. In addition, he stated that the white border across the base of the bill in this bird strongly suggested it was a White-faced Ibis and pointed out that in first alternate plumage the Glossy has relatively inconspicuous pale lines on the facial skin and no white at the base of the bill. After these comments were added, the record received only one supporting vote.

Patten and Lasley (2000) listed four records for California; as it now stands, the identity of the birds they reported at Twentynine Palms, SBE, 29–31 Aug 2000 and in the Imperial Valley, IMP, 1–15 Jul 2000 are questioned by the Committee. The difficulties in distinguishing the White-faced and Glossy Ibises are compounded by hybridization; Arterburn and Grzybowski (2003) reported apparent hybrids in Oklahoma.

MISSISSIPPI KITE *Ictinia mississippienis*. One reported near Palo Alto, SM, 27 Jan 2002 (2002-032) was seen briefly from a vehicle going north on Interstate 280. Not only was the description of the bird limited to "white head and dark gray body," but the bird was perched on a utility pole (most unusual for this species), and the species is virtually unknown in North America in winter.

COMMON BLACK-HAWK *Buteogallus anthracinus*. One reported in Brawley, IMP, 3 Nov 2002 (2002-198) was almost certainly the Zone-tailed Hawk (*Buteo albonotatus*) known to be wintering at that locality (*N. Am. Birds* 57:117, 57:257).

YELLOW RAIL *Coturnicops noveboracensis*. One was reported at an unspecified location along Highway 29, NAP, 21 Apr 2002 (2002-096). Only the upperparts were seen as the bird scurried into cattails (*Typha* sp.). The description of the bird included nothing about the bill size or wing pattern. In addition, the habitat was not typical for this species.

WHOOPING CRANE *Grus americana*. A report of two adults near Pleasant Grove, SUT, 16 Apr 2002 (2002-097) received no support.

LITTLE STINT *Calidris minuta*. The documentation provided for an adult at the Santa Maria R. mouth, SBA, 17 Aug 2002 (2002-212) suggested this species (four Committee members endorsed the record); however, some diagnostic plumage characteristics were lacking from the description. Two members felt the Sanderling (*C. alba*) was not eliminated. The Committee has traditionally required exhaustive details prior to endorsing any record of a stint in California.

WHITE-RUMPED SANDPIPER *Calidris fuscicollis*. One was reported at Tule Lake N.W.R., SIS, 8 Jul 1989 (2002-113). The single observer stated that the bird appeared to be an adult in molt and that there was a buffy wash on the breast. Adult White-rumped Sandpipers should not have buffy washes on their breasts but instead have prominent dark streaks extending down onto their flanks. In addition, the expected early arrival date for fall migrant adults in the United States is mid-August, so the 8 July date was far too early. The record received virtually no support from the Committee, though published by Kemper (2003).

BELCHER'S GULL *Larus belcheri*. An immature gull at Natural Bridges State Beach, SCZ, 6 Jul 2002 (2002-187) bore a resemblance to field-guide illustrations of juveniles of this species, and the record was supported by three Committee members (3–7). However, comparisons of the written description and specimens revealed differences. Some members were concerned about aberrant immatures of other gulls, and some were reluctant to endorse such a significant record by a single observer.

LESSER BLACK-BACKED GULL *Larus fuscus*. After first being considered a Slaty-backed Gull (*L. schistisagus*), then a Lesser Black-backed Gull, a large dark-mantled sub-adult gull at Obsidian Butte on the south shore of the Salton Sea, IMP, 22 Dec 1998–7 Mar 1999 (1999-061A) and again 21 Nov–5 Dec 1999 (2000-001) was left unidentified. Patten et al. (2003) discussed it and concluded "its identity remains a mystery." Attempts to collect it failed.

LONG-BILLED MURRELET *Brachyramphus perdix*. A report of one at the Garcia R. mouth, MEN, 23 Jul 2001 (2001-188) was accompanied by documentation that failed to convince a majority of the Committee that the bird was not a juvenile Pigeon Guillemot (*Cepphus columba*).

EURASIAN COLLARED-DOVE *Streptopelia decaocto*. Two were reported in Brawley, IMP, 24 Feb 2001 (2001-072), but their undertails and bellies were described as "almost white," strongly suggesting they were domesticated African Collared-Doves (*S. roseogrisea*) or hybrid Eurasian Collared-Doves x Ringed Turtle-Doves (*S. risoria*). The observer reporting one seen briefly at Point Reyes Station, MRN, 29 Jul 2001 (2001-124) also was not positive a hybrid could be eliminated.

EASTERN WOOD-PEWEE *Contopus virens*. A wood-pewee banded and measured on Southeast Farallon I., SF, 12–13 Sep 2001 (2002-012) had an Eastern-like call note and an entirely orange mandible, but its measurements were inconclusive for identification by the formulae in Pyle (1997). During the circulation of this record Hubbard (2002) updated Pyle's formulae; by Hubbard's criteria, the bird was more likely a Western Wood-Pewee (*C. sordidulus*).

ALDER FLYCATCHER *Empidonax alnorum*. One at Deep Springs, INY, 13 Sep 2002 (2003-011) received no support, as the observers were uncertain in the field as to the identification and the bird was silent. Many Committee members thought it could have been an Alder but were unwilling to endorse what would be only the state's fifth record on such slender documentation. The well-known difficulties in *Empidonax* flycatcher identification have led the Committee to a conservative approach to the Alder Flycatcher, reflected in the CBRC's 24% acceptance rate for this very rare species.

DUSKY-CAPPED FLYCATCHER *Myiarchus tuberculifer*. One described from Hansen Dam Recreation Area, LA, 25 Nov 2001 (2001-213) received no support on its second circulation, with Committee members concerned about the brevity of the observation and description of a silent bird.

GREAT CRESTED FLYCATCHER *Myiarchus crinitus*. One reported on Point Loma, SD, 19 Oct 2002 (2002-176) received little support because of the brevity of the observation (several looks of 3–5 seconds) of a bird observed only in flight. The skimpy description did not eliminate several other, more common *Myiarchus* flycatchers.

YELLOW-GREEN VIREO *Vireo flavoviridis*. One reported on Pt. Loma, SD, 26 Sep 2002 (2002-205) received little support, as most Committee members thought that a bright Warbling Vireo (*V. gilvus*) was not eliminated.

VEERY *Catharus fuscescens*. One reported at the Point Reyes lighthouse, MRN, 5 May 2002 (2002-103) received little support. Committee members concluded that the Russet-backed Swainson's Thrush (*C. ustulatus ustulatus*), was not eliminated; it also has a reddish-brown back and is the thrush expected in early May. There are only three accepted spring records of Veery, the earliest 17 May. One reported at Manzanar, INY, 24 May 2002 (2002-107) was seen for 35 seconds at 80 feet, a duration too short and a distance too great for the Committee to be comfortable with the identification. The Committee appreciates the very difficult identification challenge that *Catharus* thrushes pose and reviews such records carefully; its conservative approach is reflected in the 42% acceptance rate for the Veery, among the lowest of recurring birds on the review list.

YELLOW WAGTAIL *Motacilla flava*. One on Southeast Farallon I., SF, 12 Sep 1999 (2000-082) received strong support in the third and fourth rounds (8–2), but one member believed the description did not rule out the Citrine (*M. citreola*) and Gray (*M. cinerea*) Wagtails, while another was concerned with the brevity of the observation (less than 30 seconds) by an observer not experienced with the species. The Committee has been inconsistent in its review of Yellow Wagtails over the years; with growing knowledge of wagtail distribution and the occurrence of a Citrine Wagtail in Mississippi in 1992 (AOU 1998), Committee members are now more likely to expect elimination of that species in a report of the Yellow Wagtail than they have been in the past.

*RED-THROATED PIPIT *Anthus cervinus*. One reported from Salinas, MTY, 29 Sep 1984 (1984-226A) was originally accepted when submitted to the Committee in 1984 (1984-226; Dunn 1988), but the primary observer has since withdrawn this claim as "the bird was seen rather briefly, did not call, and the *japonicus* race of American Pipit was not considered" (Roberson 2002:483). The bird was unanimously not accepted on re-evaluation by the Committee in light of the observer's reconsideration.

CONNECTICUT WARBLER *Oporornis agilis*. One reported at Morongo Valley, SBE, 20 Sep 2002 (2002-169) was observed briefly, and although all members thought it may have been a Connecticut Warbler, the short description did not eliminate other warbler species and did not include mention of diagnostic behavior (walking) or structure (long undertail coverts/short tail).

MOURNING WARBLER *Oporornis philadelphia*. A majority of the Committee concluded that a bird banded and photographed on Southeast Farallon I., SF, 27 Sep 2000 (2001-028) was indeed a Mourning Warbler, but after four rounds three members had concerns regarding the bird's non-definitive measurements and believed that a hybrid Mourning × MacGillivray's Warbler (*O. tolmiei*) was not ruled out. One reported on the Christmas Bird Count at Palos Verdes, LA, 23 Dec 2001 (2002-056) received considerable initial support, although on subsequent rounds several Committee members reasoned that the description of underparts bright yellow from throat to undertail coverts and no hood eliminated this species. The Mourning Warbler is extremely rare in winter; there are only two accepted winter records for California.

RED-FACED WARBLER *Cardellina rubrifrons*. One reported on Point Loma, SD, 19 Oct 2002 (2002-177) received some support, but the brevity of the observation (10 seconds) and slender documentation were not enough for such a significant record; there are only two accepted fall records of Red-faced Warbler, the later being 12 Sep. Eight of the 13 accepted records of this species are from late May or early June at inland locations.

YELLOW-BREASTED BUNTING *Emberiza elegans*. One reported frequenting a feeder in Mission Hills, LA, 5–6 Mar 2000 (2000-105) went through four rounds of careful review before falling 7–3 because three members believed the documentation (including distant, blurred photographs) was inadequate to support the identification and 1–9 because the occurrence was unlikely to be natural.

PYRRHULOXIA *Cardinalis sinuatus*. The brief description from De Anza Springs Resort near Jacumba, SD, 1 Sep 2002 (2002-206) of a bird in "complete silhouette" with a cardinal-like call note left many members uncomfortable about making an identification of which the observer appeared uncertain in the field.

COMMON GRACKLE *Quiscalus quiscula*. One reported in the town of Klamath River, SIS, 9–11 May 2002 (2002-136) had majority support among Committee members in the first round before falling 4–6 on concerns that the description did not eliminate an immature male Great-tailed Grackle (*Q. mexicanus*) or a hybrid Great-tailed Grackle × Brewer's Blackbird (*Euphagus cyanocephalus*).

RECORDS NOT ACCEPTED, identification accepted but natural occurrence questionable

PINK-BACKED PELICAN *Pelecanus rufescens*. One on Southeast Farallon I., SF, 1–2 Nov 2002 (AdB†; KNN†; 2003-004) was considered the same as the one there 22–24 Oct 2000 (2001-019; McKee and Erickson 2002). A report of what was probably this same bird at Abbott's Lagoon, MRN, 10 Oct 2001 (2003-051) is currently under review.

HARRIS'S HAWK *Parabuteo unicincus*. One in Irvine, ORA, 10–12 Dec 1994 (RAE, RAH†; 2003-018; Figure 9) was outside the apparent geographic limits of the 1994 incursion (Patten and Erickson 2000).

DEMOISELLE CRANE *Anthropoides virgo*. The Committee unanimously endorsed the identity of an adult with wintering Sandhill Cranes (*Grus canadensis*) near Lodi and on Staten Island, SJ, 30 Sep 2001–18 Feb 2002 (CP; KMB, KH‡, LL, KMcK†, JM, DEQ, MMR, DGY; 2001-173; Figure 10). But only three members considered it a genuine vagrant. This easily identified crane breeds across central Asia and migrates to the Indian subcontinent and sub-Saharan Africa to winter (Cramp 1980). Vagrants have been recorded well to the north of this range in N Europe (Lewington et al. 1991, Beaman and Madge 1998) and NE Siberia (Dement'ev et al. 1951). Since Sandhill Cranes nest well into NE Siberia (Flint et al. 1984), there is a possibility of a vagrant Demoiselle Crane joining up with Sandhill Cranes breeding in Siberia, then migrating south with those cranes into North America. Indeed, what was probably the California Demoiselle Crane was photographed with migrant Sandhill Cranes near Smithers, British Columbia, 2 May 2002 (Bain 2002) and at Gustavus, Alaska, 13–14 May 2002 (Daniel D. Gibson pers. com.).

Because the Sandhill Cranes breeding in Siberia are all believed to winter in the Great Plains rather than California, and because Demoiselle Cranes are relatively common in captivity, with documented records of escapees in North America, a majority of CBRC members questioned the bird's origin, though all agreed it may have been a genuine vagrant.

PAINTED BUNTING *Passerina ciris*. An adult male in Arcadia, LA, 1–2 Aug 2002 (MSanM, SSo†; 2002-155) was wearing an ill-fitting band, suggesting it was other than a U.S. Fish and Wildlife Service band. A female or first-fall Painted Bunting frequenting a feeder in Los Angeles, LA, 25 Nov–2 Dec 2000 (AnB, EB; 2000-148) took four rounds before being not accepted (6–4) because of Committee members' doubts about the late date and the urban locality. The overwhelming majority of accepted records of Painted Buntings (94%) are of fall migrants; those outside the window of fall migration, and those reported from urban areas in southern California, particularly adult males, are generally considered by the Committee to be probable escapees.

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This report would not have been possible without the 183 observers who submitted reports to the Committee. Other individuals contributed to the Committee's review of particular species: Bruce Peterjohn thoughtfully reviewed the Glossy Ibis records and

Figure 10. This striking Demoiselle Crane, *Anthropoides virgo*, spent the winter of 2001–2002 associating with Sandhill Cranes, *Grus canadensis*, in San Joaquin County. The Committee did not accept this record on grounds of questionable natural occurrence.

Photo by Kevin McKereghan

offered insight into *Plegadis* identification. David M. Compton, Henry Detwiler, Tom M. Edell, Kimball L. Garrett, Roger Higson, Chet McGaugh, Steven G. Mlodinow, Gary H. Rosenberg, Brian Sullivan and Walter Wehtje generously assisted the Committee in understanding the status and distribution of Eurasian Collared-Doves in California and the West. Philip Unitt assisted with records of the Darter. John Arvin and Greg Lasley offered information on Curve-billed Thrashers in captivity along the Texas border. Our understanding of the terminology of birds' ages was enhanced by Peter Pyle, who helped us with many of the records reported here. Kimball Garrett, Todd McGrath, Mike Rogers, and Mike San Miguel reviewed and improved earlier drafts of this report; Richard A. Erickson, Marshall Iliff, Peter Pyle, and Philip Unitt provided particularly extensive and useful editorial comment. Peter LaTourrette continued his capable stewardship of the WFO–CBRC website. Peg Stevens and Jon C. Fisher continue to archive the Committee's materials at WFVZ. We extend our thanks to all.

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WARBLING VIREO NESTING ECOLOGY IN THE NORTHERN SIERRA NEVADA

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ABSTRACT: In California, for unknown reasons, the Warbling Vireo (*Vireo gilvus swainsonii*) has poor reproductive success, and its numbers have declined over the past 20 years. From June through August 1998 we monitored 70 nests of the Warbling Vireo in a previously unstudied population on the eastern slope of the northern Sierra Nevada. Nests were generally placed 7 m or higher in mature trees, situated at over 50% of the nest-plant's height, and most often in the periphery of the nest-plant's foliage. The two most common nest-plant species were the Quaking Aspen (*Populus tremuloides*, $n = 30$) and Lodgepole Pine (*Pinus contorta*, $n = 30$). Such heavy reliance on a conifer by the Warbling Vireo has not been reported previously. Nest success was not significantly associated with habitat or nest-site characteristics; thus successful sites did not differ dramatically from unsuccessful sites. Most egg dates were concentrated within a single week (2–9 July), and most of the successful nests were in the egg-incubation phase during the first two weeks of July. Eighteen nests fledged at least one Warbling Vireo; one nest fledged a Brown-headed Cowbird (*Molothrus ater*). Seventy-four percent of nesting attempts failed; most failed nests showed signs of avian rather than mammalian predation. We recommend that vireo conservation efforts in the northern Sierra Nevada focus on increasing the availability of suitable nest sites by promoting mature stands of aspens and pines offering well-concealed nest sites in the periphery of the foliage, limiting forest disturbance in July during the critical nesting period, and minimizing environmental modifications that favor avian nest predators such as Steller's Jay (*Cyanocitta stelleri*).

Several species of North American vireo have endured drastic population declines or regional extirpation in recent times (e.g., Bell's, *Vireo bellii*, Black-capped, *V. atricapillus*, and Gray, *V. vicinor*, Gardali et al. 2000). Despite considerable research attention focused on endangered vireos, the basic natural history and population trends of the much more widespread Warbling Vireo (*V. gilvus*) are not well known (Gardali and Ballard 2000, Ward and Smith 2000). Various lines of evidence suggest that Warbling Vireo (*V. g. swainsonii*) populations are declining in California (Gardali et al. 2000, Gardali and Jaramillo 2001), despite moderately positive population trends in North America as a whole (+1.2% per year, $P < 0.05$; Sauer et al. 2001). Breeding Bird Surveys imply that California populations of the Warbling Vireo have declined annually by 1.0% ($P < 0.04$, Sauer et al. 2001). In addition, at Palomarin, Marin County, autumnal capture rates of the Warbling Vireo have decreased over the past two decades by 9% per year (Ballard et al. 2003). Furthermore, in the last century, the Warbling Vireo has been largely extirpated from the Sacramento Valley and San Diego County (Gaines 1974, Unitt 1984, Gardali and Ballard 2000).

Demographic studies suggest that low reproductive success rather than low adult survivorship is the most important contributor to the decline (Gardali et al. 2000, Gardali and Jaramillo 2001). Because the species' basic nesting ecology has been characterized for only a few populations in western North America (Gardali and Ballard 2000), the ultimate causes of this low productivity remain unknown.

For conservation plans for declining neotropical migrants such as the Warbling Vireo to be effective, the stage or stages in the annual cycle that limit population growth, as well as habitat features that directly influence reproduction and survival, must be identified (Martin 1992, Gardali et al. 2000). Toward that end, we analyzed in detail the breeding cycle and nest-site characteristics of a previously unstudied population of Warbling Vireos nesting in broadleaf and mixed coniferous forests on the eastern slope of the northern Sierra Nevada. Avian habitat relationships in the northern Sierra Nevada are poorly understood in comparison to those in the southern Sierra Nevada and Sierra foothills, for which there is extensive literature, e.g., Verner and Boss (1980) and numerous references therein. Thus identifying key environmental characteristics for vireos in this area will not only deepen our understanding of avian habitat associations in western North America but will also advance the development of land management appropriate to benefit the Warbling Vireo in California.

METHODS

We studied Warbling Vireo breeding ecology from June through August of 1998 in three riparian areas on the eastern slope of the Sierra Nevada in northern California in the Tahoe National Forest: Sagehen Creek (7 km northwest of Hobart Mills in Nevada County at 39° 25.852′ N, 120° 14.481′ W, elevation 1937 m), Davies Creek (12 km north of Hobart Mills in Sierra County at 39° 30.699′ N, 120° 9.632′ W, elevation 1900 m), and Klondike Meadow along East Martis Creek (17 km southeast of Hobart Mills in Placer County at 39° 18.357′ N, 120° 03.206′ W, elevation 2120 m). Each study area consisted of Sierran montane riparian and meadow habitats with stands of willow (*Salix* sp.) and occasionally alder (*Alnus* sp.) bordered by conifers, primarily Lodgepole Pine (*Pinus contorta*), and broadleaf trees, primarily Quaking Aspen (*Populus tremuloides*) and Fremont Cottonwood (*P. fremontii*).

We located Warbling Vireo nests by following adult vireos (Martin and Geupel 1993). We monitored the progress of each nest at least once a week and no more than twice a week. To identify critical periods in the nesting cycle, we recorded dates on which pairs were observed building nests, laying eggs, incubating eggs, or brooding nestlings. For unsuccessful nesting attempts, we noted the stage at which failure occurred (i.e., abandonment while building or laying, egg incubation, or nestling period). Failed nesting attempts were those in which the adult pair, the nest, or all of its contents disappeared before fledging was possible. Whenever possible, we classified failed nests to the most likely type of predator as outlined by Morton et al. (1993). We identified the nest predator as "avian" if the nest contents disappeared before fledging but the nest cup appeared undisturbed, and "mammalian" if the nest was knocked down or the nest cup lost its integrity. Clearly, there are limitations to this indirect method of identifying nest predators (Larivière 1999, Thompson and Burhans 2003).

We examined a suite of nest-site characteristics, many of which are likely to be affected by proposed management to restore late-seral forest structure and regenerate aspen stands throughout the Sierra Nevada (SNFPADSEIS 2003). For each nest, using protocols from Ralph et al. (1993), we determined the plant species containing the nest, height of the nest, height of nest plant, nest-plant diameter at breast height (dbh), nest orientation measured as the compass direction from the main stem to the nest, number of branches supporting the nest, average diameter of the branches supporting the nest, nest distance from central stem, nest distance from the periphery of the plant, nest concealment measured in each of the four cardinal directions from the nest (0–25% concealment was ranked "1," 26–50% concealment was ranked "2," 51–75% concealment was ranked "3," and 76–100% concealment was ranked "4"), and canopy cover measured in each of the four cardinal directions from the nest (percent canopy cover was ranked in a fashion similar to nest concealment). We tabulated summary scores for both nest concealment and canopy cover by averaging the scores in each of the four cardinal directions. To enhance the reliability of all measures, early in the field season we trained the study's participants until they achieved a high degree of repeatability.

To characterize general habitat associations for Warbling Vireos nesting in the northern Sierra Nevada, we investigated differences in nest-site characteristics among nest-plant species. Nest-site data were first tested for normality and then analyzed with a one-way analysis of variance (ANOVA, Sokal and Rohlf 1995). A Bonferroni correction was used to maintain an alpha level of 0.05 for the overall analysis (Lehner 1996). The variables "average diameter of the branches supporting the nest" and "nest distance from the periphery of the plant" were log-transformed for normality. The "number of branches supporting the nest" and the "nest canopy cover summary score" did not conform to a normal distribution even after transformation and were therefore analyzed with a Kruskal–Wallis one-way analysis of variance (Lehner 1996).

To highlight habitat characteristics critical to vireo productivity in the northern Sierra Nevada, we determined percent nest success by study site and nest-plant species. We then analyzed the likelihood of nest success using logistic regression. Independent variables included study site (Sagehen Creek, Davies Creek, and Klondike Meadow), nest-plant species, nest height, and within a nest-plant species the plant's height and diameter. The dependent variable "nest success" (Kus 2002) was coded as "0" for pairs failing to fledge young or fledging a Brown-headed Cowbird (*Molothrus ater*), and "1" for pairs where we either observed fledging, observed adults feeding fledglings in the natal territory, or observed fledglings within the natal territory accompanied closely by adults. Significance was accepted at $P < 0.05$.

RESULTS

We found Warbling Vireos nesting in Quaking Aspen, Lodgepole Pine, Fremont Cottonwood, and willow; the two most common nest plants were the aspen and pine (Table 1). Nest heights ranged from 1.2 m (in a willow) to 19.0 m (in a Lodgepole Pine), reflecting that the plants in which these nests were placed ranged in height from 1.8 m (a willow) to 28.0 m (a Lodgepole Pine). Among the four nest-plant species nest-site characteristics were very similar. Five of the nine habitat characteristics compared did not differ significantly (Tables 1–3). Most nests found (68%, 46 of 68) were in mature trees (10 to 17 m tall) and positioned in the periphery of the nest-plant's foliage (Tables 1 and 3); 51% (33 of 64) were placed at least three times as far from the main stem as they were from the periphery of the plant. Furthermore, the distance of the nest from the periphery was on average less than 1 m and invariant among the plant species (Table 3). In general, the nests were well hidden by foliage: 63% (41 of 65) had more than 50% concealment around the entire nest, and 74% (40 of 54) had more than 50% canopy cover. Most nests (81%, 50 of 62) were situated in a fork between two branches of relatively small diameter (0.20–2.50 cm); 19% of nests (12 of 62, five in Quaking Aspen and seven in Lodgepole Pine) were supported by three branches.

Four of the nest-site characteristics differed significantly by nest-plant species (Tables 1–3). For all but one of these nest-site characteristics, nests in willows (a shrub) varied the most from the general pattern. The "average diameter of branches supporting the nest" was typically small (< 2 cm), but for nests in willows it was especially small (Table 2). The general pattern for the variables "nest height" and "distance from the main stem to the nest" was that the taller the nest plant the higher the nest was placed in it and the farther it was from the main stem. Nests in willows also showed this pattern, but the distances were disproportionately small in comparison to those in other nest plants (Tables 1 and 3). The fourth differing nest-site characteristic was "nest height as a percentage of tree height." In this case, the Lodgepole

Table 1 Heights of Warbling Vireo Nests by Type of Nest Plant[a]

Nest Plant	Number of Nests	Nest Height (m)	Plant Height (m)	Nest Height (% of Tree Height)
Aspen	30	7.0 ± 3.3	10.9 ± 5.0	65.1 ± 17.0
Cottonwood	4	6.4 ± 4.0	10.6 ± 5.8	57.9 ± 12.4
Lodgepole Pine	30	8.2 ± 4.2	17.6 ± 5.6	46.6 ± 19.0
Willow	6	2.0 ± 0.6	2.7 ± 0.6	70.2 ± 9.8
All nests	70	7.0 ± 4.0[b]	13.0 ± 5.0	57.2 ± 19.4[b]

[a] Mean ± standard deviation.

[b] $P \leq 0.05$ for single-factor ANOVA examining differences in nest-site characteristics among tree and shrub species. (No statistical analysis was done on number of nests, and because of pronounced differences in growth form among plant species no analysis was performed on plant height).

Table 2 Nest-Plant Diameters, Nest Orientations, and Numbers of Supporting Branches of Warbling Vireo Nests by Type of Nest Plant[a]

Nest Plant	Diameter (cm)[b]	Nest Orientation (°)	Number of Supporting Branches	Average Diameter of Branches Supporting Nest (cm)
Aspen	28.7 ± 15.6	163.0 ± 80.5	2.2 ± 0.4	1.0 ± 0.6
Cottonwood	38.0 ± 24.8	156.8 ± 128.5	2.0 ± 0	1.1 ± 0.5
Lodgepole Pine	49.3 ± 21.4	227.9 ± 104.6	2.3 ± 0.4	1.5 ± 0.6
Willow	—	244.0 ± 128.9	2.0 ± 0.0	0.3 ± 0.1
All nests	38.2 ± 21.6	197.3 ± 102.0	2.2 ± 0.4	1.1 ± 0.7[c]

[a] Mean ± standard deviation.

[b] Of trunk at breast height (dbh).

[c] $P \leq 0.05$ for single-factor ANOVA or Kruskal–Wallis test examining differences in nest-site characteristics among tree and shrub species. (Because of pronounced differences in growth form among plant species no statistical analysis was performed on plant diameter).

Pine was the only nest-plant species in which nests were situated on average at less than 50% of the height of the nest plant (Table 1).

Nest success was low; 74% (52 of 70) of nesting attempts failed to produce fledglings. Of the nests that failed, 12% ($n = 6$) were abandoned during building/laying, 44% ($n = 23$) failed during incubation, 42% ($n = 22$) failed during the nestling stage, and one (2%) fledged only a Brown-headed Cowbird. Ten of the failed nests were positioned low enough that we could see the contents of the entire nest. Of those ten, three were abandoned during incubation, six showed signs of avian predation, and one showed sign of mammalian predation. At an additional eleven nests we were able to see the heads of nestlings above the nest's rim: eight showed signs of avian predation and three showed signs of mammalian predation. Because the contents of these nests were not completely visible we cannot rule out the possibility that some were abandoned and not depredated. However, we

Table 3 Position and Concealment of Warbling Vireo Nests by Type of Nest Plant[a]

Nest Plant	Distance from Main Stem to Nest (m)	Distance of Nest from Periphery (m)	Nest Concealment Summary Score	Nest Canopy Cover Summary Score
Aspen	1.5 ± 1.0	0.8 ± 0.6	3.31 ± 0.6	3.2 ± 0.9
Cottonwood	1.0 ± 0.8	0.8 ± 0.2	3.94 ± 0.1	3.92 ± 0.1
Lodgepole Pine	2.1 ± 0.8	0.6 ± 0.5	2.94 ± 0.7	3.21 ± 0.7
Willow	0.06 ± 0.03	1.1 ± 1.2	3.45 ± 0.6	NA[b]
All nests	1.6 ± 1.0[c]	0.7 ± 0.6	3.2 ± 0.7	3.2 ± 0.8

[a] Mean ± standard deviation.

[b] NA, not applicable.

[c] $P \leq 0.05$ for single factor ANOVA or Kruskal–Wallis test examining differences in nest-site characteristics among tree and shrub species.

have no evidence of abandonment during brooding from those nests whose contents were visible. Combining these two groups of nests together (n = 21) yields an estimate of 67% (n = 14) failure due to avian predation, 19% (n = 4) failure due to mammalian predation, and 14% (n = 3) failure due to abandonment.

Successful Warbling Vireo nests (26%, 18 of 70) were not associated strongly with specific habitat characteristics. The likelihood of an attempt's being successful did not vary significantly by study site (log-likelihood of study-site model χ^2 = 3.9, P = 0.14): 35% successful (13 of 37) at Sagehen Creek, 17% successful (4 of 24) at Davies Creek, and 11% successful (1 of 9) at Klondike Meadow. The likelihood of a successful nesting attempt was also not significantly affected by nest-plant species (log-likelihood of nest-plant species model χ^2 = 3.0, P = 0.40): 27% (8 of 30) successful in Quaking Aspen, 30% (9 of 30) successful in Lodgepole Pine, 17% (1 of 6) successful in willow, and zero (of 4) successful in Fremont Cottonwood. Neither was the likelihood of a successful attempt significantly affected by nest height (log-likelihood of nest height model χ^2 = 2.5, P = 0.11), nest-plant height (log-likelihood of nest-plant-height model χ^2 = 3.2, P = 0.08), or nest-plant diameter (log-likelihood of nest-plant-diameter model χ^2 = 1.0, P = 0.31). Inclusion of study site and nest-plant species (i.e., performing the logistic regression using both study site and nest-plant species as independent variables) did not improve the model (log-likelihood of study-site and nest-plant-species model χ^2 = 6.9, P = 0.23), nor did including nest-plant height and nest-plant diameter (log-likelihood of nest-plant-height and nest-plant-diameter model χ^2 = 1.7, P = 0.43).

The nest surveys allowed us to detail the Warbling Vireo's nesting cycle on the eastern slope of the northern Sierra Nevada. The peak period for incubation was the first two weeks in July; 46 of the nests we studied were discovered during egg incubation, and 56% (n = 26) of those were found during the first two weeks in July. Sixteen of the successful nests were monitored during incubation, and of those 75% (n = 12) were being incubated during the first two weeks in July. Fifty-three percent of egg dates (26 of 49 nests discovered with at least one egg) ranged from 2 to 9 July. The first Warbling Vireo nest was found 19 June in the egg-incubation stage at Davies Creek; the last was discovered on 10 August, also at Davies Creek. When discovered, the last nest contained one Warbling Vireo egg and one Brown-headed Cowbird nestling. Thus, the eggs for this last nesting attempt were probably laid near the end of July. One pair nesting in a willow at Sagehen Creek incubated two apparently infertile eggs for at least 25 days.

Four of the 70 nests (6%) were renesting attempts; we observed renesting only at Davies Creek. Only pairs whose first nesting effort failed during incubation and early in the breeding season (between 19 June and 24 June) attempted to renest. One female was observed dismantling the first unsuccessful nest and using those pieces to build a second nest. Another female built a nest composed of a great deal of white material, and after this nest failed she then built a second white nest that also failed. We did not observe any double brooding. Our study population was not color-banded, so it is possible that we failed to detect some renesting attempts and that some pairs could have dispersed and renested outside of the study area.

DISCUSSION

On the eastern slope of the northern Sierra Nevada Warbling Vireos nested predominantly in Quaking Aspen and Lodgepole Pine; other plant species less commonly used were Fremont Cottonwood and willow. Despite differences in growth form between trees and shrubs, in all of the nest-plant species nest-site characteristics were very similar (Tables 1–3). Warbling Vireos generally nested 7 m or higher in mature trees, placing their nests at over 50% of the nest-plant's height and most often in the periphery of the nest-plant's foliage. This preference for nesting in the periphery of the tree is especially evident in nests in Lodgepole Pine being situated at less than 50% of the tree's height (Table 1). Because of the pyramidal shape of this conifer, the branches below the midpoint extend farther from the main stem and only nests on those branches may be positioned in the outermost periphery of the plant.

Although the characteristics of the nests that we studied conform to the general pattern reported for the species (Gardali and Ballard 2000), we did discover two differences. Warbling Vireos in the northern Sierra Nevada nest regularly in Lodgepole Pine ($n = 30$, 43%), in contrast to the preference for deciduous trees described in the literature (Gardali and Ballard 2000). Studies of the vireo's nest-site selection in southern Ontario, Arizona, coastal California, and the foothills of the Owens Valley of eastern California, reported only a single nest (0.6%, $n = 162$) in a conifer (Ponderosa Pine, *P. ponderosa*; reviewed by Gardali and Ballard 2000). Also, in contrast to the general pattern described in the literature, 19% of the Warbling Vireo nests we found were supported by three branches rather than two.

The percent nest success we observed was low (26%) in comparison to other high-elevation populations (62% success in Arizona, Martin and Li 1992). In contrast to other western populations (Ward and Smith 2000), this poor success was apparently not the result of pressure from brood parasites. Of the 19 nests that fledged offspring only a single nest fledged a cowbird. Similarly, the analysis of nest success illustrated that successful Warbling Vireo nest sites do not differ dramatically from unsuccessful sites; the likelihood of a successful nesting attempt was not significantly affected by study site, nest-plant species, nest height, or within a nest-plant species by nest-plant height or diameter. This lack of differentiation may signify that less obvious habitat features play an important role in determining the Warbling Vireo's nest success. The nest site's microclimate (a subtle feature of nesting habitat) may be an important factor (Smith, Reynolds, and LeBuhn unpubl. data). The lack of differentiation also suggests that preserving and enhancing mature aspens and pines with well-concealed sites in the periphery of the foliage (i.e., those features of the habitat most often associated with vireo nests) might benefit vireo productivity simply by increasing the availability of suitable sites.

Egg dates on the eastern slope of the northern Sierra Nevada range from 19 June to the end of July. Previous estimates of Warbling Vireo egg dates for California range from 26 April through 25 July (Gardali and Ballard 2000). Altitudinal effects on local climatic conditions may explain the delayed initiation of egg laying in the northern Sierra Nevada. The majority of egg dates in the northern Sierra Nevada fell within a single week of July (2 July through 9 July). This contrasts dramatically with other western populations, in which the majority of egg dates have been reported to span over two or three weeks (Gardali and Ballard 2000). Most (75%) of our successful nests were in the egg-incubation phase during the first two weeks in July; this was also the peak egg-incubation period for the population as a whole. On the basis of an incubation period of 12 or 13 days (Gardali and Ballard 2000), the peak nestling phase falls during the last two weeks of July. In terms of offspring mortality there is little difference in risk between incubation (44% failed) and the nestling stage (42% failed). Because reproductive success is thought to be the primary factor limiting the vireo's population growth in California (Gardali et al. 2000), minimizing activities that disturb nesting during the month of July should be a focal consideration in the development of management plans in the northern Sierra Nevada.

We observed no double brooding, which Tewksbury et al. (1998) considered common among Warbling Vireos nesting in Montana. In addition, unlike Warbling Vireos near Point Reyes (Gardali and Ballard 2000), very few pairs we studied attempted to renest after a failure. A highly synchronized pulse of egg laying combined with a lack of double brooding and renesting argues that the breeding season for Warbling Vireos at high elevation in California is shorter than at lower elevations, making the birds more sensitive to disturbance.

Far more failed nests apparently suffered predation by birds (67%) than by mammals (19%). Among the avian nest predators occurring in the study area, such as Clark's Nutcracker (*Nucifraga columbiana*), American Crow (*Corvus brachyrhynchos*), and Common Raven (*C. corax*), Steller's Jay (*Cyanocitta stelleri*) is by far the most numerous and widespread (Reynolds and Smith unpubl. data). Steller's Jays are known to exert tremendous nest-predation pressure on passerines and neotropical migrants in particular (Sieving and Willson 1999). We did not observe Steller's Jays preying on Warbling Vireo nests but we did observe vireos scolding jays near nests, a reaction to a nest predator (Gardali and Ballard 2000).

Throughout its range the Warbling Vireo prefers open parkland, forest edge, and forest openings (James 1976, Gardali and Ballard 2000, Ward and Smith 2000). Open and parklike coniferous and riparian habitats in the Sierra Nevada have declined significantly over the last 150 years as a result of fire suppression and the encroachment of smaller trees (SNEP 1996). In addition, photographic analysis has revealed that all Sierran riparian corridors have been interrupted by human factors like roads, railroads, and grazing (SNEP 1996). Jay populations increase dramatically near man-modified environments (Sieving and Willson 1999), and Steller's Jays have increased significantly in California during the same period in which Warbling Vireos have declined (Gardali et al. 2000). Human alteration of the landscape of California may have contributed to the decline in the Warbling Vireo by limiting suitable breeding habitat and increasing populations of nest predators.

Our findings suggest that mature stands of Quaking Aspen and Lodgepole Pine are important features of Warbling Vireo nesting habitat on the eastern slope of the northern Sierra Nevada. In addition, our data highlight the restricted and synchronous nature of the Warbling Vireo's breeding season at high elevations and thus the importance of reducing forest disturbance during July, the critical nesting period. Our results also argue that the vireo's low reproductive success in the northern Sierra Nevada is currently determined more by nest predation than by habitat or brood parasites. Thus management practices that promote avian nest predators should be minimized. Future studies should focus on the relationship between proposed habitat changes in the Sierra Nevada (SNFPADSEIS 2003) and the feedback on the population dynamics of nest predators and the reproductive success of Warbling Vireos.

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NOTES

UPDATE ON THE STATUS AND DISTRIBUTION OF WILSON'S PHALAROPE AND YELLOW-BELLIED SAPSUCKER IN ALASKA

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The Wilson's Phalarope (*Phalaropus tricolor*) and the Yellow-bellied Sapsucker (*Sphyrapicus varius*) are relatively recent additions to Alaska's avifauna. The first observations of the Wilson's Phalarope in Alaska were made in 1962, at the Columbia Creek Flats on 20 May (64° 26′ N, 141° 25′ W) (Kessel and Springer 1966) and at Barrow on 9 June (Pitelka 1974). The Yellow-bellied Sapsucker was first observed in Alaska on 16 June 1976, near Northway Junction (Kessel 1986). Kessel and Gibson (1994) suggested a northwestward range expansion for the Wilson's Phalarope into Alaska, and we support that conclusion by reporting the first documented evidence for breeding of this species in the state. Here we also report on the westernmost breeding and occurrence records for the Yellow-bellied Sapsucker and suggest a continental westward range expansion for this species.

The Wilson's Phalarope breeds in wetlands of western provinces and states of North America (American Ornithologists' Union 1998). Recent range expansion of this species is suggested by an increasing number of breeding records from the Pacific Northwest (Colwell and Jehl 1994), from the southern Yukon (Godfrey 1986) to British Columbia (Campbell et al. 1990). This species' breeding range had reached as far northwest as southwestern Yukon Territory by the late 1970s (Kessel and Gibson 1994), although the extension of the known range into the Yukon may coincide with increased survey effort in and around wetlands (C. D. Eckert pers. comm.). The breeding records for the Wilson's Phalarope closest to Alaska have been at the only two confirmed breeding sites in Yukon Territory, near Whitehorse (Sinclair et al. 2003).

Since the 1980s, the Wilson's Phalarope has occurred erratically and in small numbers in late spring and summer in Alaska. The only prior suggestion of breeding in the state is records of juvenal-plumaged birds. A young male collected on 24 July 1985 near Fairbanks (University of Alaska Museum [UAM] 5247) constitutes the first record of a Wilson's Phalarope of this age in Alaska (*Am. Birds* [AB] 39:952). A site-tenacious pair of birds in Anchorage during the summer of 1988, and a subsequent observation of a young bird in the same area, suggested that the pair might have bred there (AB 42:1330). On 22 July 2001, two young Wilson's Phalaropes were recorded in Anchorage (*N. Am. Birds* [NAB] 55:471).

On 22 June 2001, DeCicco observed a male Wilson's Phalarope on Canvasback Lake, Yukon Flats National Wildlife Refuge (66° 23′ N, 146° 22′ W). The nest was located when he flushed the bird from vegetation and watched it perform a broken-wing display (NAB 55:471). The phalarope had built its nest on the ground, on a small grassy island, surrounded by reeds (*Sparganium* sp.). The nest, lined with the grasses *Puccinellia borealis* and *Scolochloa festucacea*, contained three small, dark green eggs with black flecks. Also on the island, located within 25 m of the Wilson's Phalarope nest, was a nesting colony of Arctic Terns (*Sterna paradisaea*). Many Red-necked Phalaropes (*P. lobatus*) were observed in the immediate area. On 2 July, the Wilson's Phalarope nest contained four eggs. On 11 July, the nest was empty and the male was seen with what appeared to be food in its beak (D. W. Shaw in litt.). The male repeatedly landed in the same location on the island, approximately 30 m from the nest; the observer assumed that young were in the immediate vicinity.

The Yellow-bellied Sapsucker breeds in forests of quaking aspen (*Populus tremuloides*), birch (*Betula* sp.), maple (*Acer* sp.), and mixed conifers (Short 1982, Eberhardt 1994, Winkler et al. 1995) from the eastern interior of Alaska (Walters et al. 2002), southwestern Yukon Territory, and northeastern British Columbia (Godfrey 1986) east across southern Canada east of the Rockies and in the United States from the Great Lakes area east to New England and south through the Appalachians to northwestern Georgia (American Ornithologists' Union 1998). Kessel (1986) described the Yellow-bellied Sapsucker as having been more widely distributed in Alaska in the recent past than it is today, relying on old scars of sap wells on paper birch trees (*Betula papyrifera*) as evidence for this conclusion. She reported scarred birch trees as common as far northwest as 20 km west of Fairbanks (64° 52′N, 147° 49′W) and as far southwest as the upper Susitna River Valley (62° 47′N, 147° 57′W), with some west to Ruby, northwest to 33 km southwest of Walker Lake, and north to the headwaters of the Middle Fork of the Koyukuk River. These sap-well scars may represent migrants, however, and do not provide evidence of a prior more extensive breeding range.

Almost all Alaska sight records are from the upper Tanana River drainage, in the eastern interior from Northway Junction to the Canadian boundary at Scottie Creek (Gibson and Kessel 1992). Prior to the breeding we report, the Yellow-bellied Sapsucker had been recorded breeding in Alaska only twice, both times in the vicinity of Northway Junction (Kessel 1986). Since 1983, this species has been recorded with some regularity at Ten Mile Lake, 9 km southeast of Northway, in Tetlin National Wildlife Refuge (T. J. Doyle and K. Larson in litt.). On 14 June 1995 Doyle (in litt.) found an active nest at Ten Mile Lake.

On 30 May 2001, A. M. Benson dectected an active Yellow-bellied Sapsucker nest at the Bonanza Creek Experimental Station (64° 43′ N, 148° 19′ W), 7.8 km southwest of Fairbanks (NAB 55:471). The nest cavity was monitored every 2–4 days until the young fledged on 8 July 2001. E. Clark and J. D. Levison (pers. comm.) observed the male and two fledglings foraging from sap wells in the area on 14 July 2001. The cavity was 14 m up in a 27.8-m living quaking aspen (diameter at breast height 36 cm).

The Yellow-bellied Sapsucker has also been observed recently at other western locations in the interior of the state. An adult female was captured at Creamer's Field Migratory Waterfowl Refuge in Fairbanks on 19 May 1999 (UAM 9048). In June 2002, Rozell observed a male drumming and excavating a nest cavity in the Bonanza Creek Experimental Station, though the bird was never detected with a mate. On several occasions, observers saw this male calling from within the previous year's successful Yellow-bellied Sapsucker nesting cavity. Also in 2002, a Yellow-bellied Sapsucker was heard drumming in the Rosie Creek drainage, west of Fairbanks, on 5 June (M. Allen in litt.). Given that the distance between these two observations was roughly 40 km, they were likely different individuals.

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BAT PREDATION BY THE ACORN WOODPECKER

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In July 2001 I observed predation on a bat (species unidentified) by an Acorn Woodpecker (*Melanerpes formicivorus*) at the Hopland Research and Extension Center in Mendocino County, California.

A population of Acorn Woodpeckers inhabits the small developed portion of the station along Parson's Creek, nesting in the large oaks. On 15 July 2001, Zebulon Young directed my attention to a hole in the door of a barn. The hole was approximately 5 cm in diameter and 2.5 m from the ground, in an area shaded by oaks most of the day. The door is made of two-by-four framework covered on both sides with plywood; the hole went through only the exterior layer of plywood, providing access to an otherwise sealed area of about 9 cm in width, 40 cm in breadth, and >2 m in depth. Young related that he had seen the woodpecker fly to this hole, reach in, pull out a bat with its beak, and fly with it into an overhanging oak tree. He pointed out the bird, high atop a thick horizontal oak branch. I could just see the head of the woodpecker rapidly appearing and disappearing from sight. The woodpecker appeared to be striking the branch on which it stood with its beak. The tap-tapping sound that usually accompanies this behavior was absent; instead, I heard a repeated call coming from the area of the woodpecker that sounded much like the high-pitched, relatively weak call of a bat. As I watched, several other woodpeckers flew to the immediate area, landing from 4 meters to less than 1 meter away, appearing to watch the activity with great interest. The closest of these engaged in repeated bobbing. Some or all of the woodpeckers were calling. As the struggle continued I eventually saw the flapping wing and a portion of the body of the woodpecker's prey, a small, dark, struggling bat.

Within two minutes the weak screeching had stopped, although the struggle appeared to continue for some minutes more. The woodpecker then flew to another branch, at which point I could plainly see the body of the bat held in the bird's beak. I lost sight of the woodpecker in the branches, but it soon reappeared, en route to a third branch. This time I noted that part of one of the bat's wings was missing. Three times more, the woodpecker flew to a different tree, or a different branch within the same tree. Each time I lost sight of it momentarily, and each time it reappeared with slightly less bat, until, bat wings entirely gone, it flew off some distance carrying just the body of the bat, and I lost the bird's trail entirely.

I could not identify the bat to species, but considering its size, dark hue, and records of species at the station, the most likely candidates include several species of *Myotis* and the Brazilian Free-tailed Bat (*Tadarida brasiliensis*).

It is possible that parts of this mammalian prey were being placed in storage: Walker (1952) and MacRoberts (1970) related that insect prey of the Acorn Woodpecker may be stored for extended periods in cracks or crevices.

Records of predation on vertebrates by Acorn Woodpeckers are sparse. Bryant (1921) observed a woodpecker eating the egg of a Western Wood-Pewee (*Contopus sordidulus*) near Yosemite Village. Mumme et. al. (1983) observed Acorn Woodpeckers eating their own eggs. Koenig et. al. (1995) noted that Acorn Woodpeckers have preyed on Western Fence Lizards (*Sceloporus occidentalis*). Koenig (pers. comm.) also mentions two unconfirmed observations in Carmel Valley, California, one of Acorn Woodpeckers dragging baby Barn Swallows (*Hirundo rustica*) from their nests, another of them pecking at a dead swallow nestling, but whether or not the babies were then consumed is unknown. Fajer et. al. (1987) recorded several attacks by Acorn Woodpeckers on a Cliff Swallow (*Petrochelidon pyrrhonota*) colony in Stanford, California. The woodpeckers were observed to take eggs and at least one nestling, although the birds were not observed to eat either the eggs or the nestling.

Shuford (1985) reported the mutilation of nestling Red-breasted Sapsuckers (*Sphyrapicus ruber*) by an Acorn Woodpecker at Point Reyes National Seashore, California. He observed the woodpecker rip a piece of flesh from a nestling, but the bird flew off and was not observed eating the meat.

This is apparently the first observation of likely predation on a mammal by the Acorn Woodpecker. Observations suggest that the birds were not competing for a nest site, or acting to protect food stores, but rather using the bat as a source of food. At least rarely, Acorn Woodpeckers apparently consume a wide range of vertebrates, including lizards, nestling birds, and bats.

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FIRST RECORD OF THE SORA IN THE STATE OF HAWAII

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The Sora (*Porzana carolina*) is the most common and widely distributed member of the rail family in North America. It breeds as far north as Alaska and Canada's Northwest Territories and winters as far south as Guyana and central Peru (AOU 1998, Melvin and Gibbs 1996). Long-distance vagrancy and dispersal to remote lands is widespread in rails (Taylor 1998). This paper reports the first Sora confirmed in the Hawaiian Islands and briefly reviews other records of rails in the islands. While the occurrence of *Porzana* rails in Hawaii could be expected, on the basis of the fossil record, surprisingly, this report is the first documentation of a vagrant of this genus in the Hawaiian chain.

On 4 September 2000, at 07:00, I found a single Sora at Keahole Point, 10.8 km northwest of Kailua–Kona on the island of Hawaii. The site was a 0.69-ha settling basin excavated from a recent lava flow. I observed the bird for 20 minutes at close range with a 56× Nikon ED fieldscope. The angle of the morning sun produced ideal lighting conditions. The bird was similar in size to an adjacent Ruddy Turnstone (*Arenaria interpres*). It foraged at the edge of a patch of makai sedge (*Bolboschoenus maritimus*) on the eastern exposure of a mudflat, cautiously weaving in and out of view, and retreated back into the sedges as the morning sun exposed the flats. At 06:50 on 15 September Reginald E. and Susan David and I resighted the Sora about 15 m south of its original location. Reginald E. David videotaped the bird as it actively foraged, preened, twitched, and crept out over aquatic plants, strategically placing its feet and long toes to keep afloat, typical Sora behavior. It fed on whole white egg sacs (later identified as those of *Trichocorixa reticulata*, water boatman) attached to the undersides of submerged makai sedge leaves and rootstocks, also on small spiders, moths, and likely midges and aquatic beetles. At 07:15 on 22 September Anthony J. McCafferty and I observed the Sora again in the same area. The bird was last seen actively foraging on a mudflat at the edge of a patch of swollen fingergrass (*Chloris barbata*). We noted no bands or injuries and heard no vocalizations.

The plumage characteristics of this bird indicate an adult Sora in definitive basic plumage with freshly molted wing feathers and some unusual markings (Figure 1). Peter Pyle of Point Reyes Bird Observatory in California made the species, age, and plumage determinations from the videotape in the Hawaii Rare Bird Photo file at Bernice Pauahi Bishop Museum, Honolulu (HRBP VT02). The Eurasian rails were ruled out mainly because of the larger size and amount of black on the face of the Kona bird. Both the Little Crake (*P. parva*) and Baillon's Crake (*P. pusilla*) lack black on the face and have black and white barred undertail coverts. The Spotted Crake (*P. porzana*) differs from Sora in its overall spotted appearance and red at the base of the bill (Taylor 1998). The eye color and lack of juvenal plumage on the Kona bird identified it as an adult. The iris is red in the adult Sora, whereas it is brown in a first-fall bird.

Of about 100 Sora specimens at the California Academy of Sciences, San Francisco, Pyle found that all first-fall birds in early September had retained some of the juvenal buff or brown in the eyeline, auriculars, and breast, whereas some adults at this time had molted into winter plumage, resembling the Kona bird but typically having more black on the throat. The throat plumage was odd for an adult, possibly because the bird encountered a light regime different from that in its usual range. Light changes in regions where local cues to hormonal and molt cycles diverge from normal cues may lead to atypical plumages. The early acquisition of basic plumage and the odd throat pattern suggest that this bird may have been in Hawaii for more than a year (P. Pyle pers. comm.).

Western Birds 35:47–49, 2004

Figure 1. Sora at Keahole Point near Kailua-Kona, Hawaii, 15 September 2000.
Photo by R. E. David

Rallids are well represented on oceanic islands, showing their powers of dispersal (Slikas et al. 2002, Taylor 1998). Accidental Sora records outside the Americas are predominantly the result of eastward movement across the North Atlantic, to Greenland, the British Isles, Spain, France, Sweden, and Morocco (Melvin and Gibbs 1996). Casual records of the Sora for the Pacific basin are from east-central Alaska, the Queen Charlotte Islands (AOU 1998), and the Galapagos Islands (Castro and Phillips 1996).

In the Hawaiian Islands, records of vagrants of this family are rare and were previously limited to one hypothetical record of the Sora, and one specimen and 5 to 12 observations of the American Coot (*Fulica americana*). Many of the American Coot records, however, are uncertain because of lack of information on variation in the Hawaiian Coot (*F. alai*) (R. L. Pyle unpubl. data). On 10 February 1992 Peter Donaldson (pers. comm.) sighted a probable Sora on the Waipio Peninsula of Oahu. He had the bird in view for about 10 seconds and made a substantial but unsuccessful effort to relocate it. On 20 November 2003 Kurt Pohlman and Donaldson (pers. comm.) reported another Sora at the Kii Unit of the James Campbell National Wildlife Refuge on Oahu.

The fossil record for the Hawaiian chain contains at least 13 endemic species of the family Rallidae. Twelve of these are of the genus *Porzana*, and all are believed to have been derived from multiple arrivals from Asia (eastward) of the widespread Eurasian Baillon's Crake, Ruddy-breasted Crake (*P. fusca*), and Spotless Crake (*P. tabuensis*). All 12 *Porzana* rails became flightless and are now extinct (Olson and James 1991, Slikas et al. 2002). Two of these, the Laysan Rail (*P. palmeri*) and Hawaiian Rail (*P. sandwichensis*), perished in historic times (AOU 1998). Today, two endemic Hawaiian rallids persist. Both are recent colonists of the Hawaiian Islands (Fleischer and McIntosh 2001), the endangered Hawaiian Coot and endangered Hawaiian Moorhen (*Gallinula chloropus sandvicensis*). The Hawaiian Coot is the only species of extant rail whose remains have been recovered in the Hawaiian Islands (Slikas et al. 2002).

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ADDITIONS TO THE AVIFAUNA OF ST. MATTHEW ISLAND, BERING SEA

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St. Matthew Island (60° 24′ N, 172° 42′ W) is located in the north-central Bering Sea and is renowned for its distinctive Beringian flora and fauna. Because of its central position between the coasts of Russia and Alaska, St. Matthew Island and its nearby satellites, Hall and Pinnacle islands, support a mixture of Palearctic and Nearctic avifaunas. Of special interest to North American ornithologists are the numerous Eurasian bird species that visit the islands each spring and fall. Winker et al. (2002) published the first comprehensive summary of bird records for the 125 species detected on St. Matthew Island from 1899 to 1997. Because of its remote location, however, St. Matthew Island is seldom visited, and the island's avifauna remains poorly described.

As part of an island-wide systematic survey for Rock Sandpipers (*Calidris ptilocnemis*) and McKay's Buntings (*Plectrophenax hyperboreus*), our crew of five ornithologists was present on St. Matthew Island from 25 May to 9 July 2003. In this paper we provide information for 11 bird species seen for the first time on St. Matthew Island. Phylogenetic sequence and nomenclature follow the American Ornithologists' Union (1998, 2000) and Banks et al. (2002, 2003, 2004). An annotated species list with details of observation is on file at the University of Alaska Museum, Fairbanks.

Mergus merganser (Common Merganser). One female seen 27 May. Common Mergansers winter in the Aleutian Islands (AOU 1998), they have been recorded on the Pribilof Islands during winter and migration (Preble and McAtee 1923), and they are casual summer visitants on St. Lawrence Island (Kessel 1989).

Falco columbarius (Merlin). One seen 29 May. Merlins are rare migrants and probable breeders on the Seward Peninsula (Kessel 1989). They have reached the eastern Aleutians (Murie 1959) but are hardly known on the Bering Sea islands (e.g., St. Lawrence Island, 2–3 June 1989—see *American Birds* 43:525, 1989).

Falco rusticolus (Gyrfalcon). Single adults seen 3 June and 6 July. Gyrfalcons are rare visitants to Bering Sea islands during migration and winter (Preble and McAtee 1923, Fay and Cade 1959).

Tringa flavipes (Lesser Yellowlegs). One seen 5 June. Lesser Yellowlegs are rare summer visitants and probable breeders as far west as the Seward Peninsula (Kessel 1989). Elsewhere in the Bering Sea, they have been recorded on the Pribilof Islands in June and October (Preble and McAtee 1923).

Tringa glareola (Wood Sandpiper). One seen 27–28 May. Wood Sandpipers are rare spring migrants on the Pribilof Islands (Preble and McAtee 1923, Kessel and Gibson 1978) and very rare spring migrants on St. Lawrence Island (Kessel and Gibson 1978).

Limosa haemastica (Hudsonian Godwit). One seen 23 June. Although there are no prior reports from the Bering Sea islands, the Hudsonian Godwit is a fairly common migrant, uncommon summer visitant, and rare, perhaps locally uncommon breeder on the adjacent Yukon–Kuskokwim delta (McCaffery and Harwood 2000). Additionally, one extralimital record exists from Plover Bay, Siberia, in June, some time in the late 1860s (Kessel and Gibson 1978).

Larus philadelphia (Bonaparte's Gull). One summer adult seen 8–10 June and 23 June. Bonaparte's Gull is a casual visitant in the Bering Sea, where known from the Pribilof Islands (e.g., 6–7 June 2002—N. Am. Birds 56:472, 2002) and St. Lawrence Island (28 May 1990—Am. Birds 44:480, 1990).

Brachyramphus marmoratus (Marbled Murrelet). Two together seen 19 June. In the Bering Sea, Marbled Murrelets are casual summer visitants on St. Lawrence Island (Kessel and Gibson 1978) and casual winter visitants on the Pribilof Islands (Preble and McAtee 1923).

Muscicapa griseisticta (Gray-streaked Flycatcher). One seen 27 May. This species is a very rare spring migrant in the western Aleutians (Kessel and Gibson 1978), and it has been observed during spring at the Pribilof Islands (11–12 June 2002—N. Am. Birds 56:473, 2002).

Catharus guttatus (Hermit Thrush). One seen 8 June. Identified as a second-year individual by the pale tips on its greater coverts. Beyond mainland Alaska, Hermit Thrushes are casual in spring on the Pribilof Islands (30 May 1989) and on St. Lawrence Island (30 May and 5 June 1989—Am. Birds 43:526, 1989).

Motacilla cinerea (Gray Wagtail). One male seen 26 May. The Gray Wagtail is known as a casual migrant as far east as the Pribilof Islands (Sladen 1966) and St. Lawrence Island (Kessel and Gibson 1978).

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BOOK REVIEWS

Ageing North American Landbirds by Molt Limits and Plumage Criteria: A Photographic Companion to the Identification Guide to North American Birds, Part I, by Dan Froehlich. 2003. Slate Creek Press. 51 pages, with 32 color photographs and 2 line drawings. Paperback, $18.50. Available from Institute for Bird Populations (www.birdpop.org/danflyer.htm). ISBN 0-9618940-2-4.

As much as banders were thrilled to discover the wealth of new information published in 1997 by Peter Pyle in the *Identification Guide to North American Birds, Part I* (hereafter *IDG1*), many found themselves limited in their ability to use that book to its full capacity. In particular, the use of molt limits (basically, the points of contrast between old and new feathers) was a relatively new concept to most North American banders, among whom there was a general unfamiliarity with how to recognize all but the most obvious molt limits (e.g., on Black-headed Grosbeaks or on Spotted and Eastern towhees). In this photographic companion (hereafter *Photographic Companion*), Froelich seeks to provide the visual aids needed to connect what banders see in the hand with what they read in Pyle's book. He also provides detailed background information on molt patterns as they relate to age-specific plumages, which should increase the readers' understanding of what she or he sees, both in the photos and in the hand. The *Photographic Companion* does not provide photographs for every species included in the *IDG1*, but instead provides photographs of molt-limit patterns using 24 species from throughout North America as examples. As with the *IDG1*, this is primarily a book for banders, although increasing numbers of field ornithologists are starting to apply "in-hand" age criteria in the field.

The introduction provides a compelling assessment of why the *Photographic Companion* was produced—and, importantly, produced with encouragement from Peter Pyle. While the *IDG1* focuses on identification and using molt limits, it provides only basic descriptions of characteristics that allow one to discriminate between individual feathers of different age classes. The traits that distinguish such feathers are often quite subtle and difficult to convey in the *IDG1*'s black-and-white illustrations, warranting further guidance in order for banders to detect such differences. The introduction also includes reminders of the useful demographic knowledge that can be gained if post-juvenile birds are aged, and of the importance in being conservative rather than over-confident when assessing birds' ages.

The three main sections of the *Photographic Companion* cover prejuvenal molt, prebasic molt, and confounding effects. The section on prejuvenal molt is brief but thorough for the purposes of this book. The book's emphasis is in the section on prebasic molt, which includes subsections on how and where to look for molt limits. The third section discusses confounding effects that relate to recognizing molt limits, such as feather wear, prealternate molts, pseudolimits, and molt timing. Distributed throughout the text are photographs with text boxes containing descriptions of specific molt patterns, tips for identifying molt limits, and cautionary points. Finally, in a concise and very useful two-page summary, Froelich synthesizes all of the previous information.

This is clearly a much-needed reference for banders. Although European banders have long been using molt limits, it has not generally been common practice to age North American birds using these subtle techniques. Unless banders have been trained extensively by those experienced in molt limits, most need need further guidance before being capable of using them. The *Photographic Companion* helps provide this guidance, without striving to be as comprehensive as Jenni and Winkler's *Moult and Ageing of European Passerines* (a reference I recommend even for banders in the Americas). As well as providing some pertinent background information on molt, it offers specific tips for identifying molt limits. Some of these expand on those provided in the *IDG1*, whereas others will be novel for most North American banders (e.g., replaced feathers often have thicker and darker shafts, are longer, and have denser barbs than retained juvenal feathers).

Some prospective buyers may initially balk at the price for such a short book; however, the numerous color photos justify it, although they are not of a quality as high as those in Jenni and Winkler (1997). These are a mix of spread-wing specimens and live birds that in most cases clearly reveal even subtle molt-limit patterns, which are also described and labeled in ways that help one discern them. In most of the photos only one individual of a post-juvenile age class is shown, generally a bird with molt limits. Photos comparing individuals of the same species with and without molt limits are, unfortunately, rare; the few that do this further enable the user to appreciate differences between age classes, and more of these comparative photos would have been a good idea. Also, to have included at least one photo of an individual that is "intermediate" and cannot be aged by molt limits would have served as a powerful reminder that banders should be conservative when using such techniques—an important point that could almost get overlooked in this book.

Photos were selected with care and are placed near their first reference in the book, presumably with a view towards fluidity and reducing the need for page flipping. I found, however, that this approach interfered greatly with reading the text, particularly because of the large text boxes associated with each photo. For example, on page 16 there are just two lines of general text sandwiched between two text boxes for associated photos on the opposite page; these two lines are the termination of a sentence that followed just five lines of text on page 12, also sandwiched between text boxes. Having to search for those lines of text resulted in a distinct lack of continuity in reading. Because of numerous references to each photo throughout the book (chosen photos were certainly well used), it would have been more ergonomic to place all of the photos and associated text together at the middle or end of the book. Additionally, the subsection headings that divide the text are appreciated where they occur, but their absence throughout much of the book reduces the reader's ability to relocate information. Thus, although care was put into making sure the reader is given all the crucial information for understanding age-specific plumage and molt patterns, additional effort in organizing the book would have greatly increased its friendliness to users.

While the photos are likely to be the real breakthrough for many banders, there is also ample text in the *Photographic Companion* that is at least as useful. Some of this information is also available in the *IDG1* and Jenni and Winkler's guide, but the *Photographic Companion's* descriptions that illuminate finer details of differentiating replaced and retained feathers are the most accessible and detailed available for North American species. In conclusion, while banders will still need extensive practice before they become fluent in the use of molt limits, Froelich succeeds in providing them with the additional resources needed to tap into the seemingly daunting descriptions of different post-juvenile age classes within the *IDG1*. With an increased ability to age birds, there is greater opportunity to determine age-class differences in survivorship, site fidelity, migration routes and timing, and other demographic parameters that may be significant to a population. I am confident that the *Photographic Companion* will prove very useful and important for the banding community, and I hope it will be read and used by all banders, novices and veterans alike.

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Diana L. Humple

Breeding Birds of Napa County, California, an Illustrated Atlas of Nesting Birds, by Murray Berner, Bill Grummer, Robin Leong, and Mike Rippey. 2003. Napa–Solano Audubon Society, Vallejo, CA. 200 pages, with 2 color endpaper maps, numerous black-and-white maps and drawings. Paperback, $25. Available from Napa–Solano Audubon Society, P. O. Box 5027, Vallejo, CA 94591. ISBN 0-615-12290-6.

Napa County, a small and largely rural county not far north of San Francisco, is perhaps most famous among the general public for its vineyards. But it is also home to a diverse breeding avifauna, ranging from the Greater Roadrunner and Northern Spotted Owl to the Yellow-billed Magpie and Snowy Plover. With the publication of this important work, we are brought one county closer to having breeding bird atlases available for all nine central California counties that border the San Francisco Bay estuary. Atlases have been published for Marin, Sonoma, and San Mateo counties, and field work has been completed for Alameda, Santa Clara, and San Francisco counties (W. D. Shuford pers. comm.); maps for this last county, and for the work-in-progress Contra Costa county atlas, are available over the World Wide Web. A pilot year of atlasing was conducted in Solano County in 1988, but that county since seems to have slipped through the cracks.

The concept of breeding bird atlases is by now fairly familiar: political entities (counties, states, etc.) are divided into blocks, usually based on a grid, and each block is censused to determine which species breed there. Field work generally involves a few years (five in this case, 1989–1993) that allow most or all blocks to be adequately sampled, and also allow for year-to-year variation to be appreciated: breeding species, and especially their abundance, may change between wet and dry years. Field workers keep track of species they find and record levels of evidence for breeding. Field work for an atlas is a great way to give purpose to one's recreational birding and typically generates a wealth of new information. After data have been collected and proofed come the tasks of plotting maps and synthesizing the information into readable accounts.

Atlases vary greatly in their approach to presenting the data, from the 480-page Marin County atlas (Shuford 1993), a mini-treatise on the natural history of coastal California birds, to the bare-bones San Mateo county atlas (Sequoia Audubon Society 2001), which simply provides maps and data with no species accounts. The Napa atlas represents a happy medium, with full-page accounts for all of the 156 species found during the atlas period. Each account includes a grid representing blocks with confirmed, probable, and possible evidence for breeding, three paragraphs of text that put each species into context by discussing its habitat (in general terms), distribution in the county, breeding seasonality, and perhaps a note on historical breeding records or population trends. Almost half of each page is taken up by a black-and-white sketch of the species, as seen through the eyes of a number of artists. Foremost among these is Sophie Webb, whose wash drawings are particularly attractive (see, for example, the brood of California Quail chicks, or the stately Spotted Owl); also notable are the raptors of Zev Labinger, the bold scratchboard images of Dana Gardner, and the soft pencil of Keith Hansen.

Oddly, most of the standard "introductory" material is placed at the end of the book, which opens simply with a table of contents, preface, acknowledgments, and a county map of place names, before dropping the reader head first into the species accounts and maps. After the accounts come a short but interesting discussion of county biogeography, a summary of weather during the atlas period (which spanned four dry years followed by a wet year), an explanation of the concept of a breeding-bird atlas, a discussion of methods employed in this atlas, and a summary of results. I see no benefit to this counterintuitive layout, and find atlases with this material at the front of the book (e.g., for Marin and Sonoma counties) to be more logical. Appendices explain breeding-criteria codes, show an example of an atlas field card, and list monthly rainfall and temperature data for Bothe–Napa State Park. There is a seven-page bibliography, and fold-out endpapers provide color maps of Napa County highways, cities, and waterways (front endpaper), and vegetation (back endpaper).

The Napa atlas bears a resemblance in layout to the Sonoma County atlas (Burridge 1995), and a comparison of the two is perhaps inevitable: despite having a significant coastline, Sonoma County hosted 159 breeding species in the six years of its atlas study (1986–1991), which highlights the richness of Napa County, with its 156 species in five years. The Sonoma atlas has a similar one-species-per-page format (although text sometimes spills over the limit, with the "surplus" grouped into a few pages at the end of the species accounts). Bird illustrations sprinkled through the Sonoma accounts are overall less aesthetically pleasing than the Napa illustrations. The Sonoma atlas has no color, and the Napa vegetation map, although a little small, is a definite plus. The species accounts of the Sonoma atlas flow better to me and, although suitably varied in prose, appear to have been crafted to a more standarized template. The maps of individual species in the Sonoma atlas are far superior to my eyes, which are those of someone not very familiar with either county. Showing the county outline, a main highway, and (unnamed) population centers under the grid of atlas blocks is extremely helpful (and typical of most atlases). By contrast, the Napa atlas "maps" are simply an abstract mass of geometry—and this is my one strong criticism of an otherwise good work. Note also that because blocks with less than 50% of their area within Napa County were not censused (some 25 in all), the grids in the species accounts look strangely at odds with the grids on the endpaper maps. For Sonoma County, all blocks that constituted some part of the county were included, surely a preferable approach. But both of these atlases are excellent overall, and combining their good points could benefit forthcoming projects.

One other difference between the Napa and Sonoma atlases reflects a larger issue in the world of atlasing. From the completion of field work to publication was an agonizingly long ten-year period for the Napa atlas. Sonoma County's atlas took "only" four years to be published, still rather a long time. The authors of breeding bird atlases are often volunteers with varied writing skills, and they tend to have full-time commitments in the "real world." But breeding-bird atlases are important documents; they are a baseline for future studies and help form the cornerstones of conservation. When organizations plan projects such as a breeding-bird atlas, I urge them to attempt to raise funds sufficient to expedite writing and publication. One medium that may help in getting data out is the Internet: witness the preliminary maps (in color, another virtual bonus) and draft text for the San Francisco County atlas, which can be seen at www.sffo.org/index.html. On the downside, however, feelings that the information is "out there" may not spark the incentive to polish and publish a final product, which might, in theory, be a draft for life.

In conclusion, the Napa County breeding-bird atlas is a document both useful and attractive, and the the Napa–Solano Audubon Society and all others involved are to be commended for producing this important work. Imagine the day when all California counties have atlases of this quality completed, and published. . . .

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Steve N. G. Howell

FEATURED PHOTO

APPARENT HYBRIDS BETWEEN THE AMERICAN AVOCET AND BLACK-NECKED STILT IN CALIFORNIA

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Birds may hybridize more frequently in captivity than in the wild because natural isolating mechanisms can fail under captive conditions (Sibley 1994). Until recently the only documented hybrid between the American Avocet (*Recurvirostra americana*) and the Black-necked Stilt (*Himantopus mexicanus*) was a bird hatched in May 1971 from a known mixed pair held in captivity at the San Francisco Zoo (Principe 1977). We report here three similar apparent hybrids in the wild.

In all cases, the presumed hybrid resembled an American Avocet but showed a dark stripe up the back of the neck, a straighter bill, a dark smudge on the face, and intermediate leg coloration. Also the white patch normally visible on the folded wing of an American Avocet was reduced so that only a narrow strip of white feathers was visible. All three wild hybrids had a fairly straight bill, slightly shorter than that of an American Avocet, with a slight upturn at the tip. In addition, all three birds appeared to have tibias longer than those of a typical American Avocet. This combination of intermediate characters and the similarity of all three wild birds to the known captive hybrid support the hypothesis of hybrid origin rather than coincidental odd mutations. The shorter bill of the captive bird may have been a sex difference. The captive bird was thought to be a male, and males of these species have shorter, straighter bills than do females.

The first apparent wild hybrid was discovered by Arnold Small and observed by a class from UCLA including Herbert and Olga Clarke on 10 March 1994. It was seen mid-morning in a sheltered pond at the Point Mugu Naval Air Weapons Station at Port Hueneme, Ventura County, where it was photographed by Robert E. Munsey, Jr. (Figure 1). Photos of this bird resemble those of the Moss Landing bird discovered only three days later, but the hybrid at Point Mugu is much paler cinnamon on the head and neck, has a less pronounced dark face patch, more extensive white on the wings, a straighter bill, and pinker legs.

The second apparent wild hybrid was found by Rosso on 13 March 1994, while he led a birding class field trip. Rosso photographed this individual in the wetlands of Elkhorn Slough on the east side of Highway 1 just north of Moss Landing Harbor, Monterey County (see back cover). This bird was observed for approximately 20 minutes in the late afternoon about 50 yards from the road. For most of that time it was solitary, but it also briefly associated with two Black-necked Stilts. Its hunting procedure was similar to that of the Black-necked Stilt, stabbing at possible food items in the cordgrass (*Spartina* sp.).

Dakin found the third apparent hybrid during San Francisco Bay Snowy Plover surveys in a closed area of salt ponds in Hayward, Alameda County, California, on 29 May, 31 May, and 17 June, 2003 (Glover et al. 2003). David Cardinal photographed this bird on two occasions. His color images were published by Sharp (2003) and Messinger (2003), and a monochrome image was published by Dakin (2003).

The cinnamon color on the head and neck of the Hayward bird was pale and diffuse, similar to that of the Point Mugu bird. The stripe of black up the back of its neck did not extend to the crown as it did on the Moss Landing and Point Mugu

Figure 1. Presumed hybrid American Avocet (*Recurvirostra americana*) × Black-necked Stilt (*Himantopus mexicanus*) near Oxnard, Ventura Co., 10 March 1994.

Photo by Robert E. Munsey Jr.

hybrids. In this respect it resembled the captive hybrid at the San Francisco Zoo. A patch of gray feathers around the eye and covering the crown suggested the facial markings of a Black-necked Stilt, but these markings were paler on than the Moss Landing bird. The white area on the folded wings was even more reduced in this individual so that the wings, at times, appeared almost entirely black. The head and body shape of the Hayward hybrid was similar to that of an American Avocet. This bird was also heard to give intermediate vocalizations, but no recordings were obtained.

The copulatory behavior of these two species is almost identical (Sordahl 2001), and attempted copulation with inanimate objects has been reported for at least six of the ten species of recurvirostrids, including both the American Avocet and Black-necked Stilt (Hamilton 1975). Such similarity in copulatory behavior, combined with the reported lack of discrimination, provides additional support for the hypothesis of wild hybridization in these species.

Within the genus *Himantopus*, hybridization in the wild has been reported frequently in New Zealand between the highly localized, critically endangered Black Stilt (*H. novaezelandiae*) and the widespread Black-winged Stilt (*H. himantopus*) (Reed et al 1993, Pierce 1984, Pierce 1996, Greene 1999, MacAvoy and Chambers 1999). Thus intrageneric hybrids have been reported more often in the Recurvirostridae than intergeneric hybrids. An analysis of the distribution of hybrids in this family, however, suggests that breeding sympatry may be at least as important as genetic similarity in predicting which hybrid combinations are likely to occur.

As this article was in preparation we learned of a possible hybrid between the Pied Avocet (*R. avosetta*) and Black-winged Stilt, photographed 2 May 2004 by Gerrit Jan Klop at Culemborg, Netherlands. Photos of the bird on the World Wide Web (http:/

/members.lycos.nl/digivogels/klutig1.jpg etc.) show its strong resemblance to the Pied Avocet, but it also has a white forehead, pinkish legs, and an almost straight bill, suggesting the Black-winged Stilt. We are unaware of any hybrids previously documented between these two species. A red band above the intertarsal joint on the right leg of this individual adds to the mystery surrounding its origin and identity.

We thank Robert E. Munsey, Jr., William Principe, and Kimball Garrett for helpful information on the Point Mugu hybrid. Kimball Garrett reviewed a draft of this manuscript and provided comments which improved it substantially. The San Francisco Bay Bird Observatory and the U.S. Fish and Wildlife Service provided funding and logistic support for Dakin during her surveys.

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WESTERN BIRDS

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Western Specialty:
Calliope Hummingbird

Photo by William E. Grenfell of Granite Bay, California:
Calliope Hummingbird *(Stellula calliope)*
Granite Bay, California, April 2003
(feeder digitally removed)

Volume 35, Number 2, 2004

NOTES

Front cover photo by © Steve H. Metz of Tulsa, Oklahoma: Red-throated Pipit (*Anthus cervinus*), San Joaquin Wildlife Sanctuary, Orange County, California, 17 November 2003.

Back cover "Featured Photo" by © Chaiyan Kasorndorkbua of Ames, Iowa: American Golden-Plover (*Pluvialis dominica*), Pinchey Bottoms, Iowa, 30 August 2003; and © Les Chibana of Palo Alto, California: Pacific Golden-Plover (*Pluvialis fulva*), Kaneohe, Hawaii, 1 September 1998.

Western Birds solicits papers that are both useful to and understandable by amateur field ornithologists and also contribute significantly to scientific literature. The journal welcomes contributions from both professionals and amateurs. Appropriate topics include distribution, migration, status, identification, geographic variation, conservation, behavior, ecology, population dynamics, habitat requirements, the effects of pollution, and techniques for censusing, sound recording, and photographing birds in the field. Papers of general interest will be considered regardless of their geographic origin, but particularly desired are reports of studies done in or bearing on the Rocky Mountain and Pacific states and provinces, including Alaska and Hawaii, western Texas, northwestern Mexico, and the northeastern Pacific Ocean.

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WESTERN BIRDS

Volume 35, Number 2, 2004

CLUTCH SIZES AND NESTING HABITS OF BIRDS AT TIOGA PASS

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ABSTRACT: We recorded clutch sizes for several birds, mostly passerines, during a lengthy study of vertebrate populations in the Sierra Nevada of California near Tioga Pass. Here we report frequencies of the various clutch sizes observed, descriptions of nest sites, and other natural-history notes. In at least three species, the Hermit Thrush (*Catharus guttatus*), American Robin (*Turdus migratorius*), and White-crowned Sparrow (*Zonotrichia leucophrys*), clutches in this montane setting tended to be larger than those reported for lowland regions. In the two species studied in greatest detail, the Dusky Flycatcher (*Empidonax oberholseri*) and White-crowned Sparrow, clutch size decreased through the breeding season with date of clutch initiation. We suggest that this commonly observed seasonal trend is cued by decreasing day length and that it is an expression of a gradual, as opposed to abrupt, onset of photorefractoriness.

Clutch size is probably the most commonly evaluated of all life-history traits in studies of avian reproduction. It is easily obtained and provides a measure of function that is broadly applicable to comparisons within and among species (Stearns 1992, Roff 2002). Furthermore, clutch size, along with the date of clutch initiation, is useful for understanding investment strategies of seasonal breeders that have broad geographic ranges.

METHODS

The study site was in Mono County, California, in the Sierra Nevada. Over three decades, 1968–1997, we studied vertebrate populations in the vicinity of Tioga Pass, at about 3000 m altitude, in the upper branches of Lee Vining Canyon from Ellery Lake to the Yosemite National Park boundary, including about 2 km each along Mine Creek and Lee Vining Creek. During these studies, we accumulated data on clutch sizes and other aspects of natural history, such as nesting sites, on various birds. We determined a clutch's starting date by at least one visit during the laying period (assuming that one egg was laid per day) and clutch size by at least two visits following the completion of laying.

Table 1 Frequency of Clutch Sizes of 15 Species at Tioga Pass

		Clutch size								
Species	*n*	2	3	4	5	6	7	8	Mean	SD[b]
Mallard (*Anas platyrhynchos*)	3	0	0	0	0	0	1	2	7.67	0.58
Spotted Sandpiper (*Actitis macularius*)	30	0	4	26	0	0	0	0	3.87	0.34
Dusky Flycatcher (*Empidonax oberholseri*)	111	6	35	70	0	0	0	0	3.58	0.60
Mountain Chickadee (*Poecile gambeli*)	10	0	0	0	0	6	2	2	6.60	0.84
Rock Wren (*Salpinctes obsoletus*)	10	0	0	1	3	5	1	0	5.60	0.84
Mountain Bluebird (*Sialia currucoides*)	3	0	0	0	1	2	0	0	5.67	0.58
Hermit Thrush (*Catharus guttatus*)	92	1	16	74	1	0	0	0	3.82	0.44
American Robin (*Turdus migratorius*)	30	0	8	22	0	0	0	0	3.73	0.45
Yellow-rumped Warbler (*Dendroica coronata*)	7	0	1	4	2	0	0	0	4.14	0.69
Wilson's Warbler (*Wilsonia pusilla*)	3	0	1	1	1	0	0	0	4.00	1.00
Song Sparrow (*Melospiza melodia*)	7	0	0	5	2	0	0	0	4.29	0.49
Lincoln's Sparrow (*Melospiza lincolnii*)	5	0	1	2	2	0	0	0	4.20	0.84
White-crowned Sparrow (*Zonotrichia leucophrys*)[a]	1154	14	196	878	64	2	0	0	3.86	0.51
Dark-eyed Junco (*Junco hyemalis*)	112	0	11	98	3	0	0	0	3.93	0.35
Brewer's Blackbird (*Euphagus cyanocephalus*)	14	0	0	9	5	0	0	0	4.36	0.50

[a] Data from Morton (2002).

[b] SD, standard deviation.

RESULTS AND DISCUSSION

We found three or more clutches of 15 species, all passerines except the Mallard (*Anas platyrhynchos*) and Spotted Sandpiper (*Actitis macularius*) (Table 1). Nearly all clutches were started between late May and mid-July.

Mallard

Mallard nests were located in marshy areas in subalpine meadows, and the first one found was at the highest altitude (3002 m) recorded for this species' breeding in California (Morton and Morton 1973). Eventually, we discovered two additional nests, and one of them hatched all eggs. On 25 July 1993 we observed the female leading the ducklings from this nest and into a patch of willows (*Salix* spp.) The next day they were swimming on a small tarn about 200 m from the nest location.

Spotted Sandpiper

The modal clutch size of the Spotted Sandpiper over a wide range of longitudes is four, with three eggs sometimes being laid late in the season. Either sex may choose the nest site, and a strong preference for previously used sites is based on experience (Oring et al. 1997). Our Tioga Pass data are in agreement with these generalizations (Table 1). Nests on our study area were built on sand bars, on small islands within creeks, and in marshy spots at the margins of lakes or tarns. Site preferences were evident in that nests were sometimes placed in precisely the same location in up to three consecutive years. One of these, for example, was in a shallow depression under a small willow (20–40 cm high) or lodgepole pine (*Pinus contorta*).

In one notable nesting cycle the first egg was laid on 28 June just as a storm commenced and buried the nest in snow. Laying resumed in this same nest, then snow free, on 5 July. On 20 July we flushed the incubating adult from four eggs, and on 27 July one egg was missing and one pipped egg and two chicks remained. Three chicks departed the nest early the next morning.

Dusky Flycatcher

From 1981 to 1985, during a study focused primarily on regulation of egg temperatures and developmental processes in nestlings (Morton and Pereyra 1985, Pereyra and Morton 2001), we recorded data on clutch initiation and clutch size of the Dusky Flycatcher. A few of the 111 nests were in meadows, these usually in willows, but most were at the periphery of meadows in lodgepole pines, willows, or stunted aspens (*Populus tremuloides*), often on talus-covered slopes. Clutches ranged in size from two to four (Table 1), with four being the mode. Four-egg clutches are particularly common in this species in first nests of the season (Sedgwick 1993).

Rock Wren

We noted clutch sizes of Rock Wrens (*Salpinctes obsoletus*) during a study of their incubation behavior and its effects on egg temperature. Their nests were usually located on talus slopes and were built in cavities under rocks or within rocky outcrops (Oppenheimer and Morton 2000).

Mountain Chickadee and Mountain Bluebird

Both the Mountain Chickadee (*Poecile gambeli*) and Mountain Bluebird (*Sialia currucoides*) are hole nesters, but the only clutches for which we obtained reliable data were laid in nest boxes (all listed in Table 1). Presumably they are representative of those laid in natural cavities.

Hermit Thrush

Across its range, the Hermit Thrush varies considerably in its choice of nest site. East of the Rocky Mountains the majority build on or near the ground, whereas west of the mountains nests tend to be higher (Jones and Donovan 1996). In central Arizona, for example, Martin and Roper (1988) found nests in small white firs (*Abies concolor*) almost exclusively, at a mean height of 1.1 m. Habitat features influencing nest-site selection at Tioga Pass appeared to be much the same as those in Arizona. Of the 92 nests noted in Table 1, five were in willows, one was in a white-barked pine (*P. albicaulis*), and 86 were in lodgepole pines. Most of these pines were young and no more than 2–3 m tall. Mean nest height was 1.0 m (standard deviation 0.5 m, range 0.2–2.7 m).

The mode of Hermit Thrush clutch size is four eggs, but means tend to be larger in the west (Jones and Donovan 1996). The mean clutch at Tioga Pass of 3.82 eggs is actually significantly larger than the mean of 3.56 noted by Jones and Donovan (1996) for other western populations ($P < 0.05$). Perhaps birds in general lay clutches at high elevations larger than expected from longitudinal or latitudinal trends in the same species at low elevations, as shown previously in the White-crowned Sparrow (Morton 1976).

American Robin

In spring American Robins tend to move upward behind the melting snowline in the Sierra Nevada, a pattern especially noticeable on the more gradual western slope, and they are among the earliest of the migratory passerines to arrive and to begin nesting around Tioga Pass (DeSante 1990). Egg laying sometimes began as early as the latter half of May. All the nests we found were in lodgepole pines. The 30 clutches noted in Table 1 were accessible from the ground or by a short climb; we did not try to climb to nests located high up in the taller trees.

All clutches were of either three or four eggs; the mean was 3.73. This figure is larger than that reported from most other locations across North America (Sallabanks and James 1999). Although at 30 our sample size was small, this difference suggests that the robin's clutch size increases with elevation, as for the Hermit Thrush.

We did not visit most robin nests regularly, but it is our impression that they seldom experienced predation. Robins are well known to mob and attack potential predators, and these behaviors may be highly effective. Although Sallabanks and James (1999) mentioned many predators on robin nests, including several corvids, Clark's Nutcracker (*Nucifraga columbiana*) was not among them. We note, therefore, that at one American Robin nest a Clark's Nutcracker succeeded in removing two of the four eggs despite vigorous defense by the parents. At another time and location we observed a robin successfully drive off a nutcracker that was flying by the nest tree. It accosted the nutcracker in mid-air, then grabbed a wing with its beak and yanked vigorously until the nutcracker managed to pull away.

Yellow-rumped Warbler and Wilson's Warbler

Although warblers were around Tioga Pass every year, we made no special effort to find their nests so obtained data on only a few. All of the seven Yellow-rumped Warbler (*Dendroica coronata*) nests were in small lodgepole pines, and the three Wilson's Warbler (*Wilsonia pusilla*) nests were on the ground beneath large willows. Stewart et al. (1978) conducted a multi-year study of Wilson's Warbler breeding biology on the eastern edge of our study area.

Song Sparrow and Lincoln's Sparrow

A few Song Sparrows (*Melospiza melodia*) and Lincoln's Sparrows (*M. lincolnii*) nested most years within our focal study area. Song Sparrow nests were built on the ground or just above it in thick willows. All the Lincoln's Sparrow nests we discovered were on the ground. In the meadows near Tioga Pass both of these species were greatly outnumbered by White-crowned Sparrows. Although smaller, they sometimes prevailed in agonistic encounters with the White-crowned. In a few cases they even caused White-crowns to abandon nests near their own. A Brown-headed Cowbird (*Molothrus ater*) egg was with four Song Sparrow eggs in one nest, and three sparrows and the cowbird fledged from it. This was the only example of cowbird fledging that we observed at any time in the study.

White-crowned Sparrow

The migratory montane subspecies of the White-crowned Sparrow, *Z. l. oriantha*, is the most abundant passerine in the subalpine meadows of the Tioga Pass area and was the primary focus of our studies. Thus we recorded extensive data on its nesting habits, including clutch size (Table 1). Many of these data, including those on nest-site selection, were addressed at length by Morton (2002), so we mention only a few points here. Clutches of the modal size, four, were not as productive as those of five eggs; that is, more young tended to be fledged from the larger clutches (neither of the two six-egg clutches survived). If their nest failed, the birds laid a replacement clutch, sometimes repeatedly, all through June and July. Also, Morton et al. (2004) found a cost of reproduction, as expressed in quality of young and in survival of adults, in relation to reproductive effort. Finally, clutch size decreased significantly through the breeding season (see below).

Dark-eyed Junco

Junco nests were built on the ground and were usually well hidden beneath a clump of grass that provided a screening overhang. We found a few interesting deviations from this pattern, however. For example, one nest was built into the end of a fallen log, another was among the still-green needles of a fallen lodgepole pine, another was in a hole in a muddy bank, and another was simply placed in the open amid the fallen needles of a Jeffrey pine (*P. jeffreyi*).

The modal clutch size of the Dark-eyed Junco is usually four (Austin 1968), the same as we found (Table 1). Although five-egg clutches are rare at Tioga Pass, in northern Utah Smith and Andersen (1985) found their frequency to increase in years of late snowmelt. These authors suggested that an extra egg might have been laid because females were able to accumulate reserves while waiting for nesting sites to clear. At our study site juncos may not have been delayed appreciably in years of heavy snow because they often nest on steep south-facing slopes, among the first places to become free of snow.

Brewer's Blackbird

During the first 20 years of the study we observed this species but usually only from mid-summer onward, when flocks flew in and foraged on the meadows, especially in the morning. We presumed that these birds were from breeding colonies in the shrub-steppe at the lower end of Lee Vining Canyon near Mono Lake, some 10–20 km away. Then, in June 1987, Brewer's Blackbirds began nesting in our study area and have continued to do so every year since. One of their nests was built on the ground amid low willows; the rest were in lodgepoles. In the last few years they have tended to concentrate around Tioga Pass Resort and nearby campgrounds, where they sometimes feed on scraps discarded by motorists and campers. Why Brewer's Blackbirds suddenly colonized Tioga Pass in 1987 is uncertain, but it may have been because the area has gradually become drier. Additional evidence for this hypothesis is that Brewer's Sparrows (*Spizella breweri*), which ordinarily nest in dry habitats at lower elevations of the eastern Sierra, also became more noticeable in the small, scattered patches of sagebrush (*Artemisia tridentata*) high up on the south- and east-facing slopes of the study area. Simultaneously, the once robust breeding population of the Yosemite toad (*Bufo canorus*) died out, probably in part because of the disappearance of marshy areas and the silting in of small tarns suitable for egg laying (Sherman and Morton 1993). Also, lodgepole pine seedlings began to invade more deeply into the meadows. We do not know if these alterations in community structure reflect regional or global climatic fluctuations, but changes in breeding distribution, such as that of Brewer's Blackbird, may prove to be useful biotic indicators of such phenomena.

Other Species

During our study we verified one complete clutch each of the following species: White-breasted Nuthatch (*Sitta carolinensis*), five eggs; Townsend's Solitaire (*Myadestes townsendi*), four eggs; Chipping Sparrow (*Spizella passerina*), four eggs; and Red-winged Blackbird (*Agelaius phoeniceus*), six eggs. A pair of Red-wings nested in a marshy area in June 1990 and hatched nestlings that were lost to a predator. The following year a pair in another marsh about 600 m away probably had a nest but then disappeared, apparently without fledging young. These were the only times we observed Red-winged Blackbirds in the study area.

Seasonal Changes in Clutch Size

A downward trend in clutch size through the reproductive season has been observed in many species of birds (Klomp 1970), but an unambiguous demonstration of this decrease is not always a simple matter: nests have to be found in sufficient quantity throughout the breeding season, first egg dates should be known so as to fix the chronology accurately, and clutch size must be variable. For example, a seasonal decrease in clutch size has been demonstrated in the Dark-eyed Junco (Smith and Andersen 1982), but our data on that species were unsuitable for detecting this result because we seldom knew exactly when eggs were laid and most clutches (87.5%) were of four eggs. On the other hand, we had gathered information on Dusky Flycatchers and White-crowned Sparrows more carefully, and clutch size decreased in both of them (Figure 1).

In the ultimate sense, such a decrease in parental investment could be an important strategy if food appropriate for rearing young, such as insect

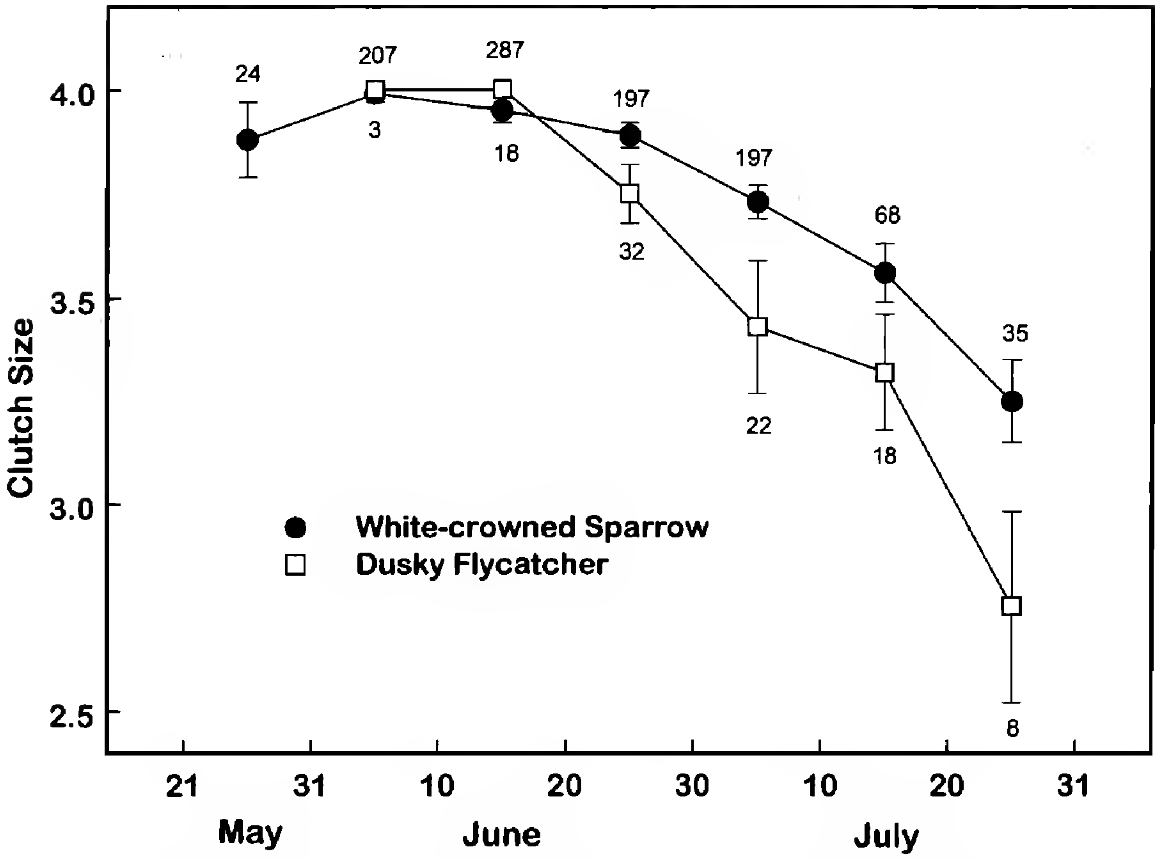

Figure 1. Mean clutch sizes (± 1 standard error) in the White-crowned Sparrow and Dusky Flycatcher in relation to clutch-initiation date (abscissa). Sample sizes are shown above the error bars for sparrows and below the bars for flycatchers.

larvae, dwindle in availability simultaneously. Food supply is not an effective proximate cue for inhibiting ovarian function, however, as shown clearly by food-supplementation studies and large annual variations in environmental conditions such as weather and residual snowpack that affect food availability strongly (Daan et al. 1988, Rowe et al. 1994, Morton 2002). Because calendar date is usually the best predictor of clutch size, the most likely cue for decreasing clutch size over time is decreasing day length (Murphy and Haukioja 1986). The birds lose their ability to lay completely when they become photorefractory, but the onset of this condition appears to be gradual rather than abrupt (Meijer et al. 1992). Thus seasonal decreases in clutch size may result from a mechanism that has evolved for the purpose of terminating reproduction at an appropriate time rather than from short-term feedback from environmental conditions such as food abundance. Hypotheses regarding control mechanisms aside, seasonal decreases in clutch size can be substantial (Figure 1). Recognition of this trend should be factored into assessments of parental effort and potential costs of reproduction in studies that rely heavily on clutch-size data. For quick comparisons of reproductive investment among populations, the currently most useful single indicator is probably the modal clutch size.

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Dusky Flycatcher

Sketch by George C. West, Birchside Studios

HOODED ORIOLE NEST FAILURE ASSOCIATED WITH A NOVEL NEST SITE

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ABSTRACT: Ecological traps occur where species are attracted to use a resource that exposes them to greater than normal risk of mortality or reproductive failure. We observed complete failure of Hooded Oriole (*Icterus cucullatus*) nests in streetlights in a south Texas suburb where use of such nest sites was relatively common. This is of concern as streetlights functioned essentially as traps: orioles built their nests within them but all these nests failed, evidently because the eggs were exposed to lethal temperatures. Moreover, Hooded Oriole nesting success on all other substrates in this area was low (31%, $n = 69$). Therefore, sufficient time for multiple nesting attempts is an important component of the oriole's reproductive success, and time lost to nesting attempts in streetlights, with no chance for success, imparts reproductive costs beyond egg losses. Deterring orioles from nesting in streetlights may increase the potential for subsequent nest attempts on more productive substrates. A simple screen installed as a barrier blocking the opening in the shades beneath the lightbulbs eliminates this unnecessary source of nest failure.

Orioles (*Icterus* spp.) normally attach their woven nests to trees and other plants (Baicich and Harrison 1997, Jaramillo and Burke 1999). The Altamira (*I. gularis*), Streak-backed (*I. pustulatus*), and Yellow-tailed (*I. mesomelas*) Orioles, however, sometimes attach nests to telegraph or electric wires (Sutton and Pettingill 1943, Brush 1998, Jaramillo and Burke 1999). In contrast, Hooded Orioles (*I. cucullatus*) rarely attach their shallow-pouched nests (height 10.2 cm, depth 6.4 cm, Harrison 1979) to man-made structures (Komar et al. 2000).

Historically, in southernmost Texas, Hooded Orioles nested extensively in clumps of Spanish moss (*Tillandsia usneoides*) (Sennett 1878). Since the 1920s, most Hooded Oriole nests in southern Texas have been found in palm trees (*Sabal mexicana* and *Washingtonia* spp.; T. Brush, pers. obs.). Since the 1970s, substantial populations of Hooded Orioles established in southern Texas have colonized habitats without significant numbers of palms, such as forests of live oaks (*Quercus virginiana*), but few nests have been found in these habitats (Pleasants and Albano 2001). Use of artificial nest substrates by Hooded Orioles may be fairly recent. About 200 egg sets collected mainly from the 1880s to 1920s were taken only from nests attached to natural substrates, that is, trees (Western Foundation of Vertebrate Zoology, Barbara Pleasants, pers. comm.). Thus, nearly all Hooded Oriole nests are suspended from leaves and branches, with occasional use of eaves and rafters of buildings (Pleasants and Albano 2001).

In southern Texas, by contrast, we observed Hooded Orioles nesting frequently in man-made structures. In Texas, Hooded Orioles now occur almost exclusively in residential areas and reach their highest abundances in suburban habitats (Brush 2000), where we found that they attached nests to buildings, yard decorations, metal cages, and wires inside streetlights.

The use of streetlights was of concern as nests were in direct contact with 100- to 175-watt lightbulbs (Figure 1). We report here on the nest success and substrate use by Hooded Orioles in suburban Ft. Clark Springs, Kinney County, Texas. We also describe a device to deter orioles from nesting in streetlights.

METHODS

As part of a larger study of Bronzed Cowbird (*Molothrus aeneus*) reproduction, Ellison intensively searched for and monitored Hooded Oriole nests in Kinney County, Texas, from 1999 to 2002. Each year, we located nests during the construction stage and monitored their activity every one to four days until the expected date of fledging. We checked the contents of each nest, except those in streetlights, by using a ladder or an extendable pole with a mirror attached. Because nests attached to streetlights were inaccessible for inspection, we determined their status by tapping on the support pole or lamp cover to elicit a response from adults or young. Nests that lacked a positive response to tapping were observed or videotaped for at least 20 minutes to ensure that nests were truly inactive. This technique was justified on the basis of activity rates and adult behavior at the accessible nests on

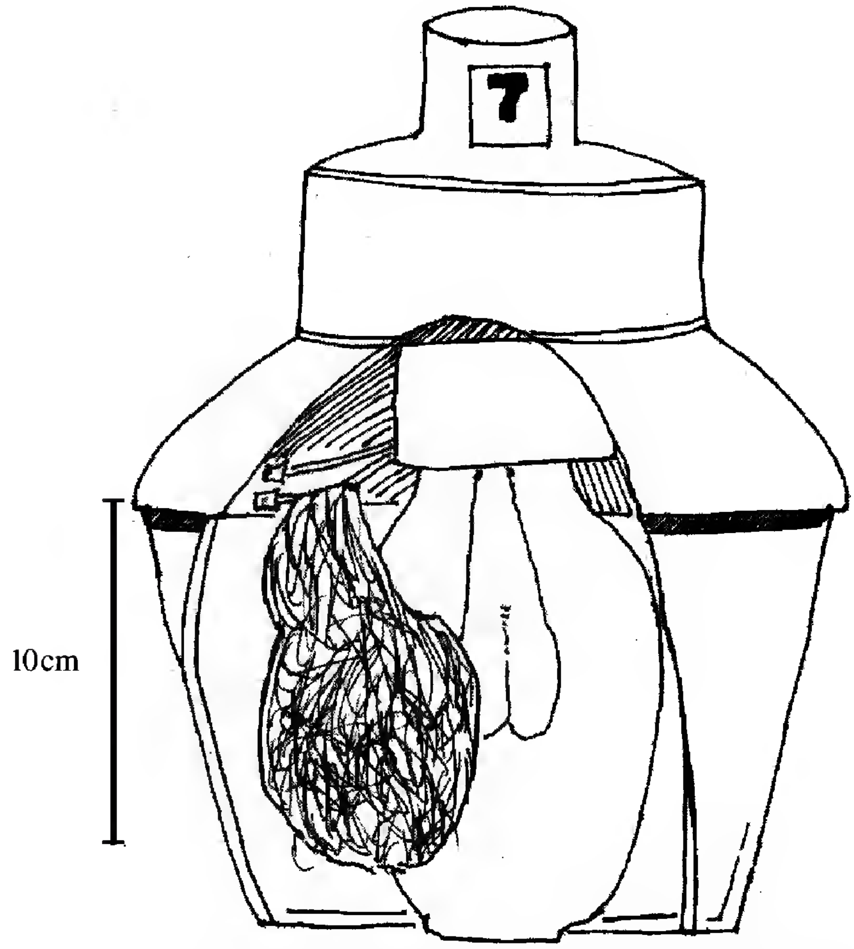

Figure 1. Placement of a Hooded Oriole nest in a streetlight. Streetlight is depicted in cross-section to illustrate nest attachment to loose wire ends and nest placement relative to light bulb.

other substrates (n = 67). We defined successful nests as those that produced at least one fledgling oriole or cowbird.

The streetlights used as nest sites were McGraw–Edison NEMA model lights that consist of a bottomless cylindrical glass shield around a high-pressure sodium bulb of 100 to 175 watts (Figure 1).

RESULTS

From 1999 to 2002, we located a total of 104 nests and determined the fates of 93 nests. At Ft. Clark Springs, Hooded Orioles nest almost exclusively in suburban habitats, as only one of 104 nests was within natural habitat. In the suburban habitats, the majority (72.1%) of nests were in trees, most of which were ornamental palms. Nests in trees experienced a 26% success rate (n = 64). Twenty-nine nests (28%) were placed on a variety of artificial substrates; 24 on streetlights, two each on large yard decorations and buildings, and one inside a windsock. The overall rate of success for the nests on artificial substrates was 17% (n = 29). All nests in streetlights (83% of the nests on artificial substrates) failed, while the five nests on all other substrates were successful. Thus, if nests in streetlights are excluded, 31% (n = 69) of nests were successful.

Once the outer shell of the nest was constructed, nests in streetlights were tended by adults for an average of 12.9 days (range 2–14 days; n = 15), as determined by flushing adults and videotaping interactions with Bronzed Cowbirds at nests. In contrast, successful nests on natural substrates were tended for up to 36 days (mean 14.8 days, n = 20), including attendance at the nest site prior to egg laying.

Three nests removed from streetlights for inspection were singed and burned through at the nest pouch, the point at which each nest contacted the streetlight bulb (Figure 2). Hooded Oriole nests are relatively thin-walled, <1 cm thick (n = 126), and the shells of the eggs within nests in streetlights were brittle and in one case charred black. The yolks of these eggs were dried and solid. None was beyond 1–2 days of embryonic development (see Lokemoen and Koford 1996).

DISCUSSION

Hooded Orioles nest primarily in palms and therefore are most common in residential areas with ornamental palms (Brush 2000, Pleasants and Albano 2001). Similarly, we found that breeding densities of Hooded Orioles in Kinney County were higher in suburban habitats than in surrounding areas with natural vegetation. Ellison detected Hooded Orioles at a rate of 0.97 ± 0.95 birds per 27-ha census (n = 60 censuses) within a suburban area from 2000 to 2002. Likewise, elsewhere in the lower Rio Grande valley Hooded Orioles are essentially restricted to suburban habitats (Brush 2000, S. G. Monk and Brush, unpubl. data). Palms in these suburban areas occur in irrigated "artificial oases," which may offer additional benefits beyond nesting substrates (e.g., greater availability of food, water, and nesting material), enhancing their attractiveness. This habitat presents Hooded Orioles with novel sites on which nests may be attached. Beyond the artificial sites listed

Figure 2. Exterior view of Hooded Oriole nest singed by streetlight bulb in Kinney Co., Texas. The exterior of the nest pouch has burned through (at arrow), exposing the nest lining of other plant, animal, and/or synthetic fibers.

above, we found nests attached to houseplants, banana trees, and several attempted though not completed on window screens.

Streetlights can represent a reproductive trap (*sensu* Dwernychuk and Boag 1972) because orioles are attracted to nest within them, only to suffer complete reproductive loss. The orioles' not tending streetlight nests beyond 14 days implies they abandoned them during the pre-laying period (normally 2–6 days) or incubation period (14 days) (Pleasants and Albano 2001). Though we did not measure egg temperatures directly, eggs were at most 2 cm from a light bulb whose temperature of 400° C (American National Standards Institute) is far beyond the lethal temperatures (41–48° C) recorded for an array of avian eggs (Baldwin and Kendeigh 1932, Lundy 1969, Bennett and Dawson 1979, Grant 1982). Orioles may not recognize streetlights as poor sites because they construct nests by day and are not exposed to the heat emitted by lightbulbs until they commence roosting on the nest or incubating by night.

There are many examples of birds' nesting in artificial situations reducing nesting success (Peck and James 1987). In particular, birds nesting in structures such as pipes (Thurber et al. 1987), rain gauges (Ellison 1936), dry-cleaning vents (T. J. Underwood pers. comm.), tin roofs, mailboxes, and lights (Peck and James 1987) often risk nest failure by exposing clutches to extraordinary temperatures. Purple Martins (*Progne subis*; Loucks 1895), House Sparrows (*Passer domesticus*; Loucks 1895, Peck and James 1987), and House Finches (*Carpodacus mexicanus*; G. E. Hill pers. comm., Ellison unpubl. data) have nested in lighting structures. Only Hill (unpubl. data) monitored fates of such nests and did not note extraordinary nest failure among 37 House Finch nests in streetlights in Ann Arbor, Michigan. In Hill's study the streetlights were of a different design with nests located farther from the bulbs.

Barring orioles from nesting in streetlights, a sure source of nest failure, can improve the chance for successful nesting. Time for successful nesting is important because Hooded Orioles need a prolonged breeding season for repeated nesting attempts to ameliorate the costs of parasitism (Pease and Grzybowski 1995). In our study the low reproductive success of Hooded Orioles was due to brood parasitism and egg damage by Bronzed Cowbirds (85% of 66 failed nests were parasitized). Theoretically, during the Hooded Oriole's breeding season in southern Texas, typically of 80 days, each female has time for three nesting attempts. Therefore, even without other sources of nest failure, the loss of 12.9 days per nesting attempt in a streetlight represents a significant fraction (16%) of the time that might otherwise have been devoted to nest attempts on more productive substrates.

To keep birds from nesting in streetlights, Rio Grande Electric Cooperative personnel installed protective screens that barred access to the lamp housing (12 in 2000, 40 in 2001). The barrier, consisting of a circular piece of 0.5-cm wire mesh with an approximate diameter of 30 cm, was cut to fit the bottom of the lamp housing. The screen was then attached to the inside and outside of the housing's lip by crimping tabs of mesh cut at 11-cm intervals.

This note is intended to alert communities and wildlife managers to the threat streetlights may pose to some bird species. Indeed, such a novel nest site did not readily appear to detract from oriole nest success until studied more closely. Electricity companies should be encouraged to maintain sealed streetlights or place screens under lamps to enhance oriole reproduction and reduce the maintenance costs of removing nest materials.

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FIRST RECORD OF THE LITTLE STINT FOR MEXICO

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ABSTRACT: A juvenile Little Stint (*Calidris minuta*) occurred at Estero Punta Banda, Baja California, Mexico, from 22 to 30 October 2002. The Little Stint breeds in the northern Palearctic and winters primarily in Africa and India. Since 1975 it has been found with increasing regularity as a vagrant in the New World, primarily in Alaska. The observation we report is the first record for Mexico and the first photographically documented record for Middle America.

The Little Stint (*Calidris minuta*) is one of seven small similarly plumaged arctic-breeding shorebirds known collectively in the United States and Canada as peeps and in Britain as stints. Members of this group pose considerable field identification challenges, the most difficult of which arise among the four small, black-legged species: the Semipalmated (*C. pusilla*) and Western (*C. mauri*) Sandpipers and the Little and Red-necked (*C. ruficollis*) Stints, all of which are similar in size, structure, and plumage.

WORLD RANGE

The Little Stint is a long-distance migrant breeding in the high Arctic and wintering primarily in Africa. It has a world population estimated at 1,434,000 (del Hoyo et al. 1996). From June to August it breeds from northern Scandinavia east through north-central Siberia (del Hoyo et al. 1996, American Ornithologists' Union [A.O.U.] 1998), occasionally as far east as the Chukchi Peninsula at Siberia's northeastern tip (Russian literature cited by Gibson and Kessel 1992). It winters throughout Africa and the Mediterranean and east through the Arabian Peninsula and the Persian Gulf to India and Myanmar (del Hoyo et al. 1996, Zimmerman et al. 1996, A.O.U. 1998, Grimmett et al. 1999); it winters rarely in Britain and southeastern Madagascar (del Hoyo et al. 1996). The Little Stint migrates widely through Europe and western Asia, typically moving south to southwest from its arctic breeding grounds. Increased attention from birders has revealed it to be rare but regular in Thailand (J. L. Dunn pers. comm.) and Hong Kong (spring only; Carey et al. 2001). Vagrants have occurred in the Cape Verde Islands, Iceland, the Faroes, Spitsbergen, Bear Island, Japan, Brunei, Papua New Guinea, and Australia (Hayman et al. 1986, Brazil 1991); there are no records from Greenland (Boertmann 1994). Fall migration takes place from July through November, spring migration from April to early June (Hayman et al. 1986). Juveniles begin their migration in late August, later than the passage of most adults, which peaks during July and early August (Hayman et al. 1986). Many immatures remain on the wintering grounds throughout their first year (del Hoyo et al. 1996).

In the New World vagrant Little Stints have been increasing in frequency since the first records in 1975 (Pellow 1976, Byrd and Day 1986). Of 91 New World records through August 2004, 22 are for on the east coast, 34 for Alaska, and 18 for the west coast south of Alaska (Iliff and Sullivan in press). Outlying records have hailed from the interior United States and Canada (7 records), Hawaii (3 records), Bermuda (1 record), Montserrat (1 record), Barbados (4 records), and South Georgia Island (1 record; Iliff and Sullivan in press). The occurrences of adults in the New World peak from late April to early June and from mid-July to late August, while those of juveniles extend from late August to late October (Iliff and Sullivan in press). Although both age classes have occurred on both coasts, juveniles have been detected more often on the west coast (Iliff and Sullivan 2004).

RESOURCES FOR FIELD IDENTIFICATION

The field identification of the four species of small black-legged peeps remains one of the more challenging problems within the family Scolopacidae and the genus *Calidris*. In particular, the Red-necked and Little Stints can be so similar in basic plumage that even some specimens have been considered unidentifiable. A classic example illustrating the difficulty of this group is a second-year stint collected at the Salton Sea, Imperial County, California, 17 August 1974 (Erickson and Hamilton 2001; San Diego Natural History Museum 38887). Although it was initially identified as a Red-necked Stint (McCaskie 1975), and the identification was supported by Veit (1988), it is still considered unidentifiable by the California Bird Records Committee (Erickson and Hamilton 2001). Similarly, the Semipalmated and Western Sandpipers are so similar in basic plumage that their respective winter ranges were determined only recently (Phillips 1975).

Wallace (1974) was the first to treat field identification of small *Calidris* sandpipers in depth. Jonsson and Grant (1984) and Veit and Jonsson (1984) updated and expanded on further advancements in the subject; the former treated the issue from a European perspective, the latter from a New World viewpoint. Identification criteria have changed little since, and readers are referred to those two excellent sources. Other excellent treatments of the field identification of small *Calidris* sandpipers are found in the illustrated field guides by Jonsson (1993), Mullarney et al. (1999), and Sibley (2000).

FIRST RECORD FOR MEXICO

At 1030 PDT 22 October 2002, we visited the south end of Estero Punta Banda in northwestern Baja California to check two small impoundments for shorebirds. Sullivan brought the group's attention to a small peep foraging on the shoreline 10 m away; its features initially suggested the Semipalmated Sandpiper. We quickly realized that it was neither a Western Sandpiper nor a Least Sandpiper (*C. minutilla*), and that the bill appeared too slender and the plumage too bright for a typical Semipalmated Sandpiper. Noticing the split supercilium, pale stripes or braces on the mantle, and unusual breast pattern, Iliff tentatively identified it as a juvenile Little Stint, and we immediately unloaded the vehicle to obtain photos and examine the bird more closely. Before any photos were secured, the bird took flight, circled around us, and settled again in the pond to the south. In flight, Sullivan and Gibbons noted the bird's soft, repeated, "tsit" call. It took us approximately 5 minutes to relocate the bird, as it apparently had shifted to the far side of the south pond. Once it was relocated, we were able to confirm that this individual possessed a suite of field marks consistent with a juvenile Little Stint. The bird spent much of its time feeding along the near edge of the north pond and allowed us to approach within 5 to 10 m. Realizing that this individual represented a first record for Mexico, we spent the next hour observing, sketching, and photographing the bird at close range (Figures 1–5). Other small sandpipers with it included 90 Dunlins (*C. alpina*), 35 Western and 30 Least Sandpipers, nine Short-billed (*Limnodromus griseus*), and one Long-billed Dowitchers (*L. scolopaceus*), as well as seven additional species of larger shorebirds.

Richard A. Erickson, Peter Gaede, Robert A. Hamilton, and Michael San Miguel next visited the location on 26 October 2002. Aware of our sighting, the group searched for the Little Stint from 1345 to 1430 PDT but to no avail. The same observers returned the following morning and found the bird feeding and roosting in the same location where we had first observed it on 22 October. They studied the bird from 0630 to 0920 PST, and Hamilton recorded 30 seconds of digital video, including audio recordings of the "tsit" call. The same observers returned to the pond on 30 October 2002 at 1300 PST and found the Little Stint still present. The next searches for the stint were 29–30 November 2002 by Kurt A. Radamaker and 18–19 December 2002 by Iliff and San Miguel, but the stint was not seen again.

Description

The following description was compiled with reference to our field notes and photographs. Topography follows Veit and Jonsson (1984).

Size and structure. In direct comparison, the Little Stint was much smaller than the Dunlin and slightly smaller than the Western Sandpiper. In body size it closely resembled the Least Sandpiper, but it differed in shape. Compared to the squat, short-necked, and short-legged look of the Least Sandpiper, the Little Stint appeared long-legged, long-necked, and long-winged, all of which gave it a comparatively slender appearance. This was especially noticeable when the bird tipped forward to feed, holding its wings and tail up at an angle of 20° to 40°, recalling the feeding posture of the Stilt Sandpiper (*C. himantopus*; Figures 2 and 4). The Least and Western Sandpipers present appeared proportionally shorter legged and assumed a more horizontal posture when feeding. The wings were fairly long with at least two primary tips visible beyond the tail tip and three primary tips visible beyond the tertials (Figures 1 and 5).

The bill shape was distinctive, being fairly long (about 2/3 head length) and almost perfectly straight (Figure 1). The tip of the bill drooped slightly, though this feature was not as pronounced as on nearby Western or Least Sandpipers. Compared with that of the Semipalmated Sandpiper (though none was present for direct comparison), the bill appeared longer, more

Figure 1. Juvenile Little Stint, Estero Punta Banda, Baja California, Mexico, 22 October 2002. Side profile showing straight bill, bold head pattern, and the patterns of the scapulars, tertials, and upperwing covert. A juvenile Red-necked Stint would not have as obvious a pale mantle "V," would lack the prominent split supercilium, would have plainer wing coverts and tertials, would be shorter-legged with a more squat appearance, and would average shorter and thicker-billed.

Photo by Brian L. Sullivan

slender, and did not have a notably bulbous tip. The bird's unusual bill structure was the first indication that this individual was not a Semipalmated Sandpiper and, for Iliff, it immediately recalled previous experience with Little Stints in Africa and New Jersey.

Several times we carefully observed the feet—best seen while the bird was preening or running—and were able to confirm the lack of webbing between the toes, eliminating both the Semipalmated and Western Sandpipers. Given similar views of Western Sandpipers, we found the webbing between the toes easy to discern. In addition, we were able to confirm the presence of a hallux, eliminating the larger Sanderling (*C. alba*), a species that has been confused with stints (Figure 4).

Plumage and soft parts. From its uniform brightness and the warm color evident on the upper breast sides, crown, tertials, and wing coverts, the bird was clearly still in full juvenal plumage (Figure 1). The wing coverts had crisp and well-defined buff edgings to otherwise dark-centered feathers (Figures 4 and 5). Although lacking any fresh pale gray of basic or winter plumage, the bird did appear to have begun its postjuvenal molt, having one row of lower scapulars missing.

Figure 2. Juvenile Little Stint, Estero Punta Banda, Baja California, Mexico, 22 October 2002. Feeding posture emphasizing long, straight bill, pale mantle stripes, flared tertials, and long rear.

Photo by Brian L. Sullivan

Figure 3. Juvenile Little Stint, Estero Punta Banda, Baja California, Mexico, 22 October 2002. When viewed head on, the pattern of the split supercilium became striking, as did the bold dark central crown and clean white throat and lower malar region. The dusky grayish wash across the upper breast was also evident in this posture.

Photo by Marshall J. Iliff

The head pattern was striking, particularly when the bird was viewed head on (Figure 3). A dark crown and eyeline were set off by a strong supercilium and a narrow lateral crown stripe that merged with the supercilium above and in front of the eye. This head pattern, shared by several species of sandpipers, is typically referred to as a split supercilium (Veit and Jonsson 1984). The supercilium extended from the upper edge of the base of the maxilla to well behind the eye and broadened noticeably behind the eye. The supercilium split on the forehead just above the eye, and the much narrower pale lateral crown stripe extended parallel to the supercilium and ended at a point just below the rear crown. The supercilium and the lateral crown stripe contained small dark streaks. Though difficult to discern, these streaks were most prominent at the rear, where the supercilium blended into the nape and rear crown, and were less noticeable in the supercilium than in the lateral crown stripe. The forecrown was pale, except for a narrow strip of dark feathering extending from just above the maxilla to the crown (Figure 3). The entire crown was dark, producing a capped appearance. This dark crown was composed of dark brown feathers, finely edged with rufous (Figures 2 and 4). At the rear margin of the dark crown patch was a rufous-orange band, making the rear portion of the crown seem quite bright from certain angles (Figures 1 and 2). The lores were dark with a narrow medium-gray line extending through the eye, expanding slightly just behind and below the eye and forming a gray triangular patch on the lower auriculars (Figure 1).

The pale gray, lightly streaked hindneck and lower cheeks set off the prominent face pattern. The throat was well defined and unmarked whitish. The belly, flanks, vent, and undertail coverts were unmarked pale or whitish. The upper breast was crossed by a very faint smooth pale gray wash, forming a dusky breast band of medium width (Figure 3). The breast band was visible in good light given head-on views, but it was pale enough that it was rarely visible at other angles. The faint breast band connected warm buff-orange extensions on either side of the upper breast, above the wings, recalling the pattern of the adult Little Stint in alternate plumage. As on an adult, the warm buff area on the sides of the breast was marked internally with some indistinct dark spotting. A finger of white penetrated along the leading edge of the folded wing, resulting in a fingerlike extension of white into the dark upperparts, recalling the pattern of a basic-plumaged Spotted Sandpiper (*Actitis macularius*; Figure 4).

The pale gray hindneck contrasted strongly with the dark back. Some pale rufous edges on the back feathers remained, but it seemed that most edges had been worn away. On either side of the back, a single well-defined line of white-tipped feathers traced a white "V" pattern on the back, boldest on the lower mantle (Figure 2). The upper scapulars were more strongly marked, being dark brown in the centers and retaining substantial orange fringes. The first row of lower scapulars (most distal) appeared quite pale, apparently because the pale gray bases of these feathers were exposed. This pattern might have been due to the second row (next most proximal) of lower scapulars having been dropped in the beginnings of a postjuvenal molt. Indeed, photos show just one row of lower scapulars (Figures 1, 2 and 4). The lower scapulars each appeared to have a prominent anchor pattern: their bases were gray, their fringes were orangish, and their tips were medium brown with a darker brown shaft streak that widened to follow the contour of the feather and form an anchorlike shape. The wing coverts contrasted slightly with the rest of the upperparts, being medium brown with narrow buff to whitish fringes. The folded wing showed prominent white tips to the greater coverts. The most proximal two or three median secondary coverts had a faint rufous tinge that set them off from the rest of the wing. The tertials were worn but still brightly edged with rufous-buff. The shortest (innermost) tertial retained a fairly bright rufous-orange edge. The next tertial, distally, had a somewhat paler fringe, with the next tertial being even paler and only faintly edged with rufous or buff. The longest tertial seemed especially tattered and retained only a worn whitish edge. The longest primaries were visible beyond the tertials and were dark, almost blackish, with very narrow pale fringes detectable only under ideal conditions.

In flight, a fairly strong white wing stripe was evident, though it was not noticeably different from the similar pattern shown by Western and Least Sandpipers. Photos show the underwings were mostly pale, with pure white axillars and pale gray underwing coverts. The leading edge of the underwing was dark, penetrated by a narrow strip of white near the body, and the outer three primaries were mostly pale whitish below with an extensive dark tip and narrow dark leading edge. The tail was dark centrally and at the tip but white along the basal edges, forming a "T" pattern. The rump was dark in the center but whitish along the edges, as on all small *Calidris* sandpipers except the White-rumped Sandpiper (*C. fuscicollis*) and Temminck's Stint (*C. temminckii*).

The eye, bill, legs, and feet were black. We scrutinized the soft parts carefully to discern true skin color and to rule out the possibility of mud affecting overall impressions. No mud was visible on the bill or legs (Figure 1).

Voice. The Little Stint called regularly throughout the observation, both in flight and during territorial disputes. While in flight, it gave a soft high-pitched "tsit" call, often more exaggerated when it was chasing Western Sandpipers. This call was reminiscent of the flight call of the Sanderling but higher-pitched.

While feeding and defending territory along the shoreline, the Little Stint regularly gave a series of 7 or 8 high-pitched "twee" notes, run together in a series of approximately 1.5 seconds duration. This call was reminiscent of similar calls given by Semipalmated and Western Sandpipers and also recalled the begging call of a juvenile Forster's Tern (*Sterna forsteri*).

Behavior. During our 90-minute observation, the Little Stint spent about 1/3 of its time roosting and 2/3 of its time feeding. When roosting, it associated more closely with a flock of approximately 30 Dunlins than with nearby groups of Western Sandpipers. It typically flew in to join the roosting Dunlins, positioned itself along the periphery of the flock, and rested on one leg with head tucked. At times, the bird seemed unsettled and periodically ran around the perimeter of the roosting birds. Typically, after 5 to 10 minutes resting it returned to feeding.

While feeding, it vigorously defended 15 m of shoreline against Western Sandpipers. It chased Least Sandpipers on several occasions but only once showed aggression toward Dunlins. Aggressive encounters usually involved the Little Stint flying directly at the intruder and calling ("tsit") repeatedly while chasing it. The Little Stint usually abandoned the chase approximately 10–15 m outside its favored stretch of shoreline, then returned to the defended area and resumed feeding. Often these chases involved an unusual flight, in which the Little Stint approached an invading *Calidris* with slow, labored wingbeats. Leukering likened the wing action to that of a displaying Cooper's Hawk (*Accipiter cooperi*), and Gibbons found it reminiscent of breeding display flights of other species of *Calidris* that he had observed on the north slope of Alaska at Prudhoe Bay. The unique defensive behavior of this individual set it apart from the other small *Calidris* sandpipers.

When feeding, the Little Stint walked hurriedly along the shoreline, intermittently picking at the water's surface. It rarely paused, and its head was in nearly constant motion (Figure 5). This behavior was consistent with the active, darting feeding behavior described in several field guides (Zimmerman et al. 1996, Grimmett et al. 1999, Sibley 2000). The stint spent most of its time walking in the shallows about 20 cm to 1 m offshore, often wading to

Figure 4. Juvenile Little Stint, Estero Punta Banda, Baja California, Mexico, 22 October 2002. Side view accentuating the rufous spotting on the sides of the upper breast, dark auriculars, rufous patch on the rear crown, and pale hind neck.

Photo by Brian L. Sullivan

Figure 5. Juvenile Little Stint, Estero Punta Banda, Baja California, Mexico, 22 October 2002. During active feeding, the bird looked rather slim overall, long-necked and long-winged.

Photo by Brian L. Sullivan

above the ankle. It rarely fed in the wet mud above the water line, for less than 1 minute at a time.

ELIMINATION OF SIMILAR SPECIES

In the field we quickly realized that the Little Stint was one of the paler, grayer, black-legged species rather than one of the browner species of *Calidris* with yellowish or greenish legs (i.e., Least Sandpiper, Temminck's Stint, or Long-toed Stint). The distinctive call and lack of vestigial webbing between the toes eliminated the Semipalmated and Western Sandpipers. Those species were also ruled out by plumage characters, notably by the combination of the split supercilium, the white mantle stripes, the rich, spotted color on the chest contrasting with a white throat, and the extensive orange fringing on the coverts and tertials. Additionally, the long-legged look and slender, straight, fine-tipped bill was unlike the shape of Western and Semipalmated Sandpipers.

A juvenile Red-necked Stint was considerably more difficult to eliminate. The stint we observed showed a pattern on the breast recalling that of an adult Little Stint in breeding plumage: the white throat contrasted strongly with a lobe of orangish color, with blackish internal spotting, extending onto the sides of the breast. The juvenile Red-necked Stint has a grayish breastband with faint streaks on the sides. The split supercilium is another feature shown by the Little but not the Red-necked Stint. The well-marked upperparts were distinctive as well, with pale mantle stripes setting off extensive orange fringes on the coverts and tertials. The Red-necked Stint tends to be duller above, lacking prominent white stripes on the mantle and having pale greater coverts and tertials that show an obvious shaft streak and lack the colorful edges. The call note, a high "tsit," was unlike calls given by the Red-necked Stinit: a raspy "quiit" (Sibley 2000) or "chriit" (Mullarney et al. 1999) or a dry, flat "chut" without the piercing quality of a Little Stint's call (Veit and Jonsson 1983). Structural features provided a final clue. The long-legged look and long slender bill gave an appearance unlike the squat, shorter-legged, and shorter-billed look of the Red-necked Stint.

DISCUSSION

The Little Stint at Estero Punta Banda represents the first record for Middle America and the southernmost record on the North American mainland; in the New World only records from Barbados, Montserrat, and South Georgia Island are more southerly (Iliff and Sullivan 2004). Other than a specimen collected 21 November 1988 at Harper Dry Lake, California, a bird that may have been attempting to winter (Heindel and Garrett 1995), the Little Stint at Estero Punta Banda is the latest recorded in North America. Since the shorebird numbers and species present on 22 October 2002 at Estero Punta Banda were typical of midwinter, we considered the possibility that the Little Stint might attempt to winter locally. A midwinter visit, however, failed to locate the bird, although relocating it would prove difficult if the bird moved away from the small ponds where it was first discovered. The estero encompasses several square kilometers of suitable mudflat and marsh that harbors several thousand wintering peeps; a winter-plumaged Little Stint would be exceedingly difficult to detect at any distance.

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LOOSELY COLONIAL NESTING BY WESTERN KINGBIRDS IN NORTHWESTERN TEXAS

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ABSTRACT: The number of Western Kingbirds (*Tyrannus verticalis*) breeding on a farmstead in northwestern Texas increased from four pairs in 1990 to 13 pairs in 2001. In most cases, nests were located in large planted shade trees at this 0.6-ha farmstead. The earliest resident birds arrived on the mean date of 20 April (n = 12 years), and earliest observed nest building was on 10 May 2000; the first fledglings were noted on the mean date of 6 July (n = 11 years). Most clutch and nestling losses resulted from nest displacement (n = 7) caused by strong winds, with only two from other causes. Ten fledglings died, all from weather events. During the 1990–2001 study period, seven adults were known to have died. Territorial defense of only a small space surrounding the nest and dispersed foraging may have permitted such a large number of pairs to breed successfully in an area where nest sites were limited.

The Western Kingbird (*Tyrannus verticalis*) breeds in south-central Canada, the western United States, and northern Mexico, occupying openings in riparian forests, woodlands, savannas, shrublands, agricultural lands, deserts, and urban areas (Gamble and Bergin 1996). In the Great Plains states and elsewhere, the species is currently more abundant than it was historically (Gamble and Bergin 1996, Scheuering 2003). With the settlement of the plains from the late 1800s on, new kingbird nesting and foraging habitats were created by the planting of shade trees around human dwellings and the construction of fences and electric-distribution poles and wires (Gamble and Bergin 1996). Between 1965 and 1979, U. S. Fish and Wildlife Service Breeding Bird Survey data suggested highly significant increases in most of the central and western portions of the continent; increases were particularly evident in New Mexico, Texas, and North Dakota, with greatest abundance in the high plains of Kansas (Robbins et al. 1986).

The Western Kingbird is now a common summer resident on the high plains of northwestern Texas (Oberholser 1974, Seyffert 2001), nesting primarily in trees about towns, suburban homesites, and especially farmsteads. It apparently was during the period 1911–25 that the species extended its breeding range south across the Oklahoma panhandle and onto the plains of northwestern Texas (*cf* Sutton 1967). Before settlement, no nest sites were available on the treeless shortgrass prairie (*sensu* Morris 1997) covering this region. Beginning around 1906, large tracts of prairie in the area were plowed (Parmer County Historical Commission 1981), and by 1950 much of the region was devoted to agriculture. Associated with landscape change and the establishment of farmsteads, shade trees were planted, in turn providing habitat for arboreal birds. Western Kingbirds readily adapted to these habitat "islands," with most stands now occupied by one to three pairs (pers. obs.). Here I report on a farmstead where many pairs of kingbirds nested simultaneously, and report the birds' breeding chronology and mortality from 1990 to 2001.

STUDY AREA AND METHODS

The study site was a small farmstead surrounded by croplands and Conservation Reserve Program grasslands, 16 km northwest of Earth, Lamb County, Texas (34° 13′N, 102° 24′W). Within an area of 0.6 ha, 24 Siberian Elms (*Ulmus pumila*) 10–12 m tall, one Red Mulberry (*Morus rubra*) <10 m tall, and one Western Red Cedar (*Thuja plicata*) were near a dwelling built around 1925 and an outbuilding built in 1958 (some elms were planted shortly after these constructions). In addition, elm saplings up to 3 m tall created a dense understory in places or were scattered at other locations. During the study period, nearby crops included cotton, corn, milo, pumpkins, beans, and winter wheat. Utility wires and poles were present to the south, north, and west, and there was a fence 0.8 km south.

The terrain is flat except for a gentle slope down toward a freshwater playa 0.8 km to the southeast. Mean precipitation for Lamb County is 45 cm, falling mostly from thunderstorms in May and June and from subtropical storms from the southwest in August and September. The mean maximum temperature in July, the warmest month, is 34° C, and evaporation rates are high.

Most of my observations were opportunistic, without a specific study design, but all of the kingbirds nested within 40 m of the dwelling, with most within 20 m. I monitored the birds daily from nest construction through fledging using 7× binoculars, or merely watching from a window or door. I usually assessed nest success but not clutch size, hatching success, or fledging success, as nests were generally inaccessible. Observations ended after the 2001 breeding season.

RESULTS

Nesting Success

From 1990 to 1992, four pairs nested annually at the site. Two of four nests fledged young in 1990 and again in 1991, but in 1992 no nests were successful, as a result of severe thunderstorms in June. Only two pairs nested in 1993, and one of these fledged young. In 1994 the population increased to three pairs, two of which fledged young.

From 1995 to 1997 three pairs continued to nest annually, and productivity increased. Nine young fledged in 1995. All pairs were successful in 1996, although I did not determine the exact number of young fledging. Seven young fledged from two nests in 1997.

In 1998 four pairs nested, and all four were successful. Six pairs nested in 1999. The greatest increases occurred in 2000 and 2001, to 11 and 13 pairs, respectively.

Breeding Chronology

Mean spring arrival (presumably males) was 20 April (standard deviation [SD] 3.62 days), ranging from 13 April 2001 to 27 April 1990 (n = 12 years). The latest known arrival was a pair together on 13 June 1994. Earliest courtship display was noted 24 April 1998; earliest nest building was 10 May 2000.

Of 68 nests observed, 63 (92.7%) were in elms and five (7.3%) were in the mulberry; no nests were in the red cedar. The mean date of first observed fledging was 6 July (SD 6.84 days), ranging from 21 June 2001 to 15 July 1995 (*n* = 11 years). Latest fledglings left the nest on the mean of 1 August (SD = 12.77), ranging from 14 July 1996 to 24 August 1997 (*n* = 10 years); the last to fledge was from a replacement nest built after a first attempt failed. During the study, 59 of 68 (86.7%) nests fledged young.

Mortality

Clutch and nestling mortality consisted of seven (10.3%) nests being displaced by strong winds associated with thunderstorms, one (1.5%) clutch lost to an unknown predator, and one brood (1.5%) lost to an arboreal Gopher Snake (*Pituophis melanoleucus*). Sixteen adult kingbirds hovered 1–3 m above the nest during the latter event, but I did not see them make any attempt to displace the snake. This event occurred on 4 July 2001, and the victimized pair migrated on 10 July. I noted 10 instances of mortality of fledglings: eight were killed during severe thunderstorms (strong winds and/or hail), and two prematurely left a nest when excessively warm temperatures from direct solar radiation apparently caused nest abandonment. Both young were dead beneath the nesting tree 2 days later. There were no observed losses to avian predators, as most potential predators were deterred by defensive mobbing by adult kingbirds; Swainson's Hawks (*Buteo swainsoni*), American Kestrels (*Falco sparverius*), Common Grackles (*Quiscalus quiscula*), and particularly Great-tailed Grackles (*Q. mexicanus*) were the usual recipients of these aggressive assaults.

I confirmed the deaths of seven adult kingbirds during breeding periods over the 12 years. Three were lost in severe thunderstorms; two were killed after colliding with vehicles on a nearby highway; one was captured by a house cat during a near-ground dispute between two rival males; and one died when its tongue became entangled in a seed-sack string while attempting to steal nesting material from a neighbor's nest.

DISCUSSION

Generally, Western Kingbirds are solitary nesters, with pairs typically not nesting in close proximity (Gamble and Bergin 1996). Exceptions, however, have been reported. For example, in the Trans-Pecos region of far western Texas, two or three pairs occasionally nested near each other, and the average distance between nests was 31 m, with the closest nests being 12 m apart (Gamble and Bergin 1996). I took no exact measurements for this study, but nests frequently were within approximately 10 m of each other and occasionally within 6 m of each other. Why this particular farmstead supported a loose colony of up to 13 pairs of normally pugnacious kingbirds is unclear (other nearby farmsteads had one to three pairs; one had five). Insect prey apparently was sufficient; after 1996 use of insecticides in spring and summer on adjacent croplands was limited, except on one cotton field to the northwest, which was treated with pesticides 11 times during the 2000 growing season (pers. obs.). The kingbirds made little use of that field. A program to eradicate boll weevils, entailing weekly spraying of some 29,000 ha of cotton, generally did not begin until late September, after kingbirds had migrated.

The high density of nests at this study site was perhaps due, at least in part, to the separation of nesting and foraging sites. After one or two days of strife during establishment of territories, conflicts usually subsided, with aggressive behavior noted thereafter only within a small space surrounding a nest. Nesting in one habitat, pairs foraged in another; the nearest foraging sites were >200 m from the nests, with most 0.8–1.2 km away. As the kingbirds dispersed to forage, they consistently used narrow flight corridors through and away from the farmstead trees, thus generally avoiding intraspecific conflicts. Nest location usually dictated departure direction; for example, pairs with nests in trees at the northeast corner of the farmstead left to the north, northeast, or east. Once fledglings attained sufficient flying skills, young frequently accompanied parents to foraging sites; family units spent the day either perching or sallying from wires, vegetation, circle-pivot irrigation systems, or other upright objects. Similar behavior has been documented from southeastern Arizona and southwestern New Mexico (Hespenheide 1964). There also the species was highly territorial near nests, but territorial activity was not maintained at foraging sites; pairs used only a small part of the available habitat for nesting but fed in all of it. The Western Kingbird frequently breeds in regions where nesting sites are in short supply. In such areas, defending only a small space near the nest, while foraging at distant and undefended sites, is a strategy that would permit multiple pairs to occupy nearby nesting sites successfully.

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Western Kingbird

Sketch by George C. West, Birchside Studios

NOTES

FIRST SPECIMEN OF THE NEOTROPIC CORMORANT FROM THE BAJA CALIFORNIA PENINSULA, MEXICO

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On 7 February 2003, during a fish survey in the Ojo de Agua at Río La Purísima, about 20 km upstream of Carambuche, Baja California Sur (26° 19′ 24.2″ N, 111° 59′ 09.7″ W, altitude 195 m), I observed and photographed a Neotropic Cormorant (*Phalacrocorax brasilianus*) resting on a small island in the center of the river (Figure 1). A day later, this same individual was found dead in a gill net placed in the river, along with 12 exotic cichlid fish (*Tilapia* cf. *zilli*). The bodies of two of the fish were mutilated, indicating that the cormorant had attempted to feed on them. The collected specimen, an adult male (total length 720 mm; wing span 960 mm; weight 1305 g), was deposited in the Bird Collection of the Facultad de Ciencias, Universidad Autónoma de Baja California, at Ensenada (UABC-1321, Figure 2). This individual constitutes the first known specimen of this species for the Baja California Peninsula.

The collection site in this perennial water body is characterized by a series of interconnected ponds (40–60 m wide and a maximum depth of 2 m) with low salinity (<0.1 ppt) and sandy to muddy bottoms (G. Ruiz-Campos unpubl. data). The riparian vegetation here consists of exotic date palms (*Phoenix dactylifera*), reeds (*Phragmites communis*), willows (*Salix* sp.) and mule fat (*Baccharis salicifolia*).

The Neotropic Cormorant, also called the Olivaceous Cormorant, is easily distinguished from the Double-crested Cormorant (*Phalacrocorax auritus*) by its smaller

Figure 1. Neotropic Cormorant in the Ojo de Agua at Río La Purísima, Baja California Sur, 7 February 2003.

Photo by Gorgonio Ruiz-Campos

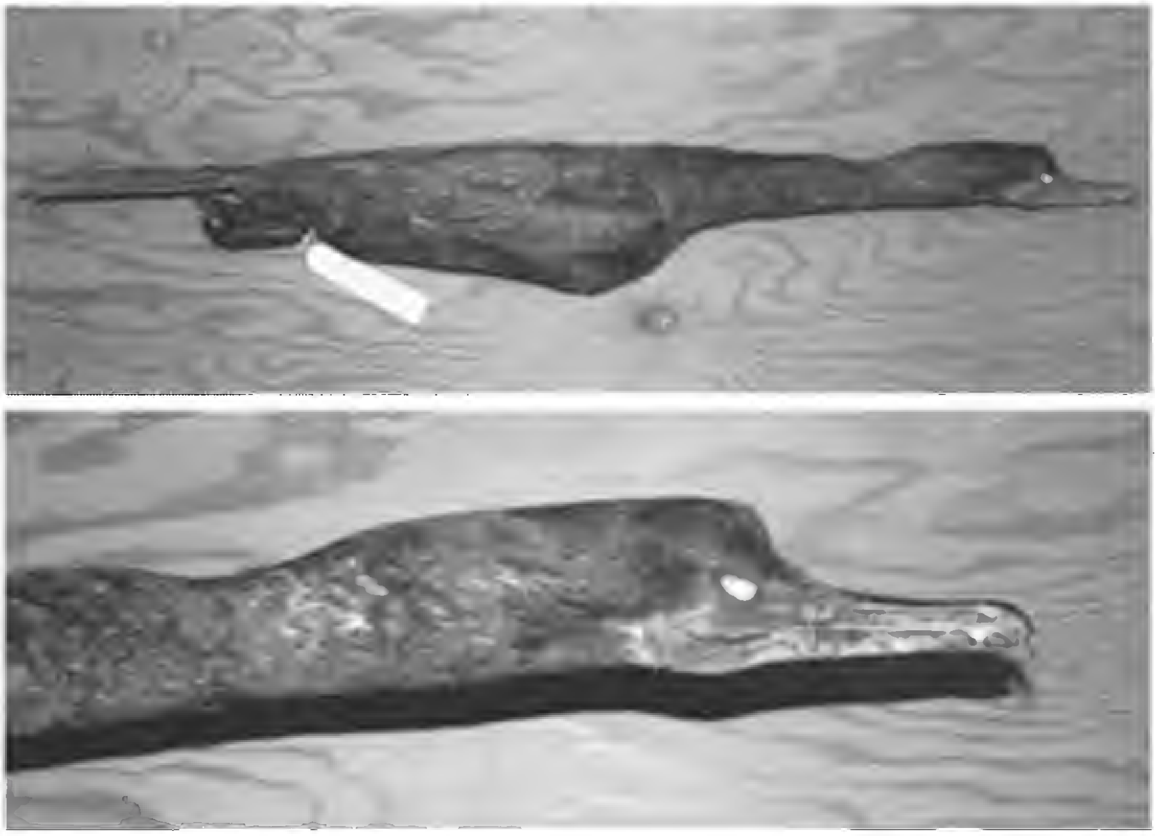

Figure 2. (A) Adult male Neotropic Cormorant collected at Ojo de Agua, Río La Purísima, Baja California Sur, 8 February 2003; (B) head of the same specimen showing the feathered, dark lores.

Photos by Gorgonio Ruiz-Campos

size and relatively longer tail, its dark, feathered lores (orange and unfeathered in the Double-crested), and its less extensive gular pouch with a pointed rear margin; in breeding plumage the thin white feathered border of the gular pouch is diagnostic (Sibley 2000). Additionally, the scapular feathers of the Neotropic Cormorant are more pointed than in the Double-crested.

Neotropic Cormorant is resident from southern Sonora, central and eastern Texas, and southeastern Louisiana south throughout most of lowland Mexico, Central America, and South America to Tierra del Fuego; vagrants have also occurred through much of the central and western United States (Kansas, Colorado, Nebraska, South Dakota, Minnesota, Illinois, Arkansas, Nevada; AOU 1998). This species is also resident on certain Caribbean islands, including Great Inagua (Bahamas), Cuba, the Netherlands Antilles, and Trinidad (AOU 1998). It has recently increased markedly in the western United States, now occurring regularly (and probably breeding) in New Mexico and southeastern Arizona. Notably, however, this species has not yet been recorded in Baja California [Norte] in the Colorado Desert region, although there are now 13 records from adjacent California, all of which are from Imperial and Riverside counties, primarily from 7 April to 7 October (California Bird Records Committee data).

Currently, the Neotropic Cormorant is known to be a scarce and very local resident in Baja California Sur. The earliest record there was of 250 at Bahía Magdalena 6–10 March 1982 (Wilbur 1987, Wurster et al. 2001); there have been at least three subsequent reports (involving three to five birds) at that locale 1989–1998 (Wurster et al. 2001). The second peninsular record was of one at San José del Cabo 13 December 1983 (Wurster et al. 2001). Subsequently, the species has been found regularly at San José del Cabo, with seven additional reports 1983–2003 (maximum of 10 on 2

Table 1 Recent Additional Records of the Neotropic Cormorant in Baja California Sur

Date	Locality	Number[a]	Source[b]
26 Oct 2001	La Paz (Estero de los Aripes)	2 (ad., imm.)	vt. RAH, RAE
26 Oct 2001	Ojo de Agua east of La Purísima	1 ad.	†FMR et al. (NAB 56:109)
11 Sep 2002	Canal Santo Domingo (Boca de Las Animas)	5 (4 ad., 1 imm.)	EP
29 Jan 2003	Chametla	1	vt. SGM, RC (NAB 57:260)
30 Jan 2003	Todos Santos	1	vt. SGM, CB (NAB 57:260)
10 Feb 2003	Carambuche (La Purísima/San Isidro)	11	†JEP (NAB 57:260)
13 Feb 2003	Todos Santos	1	JEP (NAB 57:260)
15 Feb 2003	Estero San José del Cabo	1	JEP (NAB 57:260)
6 May 2003	El Centenario flats	2	RC, DG

[a] ad., adult; imm., immature.

[b] vt., videotape; †, written description; CB, Casey Beachell; DG, Daniel Galindo; EP, Eduardo Palacios; FMR, Fred M. Roberts; JEP, James E. Pike; RAE, Richard A. Erickson; RAH, Robert A. Hamilton; RC, Roberto Carmona; SGM, Steven G. Mlodinow.

August 1985; Wurster et al. 2001, Table 1). Since 1992 it has been seen regularly in the vicinity of La Paz (Wurster et al. 2001, Table 1), and there are now two records from Todos Santos (Unitt 2001, Table 1). It now appears that the species is regular in the vicinity of La Purísima, where there are three recent reports. The northernmost records are from San Ignacio, where one adult was seen 1 March 1994, and Laguna San Ignacio, where a rectrix was found 9 April 1989 (Erickson et al. 2001). Given that this species has occurred throughout most of Baja California Sur, it should be watched for at additional locations, especially coastal bays and significant inland bodies of fresh water. Breeding on the Baja California peninsula was finally confirmed on 11 September 2002, when Eduardo Palacios observed two active nests with four adults and a juvenile in the northern part of Canal Santo Domingo near the Boca de Las Animas (25° 31.813′ N, 112° 5.249′ W).

It is still unclear whether the Neotropic Cormorant is a recent colonist of the peninsula or had simply gone undetected prior to 1982; however, the relatively thorough ornithological coverage of the Baja California Peninsula suggests the hypothesis of recent colonization is more likely.

I thank Richard A. Erickson and Eduardo Palacios for providing recent records of the Neotropic Cormorant in Baja California Sur and Marshall Iliff, Ron LeValley, and Richard A. Erickson for their helpful comments that improved significantly the content of this note.

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Heads of the Double-crested Cormorant (top) and the Neotropic Cormorant

Sketch by George C. West, Birchside Studios

WESTERN KINGBIRDS NESTING IN ASSOCIATION WITH *BUTEO* HAWKS

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Nesting associations between *Buteo* hawks and passerines have been reported in the literature for over a century (Sharp 1902, Cameron 1913, Bowles and Decker 1934, Bent 1937, Griffing 1974, McGillivray 1978). Reports involving passerine nesting associations with Swainson's Hawks (*Buteo swainsoni*) and Ferruginous Hawks (*Buteo regalis*) have been anecdotal, and to our knowledge the importance of these associations has not been investigated. In their classification of nest defenses Collias and Collias (1984) recognized birds that use "protective nesting associations with formidable species." These formidable species may include large birds of prey, colonies of seabirds, or aggressive insects. Konrad and Gilmer (1982) discussed a potentially mutualistic relationship between Western Kingbirds (*Tyrannus verticalis*) and Swainson's Hawks, in which kingbirds may benefit from the presence of hawks in the form of protection from predators and additional food from insects attracted to the nest site by the presence of prey remains, dead hawk nestlings, or excrement. The raptors, in turn, may benefit from kingbirds feeding on pest insects and from their vigilance in alarm-calling and early detection of predators. We investigated nest-site selection of Western Kingbirds in sagebrush steppe of Oregon and provide support for the idea that this species prefers to nest in association with Swainson's and Ferruginous Hawks.

Our 444.5-ha study area consisted of an isolated group of 187 western juniper (*Juniperus occidentalis*) trees growing along 4.6 km of Juniper Canyon and associated drainages on the Naval Weapons Systems Training Facility (NWSTF), Boardman, in Morrow County, Oregon. Elevations ranged from 215 to 287 m, with moderate slopes of 5% to 20%. Trees in the study area were no further than 1025 m apart, and 115 trees were clustered in a 22-ha area. Beside those in juniper trees, one kingbird nest was located in a big sagebrush (*Artemisia tridentata*), built inside an old Black-billed Magpie (*Pica pica*) nest, and several were built on sheds and fences associated with ranching operations. These were not located in the vicinity of trees and were excluded from analysis.

Using aerial photographs, we located every juniper tree in the study area and marked each tree with a numbered metal tag. In addition, we recorded the height, circumference, and coordinates of each juniper. Trees were inspected for nesting activity no less than once every 2 weeks from April through July in 1996 and 1997. Once we located nests, we checked them at least once a week until their outcome was determined.

We tested for a nesting association between kingbirds and the raptors by using Fisher's exact test (Sokal and Rohlf 1995). First egg dates for kingbird nests ranged from 20 May to 29 June (median 31 May). Because the raptor nests were observed from a distance we did not record clutch-initiation dates but rather the first date that a nest site was noted as occupied. For Swainson's Hawks these dates ranged from 11 April to 27 May (median 5 May). Ferruginous Hawks initiated nests as early as mid March, prior to our arrival on the study area. First observed activity dates ranged from 22 March to 18 April (median 10 April). Hawk nests that failed prior to the kingbird's median clutch-initiation date were excluded from this analysis. When multiple kingbird nests were built in a single tree within the same year, only the first nest was used in our analysis.

We calculated tree density at kingbird nest sites by centering a 15-ha circular plot around each nest tree. We selected 15 ha on the basis of the territory size of kingbirds nesting in the desert of New Mexico (Cuesta 1974), and we assume that this area approximates kingbird territory size in our study area. We compared nest-tree height with the mean height of neighboring trees (within each 15-ha plot) by using a *t* test in which equal variance was not assumed (StataCorp 1997). We used ArcView's Spatial Analyst (Environmental Systems Research Institute 1996) to map tree density throughout the study area by 2-m grid cells. We devised an index of tree density with five classes (class 1 = 1–3 trees/ha, class 2 = 4–9 trees/ha, class 3 = 10–21 trees/ha, class 4 = 22–44 trees/ha, and class 5 = 45–83 trees/ha). Cells were assigned to a density class by the number of trees in the surrounding 15-ha area. Most (67.5%) of the 444.5-ha study area was in tree-density class 1, 20.9% was in class 2, and less than 5% was within tree-density classes 3–5.

In 1996, we located seven kingbird nests, all built in different trees. In 1997 nesting kingbirds used 12 different trees, four of which contained multiple nesting attempts. At kingbird nest sites, the proportion of the surrounding 15-ha area in each tree-density class was similar to that of the study area as a whole (Figure 1). For the nine nest trees in 1997 that had at least one additional tree within the buffered plot, the nest tree and neighboring trees did not differ in mean height (*t* test, $P = 0.58$). In 1996, kingbirds selected two of five trees containing active hawk nests for their own nests, while only five of 182 trees without hawk nests were used by kingbirds (Fisher's exact test, $P = 0.011$). In 1997, kingbirds nested in six of eight trees with active hawk nests and only six of 179 trees without active hawk nests (Fisher's exact test, $P < 0.001$). Even when we exclude the 80 trees that fell within the highest density class the nesting association remains statistically significant in both years (Fisher's exact test, $P = 0.034$, $P < 0.001$, respectively).

Kingbirds have been reported to select areas with large widely scattered trees and, at a finer scale, build nests in the tallest trees (Bergin 1994). The proportions of area in each of five tree-density classes surrounding kingbird nest sites were similar to the proportions for the study site as a whole, suggesting that kingbirds were not selecting or avoiding areas with high or low tree density. Additionally, we were unable to find evidence in this study that kingbirds were selecting taller trees.

The protective-nesting hypothesis suggests that nest success should increase under the protection of a larger, more formidable neighbor (Collias and Collias 1984).

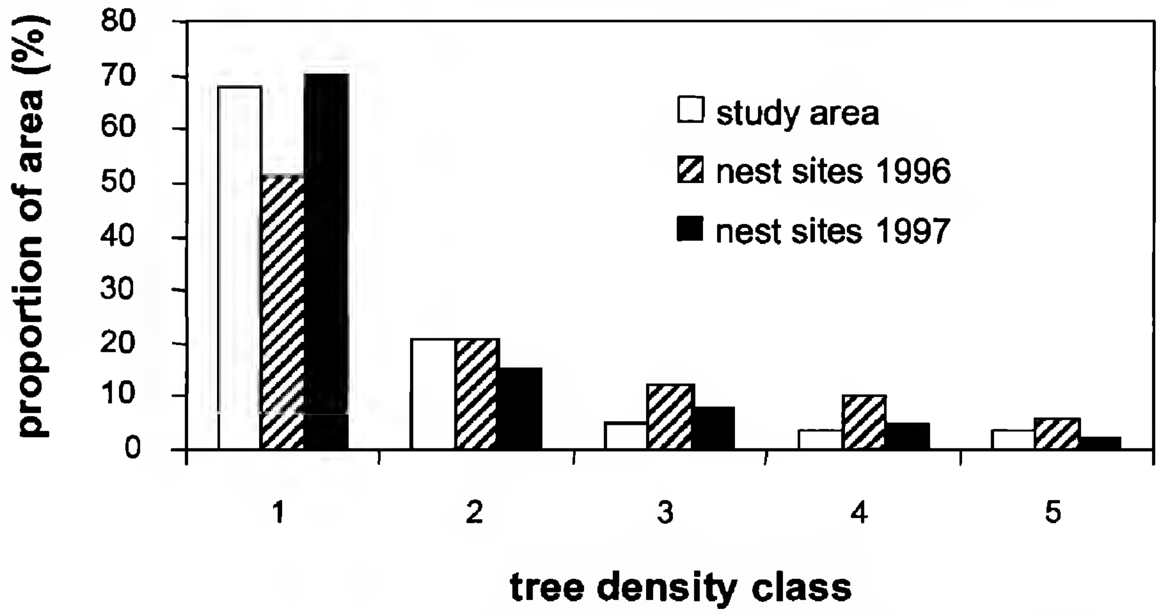

Figure. 1. Proportion of study area (444.5 ha) and proportion of 15-ha buffered area surrounding Western Kingbird nest trees ($n = 7$ in 1996, $n = 12$ in 1997) within five density classes (class 1 = 1–3 trees/ha, class 2 = 4–9 trees/ha, class 3 = 10–21 trees/ha, class 4 = 22–44 trees/ha, and class 5 = 45–83 trees/ha).

Potential diurnal nest predators frequently encountered on the NWSTF included the Common Raven (*Corvus corax*) and Black-billed Magpie, and hawks appeared to defend against these species adequately. Western Kingbirds arrived at our study site and began nest building after hawks had initiated nesting. This suggests that kingbirds are seeking the association with *Buteo* nests. Because of small sample sizes we were unable to test the predator-avoidance hypothesis, but we suggest the relationship is more likely commensalistic than mutualistic, conferring no benefit to the nesting raptors, and perhaps bearing an energetic cost to the raptors, as kingbirds were regularly observed harassing both adult and nestling Swainson's Hawks. A motion-triggered video camera used in 1996 as part of a provisioning study recorded frequent and extreme harassment of adult and nestling Swainson's Hawks by kingbirds. On one occasion in July 1997, we observed a kingbird land on the back of a female Swainson's Hawk as she left her nest and ride there, with wings outspread, for approximately 200 m.

This study has demonstrated a nesting association between Western Kingbirds and *Buteo* hawks breeding in juniper–sagebrush steppe. Future work on this interspecific association should focus on the reproductive costs and benefits of sharing a nest site.

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A SPECIMEN OF THE NOMINATE SUBSPECIES OF THE RED-SHOULDERED HAWK FROM CALIFORNIA

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The Red-shouldered Hawk (*Buteo lineatus*) is a polytypic species with a disjunct North American breeding range. Four or five subspecies in two distinct groups are recognized (AOU 1957, Stresemann and Amadon 1979, Wheeler 2003a). Three or four of these (in one group) breed in the eastern half of North America, whereas one well-marked subspecies, *B. l. elegans*, resides along the Pacific coast, primarily in California, but also in southern Oregon, western Nevada, western Arizona, and Baja California (Wilbur 1973, Glinski 1982, 1998, Howell and Webb 1995, Marshall et al. 2003, Wheeler 2003b). The nominate subspecies, *B. l. lineatus*, is migratory, breeding primarily in the northeastern United States and migrating as far south as Florida and central Mexico (Stresemann and Amadon 1979, Howell and Webb 1995, Wheeler 2003b). Three other resident subspecies from the southeastern United States and northern Mexico have been recognized, *texanus*, *alleni*, and *extimus*; however, Wheeler (2003a) synonymized *texanus* with *alleni*.

On 21 September 1996 Moore found a dead *Buteo* hawk along Interstate 5, 5.8 km north of Twin Cities Road, Sacramento County, California. It was very fresh, having presumably been struck and killed by a motor vehicle within the previous 24 hours. The specimen (T. B. Moore 677) was donated in September 1999 to the Museum of Wildlife and Fisheries Biology (WFB), Davis, California. In February 2001 Engilis prepared it (A. Engilis, Jr., 2258) as a freeze-dried whole specimen with the left wing extended (WFB 4819). The bird was in a state of partial decomposition (because of a previous freezer malfunction), so the specimen could not be weighed accurately and the gonads could not be examined to ascertain sex. It was in fresh definitive plumage, and it showed no signs of prior captivity or evidence that it had been unnaturally transported by motor vehicle. In March 2001 Pyle and Engilis tentatively identified the specimen as *B. l. lineatus*, the first record of this subspecies in California (*cf.* Patten et al. 2003). This identification was confirmed by Pyle during direct comparison with other Red-shouldered Hawk specimens at the National Museum of Natural History (USNM), Washington, D.C., in August 2001.

The specimen from California was larger than most other Red-shouldered Hawks at USNM. In size it is typical of female *lineatus*, particularly in wing and tarsal lengths (Table 1, Figure 1), but too large to be any of the other subspecies or a male *lineatus*. The plumage of the California bird was also typical of *lineatus* but not of *elegans* (Figure 1) or the other subspecies. Important characters shown by the California bird and diagnostic of *lineatus* in definitive plumage include a dark-centered crown, upperpart feathers with thin rufous edging, dusky greater coverts and secondaries with indistinct grayish bars, dusky rectrices with seven narrow and indistinct whitish bars, a dark throat, and distinct and relatively wide blackish streaks on the breast (Figure 1). By contrast, in definitie plumage, *elegans* shows a paler crown, upperpart feathers with broader rufous edging, blacker greater coverts and secondaries with more distinct white bars, fewer (3–5) and broader bars on the rectrices, a paler throat, and an unstreaked breast with a brighter rufous-orange wash (Figure 1). In addition to being

Figure 1. Red-shouldered Hawk specimens WFB 3251 (left), WFB 4819 (center), and WFB 4856 (right) showing dorsal (top) and ventral (bottom) aspects. All three specimens are adult females in typical plumage. WFB 3251 (*elegans*) was collected near Stinson Beach, California, in 1984 or 1985; WFB 4819 (*lineatus*) was collected in Sacramento County, California, on 26 September 1996; WFB 4856 (*lineatus*) was collected in Lincoln County, North Carolina, on 14 December 2000. See text for subspecific diagnosis.

Photos by Andrew Engilis, Jr.

Table 1 Measurements (mm) of Subspecies of the Red-shouldered Hawk[a]

	n	Wing chord	Tail length	Culmen from cere	Tarsus
California specimen[b]		350	212	23.9	83.2
B. l. elegans					
Female	55	290–322	185–215	20.2–23.7	72–79
Male	46	276–309	180–210	19.6–22.5	71–78
B. l. lineatus					
Female	48	326–360	209–236	22.6–25.1	77–85
Male	34	309–341	197–223	20.8–23.1	74–81
B. l. texanus					
Female	12	322–345	191–220	20.6–24.7	75–82
Male	9	304–329	179–211	18.9–23.1	73–79
B. l. alleni					
Female	24	294–338	182–209	21.2–24.1	76–82
Male	43	278–321	173–200	19.4–22.3	73–80
B. l. extimus					
Female	13	287–315	173–204	19.9–23.6	73–81
Male	10	272–301	163–194	18.2–21.9	70–78

[a] Ranges are based on 95% confidence intervals as estimated by means plus or minus 2 standard deviations from values given in the literature (Friedmann 1950, Oberholser 1974, Palmer 1988, Crocoll 1994) and from 105 specimens measured by Pyle and Engilis at the Museum of Wildlife and Fisheries Biology, University of California, Davis, the U. S. National Museum, Washington, D.C., the California Academy of Sciences, San Francisco, and the Museum of Vertebrate Zoology, University of California, Berkeley.

[b] WFB 4819; measurements recorded by Engilis.

smaller (Table 1), the two or three southeastern subspecies differ from *lineatus* and the California bird in having generally paler and grayer crowns and/or upperparts, fewer white bars on the rectrices (4–6 in "*texanus*" and 4–5 in *alleni* and *extimus*), and paler reddish underparts with thin or no black streaking on the breast. Thus the combination of size and plumage confirm the California specimen as an adult female *B. l. lineatus* (*cf.* Friedmann 1950, Johnson and Peters 1963, Oberholser 1974, Wheeler 2003a).

North of Mexico, Red-shouldered Hawks are rarely recorded far from the species' breeding range. In western North America, the AOU (1998) referred to extralimital records from Washington, southern Idaho (sight report), Montana, southern Saskatchewan (sight reports), Utah, and southern Arizona, but few of these have apparently been confirmed to subspecies. Specimens of two fledglings taken in southwestern Arizona during the summer of 1970, another bird photographed near Tucson on 15 January 1976, and a sight record from Valencia, New Mexico, 17 February 2002 were identified as *B. l. elegans* (Glinski 1982, Williams 2002; but see Glinski 1998 concerning the fledglings). A specimen reportedly taken at Elgan, Utah, on 28 September 1939 by biologists studying locust ingestion in birds (Knowlton and Harriston 1943) was identified uncritically as *B. l. lineatus* and accepted as such by Friedmann (1950). However, the specimen was not saved (Hayward et al. 1976), Behle (1944) apparently did not accept this subspecific diagnosis, and Behle et al. (1985) and Crocoll (1994) attributed Utah records to *elegans*. In Colorado, a Red-shouldered Hawk collected in El Paso County, on an unknown date, was identified as *lineatus* by Allan R. Phillips (Bailey and Niedrach 1965). Ten records from Colorado summarized by Andrews and Righter (1992) were primarily during migration in the eastern half of the state, suggesting that they represent *lineatus* more likely than *elegans*. A photo of an over-wintering bird from Colorado published by Webb (1978) appears to be of *lineatus*. We could locate no other published records of *lineatus* closer to California than Colorado. Farther east, *lineatus* breeds and winters rarely and is an uncommon migrant through the eastern Great Plains (AOU 1957, Thompson and Ely 1989, Sharpe et al. 2001, Tallman et al. 2002).

Recent sight observations indicate an expansion of Red-shouldered Hawks into Washington and throughout the Great Basin, primarily during spring and fall (e.g., Truan and Percival 2000, Floyd 2002, Mlodinow et al. 2002, Trochlell 2002), but none of these observations has been attributed to subspecies. We encourage observers in these areas to identify and publish the occurrence of these well-marked subspecies groups. On the basis of this information and the California specimen, we surmise that *B. l. elegans* is expanding its range north and east, perhaps as far as Utah and New Mexico, and that *B. l. lineatus* migrates uncommonly through the Great Plains and can rarely stray as far west as California. Late September, the date of the California specimen, is early for migration of *lineatus* (Wheeler 2003a), suggesting the possibility that this individual arrived previously (as a fall, winter, or spring vagrant) and remained in the region for the summer.

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ADDITIONAL NOTES ON THE SOUTHERN LIMIT OF THE ANCIENT MURRELET IN BAJA CALIFORNIA, MEXICO

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The Ancient Murrelet (*Synthliboramphus antiquus*) has been recorded six times in Mexican waters, five times off the northwest coast and once off the southeast coast of the Baja California peninsula. The first record, and the only specimen, was of a bird taken near Ensenada on 25 December 1927 (Grinnell 1928). The second record was of a group of five seen near Islas Los Coronados on 24 February 1980 (McCaskie 1980, Erickson et al. 1995, Howell and Webb 1995), not 1975 as given by Wilbur (1987). An apparently unhealthy bird in first-year basic plumage was photographed at close range in Ensenada harbor on 9 January 1994 (Erickson et al. 1995). The following year, a group of three was observed west of Punta Arena near the southeast tip of Baja California Sur on 21 December 1995. These birds had "black bibs with white [plumage] behind" (Erickson and Howell 2001:126), suggesting individuals in their second year or older. This record is the most southerly of the Ancient Murrelet on the eastern coast of the Pacific Ocean. Nearly three weeks later, on 8 January 1996, one Ancient Murrelet was seen just north of Ensenada at El Sauzal harbor. Last, an individual was observed at Ensenada on 3 January 1998 (Erickson and Howell 2001).

While examining specimens of alcids in the Museum of Comparative Zoology (MCZ) at Harvard University, Sealy located the specimen of a female Ancient Murrelet (Figure 1) collected "near Ensenada" in 1927 (original field number 2311 in the Wright M. Pierce collection, now MCZ 250816, original number 11697). No additional information was given on the label. Judged from the bird's plumage and measurements (flattened wing 139.2 mm, culmen 12.0 mm, bill depth 5.8 mm, tarsus diagonal 27.7 mm), the specimen is of an individual in its first year, not "apparently [an] adult," as Grinnell (1928:56) had stated (see Sealy 1976, Sealy et al. 2001). The white throat and gray chin, lack of white feathers encircling the crown, and slightly worn primaries, secondaries, and wing coverts are typical of individuals in December of their first winter (Gaston 1992, 1994, Sealy et al. 2001).

Figure 1. Specimen of a first-year female Ancient Murrelet (MCZ 250816) taken near Ensenada, Baja California, Mexico, on 25 December 1927.

Photo by Jeremiah Trimble

From October to December, Ancient Murrelets normally arrive in various portions of their primary wintering range between southern British Columbia and central California (Gaston and Jones 1998). Numbers build up from November through January, then decline in February and March when birds depart for breeding colonies, which are attended as early as March in the Queen Charlotte Islands in northern British Columbia (Ainley 1976, Sealy 1976, Gaston et al. 1993, Gaston 1994). The Ancient Murrelet has been recorded in Mexican waters between late December and late February, during the nonbreeding period of primarily southward dispersal. A link has been suggested between sightings in Mexico in 1980, 1994, and 1995 and the larger-than-usual numbers of individuals occurring south of central California, commonly considered the southern limit of the species' winter range, in the winters of 1979–80, 1993–94, and 1994–95 (McCaskie 1980, 1996a, b, Erickson et al. 1995, Erickson and Howell 2001). Mexican records from 1927, 1996, and 1998, however, apparently did not coincide with unusually large numbers in southern California (Grinnell and Miller 1944, McCaskie 1996a, b, Erickson and Howell 2001). In fact, Ancient Murrelets occur in small numbers in southern California in winter in many years (even rarely in summer), with several records near the United States–Mexico border (Howell 1917, Unitt 1984). All Mexican records except the one from Punta Arena are from within 100 km of the border but still within the southern periphery of colder waters of the California Current within the Southern California Bight (Dailey et al. 1993). The northernmost part of the Baja California peninsula probably represents the previously overlooked southern extent of the Ancient Murrelet's winter range, which supports small numbers of birds in certain years. The southern extent of the winter range, therefore, is slightly north of that mapped by Gaston and Jones (1998:217). The southern extensions of the winter ranges of several other alcids, such as the Common Murre (*Uria aalge*), Pigeon Guillemot (*Cepphus columba*), Marbled Murrelet (*Brachyramphus marmoratus*), and Rhinoceros Auklet (*Cerorhinca monocerata*), occur in the same part of Mexico, at the southern end of the California Current (Erickson et al. 1995, Howell and Webb 1995, Gaston and Jones 1998). Only three species of alcids, Xantus's Murrelet (*S. hypoleucus*), Craveri's Murrelet (*S. craveri*), and Cassin's Auklet (*Ptychoramphus aleuticus*), winter regularly in coastal waters south of the California Current, although this is not mapped accurately for the Xantus's Murrelet in Gaston and Jones (1998:207). Two of the latter species also breed to some extent south of the California Current, whereas all Craveri's Murrelets apparently breed south of this current (Gaston and Jones 1998).

The group of three Ancient Murrelets observed at Punta Arena (23.5° N) was 1700 km south of the United States–Mexico border. These birds were much farther south than the other records and were south of the point to which the California Current extends in any year. Thus these birds likely were vagrants of one of the most vagrancy-prone alcids, with approximately 100 extralimital records for North America, often far inland (Munyer 1965, Verbeek 1966, Sealy and Carter 1980, Sealy et al. 2001). Most birds found inland, however, have been first-year birds in basic plumage, whereas the Punta Arena birds apparently were in alternate plumage, that is, subadults or adults. On the Asian side of the Pacific Ocean, occurrences of the Ancient Murrelet as far south as Hong Kong (22.5° N) have been regarded as accidental (Chalmers 1986). Additional observations along the west coast of Baja California, south of Ensenada, are needed to reveal whether Ancient Murrelets winter occasionally south of the waters of the California Current. Observers should look for birds in both basic and alternate plumages, especially between October and March.

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A REVIEW OF THE LITERATURE OF *ACCIPITER STRIATUS PEROBSCURUS*, WITH A REPORT OF SPECIMENS FROM CALIFORNIA, COLORADO, AND NEW MEXICO

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Snyder (1938) described a dark, rainforest subspecies of the Sharp-shinned Hawk (*Accipiter striatus perobscurus*) from Graham Island, Queen Charlotte Islands, British Columbia. This subspecies is darker dorsally and ventrally in all plumages than the widespread North American subspecies *A. s. velox* (Figures 1 and 2). Snyder gave its summer range as from southeastern Alaska (Yakutat Bay) south on the islands and adjacent coast of British Columbia to Vancouver Island, and its winter range as from the Queen Charlotte Islands to Vancouver Island "and apparently south to the San Francisco Bay region of California." He also mentioned an inland record from the Okanagan Valley of British Columbia. The American Ornithologists' Union added *A. s. perobscurus* to its check-list in the 19th supplement (AOU 1944), with its summer and winter ranges as delineated by Snyder. In this note I extend the winter range, clarify the characters of the subspecies, and suggest that migrants and wintering birds in other collections be reexamined.

Brodkorb (1940) added the mainland locality of Hazelton, British Columbia, as a possible nesting locality on the basis of juveniles taken 3 and 4 August, though juveniles of *A. s. velox* were also taken there 28 July and 12 August, and he cited November specimens from Portland and Tillamook, Oregon. Aldrich, when working on the *Birds of Washington* (Jewett et al.. 1953), probably provided Friedmann (1950) with the nesting range in that state, as Jewett et al. wrote "probably breeding in the Puget Sound region and on the Olympic Peninsula." The AOU (1957) apparently followed Jewett et al. in including the Olympic Peninsula in the nesting range and in extending the winter range to Oregon, but it deleted California from the range entirely.

Subsequent authors (e.g., Godfrey 1986, Palmer 1988) have accepted *perobscurus* as valid, repeating the taxon's nesting and winter ranges as outlined by the AOU (1957). Brown and Amadon (1989), del Hoyo et al. (1994), Bildstein and Meyer (2000), and Ferguson-Lees and Christie (2001) all omitted both the Alaska and Washington portions of the nesting range, although VIREO provided Bildstein and Meyer (2000) with a photo of a typical *perobscurus* to use as a front-cover illustration. That photo was taken near Santa Barbara, California, in November 1999. Neither *perobscurus* nor dark Sharp-shinned Hawks have been reported from Arizona (Phillips et al. 1964, Monson and Phillips 1981), Colorado (Bailey and Niedrach 1965), Idaho (Burleigh 1972), Texas (Oberholser 1972), or Utah (Hayward et al. 1976, Behle 1985). In their treatise on the birds of British Columbia, Campbell et al. (1990) neglected to address *A. s. perobscurus*.

I compared two dark adults from New Mexico and an immature from Yakima County, Washington, in the Museum of Southwestern Biology (MSB) with specimens of *perobscurus* at the American Museum of Natural History, including immature topotypes from the Queen Charlotte Islands, and at the United States National Museum of Natural History (USNM). They proved to be migrant of *perobscurus*. Subsequently, using the relative color and pattern characters presented in Table 2, I identified an adult from California and immatures from Oregon, Washington, Colorado, and New Mexico (Table 1) as *perobscurus*. These specimens are illustrated in Figures 1 and 2.

In addition to dark coloration, Smith (1988) characterized coastal populations from northern California to southeastern Alaska as having relatively short wings and tails and relatively long but thin tarsi. Using the correction factors compiled by Smith (1988)

Figure 1. Top row, four adults of *Accipiter striatus velox* from New Mexico, December–April. Bottom row, left to right, four adults of *Accipiter striatus perobscurus*: MSB 12116, California, Humboldt Co.; MSB 12121, California, Humboldt Co.; MSB 4966 New Mexico, Socorro Co.; MSB 18769 New Mexico, Valencia Co. (see Table 1 for full data).

Figure 2. Top row, four immatures of *Accipiter striatus velox* from Nevada, Arizona, and New Mexico, September–December. Bottom row, left to right, five immatures of *Accipiter striatus perobscurus*: MSB 23480, Oregon, Benton Co.; MSB 4303 Washington, Yakima Co.; MSB 19976, Washington, Stevens Co.; MSB 12943, Colorado, Boulder Co.; MSB 3888, New Mexico, Curry Co.

Table 1 Specimens of *Accipiter striatus perobscurus* in the Museum of Southwestern Biology

MSB no.	Sex	State	County	Locality	Date
Adults					
12116	male	California	Humboldt	near Arcata	1 January 1959
12121	female	California	Humboldt	Eureka	12 February 1959
4966	female	New Mexico	Socorro	Socorro	22 December 1981
18769	female	New Mexico	Valencia	Los Chaves	19 February 1994
Immatures					
4303	female	Washington	Yakima	Toppenish, 12 mi. W	27 December 1957
19976[a]	female	Washington	Stevens	Northport, 19 mi S, 5 mi. E	[1995–1997]
23480	male	Oregon	Benton	Philomath, 2 mi E	1 November 1966
12943	male	Colorado	Boulder	Lyons, 1 mi N	[1980s]
3888	male	New Mexico	Curry	Clovis	9 September 2003
23801[b]	male	New Mexico	Santa Fe	Pajarito Village	13 October 2003

[a] Intermediate *A. s. velox* × *A. s. perobscurus*.

[b] Not illustrated in Figure 2.

to compare measurements of dried museum specimens with those of live birds, I found that only six of the ten specimens I identify here as *perobscurus* have wing chords shorter than the mean (per age and sex) of a very large series of migrants trapped in the Goshute Mountains of Nevada (Hoffman et al. 1990). Only three of four males (no females) have tails longer than Nevada migrants. However, seven of ten have tarsi longer tarsi and all ten have tarsi thinner than the Nevada birds.

Snyder's description (1938) was almost exemplary, but I believe he overemphasized that the first-year plumage is more diagnostic than the adult plumage. This statement has been cited uncritically by subsequent authors (Friedmann 1950, Palmer 1988, Bildstein and Meyer 2000), but it is certainly not the case in the small series presented here (Figures 1 and 2). I wonder if Snyder's type series might have contained late migrants of *velox*. Brad Millen of the Royal Ontario Museum (ROM) kindly posted on the World Wide Web nine files of photos of that museum's series of adults of

Table 2 Relative Color and Pattern Differences Distinguishing *Accipiter striatus perobscurus* from *A. s. velox*

Plumage	Character	*A. s. velox*	*A. s. perobscurus*
1st fall/winter	dorsum	browner	more sooty
	venter	streaking less dense	streaking denser, often darker
	tarsal flags	pinker, less heavily barred	darker, more heavily barred
	light tail bars	lighter, clearer gray	slightly darker
2nd fall/winter	dorsum	browner	more sooty, but some inseparable from
	venter	streaking less dense	*velox* streaking denser, often darker
	tarsal flags	pinker, less heavily barred	average darker and more heavily barred
	light tail bars	medium gray	medium gray
Definitive	dorsum	medium to dark gray, often	sooty barring occasionally massive,
	venter	with bluish cast barring paler	always heavier and darker
	tarsal flags	and less dense lighter and	heavier and darker
	light tail bars	pinker medium gray	a shade darker

perobscurus, including the type specimen. The type is not a "juvenile" as stated by Snyder but is in second-year plumage.

Although Snyder indicated that *perobscurus* is migratory south to the San Francisco Bay area, and the 19th supplement to the AOU Check-list said it wintered to central California (AOU 1944), Friedmann (1950) and the AOU (1957) stated that it ranged in winter south only to Oregon, and Palmer (1988) said it was nonmigratory. However, J. A. Munro collected an adult female (ROM 86061) 19 November 1953 in San Luis Obispo County, California. Patten and Wilson (1996) published a photograph of a bird seen by J. C. Wilson on 12 November 1994 at Bakersfield, Kern County, California. The bird, an immature, was uniformly warm brown below, and they considered it to be a dark morph. Clark and Wheeler (1998), without having seen the colored slides of the bird (Patten in litt. January 2004), decided it was *perobscurus*. I examined the three original slides and cannot decide if it is a morph, a phase, or, more likely, simply stained, but the bird definitely cannot be identified as *perobscurus*. Clark and Wheeler (1998) published a photo of specimens of four subadults but failed to give any information about them. They also mentioned a juvenile "male" collected on "Lassen Park, California, in 1908" but failed to cite its number or give its date. That specimen is actually a juvenile female by size (wing chord 205, tail 162), USNM 164125, collected by A. K. Fisher (field no. 85), on 26 August 1898, on Lassen Peak at the lower edge of the Hudsonian zone. This specimen tentatively may extend the nesting range of *perobscurus* south to Lassen Peak, Shasta County, California, although migrant Sharp-shinned Hawks may occur by that date. Note that Grinnell and Miller (1944) recognized "darker variants among the winter populations" and wrote that "some moderately dark individuals apparently are permanent residents in California," but they did not call them *perobscurus*. Such specimens should now be reexamined. The nesting range of *perobscurus* is surrounded by that of *velox*, so one would expect intermediates such as MSB 19976, the middle specimen in the bottom row in Figure 2, presumably a migrant, from Stevens County in eastern Washington. This window-killed female is typical of *perobscurus* dorsally but is as pale as *velox* ventrally, a mosaic of intermediacy, rather than just a blend of characters of the two subspecies.

It is interesting to note that there are three other sooty-backed subspecies of raptors adapted to the rain forests of the coastal British Columbia region: of the Northern Goshawk (*Accipiter gentilis laingi*), the Peregrine Falcon (*Falco peregrinus pealei*), and the Merlin (*Falco columbarius suckleyi*). Only the goshawk is apparently nonmigratory. There are five specimens of the *F. c. suckleyi* from New Mexico, one from Lake La Jara (AOU 1957), and four in the MSB collection. Two of these are intermediate toward *F. c. columbarius*. Specimens in other western collections should be examined in a search for these occasional long-distance wanderers.

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BOOK REVIEWS

Birds of the Salton Sea: Status, Biogeography and Ecology, by Michael A. Patten, Guy McCaskie, and Philip Unitt. University of California Press. 363 pages. 53 photographs (black-and-white), figures, maps. Hardback. $65.00. ISBN 0-520-23593-2.

The avifauna of vast landscapes in the western U.S. is often surprisingly poorly known (e.g. the entire state of Nevada). Too often, these regions are suddenly faced with major threats—from urban sprawl, water diversions, a proposed military base expansion—each one sending conservationists scrambling for data to mine and experts to interview. The Salton Sea, a large region of brackish wetlands and agricultural habitat in southeastern California, is used by millions of individuals of more than 400 bird species each year. Yet, until the late 1990s, it too had all but fallen through the cracks, ornithologically speaking. With one fell swoop, the publication of *Birds of the Salton Sea* has turned the tide on this trend, synthesizing decades of taxonomic research and observational data on bird distribution—the raw material for conservation work.

Prior to some pioneering census work by Point Reyes Bird Observatory in the late 1990s (Shuford et al. 1999, 2000, 2002), data from the sea had been limited to scattered notes on out-of-range species, toxicology reports, and a smaller number of research papers on breeding seabird biology. The sea has never been included in a breeding bird atlas, and neither has a Breeding Bird Survey route ever intersected much of its habitat. The two Audubon Christmas Bird Counts at the north and south ends, though long playing, cover just a fraction of the bird habitat available at the sea (and only for two days a year). Notable compendia on birds have been produced from regions just to the west (Unitt 1984) and east (Rosenberg et al. 1991), yet for most of the past 15 years, the sea's researchers and conservationists have relied on information that was either outdated (e.g. Garrett and Dunn 1981) or anecdotal and uneven (Massey and Zembal 2002).

Birds of the Salton Sea is generally well organized, exhaustively researched, clearly written, meticulously accurate, and absolutely chock-full of new and otherwise unavailable information on the birds of southeastern California. A glance at the bibliography alone—a Patten/Unitt *tour de force* of records committee proceedings, toxicology reports, identification essays, taxonomic analyses, and turn-of-the-century (and earlier) observations dredged from journals and survey reports—should inform the reader that this is an essential addition to any library of western birds.

The book opens with a concise and eminently readable "A History of the Salton Sink," which traces the Salton Sea's evolution from the former head of the Gulf of California (Pliocene) to its eventual isolation from the gulf, owing to sediment flowing out of the Colorado River delta. This is followed by a lucid description of the resulting Lake Cahuilla, a massive inland lake filled by Colorado River floodwaters as recently as 400 years ago, and "resurrected" numerous times in somewhat smaller dimensions during the 1800s by the same Colorado River floods heading northwest (= downhill) out of the delta. The authors then describe the result of the "fortuitous engineering blunder" nearly 100 years ago—the sea's accidental (re-) creation by a flooded irrigation canal, a scenario neither wholly artificial nor wholly natural. This section should prove invaluable to educators and speakers searching for materials for courses and lectures. The authors make good use of historical references without inundating the reader with lengthy descriptions and analyses.

The following section, "Conservation and Management Issues," provides an overview of selected conservation issues, and the final introductory section, "Biogeography of the Salton Sea," offers a mixture of archaeology, climate, hydrology, and vegetation, concluding with a synthesis of the modern-day distribution of the major groups of birds. Portions of the section "Biogeography of the Salton Sea" are strong, and the general reader may be most interested in the discussion of migratory pathways through the region, which the authors developed by synthesizing decades of field notes from Riverside, Imperial, and San Diego counties (few of which have appeared widely elsewhere; see figures 20–23). For example, flocks of Black Brant, regularly observed flying over the Anza–Borrego Desert immediately west of the Sea, are virtually unknown in Banning Pass to the northwest, suggesting a spring migration route out of the Gulf of California and across the Peninsular Ranges (rather than one passing through the Los Angeles Basin). After this section, the authors insert a comprehensive 30-page table of every recorded bird taxon known from the Salton Sink, including seasonal status codes, record type (i.e., specimen, sight record, or photograph), and applicable museum collection or reference information.

The heart of the text, the species accounts, starts 70 pages in, and follows a consistent format that includes a seasonal summary (e.g., for the Osprey: "Uncommon perennial visitor, more numerous in winter [late October to mid-March]"), paragraphs on historical and present status, ecology, and, where appropriate, taxonomy. Interspersed within the accounts are "family summaries" that begin each section.

The seasonal summaries within the species accounts are among the most detail-rich and carefully researched of any comparable publication, filled with early/late dates, high counts, and specific locales. The historical information tracing changes in the abundance of species' (and subspecies') status provided by these accounts is among the best I've seen for any region of California (e.g., the summaries for Greater White-fronted Goose and Clapper Rail). These accounts constitute the unique and lasting contribution of *Birds of the Salton Sea*. To relate just a few facts revealed: there are more Snowy Plovers in summer (200–225 pairs) than in winter (1/2 to 3/4 that number), and the winter population is the largest in the Interior West. One species of gull (the Ring-billed Gull) occurs in numbers more than an order of magnitude greater than the next most common species (California Gull) and winters by the hundreds of thousands in flooded fields of the Imperial Valley. Any large gray thrasher in mid-winter is as likely to be a Curve-billed (an extremely rare vagrant to California) as a Bendire's (breeds less than 50 miles away) and *definitely* not a Le Conte's, which is almost as rare, and appears only from spring to fall). The Large-billed Savannah Sparrow, a Gulf of California endemic, may become the next breeding bird of the Salton Sea, if it hasn't already done so by the time you read this.

The final section of the species accounts, taxonomy, is equally strong, with a few accounts comprehensive enough to warrant separate papers. All subspecies described for each species recorded within the Salton Sink are discussed in detail (as well as the history of various invalid races). The authors stray well beyond the boundaries of their study area, with many of the resulting sections being micro-treatises on the taxonomy of bird populations of the entire western U.S. (see California Gull, Brown Creeper, Common Yellowthroat). Perhaps as important (to birders at least), the authors include subspecific identification criteria that are otherwise difficult to find in contemporary ornithological literature for all but a handful of taxa.

Only because *Birds of the Salton Sea* contains the subheading Status, Biogeography, *and* Ecology is it necessary to assess its treatment of all three equally, and it will become clear to most readers that the first two topics receive preferential treatment. The introductory pages within "Conservation and Management Issues" already feel somewhat dated (perhaps inevitable?) and at times oversimplified. For example, the mass bird die-offs that continue to bring the Salton Sea so much negative attention are awarded just seven sentences and one vague graph, despite the authors' feeling that the die-offs may be "heralding a collapse of the ecosystem" (p. 8). The population-level effects of these die-offs are not clarified or explored in this section, or in the rest of the book. Were the kills of tens of thousands of Eared Grebes and pelicans in the early and mid-1990s responsible for the apparent crash in their numbers five years later during the early 2000s (K. C. Molina pers. comm.), despite the occurrence of several "good years" (e.g., 1999) in between?

Several studies of contamination of birds by pesticides (especially DDE) and heavy metals are cited but are not explored in much detail, despite the authors' repeated comments that such contamination is among the gravest threat to birds here. The reader will learn that studies have linked reproductive failures of the White-faced Ibis in Nevada to the birds' contamination by DDE on their wintering grounds in the Imperial Valley, but details are scant. Where is the contamination coming from? Are there "safe areas" without it? Are the hundreds of ibis pairs currently nesting in the Imperial Valley (or their offspring) suffering from this?

Bird habitat is also treated unevenly within "Biogeography." For example, the description of vegetation and habitat later in this section, though accurate, seems overly technical (e.g., "heliophytic" and "mesophytic" referring to the more familiar terms "wetland" and "riparian"), and there is little information on which birds are associated with which habitats (though a few are included in the photograph captions). Also missing are maps (even schematic ones) of the locations of the major bird communities within the sink, which are readily available in the oft-cited Shuford et al. (2000).

Although the species accounts are on the whole exceptionally well done, the "ecology" sections within them are probably best considered brief comments on microhabitat preference, since only a handful of accounts make even an attempt to describe the ecology of the species treated, even when an opportunity is readily available (e.g., the Eared Grebe and pelican die-offs; seasonal use of different habitats by the Mountain Plover). For example, nest-site choice in the White-tailed Kite, a species that has recently appeared as a breeder throughout the Southwest, is mentioned only as "Kites have nested in large Fremont Cottonwoods." Are there at least anecdotal generalizations that could have been included about site selection (e.g., that they prefer isolated groves of trees, surrounded by well-irrigated fields, with an abundance of prey through the breeding season)?

The tables presented in *Birds of the Salton Sea* are on the whole inconsistent. Several (e.g., salt levels during the early 1900s; fossil birds at Lake Cahuilla) could have been placed in an appendix, if used at all, which also might have been the place for the 30-page "Checklist of Birds of the Salton Sea." Most of the remaining tables in the book (9 out of 13) are scattered through the species accounts, which, although logical, forces the reader to comb through each section. A prominent selection of tables of bird counts in the introductory chapters would have been convenient. Several of these tables will be inaccessible to the great majority of readers, and more appropriate for separate papers, (e.g., mensural differences among races of Red Knots and California Gulls from the sea). On the other hand, the two pie charts (figures 19 and 63), which present relative proportions of breeding seabirds and wintering sparrows, are thoroughly enlightening, and should be useful for conservationists characterizing the sea's waterbird community, or for visiting birders combing through sparrow flocks. Finally, the map showing the region covered and the locations of sites mentioned in the text (both thoroughly buried on pp. 69 and 70) would have been better reproduced in the first few pages if not just inside the cover.

Technically speaking, this book is near perfect, and there are very few typos or oversights in the text and no real inaccuracies that I could find (though in just one instance, I detected an inconsistency between the family summaries and the following species accounts: on p. 218, the Vermilion Flycatcher is declared "extirpated" as a breeder, but later [p. 224] it is termed a "rare breeder in the Imperial Valley"). However, these in no way detract from the remarkable quality of scholarship, which is thoroughly impressive. The book is an excellent source of seasonal, distributional, and taxonomic information on the region's avifauna. Though it suffers from brevity when diverging into other fields (e.g., conservation, ecology), it is on the whole a welcome and long-overdue treatment of the birdlife of a region of international importance.

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Daniel S. Cooper

The Birdwatcher's Companion to North American Birdlife, by Christopher W. Leahy. 2004. Princeton University Press. 1039 pages, scattered line illustrations. Hardback. $39.50. ISBN 0-691-09297-4.

The promotional blurb calls this *Companion* "both a practical handbook for amateurs and a handy reference for seasoned birders." It is basically a reference manual of eclectic scope that covers topics related to North American birds (north of Mexico), with entries arranged alphabetically. Examples? Try "drake," "Hutton," "names, colloquial," "skimmer," "wreck," and "xanthochromatism," to name but six that my eyes lit upon in a random opening of pages. On page xii, the author explains his two-fold desires in writing such an encyclopedia: to have at his fingertips a book that could answer numerous technical to trivial questions about birds, and a longing for nontechnical accounts of the basic elements of birdlife that could be read for pleasure as well as information. An earlier iteration of the *Companion* was published in 1982, but this 2004 edition is greatly updated and expanded.

Readers may be tempted to dip into the book right away, picking subjects that interest them, or looking for definitions of bird-related words—and this is certainly what I did on opening my copy. But, as with most books, a few minutes reading the introductory material are well spent. The introduction will help readers appreciate the book's layout and refine their search image for information. It notes how broad subjects (e.g., flight, migration, molt) are treated in essay form with the aim of summarizing present knowledge. It lists examples of subjects that readers may not look for because they might not think of them, such as "cats," "chumming," "politics, birds in," and "religion, birds in." It lists subjects that come under the umbrella of physiology and anatomy (e.g., bursa of Fabricius, ossification, touch); it lists the family-level entries that can be found (albatross, anhinga, auk, etc.); it explains how bird-finding localities are organized; and it discusses other types of entries, such as name definitions and etymology, biographies (for all whose names appear in current scientific or English species names of North American birds), and nouns of assemblage. There is also a brief note on pronounciation (guides to which are provided for potentially unfamiliar words), an explantion of the bibliography, and a list of the appendices.

Then you're into a wealth of information—hundreds of entries, from "Abbreviations" to "Zygodactyl." Following these are six appendices, mainly lists and notes on the classification of North American birds. The book ends with a selected bibliography arranged by subject entries in the main text; thus, if you're interested in a specific subject, say, brood parasitism, you can find references to it quickly rather than having to search through the main entry or the whole bibliography.

How does one review such a work? I spent parts of two days leafing through the *Companion*, skipping from subject to subject (the accounts are well cross-referenced), and finding that time had slipped by, an hour here, and an hour there—time far better spent than surfing the Internet for information likely to be less carefully researched and less well written. An example of the writing style: "The auks, cormorants, and some other seabirds tend to be vocally reserved, though many tubenoses are given to weird nocturnal arias during the breeding season" (p. 731). Leahy indeed conveys a wealth of information in an easy, readable manner, so one of the book's objectives has been achieved.

What of content? Well, the *Companion* is a hefty mine of facts, although, like any book in a similar vein, it cannot be truly comprehensive. A work of this nature is predisposed to criticism for including some subjects but not others. As a test, a selection of birdwatching friends and I picked subjects we thought to find in the *Companion*, and for which we'd like a handy explanation or discussion. Of 25 terms or subjects, 12 could not be found at a first strike, but four of these were tracked down by looking in related entries (this was before I had read the introduction!). This means that I haven't (yet) found definitions for eight terms, although two of these (Neotropical migrant and stopover) are mentioned, without explanation, in the generally good discussion of migration. These two seem as worthy of inclusion as anachronistic inanities like the "six hundred club." The other six misses were aspect (as in plumage aspect of the Humphrey–Parkes system), fidelity (and not listed under site or mate), humerals (and not mentioned under wing), monophyletic (and not mentioned in the overview of taxonomy), productivity (related to monitoring bird populations), and riparian (certainly a buzzword in western habitat conservation). Still, the hits amount to about 70% of potential entries being included, which isn't bad. The last omission, riparian, may reflect a slight eastern bias in the *Companion*. For example, among journals listed as containing articles of "continentwide or international interest" we find *British Birds* but not *Western Birds*, and the Cordilleran Flycatcher (rather than the Pacific-slope) is purportedly a speciality of Yosemite (p. 883).

I was surprised to note a few outright errors, such as Northern Wheatears supposedly wintering in southeast Asia (pp. 493, 867; perhaps copied from the 1998 AOU checklist, which conveys the same misinformation). On p. 103, it is said that only the Masked and Blue-footed boobies have sexually dimorphic voices—but it is well known that the Brown Booby shares this trait. And the orbital ring (p. 597) is defined as "identical to an eye ring," despite the widespread distinction that the former refers to naked skin, the latter to feathering. In particular, Appendix I (checklist of North American birds, ambitiously enumerating subspecies) and Appendix II (checklist of casual and accidental species) are fraught with mistakes that could be corrected in the next printing. Here are some examples I found in a quick scan: Heermann's Gull does not breed off "Baja, California;" species that are *not* monotypic include the Lesser Black-backed Gull, Berylline Hummingbird, California, Canyon, and Spotted (misspelled *macualatus*) towhees; the Eastern Towhee comprises four (not 12) subspecies; the Tamaulipas Crow *is* monotypic; the Bermuda Petrel has not been recorded off the state of Oregon (!); and the Spoonbill Sandpiper record from British Columbia is overlooked. In a work of this scope, typographical errors are to be expected, but they are uncommon, not rare. More diligent copy-editing would have benefited the final product and remedied nonsensical sentences such as "Sanderlings tend to be comparable to or greater than breeding ranges in extent." (p. 495). More diligent proofreading would have added page numbers for (presumed) pp. 935–947.

In conclusion, while experts could quibble over details of their own subjects, the *Companion* offers well-balanced overviews of most topics (e.g., see Problems Involving Birds, especially the last paragraph) and a quick definition of miscellaneous words (now what kind of foot is anisodactyl?). It is a worthwhile addition to the library of anyone with an interest in North American birds. There is something for everyone here but not everything for someone—except perhaps the author, who is to be congratulated on an impressive feat of compilation and literacy.

Steve N. G. Howell

FEATURED PHOTO

IDENTIFICATION OF ADULT PACIFIC AND AMERICAN GOLDEN PLOVERS IN THEIR SOUTHBOUND MIGRATION

ALVARO JARAMILLO, San Francisco Bay Bird Observatory, P. O. Box 247, Alviso, California 95002

Connors (1983) and Connors et al. (1993) confirmed that American (*Pluvialis dominica*) and Pacific (*P. fulva*) Golden-Plovers breeding in sympatry in Alaska are distinct species, a conclusion adopted by the A.O.U. (1993). Distinguishing these two species requires that the bird's age or plumage class be determined first before the species can be identified. At any stage the identification requires close study, but adults in molt are the most difficult. In both species some prebasic molt takes place during fall migration. Because some field marks useful in juvenal or basic plumage, such as the color of the supercilium, do not apply to molting adults, many purported sightings of American Golden-Plovers have been questioned, and the distribution of adults in fall migration is uncertain. All or nearly all American Golden-Plovers occurring along the Pacific coast south of Alaska in fall migration are juveniles. In fact, there may be no certain records of adults in this region at this season (Paulson 1993). Because of uncertainty over published records, the California Bird Records Committee added the American Golden-Plover to its review list (Cole and McCaskie 2004), seeking documentation for all American Golden-Plovers in California from 2004 onward. This note is an attempt to focus attention on this issue in field identification.

The Pacific Golden-Plover breeds largely in Siberia east to westernmost Alaska and winters along the coasts of Asia and Australia, on Pacific islands, and in small numbers in California. The American Golden-Plover breeds from Alaska east to Baffin Island and winters in southern South America. Although some populations of the Pacific have migrations as long as those of the American, some Pacific Golden-Plovers breeding in Alaska perform a comparatively short but nonstop migration to the Hawaiian Islands. American Golden-Plovers winter in the southern hemisphere, almost all in the pampas region of eastern Argentina. Any golden-plover in winter in California is almost certainly a Pacific Golden-Plover.

When golden-plovers are in full alternate plumage, the male American is distinguished by bulging teardrop-shaped white patches on the sides of the breast, black flanks, and black undertail coverts. At this stage the male Pacific has a white strip of more or less uniform width extending from the sides of the breast through the flanks and partly white undertail coverts. In both species females have a variable number of white feathers scattered among the black ones on the underparts, but they maintain a pattern similar to that of the males.

While the birds are in their breeding range, the alternate plumage of both species begins to change through slow molting during the incubation period, when a less conspicuous plumage is more advantageous than during courtship. Jukema et al. (2003) proposed that this molt is distinct from the prebasic molt, although it may be part of a protracted prebasic molt. Once body molt begins in earnest, it affects the head and neck first. The upperparts, central belly, and breast appear to be some of the last body feathers to be molted. Even well into their prebasic molt some individuals, especially male American Golden-Plovers, can be identified by their remaining alternate plumage.

The top photo on this issue's back cover shows one such bird. Although a great proportion of the body is in basic plumage, we can see several features that identify this individual as an American Golden-Plover. Molt of the flanks is nearly complete, but a few telltale black feathers remain, suggesting the black flank pattern of the American. There is a ghost pattern of the teardrop-shaped white patch on the sides of the breast typical of the American Golden-Plover; this contrasting patch remains well into the prebasic molt but is not present on the Pacific Golden-Plover. Finally, the undertail coverts show a substantial black, again suggesting the American Golden-Plover.

The lower photo is of a Pacific Golden-Plover in a similar stage of molt. This bird shows no ghost of a white teardrop on the sides of the breast, no black on the flanks, and no black on the undertail coverts. On the upperparts the more worn feathers of the alternate plumage can be distinguished from the fresh feathers of the basic plumage; the latter plumage shows bright golden colors, unlike the more subdued and grayish feathers of the American Golden-Plover. At this stage of molt the whitish supercilium, typical of the American Golden-Plover in basic plumage, is of no use in distinguishing these two species, as the white supercilium of the alternate plumage may still remain on a Pacific Golden-Plover, as seen in this lower photo.

Structurally, the upper bird is long-winged, with a long primary and wing extension, as is typical of an American Golden-Plover. The primary projection (distance the primaries project past the tertials) is longer on the American Golden-Plover, with four or five primary tips visible past the tertials. On the Pacific Golden-Plover only two or three are visible (Dunn et al. 1987, Johnson and Johnson 2004). Similarly, wing projection (distance primaries extend past the end of the tail) is less than 1 cm in the Pacific Golden-Plover but 1–2 cm in the American Golden-Plover (Johnson and Johnson 2004). The differences in primary extension may be accentuated by apparently longer tertials in the Pacific Golden-Plover (pers. obs. and examination of photos), although tertial lengths have not been quantified. There is overlap between the species in bill length and thickness and in leg length. The bill and legs average longer in the Pacific Golden-Plover, although the American Golden-Plover is larger in overall size, as reflected in other measurements. Although not diagnostic, the longer-billed and longer-legged look of the Pacific Golden-Plover in the lower photo is a useful supplementary feature. Males and females are about the same size in each species.

The timing and extent of molt are correlated with migration distance, age, and the bird's reproductive and nutritional status. Molt in golden-plovers varies substantially not only by species but by age and migratory status. Understanding these differences may help in field identification. Juveniles of both species arrive on the wintering grounds in juvenal plumage. Pacific Golden-Plovers may remain in the winter range during their first and sometimes second summer; these over-summering birds tend to molt into a dull alternate plumage resembling the basic plumage. But many one-year-old birds move north to the breeding grounds in their first spring, and these tend to assume a brighter alternate plumage. Surprisingly, Pacific Golden-Plovers never molt primaries during their first winter. Immatures summering in the winter range molt their wings during their first summer (July–November), whereas immatures migrating to the breeding range do so in their second autumn (August–January) (Johnson and Johnson 1983). Young Pacific Golden-Plovers may perform three migrations on juvenal primaries! According to Johnson and Johnson (1983), American Golden-Plovers, on the other hand, molt their primaries during their first winter. Therefore, in their first spring, they show primary wear similar to that of adults, while in Pacific Golden-Plovers the first spring birds' primaries are noticeably more worn than those of the adults. In the golden-plovers as in the Black-bellied Plover (*P. squatarola*), it is unclear if there are one or two body molts in the first winter. The bright plumage colors acquired by some first-spring birds may not be due to a molt different from that of birds retaining a subdued plumage; rather, the plumage differences may be due to differences in hormone levels controlling the colors of the feathers as they grow (Howell and Pyle 2002).

The molt schedule of adult Pacific Golden-Plovers has been well documented, but the same cannot be said for the American Golden-Plover. The available evidence is that the molt of the American is significantly later than that of the Pacific, this difference being most clear in wing molt. The schedule of body molt is more poorly known. Most adult Pacific Golden-Plovers return to wintering areas in August with one quarter or less of the alternate plumage remaining; fewer than 15% show a larger percentage of alternate plumage upon return (Johnson and Johnson 1983). Body molt is therefore performed largely on the breeding grounds, or at a migration stop-over site, if any. Therefore fall migrant adult Pacific Golden-Plovers should show a mix of basic and alternate body plumage when they arrive in California. Primary molt of adult Pacific Golden-Plovers tends to occur on the wintering grounds (August–December), although a few individuals begin primary molt on the breeding grounds (Johnson and Johnson 1983). American Golden-Plovers molt little of the body on the breeding grounds, and no primaries are molted there (Cramp and Simmons 1983). Body molt appears to occur at migratory stop-over sites, as less than 50% of American Golden-Plovers arriving in Argentina show traces of alternate plumage (German Pugnali pers. comm.). Primary molt in the American Golden-Plover takes place in the nonbreeding range, and adults are in the early stage of wing molt in mid-October (pers. obs.). In comparison, Pacific Golden-Plovers are at a similar stage of primary molt from August to mid September (Johnson and Johnson 1983), suggesting that the American molts its wings one to two months later than the Pacific. Thus an autumn golden-plover in wing molt in California, and probably anywhere in North America, is almost certainly a Pacific.

To identify a southbound adult golden-plover concentrate on its structure, particularly primary projection, and the remnants of alternate plumage. Molt timing and extent may help in making an identification; in particular, a golden-plover in wing molt in North America is much more likely to be a Pacific, and a first-summer individual with well-worn primaries again points to a likely Pacific. A careful use of structure, molt timing, and remnants of alternate plumage should be enough to identify the majority of molting adult golden-plovers. Observers are encouraged to fill in the blanks of what is known on the timing of body molt in these plovers, particularly with respect to the American Golden-Plover. A critical question still to be answered is when the tertials are dropped.

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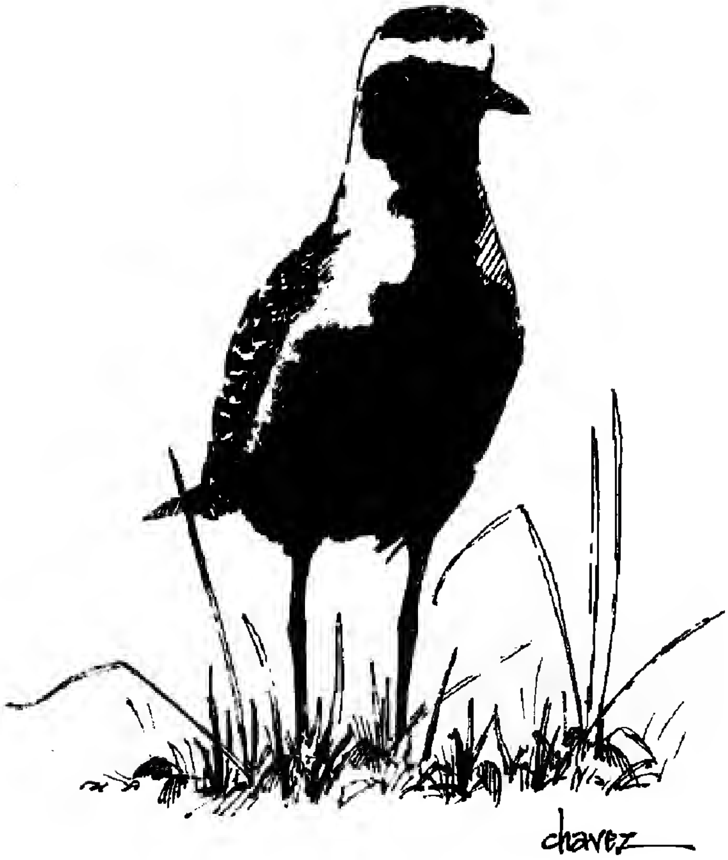

American Golden-Plover

Sketch by Jamie M. Chavez

World Wide Web site:
www.wfo-cbrc.org

WESTERN BIRDS

Quarterly Journal of Western Field Ornithologists

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WESTERN BIRDS

Vol. 35, No. 3, 2004

Western Specialty:

Black - throated Sparrow

Photo by © Brian E. Small of Los Angeles, California:
Black - throated Sparrow *(Amphispiza bilineata)*
Kern County, California, February 2001

Volume 35, Number 3, 2004

NOTES

Front cover photo by © Steve H. Metz of Tulsa, Oklahoma: Red-billed Tropicbird (*Phaethon aethereus*), deep water off Santa Barbara, California, 11 September 2004.

Back cover "Featured Photos" by © Stephen J. Davies of Bethesda, Maryland: Lesser Canada Goose (*Branta canadensis parvipes*) and Taverner's Cackling Goose (*Branta hutchinsii taverneri*), Arrowhead Marsh, Alameda County, California, 25 January 2004.

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WESTERN BIRDS

Volume 35, Number 3, 2004

SEASONAL ABUNDANCE OF MARINE BIRDS IN NEARSHORE WATERS OF MONTEREY BAY, CALIFORNIA

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ABSTRACT: Monterey Bay, California, is a site of regional significance for marine birds. I studied the seasonal abundance of marine birds within 1 km of shore in Monterey Bay during 1999 and 2000. Total bird abundance was greatest during spring and fall migration, whereas diversity was greatest during winter. Species assemblages were fairly consistent by season in both years, but three species were more abundant during summer and fall 2000 than during those seasons in 1999. This increased abundance may have been a response to reduced prey availability outside the study area, related to sea-surface temperature in spring 2000 being higher than in spring 1999. The mean density of all species (363 birds/km^2) was considerably greater than the density reported for Monterey Bay as a whole, indicating that the nearshore environment should receive unique consideration in studies of the abundance and distribution of marine birds.

Waters over the continental shelf of central California sustain the greatest biomass and density of seabirds within the California Current system (Briggs et al. 1987). Within this area, Monterey Bay is an area of regional significance, with an abundant and diverse assemblage of seabirds throughout the year. The majority of seabirds occurring in Monterey come here to feed on abundant prey when not breeding. Although seabirds in Monterey Bay have been fairly well studied (Stallcup 1976, Baltz and Morejohn 1977, Mason 1997, Benson 2002), there have been no published studies focusing on the seasonal abundance or distribution of marine birds very near shore (<1 km from shore). Opportunistic observations and aerial survey data from Monterey Bay (Bonnell and Ford 2001) indicate that the density of marine birds within 1 km of shore is greater than the density farther offshore.

The seasonal abundance of marine birds in Monterey Bay is related to marine productivity, climatic conditions, and the breeding and migratory behavior of individual species (Ainley 1976, Benson 2002). Marine productivity is greatest in summer, after northwest winds induce coastal upwelling north of the bay. Cool, upwelled waters are advected into the bay, where the surface circulation is cyclonic, flowing from south to north along the shore (Breaker and Broenkow 1994, Paduan and Rosenfeld 1996). Temperature and chlorophyll concentration in summer usually are greatest in the northeast corner of Monterey Bay, where an "upwelling shadow" results in water remaining longer (Graham and Largier 1997, Pennington and Chavez 2000). Chlorophyll concentration and carbon uptake within Monterey Bay are generally greatest near shore in the fall (Pennington and Chavez 2000). Although primary productivity in winter is lower, some upwelling occurs within Monterey Bay year round as a result of the orographic effects of the steep Monterey Submarine Canyon (Breaker and Broenkow 1994). Very near shore (at depths generally less than 10 m), these oceanographic factors may have less effect on marine productivity than wave action and nutrient input from two rivers, the Pajaro and the Salinas.

Three oceanographic seasons have been recognized for Monterey Bay: upwelling (approximately March to August), oceanic (October to December), in which warm surface water is advected into the bay, and Davidson Current (December to March), in which the warm north-flowing Davidson Current enters the bay (Bolin and Abbott 1963). These seasons can be indistinct and vary considerably in timing and intensity from year to year (Pennington and Chavez 2000). The occurrence of different seabird assemblages in Monterey Bay appears to be related to both oceanographic and climatic seasons and is affected by variation from year to year in marine productivity (Ainley 1976, Mason 1997, Roberson 2002).

From February 1999 to March 2001, I studied the seasonal abundance of marine birds near shore in Monterey Bay. This study provides baseline data on the abundance of seabirds in this highly productive but little-studied portion of Monterey Bay.

METHODS

I conducted 34 at-sea surveys for marine birds between 11 February 1999 and 19 March 2001. Transects paralleled the shore, between 400 m and 800 m off shore (the distance to shore varied as a result of surf conditions), between Capitola (Santa Cruz County) and Monterey Harbor (Monterey County). I covered the northern and southern sections of Monterey Bay, separated at Moss Landing, over two consecutive days. The combined length of the transects was approximately 47 km. The habitat surveyed was off of a sandy shoreline, in water <10 m deep. The study area receives freshwater input seasonally from the Pajaro and Salinas rivers, and a tidal plume formed daily at the mouth of Elkhorn Slough, a large tidal embayment at Moss Landing. Also at Moss Landing, the deep Monterey Canyon provides topographic relief to the otherwise gently sloping continental shelf offshore of the survey area. To avoid temporal autocorrelation, bay-wide transects were conducted at least two weeks apart.

Surveys were conducted from a 17-foot (5.2-m) open motorboat traveling consistently at 15 km/hr (8 knots). Two observers recorded birds within 50 m of the vessel, for a 100-m strip transect. All birds on the surface of the water were identified to the lowest level possible and recorded. Birds of several categories were difficult to identify to species. Western and Clark's Grebes (*Aechmophorus occidentalis* and *A. clarkii*) frequently dove in response to the survey vessel and were difficult to distinguish; they were pooled as "Western/Clark's Grebe." On the basis of surveys when the two species could be distinguished, Clark's Grebes probably composed 5–10% of the total number of *Aechmophorus* grebes. Subadult gulls were often unidentified, and contributed the majority of the "unidentified gulls." Thayer's Gulls (*Larus thayeri*) were not distinguished from Herring Gulls (*Larus argentatus*); these two species were pooled. Finally, the Eared and Horned Grebes (*Podiceps nigricollis* and *P. auritus*) were pooled. Flying birds were recorded only if they were plunge-divers (i.e., terns and pelicans) because other birds in flight were presumed to be passing through and not associated with the habitat surveyed. Surveys were conducted only in sea conditions of Beaufort 3 or less. Sea-surface temperature (SST) was measured every 5 seconds approximately 0.5 m below the surface by means of an Onset Tidbit XT temperature logger. I calculated mean SST for each survey, and mean monthly SST as the mean of all survey means during that month. I calculated a mean monthly upwelling index from daily upwelling index values measured at 36° N, 122° W, southwest of Monterey (Pacific Fisheries Environmental Lab 2001; www.pfeg.noaa.gov/).

I computed the mean density of each seabird species or pooled category by survey, by month, and by season. I chose four seasons that corresponded to approximate oceanographic seasons: spring or early upwelling (March, April, and May), summer or late upwelling (June, July, and August), fall (September, October, and November), and winter (December, January, and February). These seasons also corresponded to the life cycles of many seabirds, which breed in spring and summer and migrate to and from wintering sites in fall and spring. I compared seasonal seabird abundance data graphically and by means of the percentage-similarity index, in which percentage similarity is the sum of all the minimums of either the percentage of a given species (out of the total) in sample 1, or the percentage of that species in sample 2 (Krebs 1999). Using Student's *t* tests (Zar 1996), I tested for differences by season between 1999 and 2000 in overall bird density, richness (species count), SST, upwelling, and density of 17 species with mean densities >1.0 birds/km.

RESULTS

Oceanographic Factors

The mean SST recorded during all transects was 13.2° C [standard deviation (SD) 1.7)]; it was highest in August and lowest in February (Figure 1). A reduction in temperature in April of both years probably indicated the onset of spring upwelling. With readings throughout each year combined, there was no significant difference in mean temperatures between 1999 and 2000 (*t* test, $P = 0.32$). In spring 1999, however, mean SST was significantly greater than in spring 2000 than (*t* test, $P = 0.002$); between other pairs of seasons the mean SST did not differ significantly (*t* test, $P > 0.88$).

The monthly upwelling index was greatest from March to August (Figure 2). Although upwelling in the California Current was unusually strong in

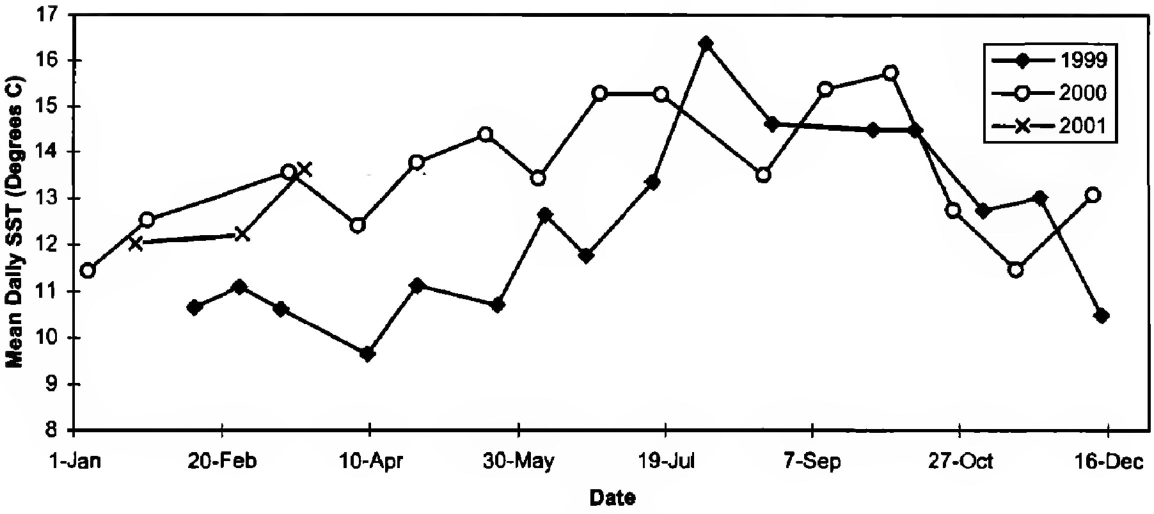

Figure 1. Mean daily sea-surface temperature recorded during 34 transects in nearshore Monterey Bay from 1999 to 2001.

summer 1999 (Schwing et al. 2000), there was no significant difference between 1999 and 2000 in mean upwelling indices at 36° N, 122° W (*t* test, $P = 0.41$). Neither was there any difference in mean upwelling between 1999 and 2000 in any pair of seasons (*t* test, $P > 0.11$).

Bird Abundance and Diversity

I recorded 43 species of seabirds (Table 1). Within the categories of pooled species, I identified all species except Thayer's Gull, and each species contributed to the figures for overall diversity. The mean density of all species combined was 362.6 birds/km^2 (SD 264.7). Overall seabird density was greatest in winter 1999–2000, least in summer 1999. Peaks in seabird abundance in September and April (Figure 3) resulted from increased numbers of Sooty Shearwaters and, in April 1999 and 2000, from increased numbers of Western/Clark's Grebes. The mean number of species per survey was

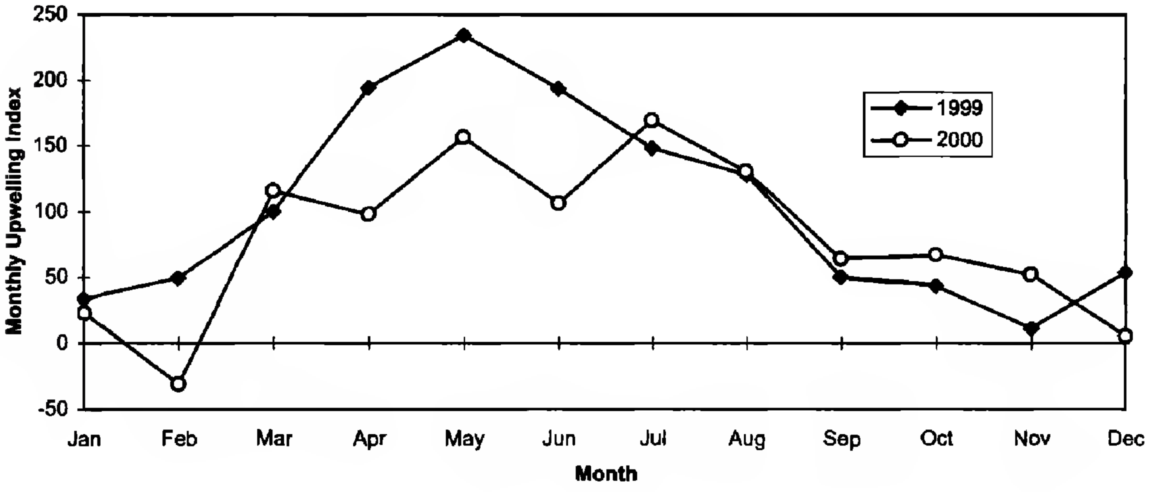

Figure 2. Mean monthly upwelling index reported by the Pacific Fisheries Environmental Lab (www.pfeg.noaa.gov/) west of Monterey Bay in 1999 and 2000. Means are calculated from daily upwelling values.

Table 1 Mean Density of Seabirds in Nearshore Monterey Bay, 1999–2001[a]

Species[b]	Mean density[c]	Spring 1999	Summer 1999	Fall 1999
Western/Clark's Grebe (*Aechmophorus* spp.)	202.42 (0.89)[a]	325.25 (1.01)	35.51 (0.25)	225.86 (0.93)
Sooty Shearwater (*Puffinus griseus*)	46.14 (4.09)	0.00 (0.00)	0.08 (2.24)	0.05 (2.00)
California Gull (*Larus californicus*)	22.62 (1.17)	7.68 (0.84)	5.16 (1.34)	29.42 (0.66)
Surf Scoter (*Melanitta perspicillata*)	20.09 (1.03)	26.96 (0.38)	12.15 (1.02)	11.26 (1.26)
Brandt's Cormorant (*Phalacrocorax penicillatus*)	14.35 (1.55)	1.79 (1.08)	8.14 (1.02)	11.90 (1.03)
Western Gull (*Larus occidentalis*)	13.83 (0.83)	3.90 (0.73)	8.71 (0.56)	32.58 (0.33)
Brown Pelican (*Pelecanus occidentalis*)	6.87 (1.40)	1.83 (1.19)	6.95 (0.59)	8.21 (0.97)
Heermann's Gull (*Larus heermanni*)	5.57 (1.90)	0.11 (2.00)	2.86 (1.44)	13.43 (1.05)
Elegant Tern (*Sterna elegans*)	5.48 (2.08)	0.00 (0.00)	15.82 (1.00)	6.63 (1.14)
Unidentified gull	5.41 (1.52)	2.05 (1.73)	4.67 (1.57)	11.24 (1.35)
Common Murre (*Uria aalge*)	3.52 (1.87)	0.00 (0.00)	2.40 (1.99)	6.69 (1.18)
Marbled Murrelet (*Brachyramphus marmoratus*)	2.74 (1.99)	1.78 (1.84)	0.17 (1.05)	3.94 (1.82)
Mew Gull (*Larus canus*)	1.34 (3.21)	0.05 (2.00)	0.04 (2.24)	1.00 (1.49)
Forster's Tern (*Sterna forsteri*)	1.33 (1.38)	1.68 (1.01)	0.13 (1.49)	2.16 (1.11)
Pacific Loon (*Gavia pacifica*)	1.29 (1.63)	2.48 (1.78)	0.00 (0.00)	0.73 (1.06)
White-winged Scoter (*Melanitta fusca*)	1.29 (1.50)	1.26 (1.41)	0.04 (2.24)	0.79 (2.00)
Caspian Tern (*Sterna caspia*)	1.15 (1.73)	3.98 (0.75)	2.76 (0.79)	0.05 (2.00)
Common Loon (*Gavia immer*)	0.99 (1.35)	3.46 (0.74)	0.21 (1.23)	1.15 (0.94)
Eared/Horned Grebe (*Podiceps* spp.)	0.83 (1.33)	0.84 (0.94)	0.08 (2.24)	0.79 (1.38)
Glacuous-winged Gull (*Larus glaucescens*)	0.73 (1.55)	0.37 (1.35)	0.13 (2.24)	0.53 (2.00)
Pigeon Guillemot (*Cepphus columba*)	0.72 (1.55)	0.42 (0.82)	1.42 (0.92)	0.63 (1.18)
Bonaparte's Gull (*Larus philadelphia*)	0.56 (3.49)	0.21 (1.41)	0.00 (0.00)	0.16 (2.00)
Pelagic Cormorant (*Phalacrocorax pelagicus*)	0.54 (1.22)	1.42 (0.61)	0.71 (1.50)	0.52 (1.48)
Herring/Thayer's Gull (*Larus* spp.)	0.53 (2.32)	0.11 (2.00)	0.29 (0.96)	1.79 (1.85)
Unidentified loon	0.46 (2.28)	1.47 (1.91)	0.04 (2.24)	0.32 (1.15)
Double-crested Cormorant (*Phalacrocorax auritus*)	0.44 (3.48)	0.00 (0.00)	0.29 (2.24)	2.94 (1.33)
Unidentified cormorant	0.17 (3.55)	0.79 (1.83)	0.04 (2.24)	0.58 (1.55)
Red-necked Phalarope (*Phalaropus lobatus*)	0.15 (4.61)	0.00 (0.00)	0.80 (2.24)	0.00 (0.00)
Unidentified scoter	0.14 (3.06)	0.05 (2.00)	0.00 (0.00)	0.00 (0.00)
Other waterfowl[d]	0.14 (2.69)	0.21 (1.41)	0.00 (0.00)	0.05 (2.00)
Rhinoceros Auklet (*Cerorhinca moncerata*)	0.13 (2.50)	0.00 (0.00)	0.00 (0.00)	0.48 (1.72)

Winter 2000	Spring 2000	Summer 2000	Fall 2000	Winter 2001
405.70 (0.07)	197.80 (0.47)	230.71 (0.57)	115.68 (0.73)	221.57 (1.19)
0.00 (0.00)	171.64 (2.00)	0.00 (0.00)	220.42 (2.00)	0.00 (0.00)
70.91 (0.43)	0.31 (1.59)	10.57 (0.89)	42.03 (0.65)	36.61 (0.96)
25.81 (0.59)	22.22 (1.08)	0.95 (1.16)	8.57 (1.81)	54.93 (0.63)
2.03 (0.76)	2.20 (0.69)	55.79 (0.61)	35.06 (0.47)	2.86 (0.33)
12.34 (0.48)	3.62 (1.27)	15.90 (0.73)	27.70 (0.14)	10.80 (0.43)
0.14 (0.87)	1.63 (0.72)	11.70 (1.01)	24.96 (0.45)	1.60 (1.00)
0.07 (1.73)	0.00 (0.00)	8.59 (1.01)	21.39 (0.85)	0.28 (1.73)
0.00 (0.00)	0.11 (2.00)	10.20 (1.83)	9.89 (1.71)	0.00 (0.00)
5.89 (0.93)	1.63 (1.02)	8.71 (1.26)	10.38 (1.07)	1.18 (1.06)
0.14 (0.87)	0.05 (2.00)	6.35 (0.71)	13.69 (0.83)	0.00 (0.00)
4.91 (0.86)	1.05 (1.51)	0.05 (2.00)	1.06 (1.75)	8.70 (1.73)
0.14 (1.73)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	7.25 (1.51)
1.40 (0.48)	4.20 (0.64)	0.37 (1.18)	1.00 (1.61)	0.28 (1.15)
0.84 (0.50)	0.89 (1.12)	0.63 (1.19)	3.31 (1.06)	2.16 (0.62)
3.43 (0.71)	1.26 (0.98)	0.00 (0.00)	0.11 (2.00)	2.37 (0.50)
0.00 (0.00)	0.53 (1.06)	1.63 (1.35)	0.11 (1.15)	0.00 (0.00)
0.42 (0.86)	0.95 (0.73)	0.26 (1.20)	0.84 (0.74)	1.11 (0.47)
0.98 (0.33)	0.63 (1.58)	0.00 (0.00)	1.27 (1.50)	2.58 (0.49)
3.09 (0.58)	0.10 (1.15)	0.11 (2.00)	0.58 (2.00)	1.74 (0.07)
0.07 (1.73)	0.21 (1.41)	1.94 (1.00)	1.05 (1.37)	0.00 (0.00)
3.57 (1.63)	0.21 (1.41)	0.00 (0.00)	1.32 (2.00)	0.07 (1.73)
0.49 (0.25)	0.53 (0.76)	0.26 (0.77)	0.05 (2.00)	0.07 (1.73)
1.47 (0.14)	0.05 (2.00)	0.05 (2.00)	0.42 (1.69)	0.70 (1.25)
0.21 (1.00)	0.84 (1.06)	0.05 (2.00)	0.10 (2.00)	0.63 (1.20)
0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.42 (0.91)	0.00 (0.00)
0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
0.00 (0.00)	0.00 (0.00)	0.31 (2.00)	0.00 (0.00)	0.00 (0.00)
0.84 (1.52)	0.16 (2.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
0.14 (0.87)	0.16 (2.00)	0.00 (0.00)	0.11 (1.15)	0.77 (1.50)
0.35 (1.25)	0.00 (0.00)	0.05 (2.00)	0.05 (2.00)	0.14 (0.87)

Table 1 *(continued)*

Species[b]	Mean density[c]	Spring 1999	Summer 1999	Fall 1999
Long-tailed Duck (*Clangula hyemalis*)	0.11 (2.85)	0.42 (2.00)	0.00 (0.00)	0.00 (0.00)
Red-throated Loon (*Gavia stellata*)	0.11 (2.52)	0.42 (1.69)	0.04 (2.24)	0.11 (2.00)
Parasitic Jaeger (*Stercorarius parasiticus*)	0.10 (3.06)	0.00 (0.00)	0.04 (2.24)	0.37 (1.64)
Unidentified bird	0.10 (2.42)	0.16 (1.27)	0.00 (0.00)	0.53 (0.95)
Ring-billed Gull (*Larus delawarensis*)	0.08 (2.88)	0.11 (1.15)	0.00 (0.00)	0.05 (2.00)
Brant (*Branta bernicla*)	0.04 (2.96)	0.11 (2.00)	0.00 (0.00)	0.00 (0.00)
Red-necked Grebe (*Podiceps grisegena*)	0.04 (2.95)	0.16 (1.27)	0.00 (0.00)	0.00 (0.00)
Red Phalarope (*Phalaropus fulicarius*)	0.03 (5.83)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Unidentified alcid	0.01 (4.06)	0.00 (0.00)	0.04 (2.24)	0.05 (2.00)
Northern Fulmar (*Fulmarus glacialis*)	0.01 (5.83)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Ancient Murrelet[e] (*Synthliboramphus antiquus*)	0.01 (5.83)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Total	362.61	391.53	109.75	376.98

[a] Figures in parentheses are coefficients of variation.

[b] In order of abundance.

[c] In birds per square kilometer.

[d] Includes Ross' Goose (*Chen rossii*), Cinnamon Teal (*Anas cyanoptera*), unidentified scaup (*Aythya* sp.), Bufflehead (*Bucephala albeola*), Red-breasted Merganser (*Mergus serrator*), and Ruddy Duck (*Oxyura jamaicensis*).

[e] Ancient Murrelets occurred during February 1999, outside of seasonal categories.

16.8 (SD 3.2). Species richness (maximum number of species recorded) by season was greatest in December and November and least in June and May (Figure 4). Six species or pooled categories had mean densities >10.0 birds/km^2: Western/Clark's Grebe, Sooty Shearwater, California Gull, Surf Scoter, Brandt's Cormorant, and Western Gull.

The Western Grebe was the most abundant species. The mean density for the genus *Aechmophorus* was 204.4 birds/km (SD 180.2), composing 56% of all birds recorded (Table 1). Western/Clark's Grebes were recorded on all surveys but were most abundant in winter and spring. Counts regularly exceeded 1000 birds per survey. The highest count, in April 1999, was of more than 3800 birds. High counts in late spring coincided with a shift in distribution to the north end of Monterey Bay, where courting behavior was occasionally observed. Western Grebes were usually found in large dense flocks. Single grebes identified outside of flocks were more likely to be Clark's than the Western.

Large flocks of Sooty Shearwaters were encountered twice, in April and September 2000. Although shearwater flocks were recorded on only two surveys, Sooty Shearwaters were the second most abundant species, with

Winter 2000	Spring 2000	Summer 2000	Fall 2000	Winter 2001
0.07 (1.73)	0.05 (2.00)	0.00 (0.00)	0.05 (2.00)	0.14 (1.73)
0.00 (0.00)	0.16 (2.00)	0.00 (0.00)	0.11 (1.15)	0.07 (1.73)
0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.42 (1.35)	0.00 (0.00)
0.00 (0.00)	0.05 (2.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
0.07 (1.73)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.28 (1.73)
0.00 (0.00)	0.11 (2.00)	0.00 (0.00)	0.00 (0.00)	0.07 (1.73)
0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.21 (1.00)
0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.35 (1.73)
0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.14 (1.73)
0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
545.55	413.33	365.20	542.17	359.65

a mean density of 46.1 birds/km^2 (SD 188.8). On the surveys when they were encountered, density exceeded 680 birds/km^2, and the shearwaters were in dense flocks (all 3268 birds recorded in April 2000 were within 1 km of transect near Capitola). One to two birds were recorded on surveys in July and September 1999.

The California Gull was the third most abundant species, with a mean density of 22.6 birds/km^2 (SD 26.6). California Gulls were recorded in all months but were most abundant from September to January. The Surf Scoter was the fourth most abundant species, with a mean density of 20.9

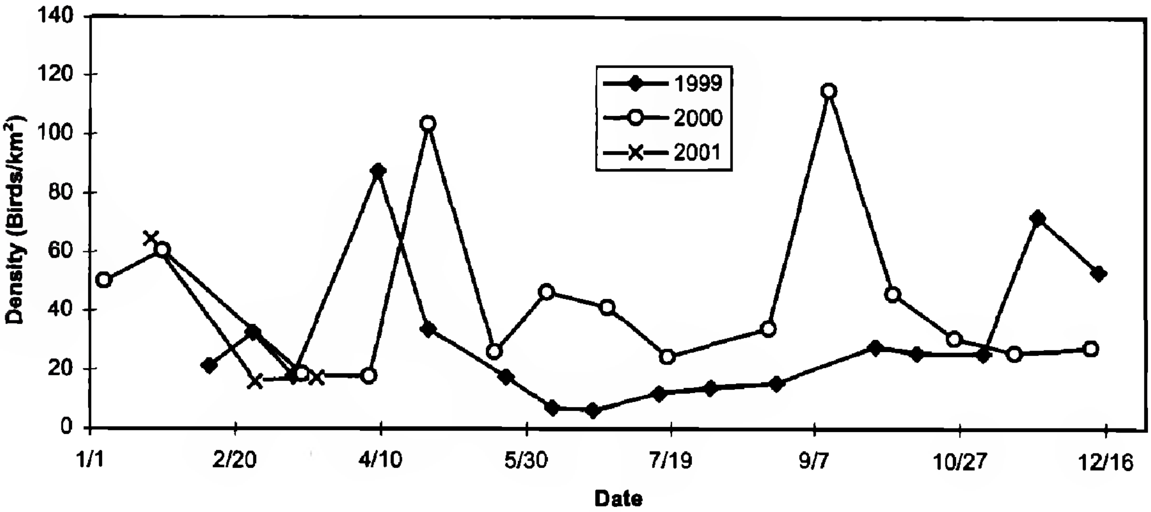

Figure 3. Daily density of all seabirds in nearshore Monterey Bay, 1999–2001.

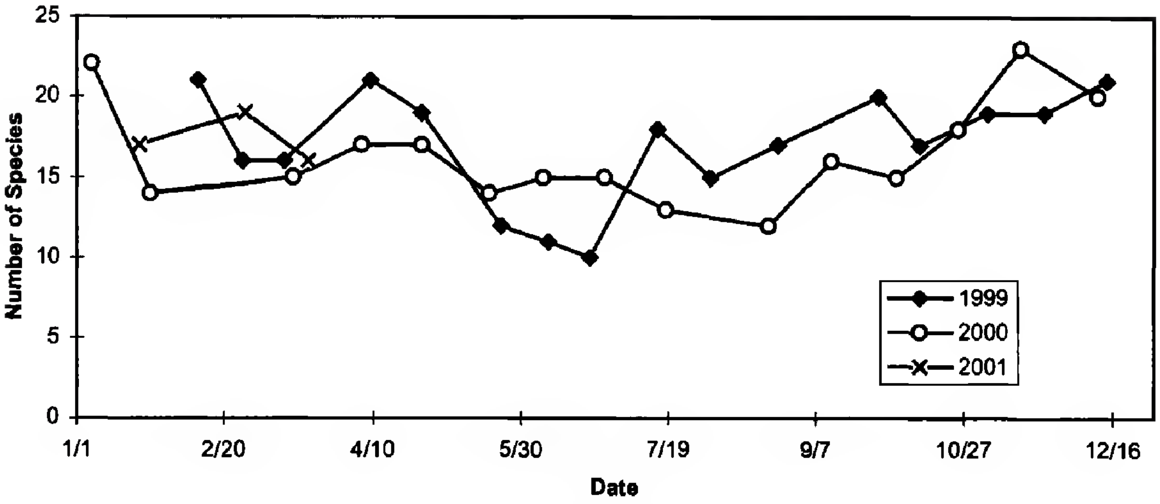

Figure 4. Daily species richness (species count) of seabirds in nearshore Monterey Bay, 1999–2001.

birds/km^2 (SD 20.7). Surf Scoters were most abundant in winter (December to March) but were recorded in all months except September. Surf Scoters were usually in fairly dense flocks, sometimes associated with White-winged Scoters.

Brandt's Cormorants were mostly absent from the study area from January through May, during prebreeding colony attendance and the early part of their breeding season. This species was common on Monterey Bay from June to November, with an overall mean density of 14.4 birds/km^2 (SD 22.3). Brandt's Cormorant was the fifth most abundant species, with >50 birds/km^2 on several days. The Western Gull was the sixth most abundant species, with a mean density of 13.8 birds/km^2 (SD 11.5). Western Gulls were present year round but were most abundant during fall.

The 26 most abundant species or pooled categories whose seasonal abundance I analyzed comprised four general categories: migrants (occurring primarily March–May and September–November), winter birds (November–March), summer birds (April–September), and fall birds (July–November). Nine species occurred primarily during winter (Figure 5), nine occurred during fall (Figure 6), six occurred primarily during migration, in spring and fall (Figure 7), and two occurred primarily during summer (Figure 8).

The percent similarity index (PSI) for each season ranged from 0.46 to 0.95 (Table 2). I excluded the Sooty Shearwater from the PSI calculations because this species was so patchy, temporally and spatially, extremely abundant when present, and not effectively sampled in this nearshore study. Although the Sooty Shearwater is usually the most abundant bird in Monterey Bay during spring and summer (Ainley 1976, Briggs et al. 1987, Mason 1997), it was rarely recorded during this study. In comparisons between seasons, the PSI implied greatest similarities between spring 1999 and spring 2000, spring 1999 and winter 2000, winter 2000 and spring 2000, and winter 2000 and winter 2001. These values were affected positively by density values for Western/Clark's Grebes, which usually composed more than 50% of all birds recorded. Separate PSI values calculated with the Sooty Shearwater and Western/Clark's Grebes excluded never exceeded

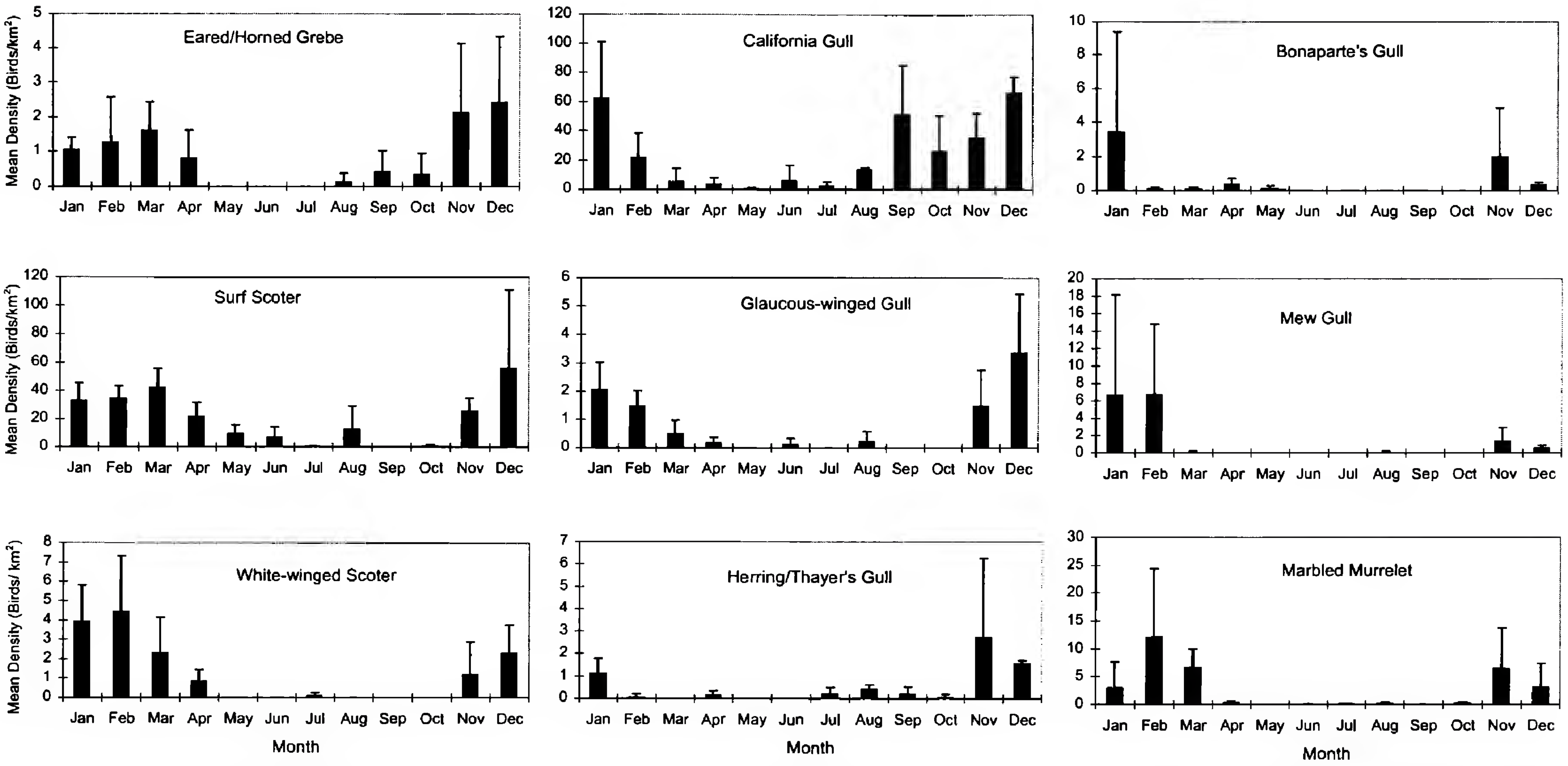

Figure 5. Mean monthly density of nine species or pooled categories of seabirds occurring in nearshore Monterey Bay primarily during winter, based on 34 surveys from 1999 to 2001. Error bars show one standard deviation. Note differences in *y*-axis scales.

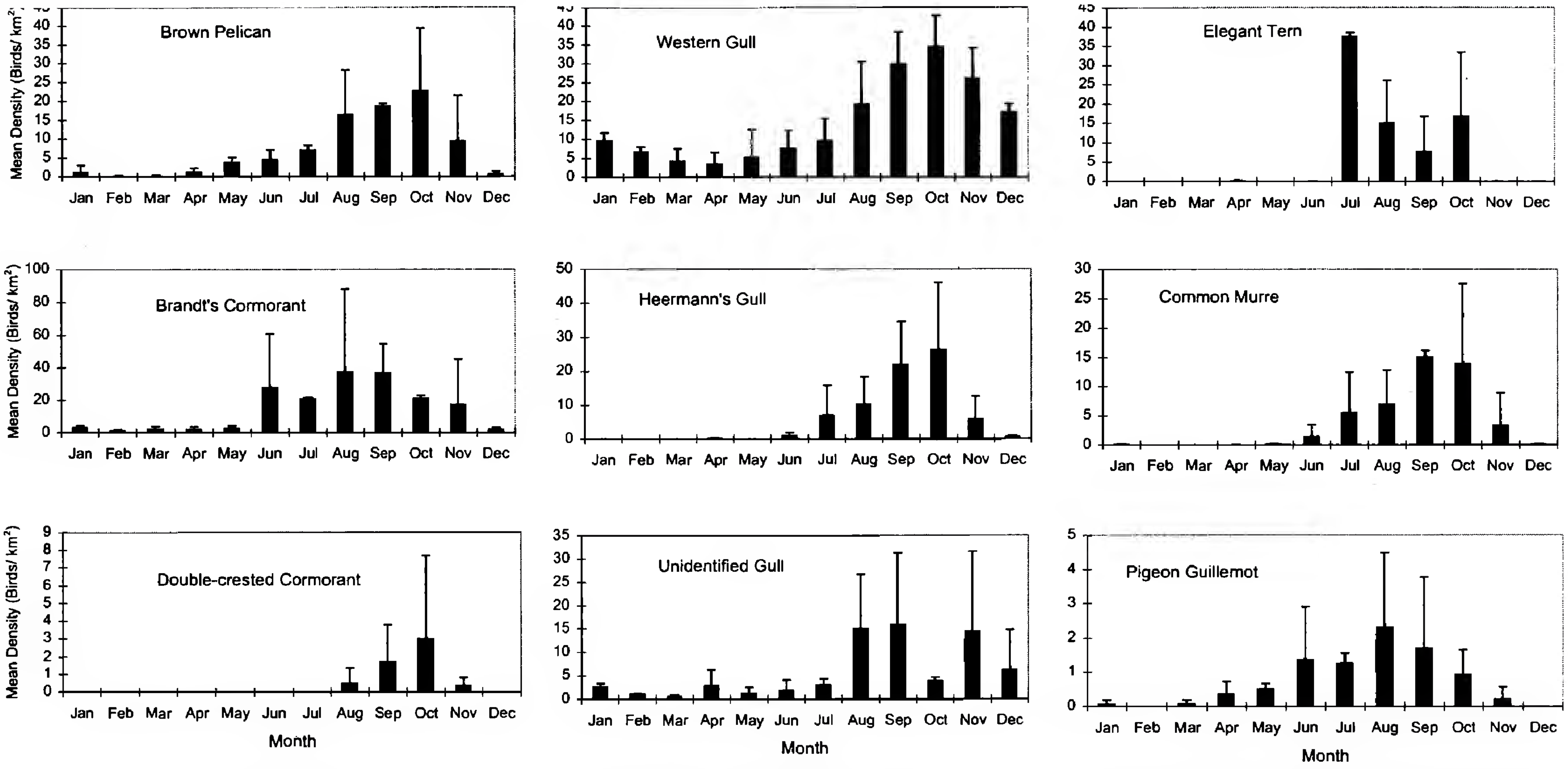

Figure 6. Mean monthly density of nine species or pooled categories of seabirds occurring in nearshore Monterey Bay primarily during fall, based on 34 surveys from 1999 to 2001. Error bars show one standard deviation. Note differences in *y*-axis scales.

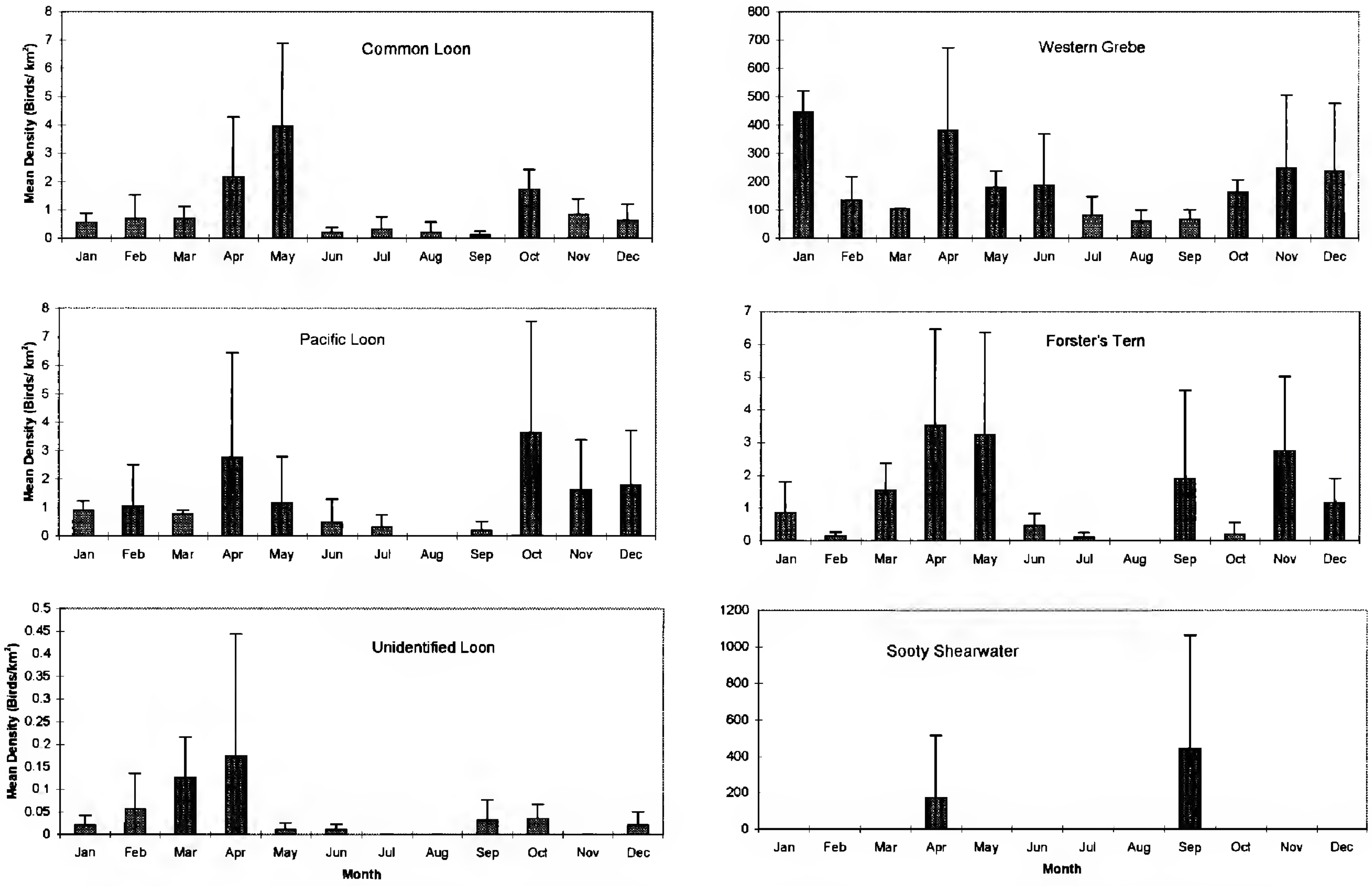

Figure 7. Mean monthly density of six species or categories of seabirds occurring in nearshore Monterey Bay primarily during migration, based on 34 surveys from 1999 to 2001. Error bars show one standard deviation. Note differences in *y*-axis scales.

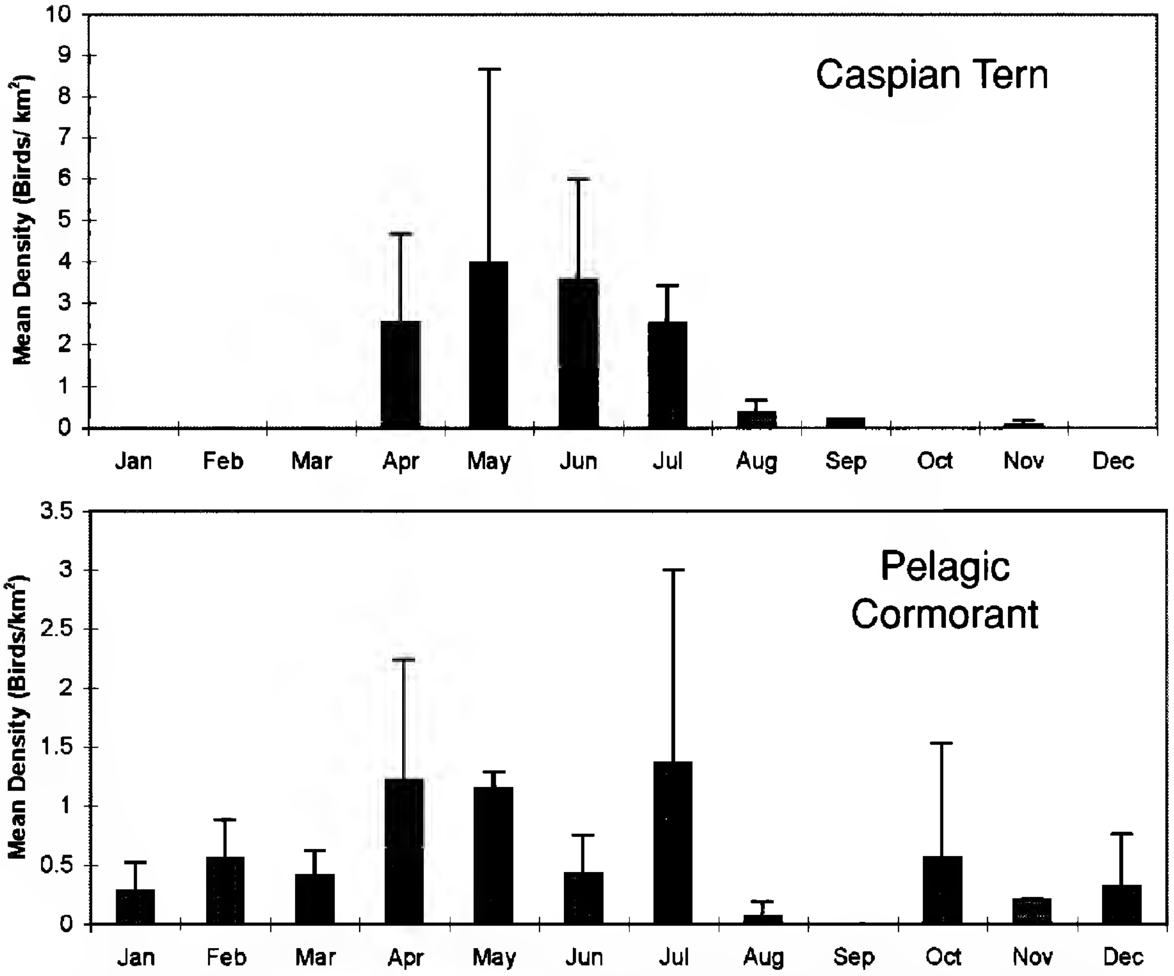

Figure 8. Mean monthly density of two species of seabirds occurring in nearshore Monterey Bay primarily during summer, based on 34 surveys from 1999 to 2001. Error bars show one standard deviation. Note differences in y-axis scales.

0.8 (range 0.25 to 0.77; Table 3), indicating that consistent high counts of Western/Clark's Grebes affected PSI values greatly. PSI values for the remaining species exceeded 0.7 three times, two of which were for the same season (spring 1999/spring 2000 and fall 1999/fall 2000), with the remaining value between spring 1999 and winter 2001.

Between 1999 and 2000 overall mean density did not differ significantly, but in comparisons between paired seasons, density was greater in summer 2000 than in summer 1999 ($P < 0.001$). There was no difference in density between other paired seasons ($P > 0.28$). Mean species richness (number of species per survey) did not vary significantly from 1999 to 2000 or in comparisons of any pair of seasons ($P > 0.57$). Of the 17 most abundant species whose abundance I compared by paired seasons in 1999 and 2000, only three varied significantly in abundance. The mean density of Western/ Clark's Grebes and Brandt's Cormorants was significantly greater in summer 2000 than in summer 1999 (Table 1; t test, $P = 0.01$ and $P = 0.02$, respectively). The mean density of Brown Pelicans was significantly greater in fall 2000 than in fall 1999 (t test, $P = 0.05$). The other 14 species did not differ by year at any season ($P > 0.05$).

Table 2 Percentage Similarity Indexes of the Species Composition of the Nearshore Avifauna of Monterey Bay by Season, All Species Except the Sooty Shearwater Included[a]

	Spring 1999	Summer 1999	Fall 1999	Winter 2000	Spring 2000	Summer 2000	Fall 2000	Winter 2001
Spring 1999	1.0	0.46	0.70	**0.85**	**0.95**	0.69	0.45	0.75
Summer 1999		1.0	0.64	0.47	0.47	0.61	0.74	0.54
Fall 1999			1.0	0.77	0.69	**0.82**	0.73	0.78
Winter 2000				1.0	**0.84**	0.71	0.57	**0.82**
Spring 2000					1.0	0.68	0.45	0.76
Summer 2000						1.0	0.68	0.70
Fall 2000							1.0	0.56

[a]Values greater than 0.8 are in bold.

DISCUSSION

Bird Abundance and Diversity

As expected, the density of seabirds near shore in Monterey Bay was considerably greater than mean densities reported from studies conducted at larger spatial scales farther offshore. The mean density of 362.6 birds/km^2 in this study was more than double the 173 birds/km^2 reported primarily offshore in Monterey Bay from 1992 to 1994 (Mason 1997). Briggs et al. (1987) reported a density of 110 birds/km^2 over the continental shelf in California from 1975 to 1983, and Gould et al. (1982) reported a density of 158 birds/km^2 in the Gulf of Alaska. Seabird densities reported by other studies elsewhere in the North Pacific are typically <100 birds/km^2 (Gould and Piatt 1993). Because most of these other researchers recorded all birds in flight (not plunge-divers only), if I had followed the same protocol the densities I report would be even higher, especially for gulls. Mason (1997), for example, estimated that 44% of gulls recorded were flying. The only re-

Table 3 Percentage Similarity Indexes of the Species Composition of the Nearshore Avifauna of Monterey Bay by Season, All Species Except the Sooty Shearwater and Western/Clark's Grebes Included[a]

	Spring 1999	Summer 1999	Fall 1999	Winter 2000	Spring 2000	Summer 2000	Fall 2000	Winter 2001
Spring 1999	1.0	0.46	0.42	0.50	**0.75**	0.26	0.36	**0.72**
Summer 1999		1.0	0.60	0.40	0.42	0.64	0.62	0.37
Fall 1999			1.0	0.50	0.37	0.57	**0.77**	0.46
Winter 2000				1.0	0.42	0.25	0.43	0.65
Spring 2000					1.0	0.25	0.31	0.62
Summer 2000						1.0	0.69	0.22
Fall 2000							1.0	0.41

[a]Values greater than 0.7 are in bold.

gional studies indicating greater densities of birds in the marine environment include wintering waterfowl. Kelly and Tappen (1998), for example, reported densities of >500 birds/km^2 on Tomales Bay, Marin County, California, but the majority of these birds were waterfowl. The high density of marine birds in my study largely was due to Western/Clark's Grebes. I recorded a mean of 202.4 grebes/km^2, whereas Mason (1997), studying a larger area, reported a mean of 33.2 grebes/km^2. I also recorded greater densities of gulls, although Mason recorded greater densities of Sooty Shearwaters and Common Murres.

The species richness I recorded was less than that reported by Mason (1997). Mason recorded 57 species, whereas I recorded 43; Mason recorded a mean of 20.5 species per survey, whereas I recorded 16.8. Greater overall bird abundance and differences in dominant species in my study were likely a result of the distance from shore at which surveys were conducted (<20% of Mason's surveys were within 1 km of shore). Greater diversity in Mason's study was likely a result of a greater diversity of habitats sampled, including the Monterey Canyon. I did not encounter many large flocks of Sooty Shearwaters in summer months probably because I usually conducted my surveys between 0800 and 1200 hours, when Sooty Shearwaters seem less common near shore (pers. obs).

Several species were remarkably abundant near shore in Monterey Bay. Western/Clark's Grebes occurred year round, but they were most abundant during migration. If Western/Clark's Grebes are found in similar densities from shore to about 1 km offshore (and additional birds can be found considerably farther offshore), the total number of Western/Clark's Grebes on Monterey Bay in winter during my study was probably in excess of 10,000 individuals and may have occasionally exceeded 30,000. Briggs et al. (1987) estimated that the population of Western/Clark's Grebes spending the winter in California is less than 60,000, so up to half of the state's wintering population may congregate in Monterey Bay. Winter counts of California Gulls of more than 75 birds/km^2 can be extrapolated to a local population in winter of 5000 or more birds. Numbers of California Gulls breeding in south San Francisco Bay have increased dramatically in the last 20 years (Shuford and Ryan 2000), and this colony may contribute to the large population of Califonia Gulls wintering on Monterey Bay. The local (southernmost) population of the Marbled Murrelet, breeding in the Santa Cruz Mountains just north of the study area, consists of approximately 600 birds (Z. Peery pers. comm.). Extrapolating observed densities of Marbled Murrelets to the nearshore zone from about 300 to 1300 m offshore, it appears that about half of this population may move into Monterey Bay for the winter. During winter 2000–2001, this extrapolation suggested a population of >400 birds in Monterey Bay.

Because of the high abundance of birds in nearshore waters of Monterey Bay this area is of conservation importance, particularly for some species that occur only near shore. The Surf and White-winged Scoters, Marbled Murrelet, and Pigeon Guillemot are among several species that are limited in their local distribution to within a few kilometers of the coast. Many other species, including Western/Clark's Grebes and all three cormorant species, occur in greater densities near shore than farther off shore. Nearshore waters of Monterey Bay may be particularly important for species that molt their flight feathers here, especially those that are flightless while molting their remiges simultaneously. Common Murres, Marbled Murrelets, Pigeon Guillemots, and Western/Clark's Grebes are flightless during remex molt in late summer and early fall, and loons are flightless during midwinter molt, confining them to prey available locally during this time. Summering Surf Scoters may also be flightless. In addition, during late summer, the study area is likely an important nursery area for young Common Murres.

The abundance of birds in nearshore Monterey Bay presumably is linked to prey abundance and availability. Most seabirds recorded in this study feed primarily on small fish, especially the northern anchovy (*Engraulis mordax*; Morejohn et al. 1978). Although no studies comparing the abundance of small fish in nearshore and offshore waters of Monterey Bay have been conducted, in Kachemak Bay, Alaska, Abookire et al. (2000) found small schooling fish more abundant in stratified nearshore waters than in deeper water. Chlorophyll concentrations off California are often greatest in Monterey Bay (Breaker and Broenkow 1994, Croll 1990), and within Monterey Bay, chlorophyll values are greatest near shore (Pennington and Chavez 2000). The increased phytoplankton abundance indicated by these high chlorophyll concentrations presumably leads to a greater abundance of zooplankton and small fishes near shore. Greater primary production near shore in Monterey Bay may result from relatively greater input of nutrients from rivers (Skov and Prins 2001) and wave action on beaches (Ross et al. 1987) or from nutrient-rich upwelled water advected into southern Monterey Bay and circulated along shore to the north (Croll 1990, Graham and Langier 1997). In addition, the nearshore environment provides a greater range of foraging opportunities for marine birds. Not only are small schooling fishes available here, benthic and epibenthic fishes and invertebrates more accessible to birds in shallower water.

Seasonality

The seasonality of seabird abundance is a function of several factors, including breeding and molting seasons, prey availability, and climate. Forage fish probably are most abundant near shore in Monterey Bay during summer and fall. In trawls conducted to sample potential prey of the harbor porpoise (*Phocoena phocoena*) near shore in northern Monterey Bay from September to December 1996, the white croaker (*Genyonemus lineatus*) and northern anchovy were the most abundant species caught (Byrd 2001). Although the exact seasonal distribution of anchovies in Monterey Bay has not been studied, large shoals of anchovies can often be seen near shore in summer and fall (pers. obs.). In southern California, Allen and DeMartini (1983) found that anchovies are most abundant near shore in late summer, when SST is greatest. In California Common Murres typically move closer to shore in late summer, presumably to feed on abundant northern anchovies (Oedekoven et al. 2001). Castillo et al. (1996) found that off Chile a thermohaline front predictably moves toward shore during summer, concentrating anchovies between the front and shore. A similar phenomenon may result in high concentrations of anchovies in nearshore Monterey Bay. Market squid (*Loligo opalescens*), which during summer concentrate near shore in southern Monterey Bay to spawn, also are an important prey for seabirds (Morejohn et al. 1978, McInnis and Broenkow 1978).

In general, seabird seasonality appears to be more a function of the breeding and migratory behavior of the birds in the study area than of oceanographic seasons. Of the birds whose abundance peaked during fall, most have early breeding seasons, allowing them to take advantage of abundant prey in Monterey Bay during late summer and fall (Briggs et al. 1983). Fall is also the season during which most seabirds molt their flight feathers. Birds undergoing molt are limited in their foraging ranges and thus rely heavily on localized prey during this time.

Seabird species whose abundance peaks during winter breed mostly north of Monterey Bay, and for these species, Monterey Bay likely represents a good trade-off of migration distance, prey availability, and mild climate. Although prey available in Monterey Bay are probably fewer in winter than in summer, winter prey abundance there may be greater than at lower latitudes, where year-round primary production is lower (Hickey 1998). In addition, winter weather generally is more severe north of San Francisco Bay, affecting the ability of marine birds to forage and maintain their body temperature (Schreiber 2002).

Despite the high diversity and abundance of many species during winter, total bird abundance was greatest during migration periods in April and September. Similarly, Mason (1997) recorded the greatest density of seabirds in Monterey Bay during fall, in September 1992. Portions of most populations of migrants also winter in the study area. The peaking of Western/Clark's Grebes during migration was unexpected. This pattern of seasonal abundance differs from that elsewhere in coastal California, where these grebes are most abundant in winter (Briggs et al. 1987, Shuford et al. 1989). In late spring, I observed dense large flocks in northern Monterey Bay. These flocks may have been composed of birds staging for migration to breeding areas, primarily in the Great Basin. Western/Clark's Grebes are typically absent from coastal California during summer (Briggs et al. 1987, Shuford et al. 1989), thus relatively high densities of these grebes in summer (ca. 100 birds/km^2) may be unique to Monterey Bay. Most Western/Clark's Grebes apparently leave Monterey Bay during August and September, to undergo flight feather molt elsewhere (Stout and Cooke 2003).

Year-toYear Variability

Between the two years of the study patterns of seasonal abundance were fairly consistent. Pairwise comparisons of the PSI for all species by seasons corresponded loosely to expected values: all values >0.8 were for the same season or adjacent seasons (i.e., values were not high for opposite seasons, such as winter and summer). The greatest PSI value was between spring 1999 and spring 2000. With Sooty Shearwaters and Western/Clark's Grebes removed from the analyses, the pattern still held. The only exception was a value >0.7 between spring 1999 and winter 2001. This similarity between spring 1999 and winter 2001 may have been related to the mean SST being coldest in spring 1999, resulting in conditions similar to those typical of winter.

With and without Sooty Shearwaters and Western/Clark's Grebes, PSI values were high in spring (March, April, and May). During spring, marine birds probably use the nearshore waters of Monterey Bay as a predictable site for locating prey. Predictability of prey is important before the breeding season, when birds must be in peak physical condition. In comparisons of the same seasons in different years, summer (June, July, and August) had the lowest PSI values in both analyses and was the period of least overall abundance. Birds were less abundant in nearshore Monterey Bay during summer because most species bred outside the study area. Birds present during summer likely represented wandering nonbreeders. During summer, when upwelling in the California Current is highly variable, the distribution of marine birds in the current may be less predictable than during winter. During late summer and fall, variation in postbreeding dispersal may cause the spatial and temporal distribution of many species to vary greatly from year to year (Briggs et al. 1987).

Between the two years of the study upwelling and SST were similar, and I did not expect significant differences in density or abundance of nearshore birds. Western/Clark's Grebes and Brandt's Cormorants, however, were more abundant in summer 2000 than in 1999, and Brown Pelicans were more abundant in fall 2000 than in 1999. The greater density of birds overall in summer 2000 primarily was a result of the greater abundance of Western/Clark's Grebes, the most abundant species. The greater abundance of these species in 2000 could be the result of greater prey availability in 2000. SST, however, was significantly higher in spring 2000 than in spring 1999, indicating greater water-column stratification, and lower primary productivity in spring 2000, potentially leading to a reduction in prey abundance during summer. Species more abundant in 2000 than in 1999 may have been responding not to an increase in prey availability in the study area but to a decrease in prey availability outside the study area. Given the typically high availability of prey near shore in Monterey Bay, these species may have responded to a decrease in prey abundance on a regional scale (e.g., the central coast of California) by moving to nearshore Monterey Bay. In Monterey Bay, prey may have been similarly reduced, but still may have been more abundant than elsewhere. Greater prey abundance near shore is likely the reason for Common Murres shifting closer to shore in central California during El Niño (Ainley et al. 2002). Similarly, Benson et al. (2002) found that during El Niño of 1998 some cetaceans were more abundant in Monterey Bay than normal; they proposed that this shift was a result of this "oasis" effect when productivity elsewhere was reduced.

This study provided data on the year-round occurrence of seabirds in Monterey Bay over more than one year, but annual variability cannot be explored fully in a two-year study. Annual variability in oceanographic conditions (especially El Niño) can have dramatic effects on the abundance and distribution of marine birds in the California Current (Ainley et al. 1995, Becker and Beissinger 2003). During a pilot study in 1998 (unpubl. data), I recorded >1000 Surf Scoters on two different surveys in March, more than five times the abundance recorded during this study. El Niño prevailed in 1998, so this substantial annual variability likely was related to oceanographic or climatic factors. Decadal-scale changes in oceanographic conditions also have been found to affect marine food webs and seabird distribution in the northeast Pacific (Veit et al. 1996, Anderson and Piatt 1999, Chavez et al. 2003). Changes in oceanographic conditions at various temporal scales presumably lead to changes in abundance of marine birds using the nearshore waters of Monterey Bay. Quantifying this variability through long-term monitoring would be useful in determining the effects of oceanographic conditions.

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GLOSSY IBIS RECORDS FOR COLORADO AND NEIGHBORING STATES

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ABSTRACT: The Glossy Ibis (*Plegadis falcinellus*) first arrived in the New World in the early 1800s. During the twentieth century, this species expanded its breeding range rapidly, extending as far west as Louisiana. Vagrants have occurred throughout the Great Plains and even to California. Colorado's 35 documented Glossy Ibis through 2002 are more than in any neighboring state by at least 40%. These records represent primarily single birds during spring migration; however, recent records include some of multiple birds, as well as one in fall. Timing of these records, the birds' association with flocks of the White-faced Ibis (*P. chihi*), and lack of nesting sites in Colorado suggest that the Glossy Ibis is continuing its migration outside of Colorado. The increased number of records, increased number of birds per record, and recent reports of potential hybrids in Oklahoma and Colorado also suggest that the Glossy Ibis may be expanding its breeding range west into the Great Plains.

The Glossy Ibis (*Plegadis falcinellus*) is a cosmopolitan species native to the Old World from southeastern Europe to Australia. It probably colonized North America in the early 1800s, with the first record from New Jersey in 1817 (Baynard 1913). During the early 1900s, the Glossy Ibis was known to nest in the United States only in Florida (Bent 1926). Nesting records from other states followed, and by the early 1960s the Glossy Ibis bred along the east coast as far north as New York (Davis and Kricher 2000). Currently, the Glossy Ibis resides permanently along the Gulf coast from eastern Louisiana to Florida and north along the Atlantic seaboard to North Carolina (Davis and Kricher 2000). Its breeding range extends still farther north along the Atlantic coast to southwestern Maine.

Members of the order Ciconiiformes (storks and allies) are well-known as wanderers both before and after the breeding season. The Glossy Ibis is no exception. In spite of this species' rather limited and coastal North American range, the Glossy Ibis wanders regularly throughout the eastern United States, with some recent field guides showing a distribution from east-central Texas north to Wisconsin and east to Newfoundland (Sibley 2000, National Geographic Society 2002).

Through 2002, Colorado had 31 records of 35 individuals of the Glossy Ibis. Most of these records pertain to single alternate-plumaged adults found during spring migration. This paper examines the pattern of vagrancy (dates and locations) of the Glossy Ibis in Colorado, with reference to neighboring states, probes into possible explanations for this pattern, and notes possible hybrids in Colorado. Identification of the Glossy and White-faced Ibises (*P. chihi*) has been treated well elsewhere and is not repeated here (see Pratt 1976, Kaufman 1990, Patten and Lasley 2000). For consistency, I use seasonal definitions established by many national and state ornithological publications: spring (March–May), summer (June–July), and fall (August–November) (e.g., *North American Birds*, *Colorado Birds*). Additionally, unless otherwise noted, I use only records accepted by the respective bird records committee for each state.

STATUS IN COLORADO

Historical sightings are often difficult to evaluate. A previous lack of understanding about the characteristics distinguishing the Glossy and White-faced Ibises complicated identification issues. Robbins et al. (1966) illustrated the Glossy Ibis with white facial feathering extending around reddish eyes, as in the White-faced Ibis. Therefore, records prior to the mid-1970s, when details on *Plegadis* ibis identification were first available to the general birding public (Pratt 1976), are best considered suspect, except those supported by photographic evidence, excellent written details, or extant specimens.

I found seven published reports of the Glossy Ibis for Colorado prior to the first accepted state record in 1986 (Bailey and Niedrach 1965, Colorado Bird Record Committee [CBRC] files and references therein). Cooke (1900) published the first (date unknown) and second (4 April 1898). Presumably, the first supposed occurrence was between 1897 and 1900, as Cooke (1897) did not mention the Glossy Ibis in this previous book on Colorado birds.

Several specimens taken in Colorado in the early 1900s were reported as the Glossy Ibis. Niedrach and Rockwell (1959) mentioned two specimens, although neither was available to them for examination. One apparently "in full plumage" was collected by W. W. Cooke (1900), and the other was taken in June 1905 at Barr Lake, Adams County. An extant specimen (Denver Museum of Nature and Science 39079) collected on 22 May 1916 and identified by H. C. Oberholser was reidentified in the mid-1980s by Mark Holmgren and Joe Strunch as a White-faced Ibis (CBRC files).

I found no mention of the Glossy Ibis in the Colorado literature again until the 1950s, when 15 were reported; however, several descriptions of these mentioned the defining character as the "lack of white at point of bill attachment" or "no white apparent on face" (Thatcher 1955, 1957, Bailey and Niedrach 1965). The latter feature characterizes several plumages of the White-faced Ibis and was one of the reasons for not accepting a 1985 Colorado report (Gent 1986).

The first Colorado bird list published by the Colorado Field Ornithologists included the Glossy Ibis because of the extant specimen previously mentioned (Reddall 1973). After the specimen was reidentified, however, a later CBRC report removed the species from the state list (Gent 1987). The first recognized Colorado record was of a bird found in the western part of the state at Sweitzer Lake State Park, Delta County, 27 March 1986, associating with a flock of White-faced Ibises (Bunn 1988). This record was based on excellent written descriptions by two observers as well as a sketch.

After 1986, there were only three additional records until 1995, and none from 1991 to 1994 (Figure 1). Since 1995, the Glossy Ibis has occurred annually, with most records (28 of 35; 80%) coming from two areas east of the continental divide: the Arkansas River valley and the northern Front Range (Figure 2). In most cases, records pertain to single alternate-plumaged adults in spring associated with flocks of White-faced Ibis. Thirty-three of the 35 individuals (94%) occurred between 27 March and 31 May, and 27 of the 35 (77%) occurred between 16 April and 15 May (Figure 3). Multiple birds have been encountered since 2000: two records, one each in 2000 and 2001, are of two Glossy Ibises observed together, and a third record in

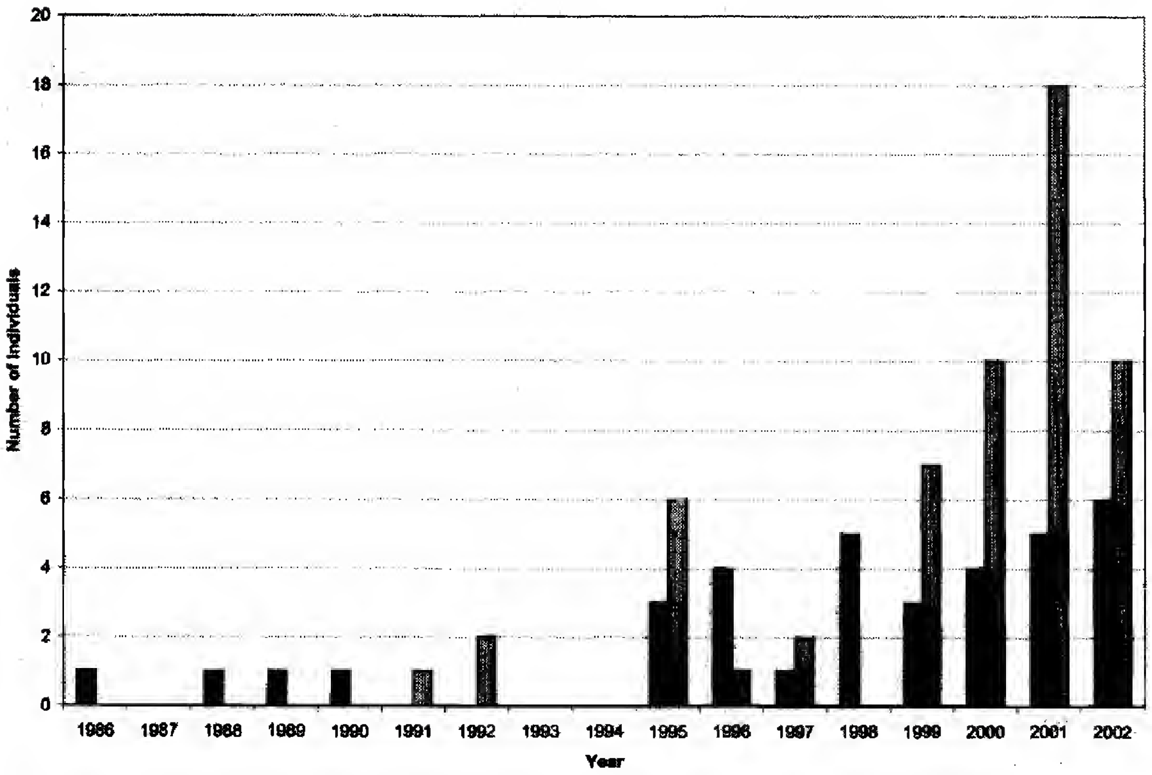

Figure 1. Yearly occurrence and number of individuals of the Glossy Ibis in Colorado (black) and neighboring states (gray).

2002 is of three birds together. Outside of spring migration, Colorado has a single summer record, 4 July 1990, from Huerfano County, and a single fall record of a bird still in alternate plumage photographed at Loloff Reservoir, Weld County, 27 August 2002 (Leukering and Semo 2004).

Recent observations have suggested hybridization between the Glossy and White-faced Ibises in North America (Arterburn and Grzybowski 2003). Possible interspecific hybrids have also been observed in Colorado. In May 2002, a possible hybrid was photographed in Broomfield County (Wood and Semo 2002). Another individual exhibiting hybrid characteristics was photographed in El Paso County, July 2003 (pers. obs. of photos). Both reports, however, have yet to be submitted to the CBRC.

STATUS IN NEARBY STATES

A specimen was obtained in Oklahoma in 1954 (Sutton 1955). Among Colorado's neighboring states, that specimen remained the region's only confirmed Glossy Ibis until 1991, when the second was documented for Oklahoma. Kansas quickly followed Oklahoma's second with its first state record in 1992, but it was not until 1999 that Nebraska recorded its first Glossy Ibis (Sharpe et al. 2001). From 1946 to 1964, however, Nebraska birders had reported 10 Glossy Ibises, although none of them was sufficiently documented (Sharpe et al. 2001). Since 1999, at least one Glossy Ibis has been recorded annually for Kansas and Oklahoma. Except for two records from Colorado and one from New Mexico, all of the region's summer and fall records come from these three states.

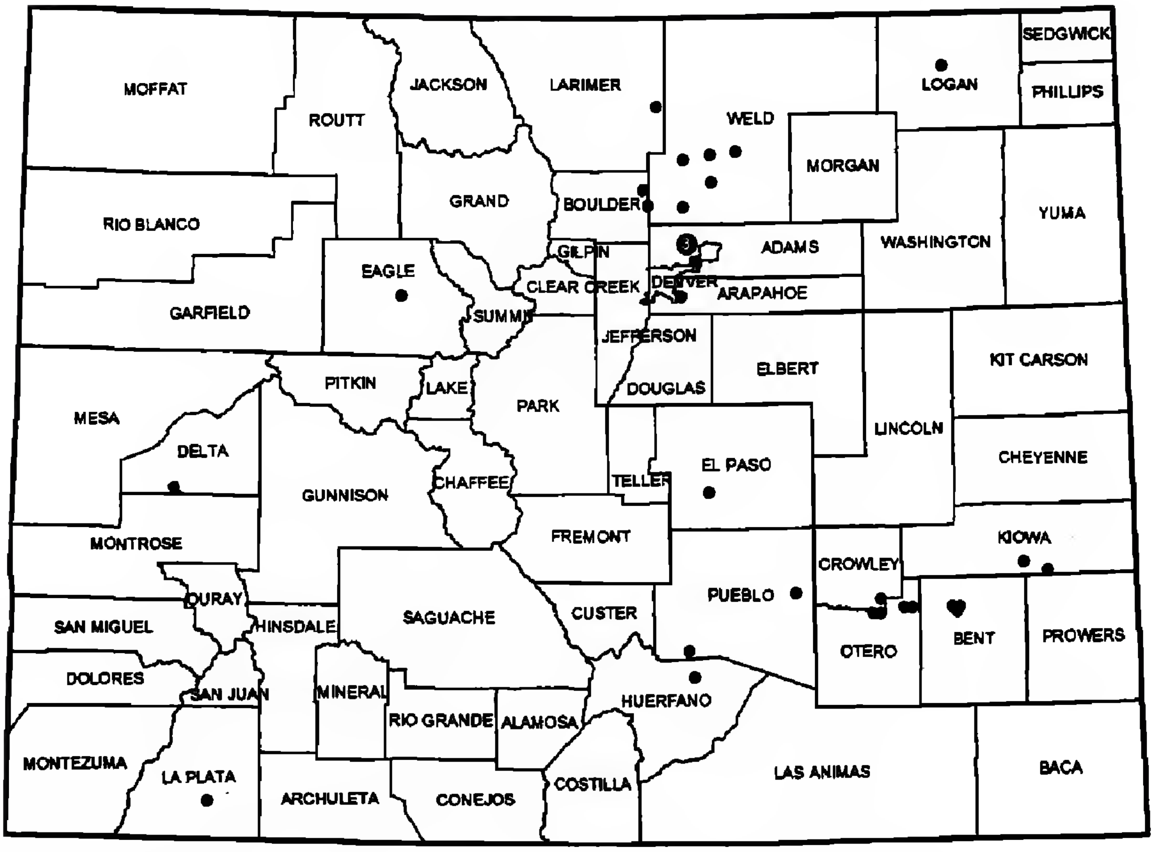

Figure 2. Distribution of Glossy Ibis records in Colorado through 2002.

Of the states north or west of Colorado (Montana, Wyoming, and Utah) only Wyoming has any accepted Glossy Ibis records. Wyoming's first was of an adult observed near Ocean Lake 5 May 1992 (Luce et al. 1997). The state's second occurred in 1999, when an adult was found near Jackson 4 May (Truan and Percival 1999). Both of these records are from the western half of the state. In 2002, four birds were reported from Wyoming, all still under review by the Wyoming Bird Records Committee. I observed one of these, an adult in definitive alternate plumage near Cheyenne 5 May. Two weeks later, on 18 May, two alternate-plumaged adults were also seen near Cheyenne by experienced observers Steve Dinsmore, Jr., and Joe Fontaine. The last sighting was of an adult near Dubois, in the western half of the state (Wyoming Bird Records Committee files). Montana lists the Glossy Ibis as hypothetical on the basis of a convincing report of an adult on 24 May 2002 near Choteau, Teton County (Lenard et al. 2003).

Arizona and New Mexico both have Glossy Ibis records, with Arizona's sole record in May 2001 (Rosenberg and Jones 2001). New Mexico's first record came in 1995, followed by three in 1999 and five in 2001, the last including the state's first fall record, of a single bird photographed in September. Four more individuals were recorded in 2002, including two birds together at Las Vegas National Wildlife Refuge on 5 May (New Mexico Bird Records Committee files).

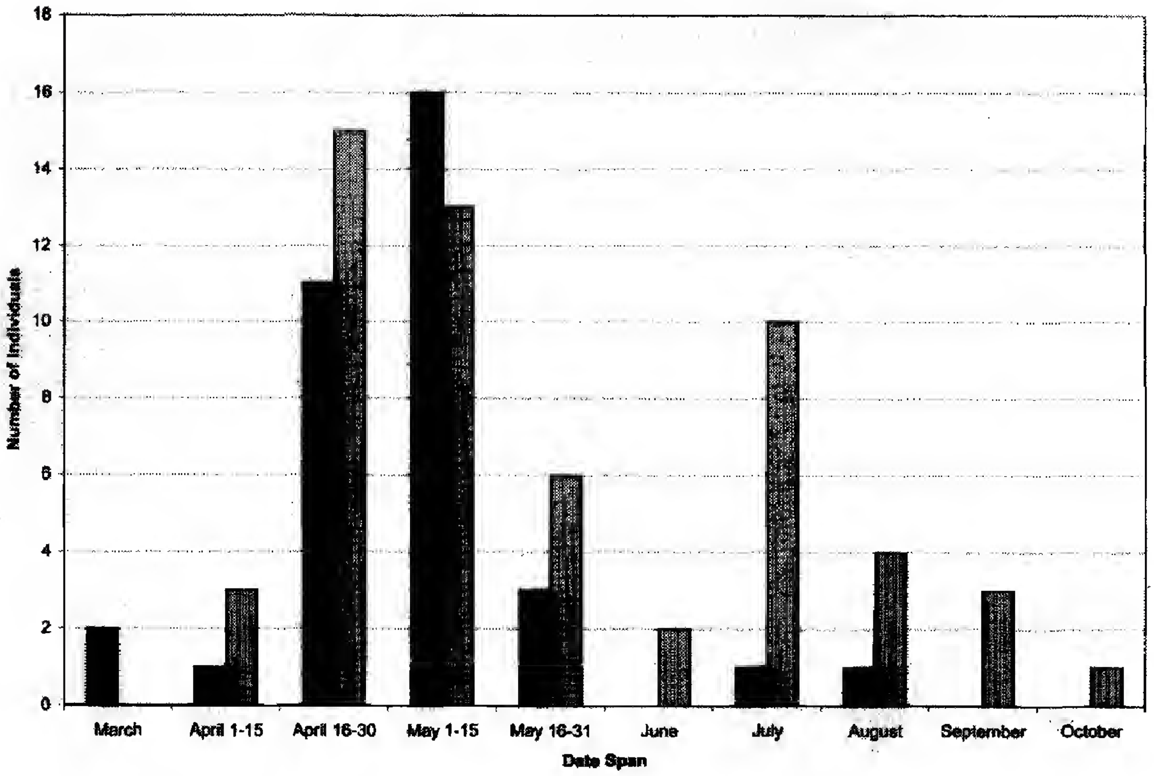

Figure 3. Seasonal distribution of Glossy Ibis records in Colorado (black) and neighboring states (gray) through 2002.

DISCUSSION

The concentration of Colorado's Glossy Ibis records in spring is not surprising. All records through 2002 are of adult birds in definitive alternate plumage (CBRC files). Adult *Plegadis* ibises differ most in this plumage, worn in spring, so a Glossy is more likely to be picked out of a flock of the White-faced at this time of year. The period of concentration of Glossy Ibis records, 16 April to 15 May (Figure 3), coincides with the peak migration period of the White-faced Ibis in Colorado (Andrews and Righter 1992). A potential source of bias contributing to this concentration of records is increased birder activity. If this factor is significant, however, then birders are under-reporting the Glossy Ibis in Colorado in summer and fall when it is difficult to distinguish from the White-faced Ibis.

Records from adjacent states, primarily Kansas, Nebraska, New Mexico, and Oklahoma, also follow this general pattern (Figure 3), peaking sharply from 16 April to 15 May. A smaller peak occurs in July (10 records). Records outside of the spring period (June–October) are dominated by Kansas and Oklahoma, encompassing 17 of 22 individuals (77%), and thus are not representative of the region as a whole. These summer and fall records probably refer to postbreeding wanderers. Kansas and Oklahoma are more likely to receive postbreeding wanderers because those states are nearer to the Glossy Ibis's known breeding locations than the other states addressed in this paper.

All but four of Colorado's 35 Glossy Ibis records in Colorado are are for 1995 and later. The pattern in neighboring states, especially Kansas, is similar. Of the 15 Glossy Ibises reported in Kansas through 2002, all but one have occurred since 1995, with only 1998 lacking a record. Since 1999, the Glossy Ibis has been reported annually in Nebraska, New Mexico, and Oklahoma, in some cases as multiple individuals. In these states the lag between 1995 and the upsurse of reports in 1999 may have been due only to a lag in birders' vigilance for this easily overlooked species.

The concentration of Glossy Ibis records in Colorado relative to neighboring states is most likely due to the concentration of birders along the heavily urbanized base of Colorado's Front Range. This area also features many reservoirs and wetlands used by the White-faced Ibis during migration. Also, the Arkansas River valley from Pueblo east to the Kansas border is visited nearly daily by birders from late April to mid-May (pers. obs.).The major wetlands where the White-faced Ibis occurs in Kansas (e.g., Quivira National Wildlife Refuge), Oklahoma (Salt Plains National Wildlife Refuge), and Nebraska (Valentine National Wildlife Refuge) are in the central or western portions of these states where the human population is low.

The contrast in number of Glossy Ibis records between eastern Colorado and regions west of the continental divide may be related to where White-faced Ibis populations winter. Banding studies in the 1960s suggest that White-faced Ibises breeding in Utah and other states west of the divide winter in western Mexico, outside the winter range of the Glossy Ibis. Ibises breeding east of the divide winter along the northern shore of the Gulf of Mexico (Ryder 1967). Therefore Glossy Ibises wandering from the southeastern U.S. are more likely to join flocks of the White-faced Ibis of the eastern population and accompany them north, provided that these flocks remain intact through spring migration and do not cross the continental divide. The few Glossy Ibises recorded in California, Arizona, and western Mexico (see Patten and Lasley 2000) may have joined flocks of the White-faced wintering in western Mexico, then migrated north with them to far western states.

Might the greater concentration of Glossy Ibis records in Colorado be due to the Colorado Bird Records Committee having a lower standard for acceptance of these records than other state records committees? I discount this hypothesis because all of Colorado's Glossy Ibises records are of birds in definitive alternate plumage. In reviewing the records I found that observers consistently mentioned the species' salient characteristics: blue facial skin, dark eyes, reduced white border on facial skin, and red tarsus joints with otherwise dark legs. Some records include diagnostic photographs as well. The documentation is adequate to exclude the possibility of hybrids, which are more likely in areas where the breeding ranges of the White-faced and Glossy overlap than in Colorado. Reports of possible hybrids in Colorado in 2002 and 2003, however, do raise the bar for future Glossy Ibis documentations.

BREEDING AND HYBRIDIZATION

The final destination for the Glossy Ibises occurring in Colorado is unknown. There is only one known nesting location for the White-faced Ibis in eastern Colorado, the privately owned Lower Latham Reservoir in Weld County. Because the site is birded heavily it is doubtful that Glossy Ibises summer there.

Each summer, the Rocky Mountain Bird Observatory surveys all accessible wetlands in Colorado as part of large-scale breeding-bird monitoring (Leukering et al. 2000). It is doubtful that ibises could nest anywhere in eastern Colorado without the site being documented at least once in the past five years of this program. Furthermore, the recent multi-year drought has severely reduced the number of wetlands on the eastern plains suitable for waterbird nesting (pers. obs.). Therefore, because the Glossy Ibis is recorded predominantly in eastern Colorado, especially along the northern Front Range (Adams, Boulder, Larimer, and Weld counties), the species is likely continuing its migration with White-faced Ibises to breeding areas farther north. The increase in reports for Wyoming, especially in 2002, provides some support for this idea, though Montana has only one convincing sighting. These states' low density of human population, hence of birders, may be responsible for this dearth of records.

The Glossy Ibis is not known to nest in Colorado or in neighboring states, though it may. In a wetland in south-central Nebraska an apparent pair of the Glossy was found in summer 2001 after a nearby colony of the White-faced Ibis was abandoned (Dinsmore 2001). Also, in summer 2002, four adult Glossy Ibises were at Salt Plains National Wildlife Refuge, Oklahoma, in a recently established breeding colony of the White-faced (Grzybowski 2002). The Glossy is also becoming regular in Kansas in summer at Quivira National Wildlife Refuge and Cheyenne Bottoms, sites of 13 of that state's 15 records, although it is possible these birds were postbreeding wanderers. No breeding was documented by the Kansas Breeding Bird Atlas (Busby and Zimmerman 2001).

Observations of apparent Glossy x White-faced Ibis hybrids in the United States are recent, although these species have interbred freely at the London Zoo (Gray 1958, Palmer 1962). Up to five apparent hybrids were discovered in Oklahoma at Salt Plains National Wildlife Refuge in summer 2002 (Arterburn and Grzybowski 2003). Two have been reported in Colorado (see under Status in Colorado). The source of these potential hybrids is unknown. They may originate from farther east where the White-faced and Glossy overlap or be the result of mixed pairings in the Great Plains at unknown locations.

Since the first accepted state record in 1986, the Glossy Ibis has become a regular, if rare, spring migrant in Colorado. The species' increase in the region suggests that it may be expanding its nesting range further. Glossy Ibis nesting should be looked for throughout the Great Plains, particularly during the late spring and summer, at known nesting locations for the White-faced Ibis.

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(Nebraska), and Sartor O. Williams, III (New Mexico), provided records of state committees or other information pertaining to Glossy Ibis occurrences in their respective states. My appreciation to Megan McLachlan of Rocky Mountain Bird Observatory for creating the map in GIS. I thank Michael A. Patten, Dan Reinking, and two anonymous reviewers for their comments.

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LOW INCIDENCE OF COWBIRD PARASITISM ON SWAINSON'S THRUSHES IN CENTRAL COASTAL CALIFORNIA

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ABSTRACT: We found a low incidence of Brown-headed Cowbird (*Molothrus ater*) parasitism (4%; 9/224 nests) of Swainson's Thrush (*Catharus ustulatus*) in central coastal California despite the high rates (33%) reported here for Wilson's Warbler (*Wilsonia pusilla*). Both species nested primarily in blackberry shrubs and ferns in similar proportions and at similar heights. Thrush nests were significantly better concealed than warbler nests. In both the thrush and warbler, however, concealment of parasitized and unparasitized nests did not differ. The number of potential cowbird perches was not significantly greater at warbler nests or at parasitized nests of either species. No cowbirds fledged from thrush nests; in thrush nests cowbird nestlings observed were last seen at ages of 4 to 7 days, whereas thrush nestlings fledged. At our study sites Swainson's Thrushes fed nestlings a variety of fruit; this partially frugivorous diet may not be suitable for cowbird nestlings, leading to their death. Parasitism significantly reduced the thrushes' clutch size, number of nestlings, and number of fledglings. In four thrush nests experimentally parasitized with real cowbird eggs we observed no rejection response, suggesting that ejection of cowbird eggs is not responsible for the low rate of parasitism observed at our sites. It is unclear why Swainson's Thrushes are parasitized infrequently at our sites, but we suggest that nest concealment may be partly responsible. We did not study behavioral differences between Swainson's Thrush and Wilson's Warbler, but such differences may contribute to the observed difference in parasitism rates.

Swainson's Thrush (*Catharus ustulatus*) breeds in northern forests across Canada from Newfoundland to Alaska, in the eastern United States it breeds along the Canadian border in New England and the Midwest, and in the West it breeds in the Rocky Mountains and along the Pacific slope south to southern California (Evans Mack and Yong 2000). The range of the Brown-headed Cowbird (*Molothrus ater*) overlaps the range of Swainson's Thrush widely, but the cowbird is not found in far northern Canada or Alaska (Lowther 1993). Over much of the thrush's range its populations are stable (Rich et al. 2004). However, the subspecies we studied, *C. u. oedicus*, is endemic to California, where it is listed as a species of special concern by the California Department of Fish and Game (W. D. Shuford pers. comm.). This subspecies breeds along the west slope of the Sierra Nevada and along the coast from at least Marin and Lake counties south to San Diego County (M. A. Ramos in Phillips 1991, Evans Mack and Yong 2000). Brown-headed Cowbird parasitism has been named in part as a likely cause of population decline for Swainson's Thrush along the central and southern California coast (Garrett and Dunn 1981, Evans Mack and Yong 2000), though little is known about the breeding biology of Swainson's Thrush. The few nest studies that do exist have found a low incidence of parasitism (0 to 8%, summarized by Evans Mack and Yong 2000). It should be noted that two parasitism estimates were from nest-record databases (Western Foundation of Vertebrate Zoology and Cornell Nest Record Program) without any reference to cowbird presence or density, four were from unpublished reports (three were single- or two-year reports from our study sites in Marin County, California), and only two estimates were from published studies, one of which found no parasitism in Alaska, where there are no breeding cowbirds (Rogers 1994).

Parasitism rates within species often vary geographically, temporally, and by landscape within a region (Lowther 1993, Donovan et al. 1995, Robinson et al. 1995). Of the other *Catharus* thrushes, only the Veery (*C. fuscesens*) and the Hermit Thrush (*C. guttatus*) have breeding ranges that overlap the Brown-headed Cowbird's (Lowther et al. 2001, Rimmer et al. 2001). The Veery has an observed parasitism rate of 19 to 87% (Moskoff 1995), and the Hermit Thrush has an observed parasitism rate that ranges from 1.5% west of the Rocky Mountains to 21.7% in Michigan (Jones and Donovan 1996). The closely related Wood Thrush (*Hylochichla mustelina*) has its highest parasitism rates in the Midwest (from 10 to 100%, depending on landscape) and lowest rates in the East (Roth et al. 1996).

Host species may have an observed parasitism rate lower than the actual rate if they are able to eject cowbird eggs (Rothstein 1975, Rich and Rothstein 1985, Sealy 1996). J. Smith (in Evans Mack and Yong 2000) reported one instance of a Swainson's Thrush ejecting a cowbird egg. Other factors that explain low brood-parasitism rates in other species include the parasite's selectivity for hosts (Soler et al. 1995, Hahn et al. 1999), avoidance of hosts that are known to eject (Sealy and Bazin 1995, Peer et al. 2002), nest defense or host vigilance (Briskie et al. 1990, Strausberger and Burhans 2001, Davis et al. 2002), host conspicuousness around the nest (Uyehara and Narins 1995, Banks and Martin 2001), asynchrony of breeding seasons (Peer and Bollinger 1997, Underwood et al. 2004), and nest-site characteristics that might make a nest more difficult to find (Briskie et al. 1990, Clarke et al. 2001). Among nest-site characteristics, two hypotheses have frequently been invoked as influencing parasitism rates: the nest-exposure hypothesis (greater nest concealment reduces parasitism rates; Martin 1993, Burhans 1997) and the perch-proximity hypothesis (trees and/or snags near the nest facilitate nest-searching by cowbirds by providing them with perches from which they view nest-building or other nesting activities; Clotfelter 1998, Hauber and Russo 2000).

Here we present data showing a low incidence of observed cowbird parasitism on Swainson's Thrush and contrast that with high rates reported for Wilson's Warbler (*Wilsonia pusilla*) at the same sites (Michaud et al. 2004). In Marin County, these host species have been sympatric with the cowbird since about 1930, when cowbirds moved in (Laymon 1987, Rothstein 1994). Both host species and cowbirds overlap in nesting habitat (Roberson 1993, Shuford 1993, Farmer 1999) and timing of nest initiation (Swainson's Thrush, 7 May–14 July, J. D. White unpubl. data; Wilson's Warbler, 17 April–10 July, Michaud et al. 2004; Brown-headed Cowbird laying dates, mid April–mid July, Trail and Baptista 1993). We compare the thrush's and the warbler's nest placement. We also compare concealment and the number of potential cowbird perches around nests of each species, distinguishing parasitized and unparasitized nests to evaluate support for the nest-exposure and perch-proximity hypotheses. We measure the effect of parasitism on Swainson's Thrush clutch size and numbers of nestlings and fledglings, and we present outcomes for parasitized nests. In addition, we report results of experimental parasitism of four thrush nests.

METHODS

As part of an ongoing multi-species monitoring project, we studied Wilson's Warblers and Swainson's Thrushes along Redwood Creek (37° 51′ N, 122° 34′ W, Golden Gate National Recreation Area [GGNRA] and Mt. Tamalpais State Park) and Lagunitas Creek (38° 02′ N, 122° 45′ W, GGNRA) in Marin County, California. From 2000 to 2002 Swainson's Thrushes were the focal species of a dissertation project, resulting in larger sample sizes of nests during those years (Table 1). We used Wilson's Warbler data from the same sites (presented by Michaud et al. 2004) for comparison with Swainson's Thrush data; we also summarized some Wilson's Warbler data not presented by those authors (e.g., nest concealment; see below).

Along each creek we established two nest-searching plots from 4 to 7 ha in size and at least 500 m apart. We searched for and monitored all nests following a standardized protocol (Martin and Geupel 1993). We checked nests every 2 to 4 days and within 2 days prior to the estimated date of fledging. After the young fledged or a nest failed, we measured nest-site characteristics and vegetation surrounding the nest (Martin et al. 1997). The primary cause of nest failure for both thrushes and warblers is predation (Evans Mack and Yong 2000, Michaud et al. 2004), and both species may renest up to three (Swainson's Thrush) or four (Wilson's Warbler) times after nest failure (J. D. White unpubl. data, Ammon and Gilbert 1999). For both species, we estimated percent concealment from 1 m above the nest (by standing or leaning over the nest) and from 1 m on the side from four cardinal directions by visually estimating how much of the nest was covered by leaves or stems (Martin et al. 1997). We averaged the four side-concealment measurements to obtain one estimate for each nest. We also examined whether minimum side concealment differed by comparing minimum concealment from any side. We counted the number of trees, snags (>1.4 m tall), and natural stumps

Table 1 Number and Percentage of Parasitized Swainson's Thrush Nests by Year, Marin Co., California, 1997–2003

Year	Parasitized nests	Total nests	Percentage
1997	1	14	7.1
1998	2	20	9.1
1999	1	16	6.3
2000	0	36	0
2001	1	72	1.4
2002	2	55	3.6
2003	2	11	18.2
All years	9	224	4.0

(<1.4 m tall) within an 11.3-m radius of Swainson's Thrush and Wilson's Warbler nests; trees were sorted into three size classes based on stem diameter (8–23, 23–38, and >38 cm diameter at breast height). We assumed that if the number of trees, snags, and stumps within a set of sites was similar then the number of branches and therefore potential cowbird perches was also similar. Sample sizes for different measurements vary because some measurements were logistically difficult to take (e.g., if a nest fell out of the shrub/nest substrate we did not measure concealment).

We used Swainson's Thrush nests monitored from 1997 to 2003 to determine cowbird-parasitism rates and outcomes of parasitized nests. At each nest, the number of fledglings was based on the number of nestlings at the last nest check prior to the estimated date of fledging. Michaud et al. (2004) reported parallel data for Wilson's Warblers at these sites.

In 2002 and 2003 we experimentally parasitized four thrush nests in four different territories (i.e., different females) with real cowbird eggs; no thrush eggs were removed. We gathered the cowbird eggs from inactive Wilson's Warbler nests on the study sites. We placed cowbird eggs in nests during egg laying; we parasitized three nests that contained three thrush eggs (each had a completed clutch of four thrush eggs), and we parasitized one nest on the day the first thrush egg was laid (completed clutch was three thrush eggs). We watched nests from a distance of approximately 30 m for 45–60 min after artificial parasitism and checked the nest after this observation to confirm that the egg remained (Sealy 1996). We removed parasitic eggs after at least two days because most ejectors remove parasitic eggs within 24 hours (Rothstein 1975, Rich and Rothstein 1985, Sealy 1996).

STATISTICAL ANALYSIS

Using Kruskal–Wallis tests (nonparametric one-way analyses of variance; procedure NPAR1WAY, SAS Institute 1999), we tested for differences between Swainson's Thrush and Wilson's Warbler nests in concealment and tree density by size classes, in number of nearby snags and stumps, and between parasitized and unparasitized nests. We used a sequential Bonferroni adjustment for joint significance for concealment (9 tests) and tree density (15 tests) (Rice 1989). We also used Kruskal–Wallis tests to examine differences between parasitized and unparasitized thrush nests in clutch size and in numbers of nestlings and fledglings, and we used a sequential Bonferroni adjustment for joint significance (3 tests). We used nonparametric tests because residuals were not distributed normally. All results are reported as mean ± standard error (SE).

RESULTS

Only 9 of 224 (4%) thrush nests were parasitized by the Brown-headed Cowbird from 1997 to 2003 (Table 1). Each parasitized thrush nest contained one cowbird egg, but none fledged cowbirds. Four of the nine parasitized nests failed during the egg stage. The cowbird eggs failed to hatch or, in two nests, cowbird nestlings were never observed. In the remaining three nests, the cowbird eggs hatched but the cowbird nestlings disappeared, whereas the thrush nestlings remained. In the first of these nests, the cowbird nestling was last seen at an age of 7 days, and the nest fledged one thrush. In the second, the cowbird was last seen at an age of 4 days, and three thrush nestlings fledged. In the third, the cowbird nestling was last seen at an age of 7 days, and the nest fledged two thrushes.

Cowbird parasitism significantly reduced the thrush's mean clutch size by 1.23 eggs ($\chi^2_1 = 16.8$, $P < 0.0001$) and significantly reduced the mean number of both nestlings and fledglings by 0.9 after Bonferroni adjustment (nestlings, $\chi^2_1 = 5.1$, $P < 0.05$; fledglings, $\chi^2_1 = 4.1$, $P < 0.05$, Table 2). In two of the nine cases of parasitism, we observed a Swainson's Thrush egg outside of the nest: in one instance the thrush egg was left on the edge of the nest: in the other the egg was on the ground approximately 1 m from the nest. Thrush eggs found outside the nest were not included in clutch-size estimates for parasitized nests.

At the nests parasitized experimentally, all females returned to incubate after we inserted cowbird eggs. The cowbird eggs remained after 45–60 min of observation and as long as 2 days (2 nests) and 3 days (2 nests) before we removed them. In three cases we removed cowbird eggs after clutch completion, and in one case we removed the cowbird egg the day of clutch completion.

Both Swainson's Thrushes and Wilson's Warblers nested in the shrub layer and used similar nest substrates at similar proportions and at similar heights (Table 3). Swainson's Thrush nests ($n = 221$) were significantly more concealed from above ($\chi^2_1 = 31.2$, $P < 0.0001$) and the side (mean side concealment, $\chi^2_1 = 14.5$, $P < 0.0001$; minimum side concealment, $\chi^2_1 = 10.5$, $P > 0.0010$) than Wilson's Warbler nests ($n = 114$) after Bonferroni adjustment (Figure 1). In parasitized ($n = 9$) and unparasitized ($n = 211$) thrush nests concealment from above or the side did not differ (above, $\chi^2_1 = 4.5$, $P < 0.05$; mean side, $\chi^2_1 = 0.8$, $P > 0.25$; minimum side, $\chi^2_1 = 0.3$, $P > 0.60$) after Bonferroni adjustment (Figure 1). Concealment from above or the side of parasitized ($n = 30$) and unparasitized ($n = 83$) warbler nests did not differ either (above, $\chi^2_1 = 0.6$, $P > 0.40$; mean side, $\chi^2_1 = 2.4$, $P > 0.10$; minimum side, $\chi^2_1 = 1.4$, $P > 0.20$, Figure 1).

There were more large trees surrounding Swainson's Thrush nests ($n = 236$) than around Wilson's Warbler nests ($n = 122$; $\chi^2_1 = 11.3$, $P < 0.001$), but there was no difference in the mean number of other potential perches (Figure 2). The mean number of potential perches around parasitized and

Table 2 Clutch Size, Number of Nestlings, and Number of Fledgings in Parasitized and Unparasitized Swainson's Thrush Nests, Marin Co., California, 1997–2003

	Unparasitized nests[a]	*n*	Parasitized nests[a]	*n*
Clutch size	3.5 ± 0.05	184	2.2 ± 0.28	9
Number of nestlings	3.1 ± 0.07	134	2.2 ± 0.37	5
Number of fledglings	3.1 ± 0.10	73	2.2 ± 0.37	5

[a] Mean ± standard error.

Table 3 Heights and Substrates of Swainson's Thrush and Wilson's Warbler Nests, Marin Co., California, 1997–2003

	Swainson's Thrush	Wilson's Warbler[a]
n	234	90
Nest height[b]	61.1 ± 2.6 cm	50.4 ± 2.5 cm
Nest substrate		
Blackberry	46%	68%
Thimbleberry	15%	—
Fern	12%	18%

[a] Data from Michaud et al. (2004).

[b] Mean ± standard error.

unparasitized thrush nests did not differ significantly (Figure 2). The mean number of potential perches around parasitized ($n = 30$) and unparasitized ($n = 82$) warbler nests did not differ significantly after Bonferroni adjustment ($\chi^2_1 = 4.7$, $P < 0.05$, Figure 2).

DISCUSSION

The observed parasitism frequency of 4% for this population of Swainson's Thrushes is similar to that reported for the species elsewhere (Evans Mack and Yong 2000). Our low parasitism frequency is surprising given the 33% observed parasitism on the sympatric Wilson's Warblers (Michaud et al. 2004) and the relatively high rates reported for other *Catharus* thrushes (Moskoff 1995, Jones and Donovan 1996) and the Wood Thrush (Roth et al. 1996). Once a nest was parasitized, the intensity of parasitism for the Swainson's Thrush and Wilson's Warbler was similar, with 1 cowbird egg per thrush nest compared to an average of 1.2 ± 0.07 cowbird eggs per warbler nest (Michaud et al. 2004).

At our study sites both Swainson's Thrushes and Wilson's Warblers nested in shrubs, and both species used the same nest substrates in similar proportions (Table 3). Swainson's Thrushes tended to nest slightly higher (~10 cm) than Wilson's Warblers (Table 3). Therefore, nest placement may not be different enough to explain the difference in parasitism rates between these species (Briskie et al. 1990). Nest initiation of both species was largely synchronous with the cowbird's egg laying, so nesting asynchrony does not explain the difference. Nest concealment, however, did differ, particularly from above the nest, and may contribute to the difference in observed parasitism. When the number of potential perches around the hosts' nests differed the difference was in a direction opposite of that expected under the perch-proximity hypothesis (Figure 2).

No cowbird nestlings fledged from thrush nests. It seems unlikely, however, that partial predation could explain cowbird nestling losses because no thrush nestlings disappeared. We suggest that cowbird nestling mortality may be due to the partially frugivorous diet of Swainson's Thrush nestlings. Western populations of the Swainson's Thrush are more frugivorous than eastern populations; Beal (1907) reported that diets of adults in California

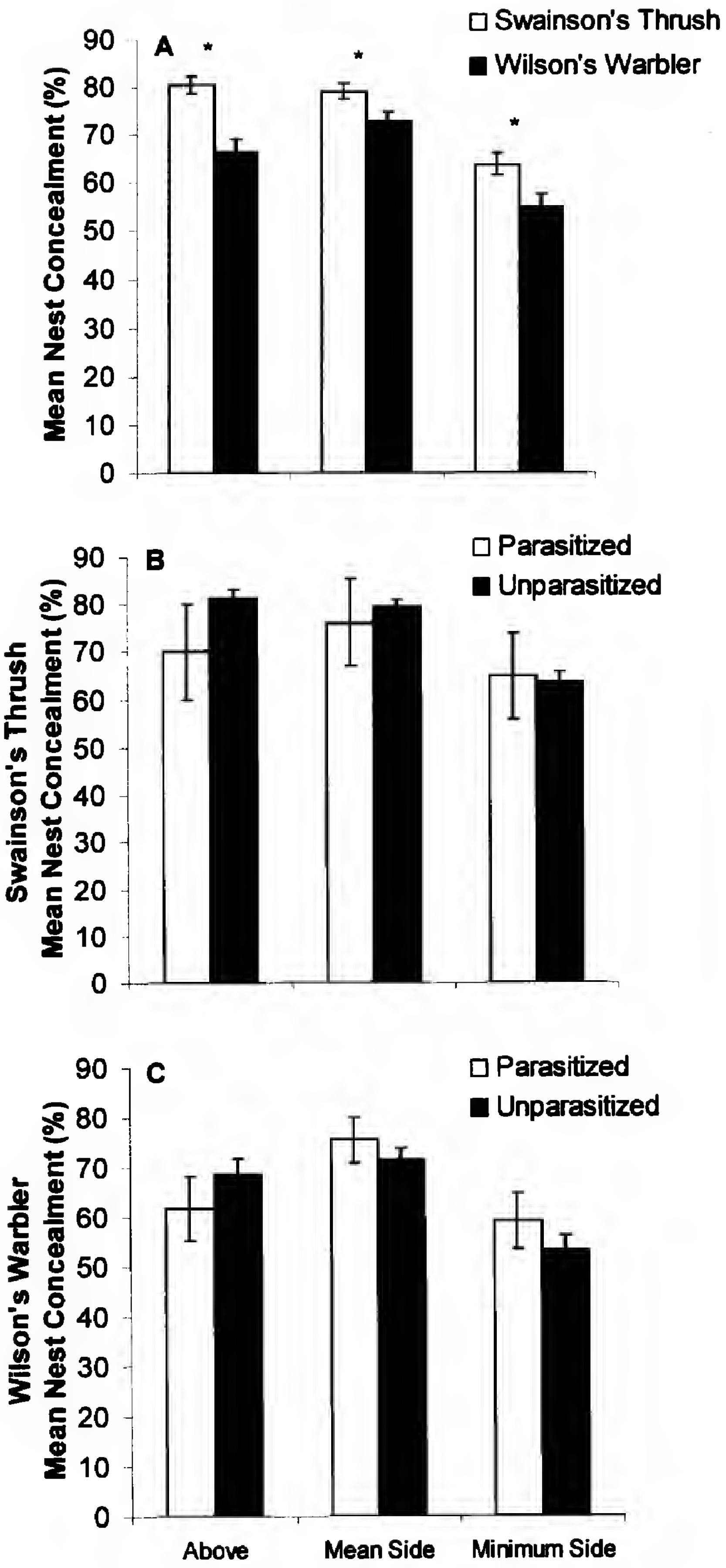

Figure 1. Mean percent concealment from above, and mean and minimum side concealment from four sides, of Swainson's Thrush and Wilson's Warbler nests (A). Mean concealment of parasitized and unparasitized Swainson's Thrush (B) and Wilson's Warbler nests (C), Marin Co., California, 1997–2002. Bars show standard error of mean and minimum percent concealment. Asterisks indicate a significant difference between means after Bonferroni adjustment.

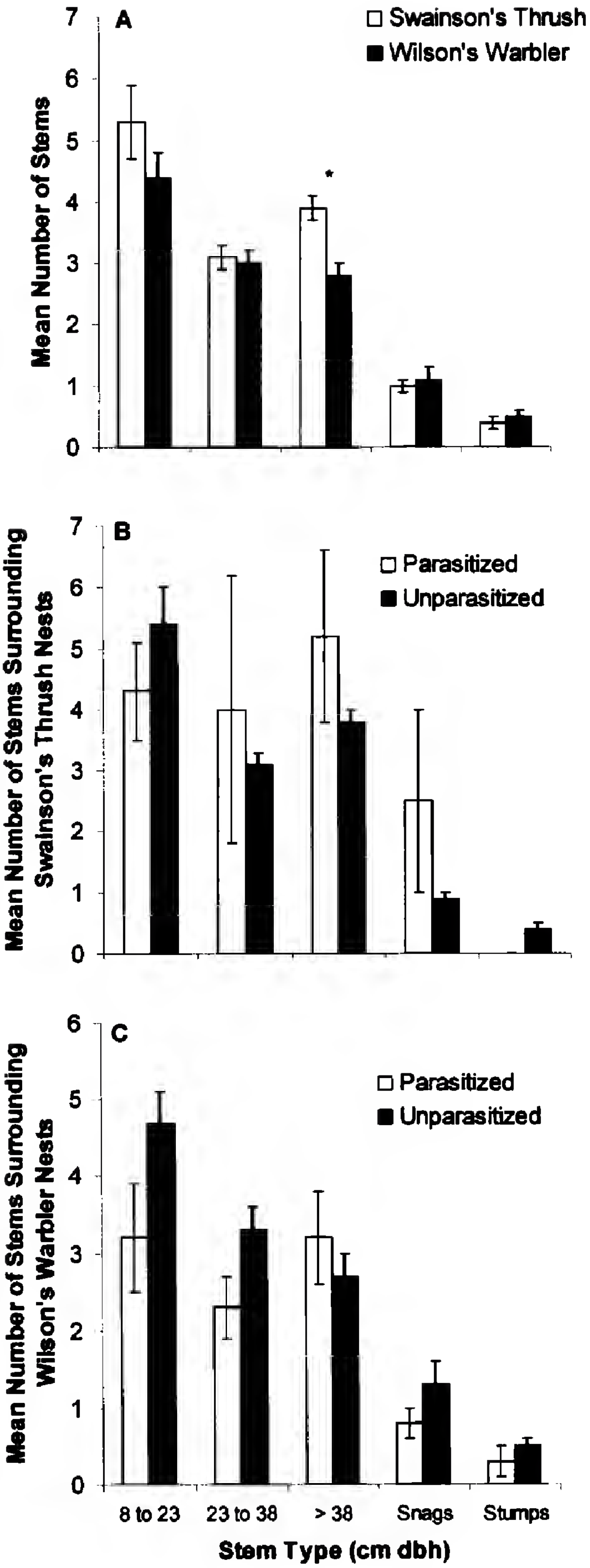

Figure 2. Mean (± standard error) number of stems surrounding Swainson's Thrush and Wilson's Warbler nests (A) and surrounding parasitized and unparasitized Swainson's Thrush (B) and Wilson's Warbler nests (C), Marin Co., California, 1997–2002. Asterisks indicate a significant difference between means after Bonferroni adjustment.

comprise 52% animal and 48% vegetable matter. Although in the thrushes and related families altricial young must be fed insects early in the nestling cycle—for example, before nestling days 3 and 7 for the Cedar Waxwing (*Bombycilla cedrorum*) and Northern Mockingbird (*Mimus polyglottos*), respectively—they may be fed some fruit thereafter (Putnam 1949, Breitwisch et al. 1984). We have observed adults feeding Swainson's Thrush nestlings Red Elderberries (*Sambucus racemosa*), Twinberries (*Lonicera involucrata*), Thimbleberries (*Rubus parviflorus*), and Dogwood berries (*Cornus sericea*). A diet with a fruit component may not be suitable for cowbird nestlings, possibly leading to mortality, as is presumed with cowbird nestlings in Cedar Waxwing nests (Young 1963, Rothstein 1976) and cowbird nestlings fed the granivorous diet of some nestling finches (Middleton 1977, 1991, Kozlovic et al. 1996). Loss of cowbird young early in the nestling period may contribute to a low frequency of observed parasitism when nests are found late in the nestling period.

Our sample of naturally (9) and experimentally (4) parasitized nests was small, but we have no reason to believe that Swainson's Thrushes eject cowbird eggs. If low observed parasitism rates were due to rapid ejection of parasitic eggs then we would expect our experimental eggs to have been ejected immediately or within the first 24 hours of parasitism (Rothstein 1975, Rich and Rothstein 1985). However, experimental parasitic eggs remained in the nest for 2 or 3 days before we removed them. Furthermore, in none of the 13 naturally or experimentally parasitized nests did we observe desertion, which can be an antiparasite response (Hosoi and Rothstein 2000, Strausberger and Burhans 2001). This apparent lack of a rejection response (ejection or desertion) to parasitic eggs is not surprising considering that cowbird parasitism is relatively new to the population we studied and likely to the entire subspecies *Catharus ustulatus oedicus* (Hosoi and Rothstein 2000). Under the evolutionary-lag hypothesis, this thrush may not yet exhibit rejection behavior because the recombinants necessary for the behavior have not yet arisen (Rothstein 1975). Additionally, if parasitic pressure is low it may not elicit antiparasite defenses in the host (Hosoi and Rothstein 2000, Davis et al. 2002). We conclude that Swainson's Thrush accepts cowbird eggs.

Further study is required to determine whether low parasitism frequencies on Swainson's Thrush nests are due to cowbird selectivity, to thrush behavior at the nest, or to some other factor. Currently, there are no data on Swainson's Thrush nest defense or response to cowbirds, nest attendance, or influence of other thrush behavior (e.g., singing rates) on parasitism frequencies. Further study is necessary to quantify the thrush's nestling diet and to establish the effect of a partially frugivorous nestling diet on cowbird nestlings to determine whether difference between the thrush and cowbird in nestling mortality is due to diet. As natural parasitism on Swainson's Thrushes is so infrequent, this could be accomplished by cross-fostering cowbird nestlings into thrush nests and monitoring their health and fate (Mason 1986, Peer and Bollinger 1997).

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NOTES

EXPANSION OF THE BREEDING RANGE OF THE BUFFLEHEAD IN CALIFORNIA

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Historically, the Bufflehead (*Bucephala albeola*) has maintained a small, isolated breeding population in extreme northeastern California, restricted to parts of Butte, Lassen, Modoc, Plumas, Shasta, and Tehama counties (Figure 1, inset). Prior to 1996, there were no known breeding records from California south of Lake Almanor, Plumas County (San Miguel 1998). However, the Bufflehead occasionally breeds outside of its principal range, and extralimital records to the south have been recorded recently in Colorado (Ringelman and Kehmeier 1990), Minnesota (Mattsson 1986), South Dakota (Whitt 1999), and California (San Miguel 1998, Patten et al. 2003). San Miguel (1998) described three cases of extralimital breeding in California from 1996, and Patten et al. (2003) reported a brood found on the Salton Sea in 1999. These successful breeding efforts were discovered in a variety of habitats in Inyo, Los Angeles, Riverside, and Tuolumne counties, up to 850 km south of the species' traditional breeding range (San Miguel 1998).

Whereas the 1996 records from Los Angeles and Inyo counties and the 1999 record from Riverside County were truly extralimital, the Tuolumne record may represent expansion of the breeding range. In 2002, there appeared to be a "Bufflehead explosion" in the Sierra Nevada, with nine breeding records reported from Alpine, El Dorado, Sierra, and southern Plumas counties. The Bufflehead continued to breed at several sites revisited in 2003, and four new breeding locales were discovered that year. Further inquiry revealed an additional breeding record for 2001. All but three of the sightings were made by multiple observers and/or me.

The sudden expansion of the Bufflehead's range in California was made apparent in 2002 by the posting of many breeding records on the Sierra Nevada birding list-server (http://groups.yahoo.com/group/sierra-nevadabirds/). In the fall of 2002, I posted a general request for breeding records and contacted those who had already posted their observations for details. During 2003, I queried as many birders and biologists frequenting the central Sierra as possible, regarding nesting Buffleheads. Since 2001 I have compiled 17 records of Bufflehead broods south of Lake Almanor, and thus outside of the Bufflehead's known breeding range (Table 1). These records, including one of a site with multiple breeding pairs and two of sites with multiple years of consecutive breeding, suggest a true expansion of the breeding range.

The records form loose clusters of breeding in the southern Lake Tahoe basin, Gold Lake/Lakes Basin area north of Bassetts, and the Henness Pass area between Bassetts and Truckee (Figure 1). Because no systematic censusing was performed, however, these aggregations probably represent a bias in concentration of birder and biologist effort. Several of these sites consist of atypical habitat, including a rock quarry, a sandy beach hundreds of meters from the nearest tree, and river oxbows adjacent to open meadows. Most sites, however, are well-wooded alpine lakes, more typical of the species' preferred breeding habitat. In none of these cases was the actual nest cavity discovered. Note also that these broods were often found unattended by adults (Table 1) and might easily have been overlooked were it not for astute observers.

The Bufflehead's prospective range expansion in California does not fit the normal pattern for this type of phenomenon. Given the trend toward warmer temperatures (i.e., global climate change), most species' distributions might be expected to shift northward in latitude or upward in elevation. This pattern has already been demon-

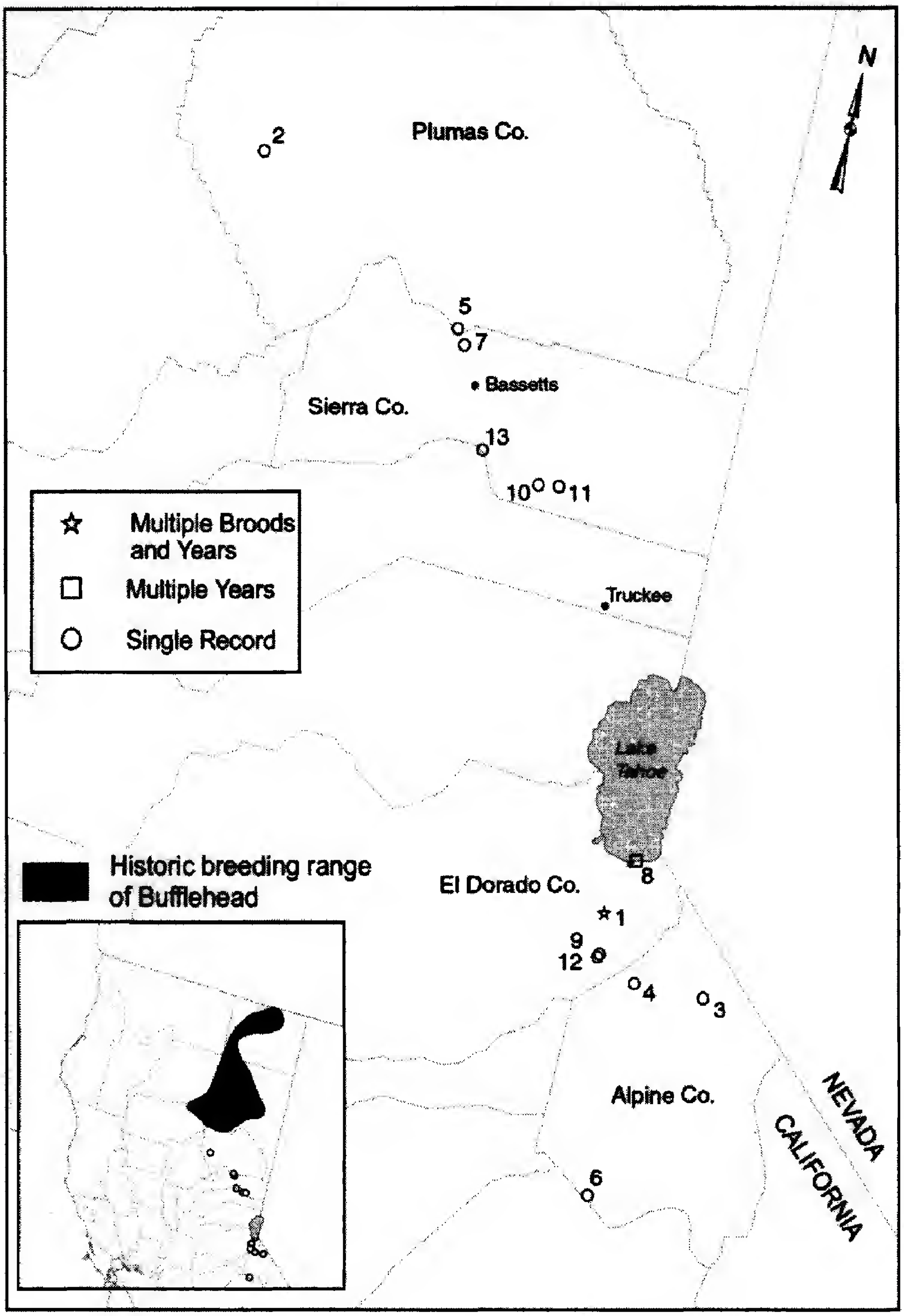

Figure 1. Bufflehead broods found south of Lake Almanor, Plumas County, California, 2001–2003. See Table 1 for description of records. Inset: distribution of current records relative to historic breeding range.

Table 1 Bufflehead Broods Found South of Lake Almanor, Plumas County, California, 2001–2003

Date[a]	County	Lake	Elevation (m)[b]	No. Chicks[a]	No. Adults[a]	Location No.[c]
2001						
27 June	El Dorado	Osgood Swamp	1999	7	1	1
2002						
18 June	El Dorado	Osgood Swamp	1999	8	1	1
22 June	Plumas	Thomson Lake	1679	7	1	2
22 June	Alpine	Indian Creek Res.	1707	11	1	3
23 June	Alpine	unnamed pond	2167	7	1	4
26 June	Plumas	unnamed pond	1977	7	1	5
5 July	Alpine	Sword Lake	2091	4	4	6
13 July	Sierra	unnamed pond	2012	9	1	7
15 July	El Dorado	Lake Tahoe	1905	2	2	8
19 July	El Dorado	unnamed pond	2219	4	0	9
2003						
15 June	El Dorado	Osgood Swamp[d]	1999	6	5	1
15 June	El Dorado	Osgood Swamp[d]	1999	7	5	1
5 July	Sierra	Webber Lake	2073	7	0	10
6 July	Sierra	Little Truckee R.	1984	8	0	11
7 July	El Dorado	Elbert Lake	2304	10	2	12
9 July	El Dorado	Lake Tahoe	1905	9	0	8
16 July	Sierra	unnamed quarry	1841	7	1	13

[a] Initial observation.

[b] Mean elevation = 1992 ± 161 m.

[c] See Figure 1.

[d] Two breeding pairs in 2003.

strated for several diverse avian taxa (Thomas and Lennon 1999, Root et al. 2003). There may be several reasons for this primarily boreal species to be expanding its range to the south. One explanation may be an increase in habitat availability. Spring is coming earlier in the west, as demonstrated by earlier pulses of spring run-off (Cayan et al. 2001). This temporal shift should translate into earlier break-up of ice on alpine lakes. It is possible that habitats now exploited by the Bufflehead in the Sierra Nevada have always been suitable in terms of food and cavity availability but were previously unavailable because of lingering ice. The Bufflehead has demonstrated an ability to adjust its breeding schedule at a site up to two weeks according to spring temperatures and the consequent timing of spring thaw (Savard et al. 1991, Gauthier 1993). Furthermore, earliest hatch dates are a full month earlier in California than in Alaska (Erskine 1972), underscoring the phenological plasticity of the species as a whole. However, the Bufflehead is highly unlikely to "short-stop," that is, to halt migration prematurely to breed at southern locations because of abnormally favorable conditions), as do many species of dabbling duck, such as the Blue-winged Teal, *Anas discors* (Bellrose 1976: 277). Because of fairly strict nest-site requirements, most cavity-nesting ducks demonstrate strong philopatry, and the Bufflehead is no exception (Erskine 1961, 1972, Gauthier 1993).

Perhaps there has been an increase in available cavities. Aging forests in the Sierra Nevada are becoming more decadent. A combination of periodic drought, beetle infestations (by *Dendroctonus*, *Ips*, *Scolytus*, and others), and a shift in United States

Forest Service policy on snag removal has resulted in a substantial increase of standing dead trees since the middle of the last century. This increase may have led to an increase in available Northern Flicker (*Colaptes auratus*) cavities, the Bufflehead's preferred nest site. Curiously, Breeding Bird Survey data from 1966 to 2002 suggest that flickers may have been declining across the Sierra Nevada during that time (trend = –0.82, *p* = 0.36, 27 routes; Sauer et al. 2003). The Bufflehead uses nest-boxes regularly (Gauthier 1988), and the species appears to be benefiting from the nest-box programs initiated in northern California within its historic range (T. Rickman pers. comm.). Most of the 13 sites I report are far from nest-box programs, and in many cases the ponds are surrounded by an abundance of snags with seemingly suitable cavities. The Bufflehead is likely benefiting from a complement of available cavities.

The expansion may be the result of an increase in population in the core of the species' range. Bufflehead numbers have increased across North America since the mid-1950s (Gauthier 1993), and there is evidence that the Bufflehead's density in northeastern California has increased since the 1980s (T. Rickman pers. comm.). It is possible that these newly exploited sites have always been suitable and available, but now Bufflehead populations have reached a point where second-year females prospecting for nest sites must go farther afield as a result of competition, both inter- and intraspecific, for these sites. Savard et al. (1991) found that mortality of Bufflehead ducklings was higher on ponds with several broods than on ponds with single broods, implying density-dependent mortality. Other cavity-nesting ducks appear to be increasing in northern California as well, including the Hooded Merganser, *Lophodytes cucullatus* (Stallcup 2002) and Wood Duck, *Aix sponsa* (Sauer et al. 2003; T. Rickman pers. comm.). The proliferation of these two species almost certainly has been the result of the installation of Wood Duck boxes at wetlands throughout California (Stallcup 2002). The California Waterfowl Association reported that it has placed over 5400 nest boxes in the state since 1991, producing approximately 30,000 Wood Duck nestlings annually (1999; www.calwaterfowl.org/Woodduck.htm; accessed 7 June 2004).

In recent years in eastern Plumas County (Eagle Lake Ranger District), Wood Ducks have been producing more eggs than Buffleheads have, in nest boxes that as recently as the 1980s were used only by the Bufflehead (T. Rickman, pers. comm.). If Wood Ducks or Hooded Mergansers are competing with Buffleheads for nest boxes, it is likely that the smaller Bufflehead might be forced to look elsewhere for suitable cavities.

The expansion of the Bufflehead in California is likely the result of a combination of factors including, but not limited to, those relating to both habitat and nest-site availability south of its historic range and population growth within the historic range. Unfortunately, there are few data that could support any of the hypotheses. Only time will tell whether this incursion is temporary or long-term. A coordinated monitoring effort, coupled with detailed habitat assessments of breeding ponds and nest cavities, would help resolve these questions. During 2004, while this article was in review, I learned of a few instances of continued breeding. Osgood Swamp has seen its fourth consecutive year of Bufflehead breeding, and a few other sites have demonstrated repeated breeding effort as well. Thus, through 2004, the expanded range appears stable at least as far south as the Tahoe Basin.

Thanks to Dan Airola, Daniel Cayan, Jeff Price, Tom Rickman, Jim Sedinger, and Brian Williams for useful discussion. Thanks to all the birders and biologists who contributed their records: Dan Airola, Richard Botoroff, Les Chibana and the Palo Alto Birding Class, Luke Cole, Chris Conard, Colin Dillingham, Brian Gibson, Phil Gordon, John Luther, Heather Matthewson, Nancy Richard, Bob Schwartz, Zach Smith. Thanks to Bruce Webb, creator and moderator of the Sierra Nevada list-server that provided a forum for many of these records to be shared publicly. Bob Elston and Piotr Bojakowsi assisted in the creation of the figure. I also thank Michael Patten and Mike San Miguel for their helpful comments on an earlier draft of the manuscript.

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SOUTHERNMOST RECORD OF A SPOTTED OWL × BARRED OWL HYBRID IN THE SIERRA NEVADA

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In the summer of 2003, we located a territorial hybrid between the Spotted Owl (*Strix occidentalis*) and the Barred Owl (*S. varia*) in the Rubicon River watershed, Placer County, in the Sierra Nevada (latitude 38° 57′ N, longitude 120° 29′ W). The individual was located in the same general area on six occasions, and it may have displaced a pair of Spotted Owls from this area. We trapped Spotted Owls and color-banded them in this area each year from 1993 to 2002. We found the pair of Spotted Owls that occupied this area in 2002 defending a different area 4.5 km to the southwest in 2003. On four occasions, we found the hybrid owl roosting in a natural cavity in a Black Oak (*Quercus kellogii*). This cavity had been used as a nest site by Spotted Owls in 3 of the past 10 years.

We captured the hybrid owl on 24 June 2003 and recorded the following measurements: mass 625 g, wing chord 320 mm, tail length 210 mm, tarsus length 59.9 mm, bill length 36.4 mm, and bill depth 22.8 mm. These measurements are within the range reported for the California Spotted Owl (*S. o. occidentalis*) by Gutiérrez et al. (1995) and at the lower end of the range reported for the male Barred Owl by Mazur and James (2000). The hybrid owl's plumage was similar to that of a Spotted Owl (Gutiérrez et al. 1995) except for five or six dark brown vertical bars on the breast. We recorded three distinct vocalizations: a long series call with 20–40 equally spaced notes, an ascending call ending with a note inflected down (Figure 1a), and a third call (Figure 1b) that was seemingly a cross between the Spotted Owl's typical four-noted location call (Gutiérrez et al. 1995) and the Barred Owl's typical "who cooks for you?, who cooks for you all?" call (McGarigal and Fraser 1985).

This is the southernmost observation of a Barred Owl or Barred × Spotted hybrid in the Sierra Nevada. This bird could represent local, undetected presence of Barred Owls in the area or dispersal of a bird from farther north. Previously, the nearest reported locations of Barred Owls or Barred × Spotted hybrids had been more than 75 km north of the Rubicon River watershed. Moreover, the Barred Owl range had not been reported to have expanded south in the Sierra Nevada in over a decade (G. Gould, California Department of Fish and Game, unpubl. data; Dark et al. 1998. It is unknown if this observation represents a long-term range expansion of the Barred Owl in the Sierra Nevada.

We thank the U.S. Forest Service for funding the study of Spotted Owl demography (contract #FS-53-9158-00-EC14 to R. J. Gutiérrez). R. J. Gutiérrez and M. Crozier read drafts of this note. We thank our field technicians who helped with surveys in 2003. We thank A. Franklin for preparing the sonograms. This research was approved by the University of Minnesota Animal Care and Use Committee (animal subjects code 0011A74061).

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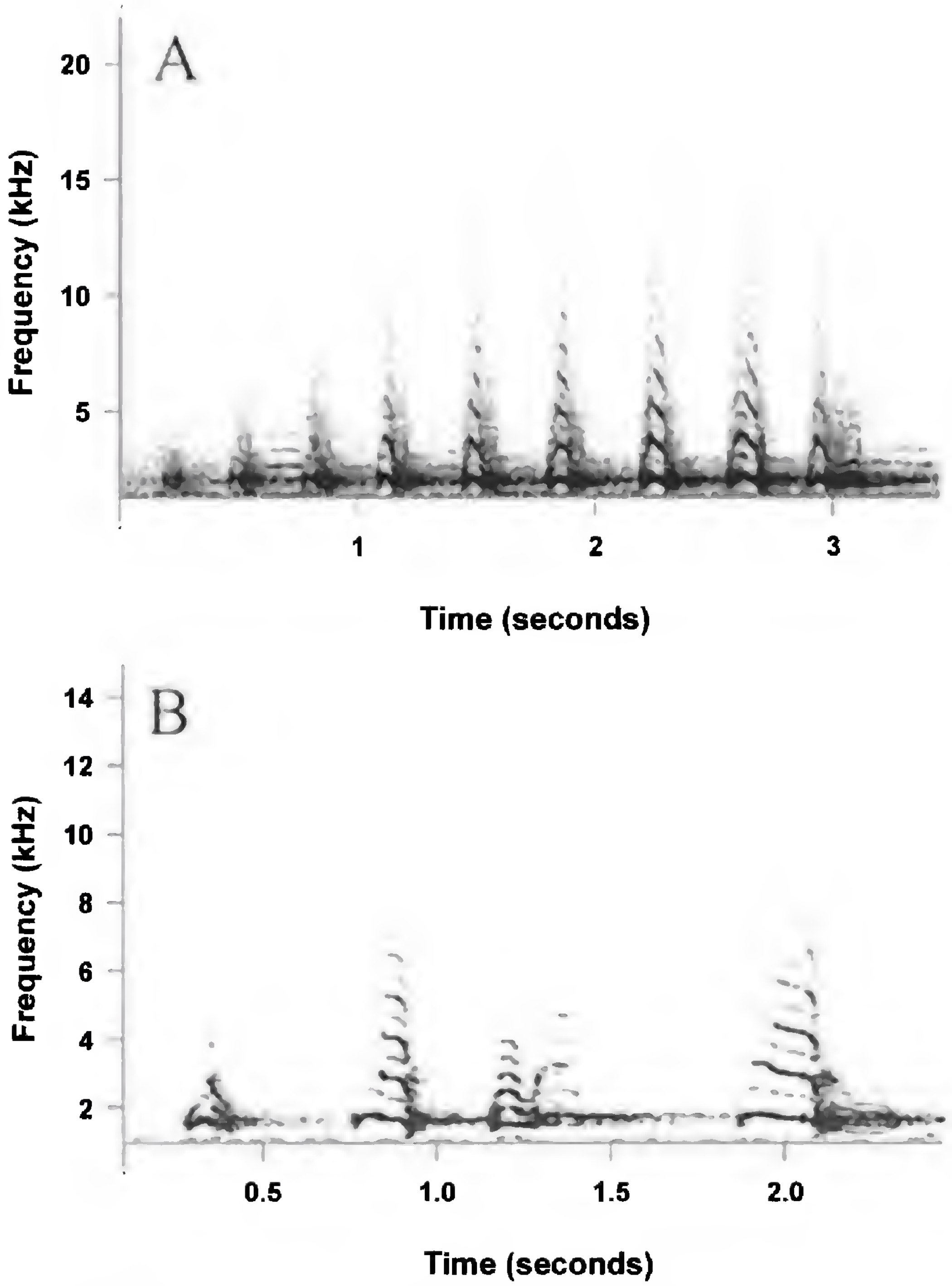

Figure 1. Vocalizations of a hybrid Spotted × Barred Owl near the Rubicon River, Placer County, California: ascending call (A) and call similar to the Spotted Owl's four-noted location call (B).

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THE SOUTHERN LIMIT IN CALIFORNIA OF THE NORTHERN PYGMY-OWL

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In northern and central California, the Northern Pygmy-Owl (*Glaucidium gnoma*) is widespread in both the Coast Ranges and Sierra Nevada. In southern California it occurs in the Transverse Ranges from Santa Barbara County (Lehman 1994) east through the San Gabriel and San Bernardino mountains. In the Peninsular Ranges of Riverside, Orange, and San Diego counties, however, evidence for the species is tenuous at best. Intensive study of San Diego County 1997–2002, toward a bird atlas for that area, failed to find the species and suggests that the few past reports were in error.

The pygmy-owl's occurrence in the San Gabriel and San Bernardino mountains is supported by several specimens in the Natural History Museum of Los Angeles County, San Bernardino County Museum, Museum of Vertebrate Zoology (University of California, Berkeley), Dickey Collections (University of California, Los Angeles), and California Academy of Sciences, San Francisco. Through the latter half of the 20th century, the species was seen regularly in many wooded canyons of both slopes of these mountains, in Los Angeles and San Bernardino counties (E. A. Cardiff, J. L. Dunn, K. L. Garrett, R. L. McKernan pers. comm.). In Riverside County, however, Robert L. McKernan (pers. comm.) has noted the pygmy-owl only in the northwest corner, in Millard and Banning canyons of the southern San Bernardino Mountains.

Grinnell and Miller (1944) inferred a range extending south from the San Bernardino Mountains to the international border. Their map, however, shows only two definite localities in the Peninsular Ranges. Both of these, from San Diego County, are based on reports in the literature, not collected specimens. One of the records is from Escondido, where Sharp (1907) reported that J. M. Hatch found a nest with heavily incubated eggs in 1895 and nestlings in 1896. The other record is from the Laguna Mountains, where Willett (1933) reported that C. L. Field found a nest with four young on 20 May 1920. Thus both reports are second hand, with no specimens to support them. Even though both works in which these records were published are landmarks in the history of California birds, I suggest that both identifications were likely mistakes and that on the basis of these errors, Grinnell and Miller overestimated the owl's range. Perhaps to avoid a gap between the San Bernardino Mountains and the two records from San Diego County, Grinnell and Miller mapped the species as occurring throughout the San Jacinto Mountains, even though Grinnell and Swarth (1913) did not find it in their intensive survey of that region.

Once Grinnell and Miller's map gave the pygmy-owl's occurrence in the Peninsular Ranges the imprimatur of legitimacy, birders expected to find the species. Some of even the most experienced identified it occasionally, usually on the basis of call only. As a result, the mistake became entrenched in the literature (Sexton and Hunt 1979, Garrett and Dunn 1981, Unitt 1984, A. O. U. 1998, Small 1998, Holt and Petersen 2000).

Hamilton and Willick (1996), however, considered the pygmy-owl unconfirmed in Orange County, finding no reports detailed enough to support the identification. Michael A. Patten (pers. comm.) knows of no well-supported records from the San Jacinto Mountains. In San Diego County, over 55,000 hours in the field from 1997 to 2002 by observers recording data for a bird atlas did not yield a single visual encounter. As the five years of this project passed, multiple observations of all other species regular in the county accumulated, and the divergence between the supposedly resident pygmy-owl and all other species became more and more obvious. As in the past, observers reported a few calls possibly from pygmy-owls in the county's mountains. Among the most promising prospective pygmy-owls were calling birds heard and tape-recorded in broad daylight about 11:00 AM by Kenneth L. Weaver and Clark R. Mahrdt on Hot Springs Mountain, San Diego County's highest peak, 2 and 3 June 2000. On 15 August 2000, William E. Haas followed up these reports by going to the site and setting mist nets to trap the birds. He caught a presumed mated pair and juvenile of the Northern Saw-whet Owl (*Aegolius acadicus*). Using Avisoft-SASLab Pro (Avisoft Bioacoustics, Berlin, Germany) and Raven versions 1.0 and 1.1 (Cornell Laboratory of Ornithology, Ithaca, New York), Haas (pers. comm.) compared Weaver's recording with recordings of the Saw-whet and Northern Pygmy-Owls; he found it more like recordings of the Saw-whet. That species' call resembles the call of the Northern Pygmy closely (e. g., Sibley 2000:277). Although the Saw-whet Owl typically forages and calls only in the evening (beginning one half hour before sunset) and at night, early in the breeding season it can be stimulated to call at midday by taped recordings or imitations of its advertising song (Cannings 1993).

I queried all the museums listed above, plus the Field Museum (Chicago), Museum of Comparative Zoology (Harvard University), and San Diego Natural History Museum for southern California specimens of the pygmy-owl. None had any from the Peninsular Ranges; the lack of specimens implied by the map in Grinnell and Miller (1944) has evidently not changed in the succeeding 60 years. Only a few sightings have been reported subsequently in *Audubon Field Notes* or *American Birds*. Hypothesizing that all these are misidentifications and that the species' true range is the same as that attested by collected specimens, I suggested this idea to the few experienced birders who had reported the species in the Peninsular Ranges. At this point the house of cards collapsed. All sightings were based on call only, often brief at night, or, in two cases, on poor views of a bird in flight (J. L. Dunn, C. G. Edwards, K. L. Garrett, G. McCaskie pers. comm.). Most observers readily recanted their previous identifications. Garrett (pers. comm.) noted that the short hoots of the Northern Pygmy-Owl are confused frequently not only with those of the Northern Saw-whet but also with those of chipmunks (*Tamias merriami* and *T. obscurus*), mammals common in southern California's foothills and mountains. The Mountain Quail (*Oreortyx pictus*) and Townsend's Solitaire (*Myadestes townsendi*) also emit calls that could be confused with those of the Northern Pygmy-Owl.

The case of the Northern Pygmy-Owl in southernmost California thus recalls that of the Semipalmated Sandpiper supposedly wintering in the eastern United States (Phillips 1975): a long-accepted distribution based on faulty evidence and false assumptions. Even in the past, when the climate was cooler and wetter, the pygmy-owl may not have ranged south of the San Bernardino Mountains. The calls of the far disjunct subspecies of the cape district of Baja California, *G. g. hoskinsii*, resemble those of *G. g. gnoma* of the Sierra Madre Occidental more than those of *G. g. californicum* of California.

I thank Jon L. Dunn, Claude G. Edwards, Kimball L. Garrett, William E. Haas, Guy McCaskie, Robert L. McKernan, Michael A. Patten, Geoffrey L. Rogers, and Kenneth L. Weaver for discussion of their observations—or lack thereof. I thank Garrett for data from the Natural History Museum of Los Angeles County, McKernan for data from the San Bernardino County Museum, Kathy Molina for data from the University of California, Los Angeles, and Douglas Long for data from the California Academy of Sciences, San Francisco. Information on specimens in the Museum of Vertebrate Zoology, Field Museum, and Museum of Comparative Zoology was available from those institutions' websites, but I thank the curators of all of these, who have been so helpful to me in other studies. And I thank the hundreds of contributors to the San Diego County bird atlas, whose level of effort was so great that it allowed conclusions to be drawn from negative results as well as positive results. The San Diego County bird atlas (Unitt 2004) was sponsored by the California Department of Transportation, U.S. Forest Service, California Department of Fish and Game, California State Parks, Zoological Society of San Diego, National Fish and Wildlife Foundation, U.S. Navy, San Diego Unified Port District, San Diego County Water Authority, Sweetwater Authority, San Diego Foundation, San Diego and Palomar Audubon societies, and numerous individual contributors.

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BOOK REVIEW

Important Bird Areas of California, by Daniel S. Cooper. 2004. Audubon California. 286 pages, 3 tables, 8 maps, 3 appendixes. Paperback. Available for $19.99 + $5.00 shipping and handling through Audubon California, 11340 Olympic Blvd., Suite 209, Los Angeles, CA 90064.

California is one of the richest and most threatened reservoirs of biodiversity on earth (Conservation International 2004: www.biodiversityhotspots.org/xp/Hotspots/california_floristic/). So it should come as no surprise that on a global scale the state itself may be viewed as an important bird area, if not for its wealth and diversity of bird species and subspecies, many of which are in jeopardy, then for its high level of endemism (Stattersfield et al. 1998). Inevitably, some areas within the state are more important for birds than others—but only recently has there been a focused effort to identify and describe these areas, let alone protect them.

BirdLife International started the Important Bird Areas (IBAs) Program in the 1980s to identify priority sites for bird conservation on a regional scale throughout the world. In 1989 it published the first directory of IBAs, *Important Bird Areas in Europe*, which covered nearly 2500 IBAs in more than 30 countries. The program has since expanded greatly, and today there are IBA efforts underway worldwide. In 1995 the American Bird Conservancy and the National Audubon Society jointly launched an IBA program in the United States. While the American Bird Conservancy has focused on identifying sites of national, continental, and global significance (see Chipley et al. 2003), the National Audubon Society has worked on developing state-based efforts. California's IBA program began in 1996, but, because it relied on local Audubon chapter volunteers to nominate sites, many areas of the state were neglected. Recognizing the need for a systematic approach to ensure that all areas of California were represented, Audubon California expanded the program in 2000, refining its site-selection criteria and appointing a bird-conservation director who could oversee and guide the program. This important book is the result of that effort.

Cooper consulted experts on bird distribution and conservation from most counties around the state, solicited them for information on appropriate sites in regions they knew best, and supplemented that information with literature research. The book treats 148 sites representing 56 counties. To qualify as a California IBA, each site had to meet the following criteria: (1) be less than 100,000 acres in extent, (2) support a bird community distinct from the surrounding region, and (3) satisfy one or more of the following general IBA criteria: (1) host more than 10% of California's, or more than 1% of the world's, breeding and/or wintering population of one or more sensitive species; (2) host more than nine sensitive species; (3) host more than 10,000 shorebirds on a one-day count; and (4) host more than 5000 waterfowl on a one-day count.

Sensitive "species," which are listed in a table in the book along with estimates of their population sizes, are those species and subspecies considered threatened or endangered by various state and federal agencies, as well as most candidates for the California Department of Fish and Game's bird species of special concern (BSSC). Cooper points out that some of the latter taxa were not included because their ranges were either too broad (e.g., Olive-sided Flycatcher) or too poorly defined (e.g., Modesto Song Sparrow). Although the Redhead and Yellow-headed Blackbird are listed as sensitive species in site accounts, they are missing from the table. The Rhinoceros Auklet, a BSSC candidate, was not included at all—but Cassin's Auklet, whose breeding population in California is more than 30 times greater than that of the Rhinoceros, and which breeds at about twice as many sites (Carter et al. 1992), was included. Also, coastal populations of the Cactus Wren, other than the subspecies that is a BSSC candidate, are also considered "sensitive" in this book.

Preceding the site accounts, which make up the bulk of the book, are descriptions of the state's bioregions. Although the descriptions convey the essence of the various regions and the birds they support, I found numerous oversights in every description. For example, although the Modoc region is the primary breeding ground for the Northern Pintail, Blue-winged Teal, and Bufflehead in the state, these species do not breed exclusively in this region, and I know of no substantiated nesting record for the Common Goldeneye anywhere even near California.

Eight maps showing the general locations of the IBAs follow, but the bioregions they depict are not the same ones described. And some IBAs seem to be misplaced. For instance, the Clear Lake Area IBA, which is in Lake County and by all accounts within the North Coast Range, is on the Sacramento Valley map. The Sierra Meadows–Southern IBA, which includes several locations in five counties, is not shown at all.

Bioregions are rarely mentioned in the actual site accounts, which are arranged alphabetically, not by bioregion. When bioregions are mentioned they do not seem to correspond to either the descriptions or the maps. Furthermore, each site account shows a "BCR" number, which corresponds to one of five "bird conservation regions," but these also do not match either the described or mapped bioregions.

The IBAs in this book range from the familiar (e.g., the Salton Sea) to the obscure (e.g., Lone Willow Slough), from highly localized (e.g., Bolinas Lagoon) to highly dispersed (e.g., Colorado Desert Microphyll Woodland), from publicly owned (e.g., Cima Dome) to privately owned (e.g., Tehachapi Oaks), from remote (e.g., the Farallon Islands) to near (e.g., Lower Los Angeles River), from untamed (e.g., Big Sur) to man-made (e.g., Terminal Island Tern Colony), from secure (e.g., Carrizo Plain) to imperiled (e.g., Lancaster). But all are important for birds.

The sites are fairly evenly distributed around the state, with about half in northern and half in southern California. Every county in California except two (Trinity and El Dorado) is represented by one or more IBAs. San Diego, Riverside, San Bernardino, Los Angeles, and Kern counties are each represented by 11–13 IBAs, more than any other counties. This suggests that these are the most important counties for birds in the state, while Trinity and El Dorado are the least important. Likewise, only two of 24 Sierra–Modoc sites are west of the Sierra–Cascade axis, possibly because the habitat, while undeniably important for a variety of birds, is generally too uniform and not distinct from the surrounding habitat. But it seems more likely that IBA-quality sites in these lesser-known regions have just escaped notice. I am sure many readers will know of sites not treated in this book that qualify as IBAs and should probably be nominated. For instance, the Fresno–Clovis Regional Water Reclamation Facility supports >1% of the global population of the Long-billed Curlew in winter, 10 sensitive species, >10,000 shorebirds on peak days, and >5000 waterfowl through most of the year (pers. obs.). Many sites in this book with far less qualified as IBAs.

The accounts, which are each one to three pages long, include the following headings: nearest town(s), size, threat, local Audubon chapter, bird-conservation region, IBA criteria, source/notes, description, birds, and conservation issues. The IBA's size, in acres, is shown as (1) <1000, (2) 1000–10,000, (3) 10,000–50,000, or (4) >50,000. Unfortunately, the areas' boundaries are not drawn or even well described. This shortcoming will likely hamper conservation planning, which to be most effective must be directed toward a distinct unit with defined boundaries. Most sites (64%) are in size classes two and three. Some sites are larger than shown (e.g., Big Morongo Canyon IBA is said to cover 1000–10,000 acres, but the preserve alone is about 31,000 acres). A few sites are larger than the IBA criteria allow (e.g., Edwards Air Force Base is 300,000 acres).

The accounts are well written and informative, but most are plagued with typos. Those for sites I know well are also weakened by factual inaccuracies. For example, the account for the Año Nuevo Area IBA (p. 40) does not include the Snowy Plover or Black Swift in its list of sensitive species, although both occur there; conversely, the Spotted Owl is listed, but I know of no convincing evidence that it occurs regularly anywhere in the Santa Cruz Mountains; the description implies there are islands besides Año Nuevo Island; Vaux's Swift and Pileated Woodpecker are said to reach their "southernmost regular distribution limit" here, though both occur regularly farther south to Monterey County; the grassland in the area is said to support "colonies" of Grasshopper Sparrow, which presumably is just a figure of speech. Año Nuevo Island is said to support one of the few California colonies of Heermann's Gull away from Mexico, but in reality a single pair (hardly a colony) attempted to nest in three consecutive years in the 1990s, failed each time, and has not tried since (Roberson et al. 2001). Such discrepancies do not give me confidence that accounts for areas I don't know well are any more accurate.

Regardless, there is much authentic and valuable information in these pages, and thought-provoking facts are often highlighted. For example, did you know that 12 species of sparrow breed around Baldwin Lake, or that the largest nesting aggregation of White-faced Ibises in California is at Mendota Wildlife Area? Because Cooper describes the vegetation and mentions other animals that also rely on these sites, reading the book cover to cover is a great introduction to California's natural heritage. It is also a sobering look at just how much of it is at risk. Almost half (45%) of the sites are classed with a threat level of high or critical. There is a laundry list of threats, which are well outlined in the accounts, including habitat loss and degradation, disturbance, competition, predation, and pollution.

Overall this book succeeds in its mission of identifying sites that are critical for the long-term viability of California's bird life. The task of safeguarding and monitoring these places, however, will be infinitely more difficult. Local Audubon chapters are apparently adopting some IBAs, which is a start. But the work will require partnerships with many stakeholders outside Audubon, including land trusts, politicians, granting agencies, governmental and nongovernmental organizations, and individual birders and nature enthusiasts.

It is a shame that this book was not better edited and reviewed for accuracy—I could go on about such flaws—but this drawback is almost inconsequential. Everyone who cares about the future of California's birds should have this book.

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Jeff N. Davis

FEATURED PHOTO

PRELIMINARY NOTES ON THE IDENTIFICATION OF CACKLING AND CANADA GEESE

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Now that the American Ornithologists Union (A.O.U.) has split the Canada Goose (*Branta canadensis*) into two species (Banks et al. 2004) field birders are faced with the not inconsiderable problem of telling the two apart. This identification issue is especially challenging for birders in the West, where a number of races of both species occur. Of the four subspecies that now constitute the Cackling Goose (*Branta hutchinsii*), the nominate Richardson's Cackling Goose (*B. h. hutchinsii*) is almost unknown west of the Rocky Mountains (A.O.U 1957), while the diminutive and very dark Cackling Goose proper (*B. h. minima*) is unlikely to be mistaken for any form of the Canada Goose. The Aleutian Cackling Goose (*B. h. leucopareia*) has features, such as a complete white ring at the base of the black neck, that make identification of most individuals straightforward.

Conversely, most individuals of three of the four western subspecies of the Canada Goose are either too large and pale (Great Basin Canada Goose, *B. c. moffitti*), or too large and dark (Vancouver Canada Goose, *B. c. fulva*, and Dusky Canada Goose, *B. c. occidentalis*) to be confused with Cackling Geese. Please note that I said "most."

The subject of this issue's Featured Photo is the identification of the two subspecies of these now full species that resemble each other most closely. Taverner's Cackling Goose (*B. h. taverneri*) has been recognized as a subspecies distinct from the Lesser Canada Goose (*B. c. parvipes*) only since the 1950s (Delacour 1951). Indeed, the A.O.U. (1957) did not include *taverneri* in the 5th edition of its checklist, and Palmer (1976) believed Taverner's to be only the darker individuals of a clinal population of *parvipes*. However, genetic work has shown that breeding populations of *taverneri* fit neatly with other Cackling Geese, and those of *parvipes* belong to the Canada Goose complex (see the citations in Banks et al. 2004).

The upper photo shows an individual believed to be *B. c. parvipes*, the middle photo depicts an apparent *B. h. taverneri*, and the bottom photo compares the same two individuals resting side by side, with the *parvipes* on the left. I believe both these individuals are adults, on the basis of the broadness of the body feathers and the nice, neat rows of pale edging on the back and wing coverts. These photos were taken in Arrowhead Marsh, Alameda County, California, in January 2004. Compare them with photos of a juvenile apparent *taverneri* on the World Wide Web at www.badboybirding.com/CAGO_11262003.htm.

Delacour (1954) described these two forms as follows: *parvipes* "similar to *moffitti* in shape and proportions, particularly the long bill and neck, and also generally in color, although varying a little more in tone, but much smaller"; *taverneri* "resembles *B. c. parvipes* but smaller with shorter bill and neck, and generally darker, although very variable in color, some specimens being as pale as *parvipes*, others as dark as *leucopareia*."

More recent treatments of Canada Goose identification haven't added much, but Johnson et al. (1979) found that the breast of *taverneri* is typically grayish, but quite variable, and frequently lighter in young birds, whereas *parvipes* has a pale breast, "sandy" colored rather than the brownish of *leucopareia* or the darker grayish of *taverneri*. These authors discussed white neck rings, noting that 40% of adults and 10% of immatures of *taverneri* have complete neck rings averaging 3–5 mm wide, with an additional 20–30% showing incomplete or trace neck rings. In their much smaller sample of *parvipes*, 8% of adults had complete neck rings averaging 8 mm in width, and 30% more showed traces of a ring. Almost all of their sample of *leucopareia* had a complete, solid neck ring averaging 14 to 20 mm in width, depending on age. Palmer (1976), however, cited a survey of nesting *leucopareia* on Buldir Island in which 17 of 64 individuals either lacked a white collar or had breasts so pale that the collar was not discernible.

The two physical measurements most often compared between the two forms are culmen length and weight. A recent summary of these data (Mowbray et al. 2002) demonstrated that the mean culmen length for *taverneri* is about 35 mm, that for *parvipes* about 42 mm, but that there is overlap (range 33–40 mm for *taverneri* and 38–44 mm for *parvipes*). More important than actual culmen length is the proportional appearance of the bill. In *taverneri* the bill is high (i.e., more centrally located on the face, with larger "jowls") and short, like that of other Cackling Geese, whereas in *parvipes* the bill appears longer and lower, like that of larger Canada Geese. The mean weight of *taverneri* is about 2500 grams, that of *parvipes* just over 3000 grams, or about a pound heavier.

The presence of a black line on the throat dividing the white chin strap has been touted as a character useful for distinguishing the two forms. In our featured birds, this line can be seen on the *taverneri* but is not present on the *parvipes*. The smudginess and small size of the chin strap on the *taverneri* has also been suggested as useful. Other pictures I have seen of purported *taverneri* have also shown a black chin stripe and smaller, grayer chin straps, but there is wide disagreement among observers as to the prevalence of these features in various populations of Canada-type geese. The only reference I have found in the literature is from Palmer (1976), who stated that the black stripe "is much more frequent northwesterly, especially in darker-pigmented birds, and evidently in males." This statement seems to be the basis of later claims, but no extensive surveys have been done, especially in the two taxa under discussion here, and observations from the east coast suggest that even eastern Canada Geese show a dark chin stripe not too infrequently. I've seen no formal references at all to the size or color of the chin straps.

At present, the best an observer can hope for is to find flocks of the two forms, in which the average larger size, longer/lower bill, paler breast, and maybe fewer black chin stripes of *parvipes* Canada Geese should separate them from *taverneri* Cackling Geese. This comparison brings up the question of range. The current center of abundance for wintering *taverneri* is the lower Columbia River area and the Willamette Valley of Oregon. Some individuals also winter in the Columbia Basin of eastern Washington and Oregon, but they are outnumbered there by *parvipes*. A small number of the latter also winters in the Willamette Valley; however, the preponderance of *parvipes*, as currently understood, winters east of the Rocky Mountains, at least as far south as the Texas panhandle. Both forms were formerly common in California's Central Valley, but numbers there are now greatly reduced, as these birds have increasingly taken to wintering farther north.

The extent of variation in all the suggested identification characters is currently unknown. This variation can be caused by differences in age, sex, diet, and nutrition, as well as by individual variability. In cases of lone vagrant individuals, many will remain unidentifiable because of this variability. In addition, observers are cautioned that confusion among other subspecies of white-cheeked geese is possible. For example, some *taverneri* Cackling Geese can approach some *occidentalis* Canada Geese in size and coloration. These are subjects for other papers.

I thank Stephen J. Davies for contributing the photographs for this feature, and Stephen C. Rottenborn for his extremely helpful comments on an earlier draft of the manuscript.

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WESTERN BIRDS

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Western Specialty:

Pigeon Guillemot

Photo by © Ian C. Tait of Mill Valley, California:
Pigeon Guillemot *(Cepphus columba)*
Southeast Farrallon Island, California, May 1988

Volume 35, Number 4, 2004

NOTES

Front cover photo by © Bill Hill of Carmel, California: Yellow-billed Loon (*Gavia adamsii*), Elkhorn Slough, Monterey County, California, 18 April 2004.

Back cover "Featured Photos" by © Jack Daynes of Poway, California; © Peter LaTourrette of Los Altos, California; and © Bob Steele of Ridgecrest, California: Red-winged Blackbird (*Agelaius phoeniceus*) and Tricolored Blackbird (*Agelaius tricolor*).

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Good photographs of rare and unusual birds, unaccompanied by an article but with caption including species, date, locality and other pertinent information, are wanted for publication in Western Birds. Submit photos and captions to Photo Editor. Also needed are black and white pen and ink drawings of western birds. Please send these, with captions, to Graphics Manager.

WESTERN BIRDS

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LANDBIRD AND WATERBIRD NOTES FROM ISLA GUADALUPE, MEXICO

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ABSTRACT: We report observations of land- and waterbirds from a 2-month visit to Isla Guadalupe, Mexico, during winter 2003. Our report includes first island records of the Spotted Sandpiper (*Actitis macularius*) and Palm Warbler (*Dendroica palmarum*). We found no evidence of the persistence of any endemic taxon thought to be extinct, despite intensive and extensive searching of parts of the island typically visited infrequently. Three taxa of endemic landbirds remain on Isla Guadalupe, but each is imperiled by the continued presence of introduced cats. We update the status of species that other expeditions reported to have colonized the island recently.

Isla Guadalupe, Mexico, is an oceanic island 260 km west of Guerrero Negro, Baja California Sur, in the Pacific Ocean. The island reaches an elevation of 1295 m and is more than 37 km in length from north to south. The first written descriptions of the flora and fauna were made by naturalists Edward Palmer in 1875 (Ridgway 1876) and Walter E. Bryant in 1885 (Bryant 1887). In response to their interesting and unique observations, Guadalupe has been visited sporadically ever since by ornithologists, marine mammalogists, botanists, and collectors.

Historically the island is known to have harbored 34 endemic species of plants, including five endemic taxa of trees. Most species of native plants on the island are now greatly reduced or thought to be extinct as a result of intense grazing by the feral goats introduced in the mid-1800s (Moran 1996). In addition to a rich flora, Isla Guadalupe once had nine strongly differentiated endemic taxa of birds, six of which are now thought to be extinct (Table 1; Howell and Cade 1954, Jehl and Everett 1985). Isla Guadalupe

Table 1 Status of Land Birds Endemic to Isla Guadalupe

Species	Current Status
Guadalupe Caracara *Caracara lutosa*	Extinct; last recorded 1903
Guadalupe Northern Flicker *Colaptes auratus rufipileus*	Extinct; last recorded 1906
Guadalupe Rock Wren *Salpinctes obsoletus guadaloupensis*	Breeder; population >1000
Guadalupe Bewick's Wren *Thryomanes bewickii brevicauda*	Extinct; last recorded 1903
Guadalupe Ruby-crowned Kinglet *Regulus calendula obscurus*	Extinct; last recorded 1953
Guadalupe Spotted Towhee *Pipilo maculatus consobrinus*	Extinct; last recorded 1897
Guadalupe Junco *Junco (hyemalis) insularis*	Breeder; population >500
Guadalupe House Finch *Carpodacus mexicanus amplus*	Breeder; population >1000

was formerly home to populations of two other species of breeding landbirds, the Red Crossbill (*Loxia curvirostra*) and the Red-breasted Nuthatch (*Sitta canadensis*), each also thought to be extirpated (Sweet et al. 2001). Possible reasons for extinctions of these populations include predation by feral cats and habitat loss inflicted by goats, perhaps in the case of the Guadalupe Caracara (*Caracara lutosa*) helped along by overcollection by ornithologists (Jehl and Everett 1985, Moran 1996). Although offshore islets provide refugia from predators and disturbance, their small size provides insufficient habitat to sustain populations of landbirds except for the Rock Wren and House Finch.

Jehl and Everett (1985) were the last to review the status and recorded history of the avifauna of Isla Guadalupe. Since their review, visiting ornithologists have reported new records of wintering, migrant, and breeding birds (Oberbauer et al. 1989, Mellink and Palacios 1990, Howell and Webb 1992, Pyle et al. 1994, Sweet et al. 2001). We report additional observations of landbirds, shorebirds, and gulls from more than two months spent on the island from 17 January to 23 March 2003. Because of the timing of our visit most of our observations of landbirds represent wintering individuals.

Throughout our account we follow the place names of Moran (1996) and Jehl and Everett (1985). During the two months we spent on the island, we lived at Campo Sur, at the south end of the island, and explored other parts of the island on single- or multiple-day trips, using Campo Sur as a base. We spent a total of 8 days actively surveying landbirds at the north end of the island, in the remaining cypress and pine trees (31 January–1 February, 7–8 February, 9–12 March). We also made several day trips to the middle of the island, including the southernmost grove of palms and the airstrip on the central plateau of the island, referred to as the *pista* (22 January, 29 January, 11 February, and during trips to the north end of the island, listed above). We visited Campo Oeste, on the west coast of the island, twice (24 and 27 January). Additionally, we visited two offshore islets: we spent 8 days on Islote Negro (3–4 February, 17–20 February, 7–8 March) and one day on Islote Zapato (13 March). Where we believe we surveyed a species' appropriate habitats sufficiently, we report a minimum population estimate. We limit the observations reported here to those of landbirds, shorebirds, and wading birds; data on seabirds will be reported elsewhere.

RESULTS

Great Blue Heron (*Ardea herodias*). We observed one, probably wintering, at Campo Oeste 24 and 27 January. Jehl and Everett (1985) considered this species "probably a rare but regular winter visitor."

Greater White-fronted Goose (*Anser albifrons*). At least five individuals wintered at the spring to the east of the cypress grove, 31 January–10 March, with one remaining individual seen to 10 April (B. S. Keitt pers. comm.). Our record (photographic and sight) is the second for the island. The species was previously reported there in January 1885 (Bryant 1887).

American Kestrel (*Falco sparverius*). We observed this species frequently along the road between Campo Sur and Campo Pista and at the north end of the island in the vicinity of the pines. We estimate that there were >15 on the island. This species breeds and winters on Guadalupe, and Bond (1943) described the resident breeding population there as an endemic subspecies, *F. s. guadalupensis*, but subsequent authors have not recognized this taxon (Howell and Cade 1954, Jehl and Everett 1985).

Peregrine Falcon (*Falco peregrinus*). We observed and photographed at least two individuals numerous times around the south end of the island from January to March. The only other island record is of a single bird seen 19 September 1896 (Gaylord 1897). What was probably the same pair was seen in mid-May (B. S. Keitt pers. comm.). Jehl and Everett (1985) considered this species "likely to have occurred regularly during migration." We suggest that it may occur regularly during the winter as well, and it could breed on Guadalupe.

Pacific Golden-Plover (*Pluvialis fulva*). We observed up to 14 wintering on the main island west of the head of Melpomene Arroyo from January to March. Our observation furnishes the fourth island record, following records of 12 in the same area as our sighting in January 1988 (Howell and Webb 1992), up to 12 at Northeast Anchorage 23 November–16 December 1973 (E. N. Mirsky, in Jehl and Everett 1985), and 20 in the same area as our sighting 22 February 1970 (Jehl and Everett 1985).

Wandering Tattler (*Heteroscelus incanus*). From January to March we frequently saw at least three wintering at the south end of the island, and on 1 March we saw one on the beach at the mouth of Esparsa Canyon. Jehl and Everett (1985) considered the Wandering Tattler "a regular visitor to the island from fall through spring."

Spotted Sandpiper (*Actitis macularius*). We saw one in basic plumage in the rocky intertidal area at the extreme southern end of the island, 2 March. It was seen at close range by two observers, and we noted the bobbing behavior, vocalization, and long tail characteristic of the species. The Spotted Sandpiper was not recorded on the island previously.

Ruddy Turnstone (*Arenaria interpres*). We observed at least four wintering in rocky intertidal areas at the south end of the island, January–March. Jehl and Everett (1985) reported "specific records for June, November–January, and April" and three in November 1964.

Black Turnstone (*Arenaria melanocephala*). We frequently observed this species wintering in rocky intertidal areas at the south end of the island, January–March. We saw no more than nine at a time. Jehl and Everett (1985) reported records for October–February and April.

Ring-billed Gull (*Larus delawarensis*). We saw an adult repeatedly circle our vessel 5 km east of Campo Sur 17 January and a first-winter bird at the south end of the island 15 March. Jehl and Everett (1985) questioned the identification of "a few" by Carl Hubbs in 1950 and reported the first island record as January 1970. Subsequently, Mellink and Palacios (1990) reported "a few" in November, and Howell and Webb (1992) saw a single first-winter bird at Northeast Anchorage in January. Ring-billed Gulls are generally rare offshore, so it is unusual that so many have reached Guadalupe (P. Pyle pers. comm.).

California Gull (*Larus californicus*). We observed one adult 3 km east of Campo Sur 17 January; one adult and one immature were seen sporadically at the south end of the island February–March. Previous visitors to the island have reported this species regularly (Jehl and Everett 1985, Howell and Webb 1992).

Herring Gull (*Larus argentatus*). We observed this species frequently at the south end of the island but never saw more than two at once. We found one dead adult in poor condition in Melpomene Arroyo 22 February but did not collect it. We saw two at Esparsa Canyon 1 March. Jehl and Everett (1985) described this species as a "common winter visitor from November–April" and stated that during the winter this species congregates at the elephant seal rookeries. In contrast, we saw no large congregations anywhere on the island.

Western Gull (*Larus occidentalis*). We saw this species frequently along the shores of the island, with maximum counts of 23 at the south end of the island (15 March), nine at Islote Negro (18 February), 30 at Islote Zapato (13 March), and 11 at the mouth of Esparsa Canyon (1 March). This species has been confirmed as a local breeder and an island resident (Jehl and Everett 1985). Resident fishermen reported it to us as breeding on a point known as "La Ventana," between Campo Oeste and Islote Negro. We were unable to visit this area to determine whether the species was nesting during our stay on the island. We estimate that the wintering population of Western Gulls was <200 birds.

Glaucous-winged Gull (*Larus glaucescens*). We saw small numbers (≤ 3) frequently at the south end of the island and two at the mouth of Esparsa Canyon 2 March. All birds were immature. This species is a regular winter visitor and has been reported November–May (Jehl and Everett 1985).

Rock Pigeon (*Columba livia*). We saw two frequently at the south end of the island January–March; we saw this species nowhere else. It may have been intentionally introduced by island residents in 1956 (C. L. Hubbs, as cited by Jehl and Everett 1985), and it has been reported regularly since.

Mourning Dove (*Zenaida macroura*). This species was abundant throughout terrestrial habitats on the island, from the cypress forest in the north to Campo Sur in the south. The first evidence of a breeding population was a

Figure 1. Guadalupe Junco, ***Junco (hyemalis) insularis***, northern cypress grove, Isla Guadalupe, 10 March 2003.

Figure 2. Guadalupe Junco, ***Junco (hyemalis) insularis***, northern cypress grove, Isla Guadalupe, 10 March 2003.

Figure 3. Guadalupe House Finch, *Carpodacus mexicanus amplus*, Campo Sur, Isla Guadalupe, 23 January 2003.

Figure 4. Guadalupe House Finch, *Carpodacus mexicanus amplus*, Campo Sur, Isla Guadalupe, 6 February 2003.

record of 24 birds in 1967, before which only single birds were seen sporadically (Jehl and Everett 1985). We estimate that the current population numbers >2000 individuals.

Burrowing Owl (*Athene cunicularia*). We observed this species frequently from Upper Circus at the north end of the island to Melpomene Arroyo at the south end and saw birds standing at the entrances of burrows twice. We found numerous carcasses of Leach's Storm-Petrel (*Oceanodroma leucorhoa*) at the entrances to burrows on both Islote Negro and Islote Zapato, evidence that the Burrowing Owl is present there and that it preys upon storm-petrels. We saw one owl on Islote Zapato (13 March). Predation of Leach's Storm-Petrel by the Burrowing Owl at Guadalupe Island has not been reported previously.

Anna's Hummingbird (*Calypte anna*). We saw this hummingbird frequently in the stand of nonnative tree tobacco (*Nicotiana glauca*) in the northeastern region of the island and once each at the northern pines (1 February), Campo Sur (5 March), Islote Negro (19 February), and Islote Zapato (13 March). The Isla Guadalupe population of this species sounds markedly different from mainland birds (Mirsky 1976), and males may lack the complete throat gorget typical of mainland populations of the species (Howell and Webb 1992). We observed two individuals with complete gorgets 1 March at the mouth of Esparsa Canyon, but all other males we observed lacked a complete gorget. This situation could indicate either a difference in plumage or a difference in the timing of breeding; most mainland Anna's Hummingbirds fledge in the early spring and molt a complete gorget by December (P. Pyle pers. comm.).

Belted Kingfisher (*Ceryle alcyon*). We saw one at Islote Negro 5 March. Jehl and Everett (1985) reported the Belted Kingfisher as regular in winter.

Northern Flicker (*Colaptes auratus*). We observed two individuals around the northern cypress grove 10 March. The endemic subspecies *C. a. rufipileus* probably died out after 1906 (Jehl and Everett 1985), but small numbers of the mainland subspecies *C. a. collaris* have now colonized (Sweet et al. 2001).

Say's Phoebe (*Sayornis saya*). We observed and photographed one, probably wintering, at the mouth of Esparsa Canyon 28 February. It was the second recorded on the island, following seven reported by E. N. Mirsky in 1973 (Jehl and Everett 1985).

Guadalupe Rock Wren (*Salpinctes obsoletus guadaloupensis*). This subspecies endemic to Guadalupe is abundant throughout the island and occurs on both Islote Negro and Islote Zapato. We located nests on the road south of the airstrip 30 January and at Campo Sur 27 Feburary, and we saw recently fledged young on the road near the *pista* 9 March, around the pines at the north end of the island 10 March, and at Campo Sur 15 March. We saw a pair with nesting material on Islote Negro 20 February. The nest at Campo Sur failed following a heavy rainstorm. Almost every published account of Guadalupe contains a report of the Guadalupe Rock Wren, and it has typically been described as common. We estimate the population at >1000 individuals.

Ruby-crowned Kinglet (*Regulus calendula*). We saw ≥5 in the northern cypress grove 31 January and 10 March. We were unable to identify the subspecies of the individuals we saw, but the endemic *R. c. obscurus* is considered extinct: no individuals of this species have been observed in summer in 50 years (Jehl and Everett 1985, Sweet et al. 2001). Small numbers have been reported in winter since 1973 (Jehl and Everett 1985, Howell and Webb 1992). It is likely that individuals now observed on Guadalupe are wintering birds and migrants.

Mountain Bluebird (*Sialia currucoides*). We saw and photographed two males wintering at the spring 31 January and two males again near the northern cypress grove 1 February. The only previous island record was of three in winter 1885–86, one of which was collected (Bryant 1887).

American Robin (*Turdus migratorius*). We found and photographed one desiccated carcass beneath the southernmost pines at the north end of the island 1 February, but we did not collect it. It provided the third island record, following sight records of a few in December 1886–January 1887 (Bryant 1887) and one at Northeast Anchorage 5 December 1973 (Jehl and Everett 1985).

Sage Thrasher (*Oreoscoptes montanus*). Three times from 29 January to 10 February we saw and photographed one around Campo Pista. The only previous island record is of a bird collected 7 January 1886 (Bryant 1887).

European Starling (*Sturnus vulgaris*). We saw 45 individuals near the spring and two near Campo Pista. This species was first reported on the island in 1971 (Jehl and Everett 1985). It is a suspected breeder, but we saw no signs of breeding during our stay. Howell and Webb (1992) reported at least 130 birds during January 1988 and suggested that the species may be only a winter visitor.

Yellow-rumped Warbler (*Dendroica coronata*). We saw six Audubon's Warblers (*D. c. auduboni*) and six Myrtle Warblers (*D. c. hooveri*, presumably) at various locations throughout the island, January–March. We agree with Jehl and Everett's (1985) suggestion that the species is "probably a regular winter visitor."

Palm Warbler (*Dendroica palmarum*). We saw and photographed one pale individual wintering at Campo Sur January–March, and we saw one bright-plumaged individual at Campo Pista 10 February. These records represent the first and second for the island. Both individuals were seen by multiple observers, and both individuals were positively identified by their characteristic tail-bobbing behavior and yellow undertail coverts.

Chipping Sparrow (*Spizella passerina*). We found one desiccated carcass under the southernmost pines at the north end of the island 1 February but did not collect it. There are only two prior records for the island, of one collected 6 January 1886 by Bryant (1887) and several seen in November–December 1973 (Jehl and and Everett 1985).

White-crowned Sparrow (*Zonotrichia leucophrys*). We saw and photographed one at Campo Sur 28 January and five in a flock with 17 Oregon Juncos in the cypress grove at the north end of the island 11 March. One was in the pines at the north end of the island 9 April (B. S. Keitt pers. comm.). Two were seen at the south end of the island 10 April 1970 (Jehl and Everett 1985), three were reported during January 1988 (Howell and Webb 1992), and several were seen in November 1989 (Mellink and Palacios 1990). This species probably occurs in small numbers regularly during both winter and migration.

Oregon Junco (*Junco hyemalis* subsp.). We saw 17 in a flock that also contained five White-crowned Sparrows in the cypress grove 11 March. These birds were probably migrating, as we saw no Oregon Juncos during our other visits to this area or surrounding areas. We observed agonistic interactions between the Oregon Juncos and the resident Guadalupe Junco. The only other island record of an Oregon Junco is of a bird—being attacked by a resident Guadalupe Junco—collected 6 January 1886 by Bryant (1887).

Guadalupe Junco [*Junco* (*hyemalis*) *insularis*]. We saw this Guadalupe endemic frequently in the cypresses, pines, Esparsa Canyon, and surrounding areas throughout our stay (Figure 1, 2). Its distribution appears to be limited to these areas alone. We saw adults carrying food near the pines and the spring 10–11 March. Of nine individuals mist-netted 11–12 March, eight were in reproductive condition (e.g., brood patch or cloacal protuberance). We estimate the population to be >500 individuals. The size of this population may change rapidly, as expeditions since 1988 have variously reported its numbers as "very low" (Howell and Webb 1992) and "common within the cypress grove" (Sweet et al. 2001). This (sub)species is the most distinctive taxon of bird remaining on Isla Guadalupe (Mirsky 1976).

Western Meadowlark (*Sturnella neglecta*). We observed this species throughout the island. It was first reported as a suspected breeder in 1988 near Campo Pista and the airstrip (Howell and Webb 1992) and has been reported as a likely breeder on all subsequent expeditions to the island. We suggest that the species' population has grown greatly since 1988 and that there are now >500 individuals on the island.

Guadalupe House Finch (*Carpodacus mexicanus amplus*). We saw this finch frequently, sometimes in large numbers, throughout the island (Figure 3, 4). We also saw birds on islotes Negro and Zapato. The highest count at the south end of the island was 31 individuals on 7 Feburary. A flock of more than 110 individuals was seen on the east slope of El Picacho 16 February. Large numbers of birds (50–100) also frequented the spring at the north end of the island. We estimate the population to be >1000 individuals. Seventeen birds captured in February and March were not in breeding condition.

House Sparrow (*Passer domesticus*). We saw two males at the south end of the island, January–March. Howell and Webb (1992) reported the first island record of this species, in 1988, and subsequent visitors to the south end of the island have also reported it. However, we observed no females during our two months at the south end of the island, suggesting that Guadalupe may not support a viable breeding population.

DISCUSSION

Extended winter field work on Isla Guadalupe has been rare since Bryant (1887) spent four months on the island in 1885. We report on 36 species of birds, mostly wintering birds and early migrants, observed during our visit, and minimum population estimates for five breeding residents. Although we have provided estimates, they amount to educated guesses, so further work to estimate the size and viability of populations of endemic landbirds on Isla Guadalupe and other Baja California islands would be valuable to conservation efforts. Two species (Spotted Sandpiper, Palm Warbler) provided first island records; four added second or third island records (Greater White-fronted Goose, Peregrine Falcon, Sage Thrasher, Mountain Bluebird). Sadly, we added no new evidence that any of the endemic taxa thought to be extinct might actually persist.

The avifauna of Isla Guadalupe has undergone massive change in the 130 years since its discovery by western naturalists. Since the initial observations and collections on the island (Ridgway 1876, Bryant 1887), ornithologists have documented the loss of eight breeding taxa, six of them endemic. Researchers have also observed the colonization or probable colonization by six taxa new to the island's avifauna. Massive, broad-scale habitat loss and alteration on the island by feral goats (Moran 1996) and predation by feral cats (Howell and Cade 1954) have resulted in permanent change to the island's avifauna.

After our visit, eradication of the feral goats began in earnest, with the population reduced to an estimated 500 by the end of 2004. Final eradication is planned for 2005. Regeneration of the native vegetation has already begun (Aguirre et al. 2004). Additionally, removal of cats would represent significant progress in protecting the remaining endemics from extinction. With the current removal of feral goats and potential future removal of cats, the avifauna of Isla Guadalupe will embark on a new and unpredictable trajectory, but the outlook of the remaining endemic taxa is now much brighter.

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ATYPICAL WILLOW FLYCATCHER NESTING SITES IN A RECOVERING RIPARIAN CORRIDOR AT MONO LAKE, CALIFORNIA

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ABSTRACT: Surveys in the 1990s did not find the Willow Flycatcher along Rush Creek, a tributary of Mono Lake, Mono County, California. In 2001 and 2002 we located nine Willow Flycatcher nests along lower Rush Creek, in a riparian corridor currently in its 15th year of long-term rehabilitation after decades of livestock grazing and water diversion for municipal, hydroelectric, and irrigational use. The mated pairs' habitat differs from that reported for the Willow Flycatcher elsewhere in California. Males selected territories in tall thickets of Woods' Rose (*Rosa woodsii*), and Woods' Rose was the substrate of all nine nests. In addition, the flycatchers' territories and nests were located farther from water than reported elsewhere in California, averaging 129 m for nine nests and 86 m for seven territories.

The Willow Flycatcher (*Empidonax traillii*) is designated as endangered by the California Department of Fish and Game. Estimates of the California population range up to at least 500 territories (Sogge et al. 2003, Green et al. 2003, Craig and Williams 1998, Klamath Bird Observatory unpubl. data, Redwood Sciences Laboratory unpubl. data). Three subspecies of the Willow Flycatcher breed in California (*E. t. adastus, E. t. brewsteri,* and *E. t. extimus*; Unitt 1987). While all three are listed as endangered by the California Department of Fish and Game, *E. t. extimus* is also listed as endangered by the U.S. Fish and Wildlife Service.

Researchers and managers lack taxonomic, habitat, and demographic data for the Willow Flycatcher on the eastern slope of the Sierra Nevada (Craig and Williams 1998), in large part because many of the region's historic populations no longer exist (Gaines 1992, Heath and Ballard 2003). In 2000, we discovered territorial Willow Flycatchers along lower Rush Creek. Situated at Mono Lake, in the heart of the eastern slope, this population represents a likely reoccupation of a riparian corridor that is recovering after decades of water diversion and grazing. The corridor's current rehabilitation has been facilitated by a return of a near-natural streamflow, improved flow management, and a moratorium on grazing that has been in place since 1991 (LADWP 1996). Much effort in California and throughout the West has been directed into modeling potential Willow Flycatcher habitat (Green et al. 2003, C. Stermer pers. comm.). The unique habitat selection of the resurgent population along lower Rush Creek represents an instructive addition to these efforts.

STUDY AREA

Rush Creek is a perennial stream flowing into Mono Lake, California, located at 37.93° N, 119.06° W. It is Mono Lake's largest tributary, with the capacity to carry 75,000 acre-feet of water per year (Gaines 1989). Our study is located on a reach locally known as "lower Rush Creek" (Figure 1),

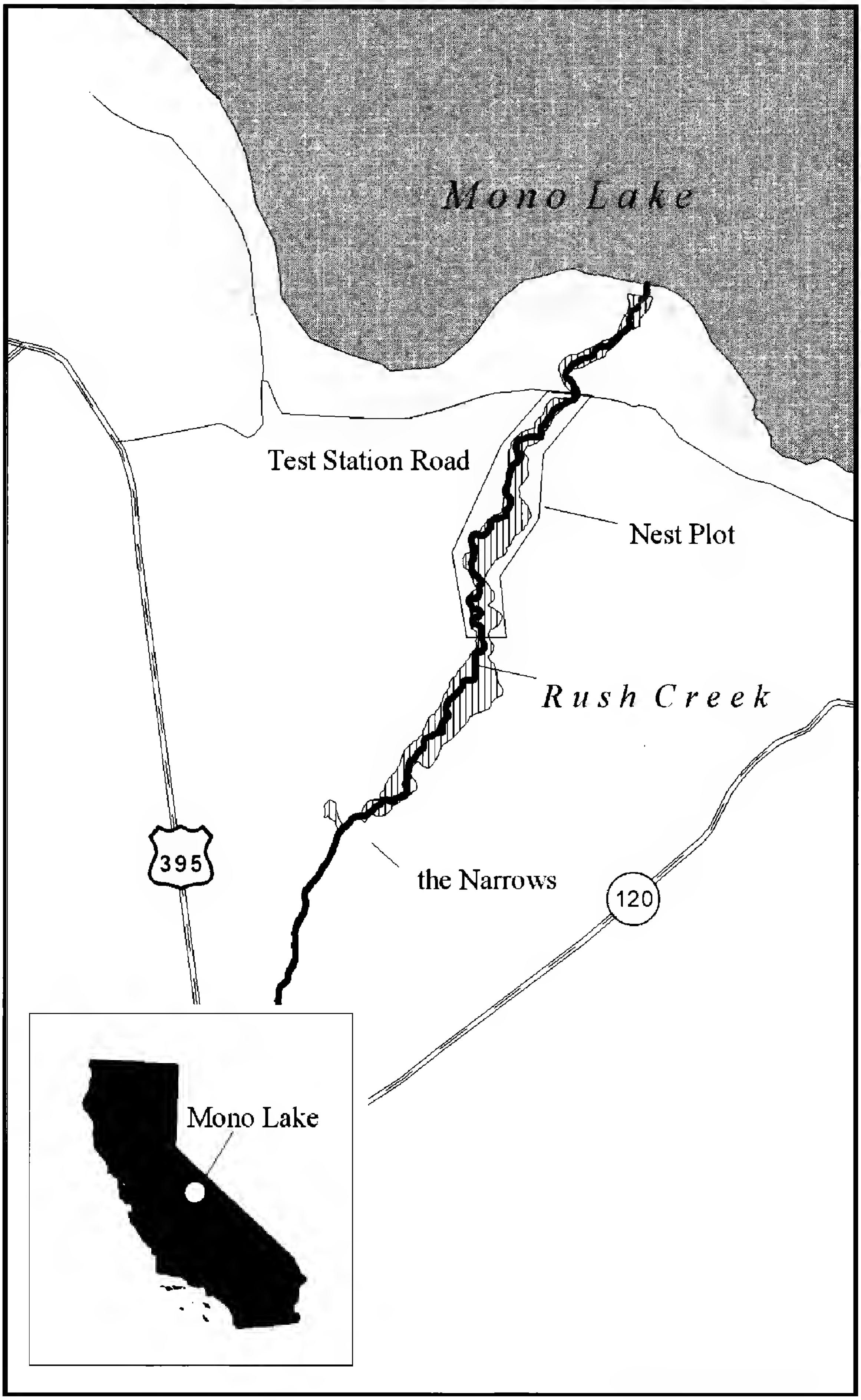

Figure 1. Lower Rush Creek and project study area.

which stretches from a cataract named "the Narrows" (2011 m above sea level) to the Rush Creek–Mono Lake delta roughly 6 km downstream (currently 1945 m above sea level; Stine 1992). This entire section of Rush Creek lies within the Mono Basin National Forest Scenic Area, which is administered by the Inyo National Forest.

Historic Conditions

Lower Rush Creek is recovering after decades of water diversion, altered flood cycles, channelization, and overgrazing (SWRCB 1994). Water diversions for local irrigation and generation of hydroelectric power began in the early 1900s, and diversions to the city of Los Angeles began in 1941 (SWRCB 1994, Stine et al. 1984). Prior to the 1941 diversions, lower Rush Creek was characterized by wide, dense riparian woodland interspersed with wet meadows, standing water, and springs. Pure or mixed stands of willow trees (*Salix* spp.) and Black Cottonwood (*Populus trichocarpa*) were interspersed with the less common Jeffrey Pine (*Pinus jeffreyi*). Descriptions of the understory from this period are scarce, but plant species listed include Woods' Rose (*Rosa woodsii*), Buffaloberry (*Shepherdia argentea*), sedges (*Carex* spp.), rushes (*Juncus* spp.), grasses, Big Sagebrush (*Artemisia tridentata*), Bitterbrush (*Purshia tridentata*), and Rabbitbrush (*Chrysothamnus nauseosus*) (LADWP 1996, Stine1991).

Grazing of cattle and sheep along lower Rush Creek began in the 1860s and was particularly intense prior to the 1934 Taylor Grazing Act (Jones and Stokes 1993). It is difficult to quantify the extent to which this grazing affected lower Rush Creek's riparian vegetation. Expert testimonies to California's State Water Resources Control Board (1994) suggested that historic grazing pressure on Mono Lake's tributaries caused significant changes to understory plants but that overstory canopies remained largely intact. Additionally, in spite of localized disruptions of stream banks, there were no widespread changes in the stream channel's structure before the 1941 water diversions (SWRCB 1994).

After 1941, water diversions to Los Angeles affected lower Rush Creek's streamflow and, subsequently, its riparian vegetation. From 1941 to 1991, streamflow averaged 52% of the pre-1941 flow. These diversions rendered lower Rush Creek's flow unreliable, and annual streamflow ranged from nine years of none to 173% of pre-1941 flow (the later from flood releases; Los Angeles Department of Water and Power unpubl. data). Lower Rush Creek's high water table was sufficient to support dense vegetation through the 1950s and mid-1960s. Starting in 1967, however, abrupt releases of water from the dam upstream (combined with Mono Lake's concurrent drop in elevation due to diversions) incised and channelized the streambed, lowering the water table and desiccating lower Rush Creek's riparian vegetation (Stine 1992).

Current Conditions

Consistent streamflow returned to lower Rush Creek after the heavy snow of 1989 and a subsequent 1994 state ruling and policy change that curtailed

Los Angeles's water diversions (SWRCB 1994). Lower Rush Creek is currently in the midst of long-term restoration (SWRCB 1998), and from July 2000 through June 2001, lower Rush Creek received 84% of its natural flow (Mono Lake Committee unpubl. data). In addition, the Los Angeles Department of Water and Power has sought to improve its water management by scheduling releases of water to mimic the timing of peak flow in late May and early June, facilitating recharge of the floodplain's water table, improving seed dispersal, and increasing sediment deposition (B. Tillemans pers. comm.). While some streambed restoration and planting have been undertaken since 1995, the riparian corridor's recovery has relied primarily on improved flow management, exclusion of grazing, and natural generation (Ridenhour 1997, J. Bair pers comm.).

In 1991, the Los Angeles Department of Water and Power placed a moratorium on grazing of its lands within the Rush Creek riparian corridor, to increase the likelihood of success of the revegetation (Jones and Stokes 1993). The State Water Resources Control Board (1998) extended this moratorium through 2008, to ensure recovery of riparian and fish habitat. Simultaneously, the Inyo National Forest has phased out grazing on its lower Rush Creek lands, in accordance with the Mono Basin National Forest Scenic Area Management Plan (USFS 1989). Consequently, by 2004 the lower Rush Creek riparian corridor had not been grazed for over 10 years, and its water had flowed continuously for 15 years.

The proportion of riparian to nonriparian cover in lower Rush Creek's riparian zone increased markedly from 1987 to 1999, after restoration of streamflow and release from grazing pressure (McBain and Trush 2003, Kauffman et al. 2000). The riparian zone is currently vegetated with the same plant species observed prior to 1941 diversions, but the structure and composition we see today is early-successional, primarily a mosaic of shrubby stands of mixed willow and Woods' Rose, interspersed with wet and dry meadows and sparse Jeffrey Pine saplings. Black Cottonwoods are less common today than as earlier described (McBain and Trush 2003).

METHODS

Point Counts

As part of more extensive songbird monitoring (Heath and Ballard 2003), we conducted 5-minute, 50-m fixed-radius point counts of all species at 15 stations, spaced 250 m apart and running parallel to the stream, along lower Rush Creek (Figure 2). We followed standards recommended by Ralph et al. (1993 and 1995) and conducted counts three times during the peak songbird breeding season (1 June–4 July) 1998–2000 and two times 2001–2002, spacing each of three or two visits at least seven days apart.

Nest Searching and Territory Mapping

We searched for nests and mapped territories within a 39-ha plot along Rush Creek every one to four days from 5 May to 15 August, 2000–2002 (Figure 2). We located and checked nests on each visit, following the guidelines of Martin and Geupel (1993) and Ralph et al. (1993). Territory sizes

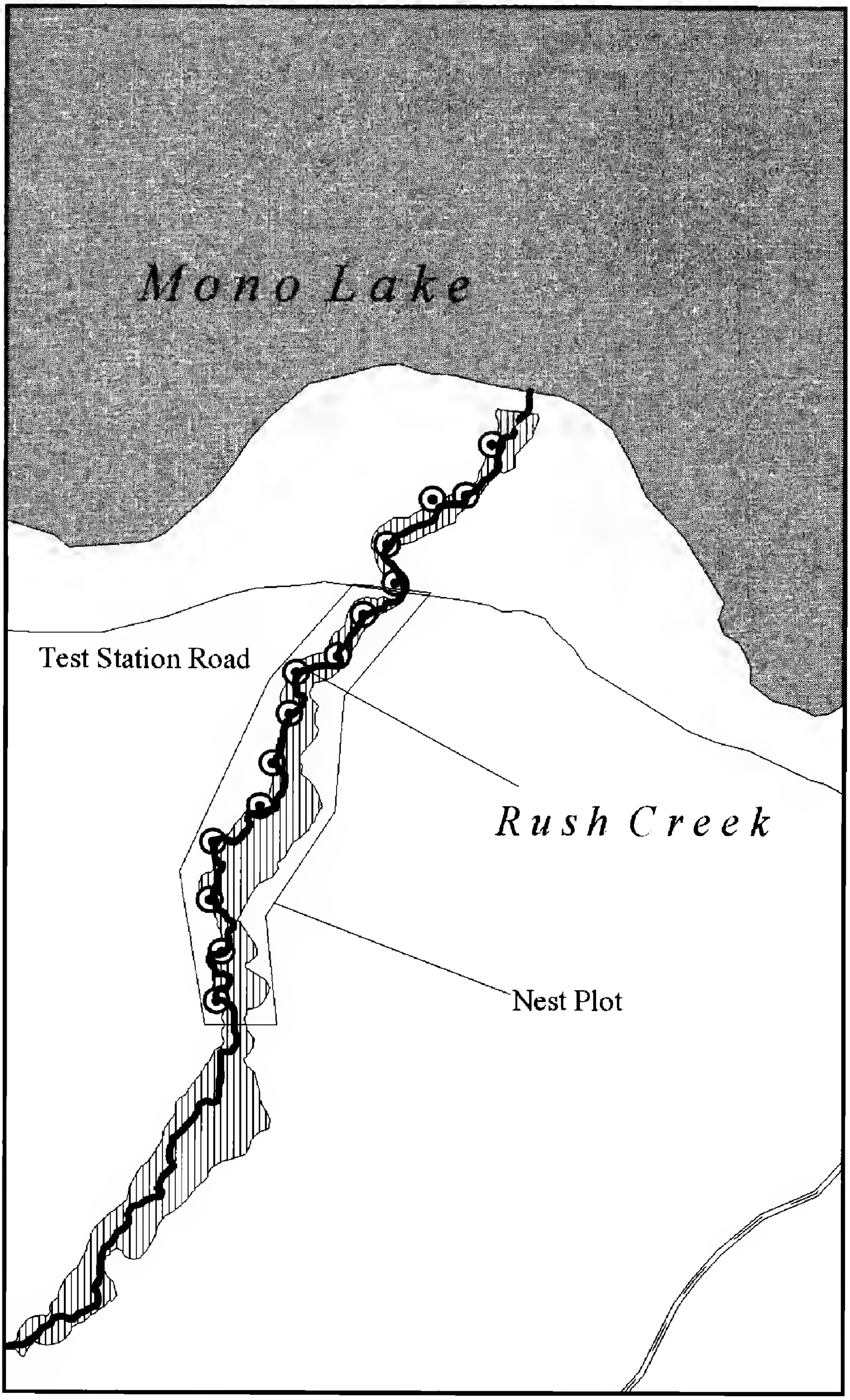

Figure 2. Lower Rush Creek: nest plot and point counts within larger study area.

were estimated from accrued plotted locations of territorial males, as recommended by the IBCC (1970). We assessed vegetation within plots of radii of 5 and 11.3 m around each nest, as described by Martin et al. (1997). We also visually estimated the proportion of major cover types within each plotted territory.

We conducted an additional survey of lower Rush Creek on 15 June 2002, covering the remainder of the riparian corridor for 2.5 km upstream of the nest plot to the Narrows, with the objective of locating and mapping additional Willow Flycatcher territories and finding nests (Figure 1). We continued to map the territory of a mated pair detected on the 15 June survey, monitored this pair's nests once every four days through 10 July 2002, and assessed the vegetation in this territory as described above.

RESULTS

Territories, Nest Establishment, and Phenology

Table 1 summarizes total adult individual Willow Flycatchers observed on lower Rush Creek by year. Two unmated territorial male Willow Flycatchers were observed on lower Rush Creek in 2000. Both sang on territory from 12 June through 30 June, and one defended the same territory until at least 2 August, our last day of surveys. We did not observe a female with either male.

In 2001, lower Rush Creek supported at least four Willow Flycatcher territories. Females and nests were found on three of these territories. Males were first detected on 23 May, and nesting commenced in mid-June (Table 2). The nest plot held a third male (unmated) that sang on territory into early August. On 18 June, during a survey using taped recordings (methods described by Bombay et al. 2000), Inyo National Forest biologists located three birds: a pair, with the male singing, and an apparently unmated male 2 km upstream of the nest plot. We located a nest on the pair's territory at the request of the Inyo National Forest. However, as Inyo National Forest biologists did not find a female with the season's fifth male (Table 1), we did not confirm this fifth territory through subsequent revisits.

In 2002, lower Rush Creek held seven to eight territorial males. Four females nested on these territories, with two females possibly sharing one polygynous male. Nests 5 and 6 were located within 10 m of the successful nests found in 2001. The sole successful nest in 2002 held a buried Brown-headed Cowbird egg.

Table 1 Numbers of Willow Flycatchers along Lower Rush Creek/on Nest-Study Plot,[a] 2000–2002

Year	Adult males	Adult females	Fledged young
2000	2/2	0	0
2001	5/3	3/2	7/7
2002	7–8/2–3	4/3	3/3

[a] See Figure 1.

Table 2 Willow Flycatcher Nesting Phenology along Lower Rush Creek, 2001–02

Nest	Date found	First egg	Clutch size	Cowbird eggs	Hatching date	Fledging date	Nest outcome
2001							
1	18 June	16 June	4	0	1 July	16 July	Fledged 3 young
2	22 June	19 June[a]	4	0	4 July	18 July	Fledged 4 young
3	11 July	Unknown	Unknown	Unknown	Unknown	Unknown	Likely depredated
2002							
4A	15 June	20 June	3	0	—	—	3 eggs depredated
4B[b]	6 July	Unknown	3	0	—	—	3 eggs depredated
5	21 June	18 June[a]	3	1 buried	3 July	18 July	Fledged 3 young
6	21 June	18 June	4	1	—	—	Fledged cowbird
7A	3 July	—	0	0	—	—	Abandoned
7B[b]	10 July	—	0	0	—	—	Abandoned

[a] Nest found after clutch completion; date of first egg estimated from date of hatching (Sedgwick 2000).

[b] Second nesting attempt within territory.

Five of the territorial males detected in 2002 were upstream of the nest-study plot on 15 June. One was mated; we believed the other four were unmated. Each of the four unmated males remained singing on its territory through 10 July 2002.

Nesting Habitat

Each nest ($n = 9$) was constructed in Woods' Rose. Nest heights averaged 137 cm plus or minus a standard deviation of 7 cm (range 108–160 cm). Woods' Rose, Narrowleaf Willow (*Salix exigua*), and Yellow Willow (*S. lutea*) provided nest cover. The height of adjacent willow cover averaged 454 ± a standard deviation of 36 cm (range 300–600 cm). Nests were constructed in slanted forks off the main stem, and nearby branches of the substrate or an adjacent rose were wound into the nest structure for added support. Although Woods' Rose reached heights of over 3 m in each of the breeding pairs' territories, the average height of shrubs supporting nests was 184 ± 11 cm (range 135–250 cm). Nests averaged 129 ± 18 m from surface water in Rush Creek (range 50–175 m). No other surface water was present within this distance at any time during the nesting season.

Breeding-Territory Habitat

Six mated males' territories (three in 2001, three in 2002) averaged 0.78 ± 0.14 ha in area (range 0.38–1.31 ha). We present results for only six territories because we did not systematically map territories of unmated males outside the study plot and because two of the seven total detected females may have shared one polygynous male. Monotypic stands of Woods' Rose 10–80 m wide dominated five of the six territories. Within the territories, Woods' Rose averaged 63 ± 9% of vegetation cover (range 20–75%), while willow [Narrowleaf, Yellow, and Shiny (*S. lucida*)] averaged 25 ± 2% (range 20–35%). Small pockets of grasses (*Leymus triticoides, Elymus elymoides* ssp. *elymoides*), sedges (*Carex douglasii*, *C. lanuginosa*) and rushes (*Juncus mexicanus*) generally <10 m across constituted the remaining vegetative cover. Males often used scattered large willows and Buffaloberry snags, which stood over the rose thickets, as song perches. Most of the breeding territories were over 90 m from the closest surface water (the stream itself), and no other surface water was within a territory at any point during the breeding season. The territories' average distance to water was 85 ± 26 m (range 0–150 m). In contrast, all but one of the breeding territories were within 20 m of the riparian corridor's upland sagebrush edge (average distance 11 ± 5 m, range 0–30 m).

DISCUSSION

The Willow Flycatcher was once a common breeding bird in the Mono Basin (Grinnell and Storer 1924). The collection of the Western Foundation of Vertebrate Zoology (WFVZ) contains multiple pre-1941 nest records for the area, and Joseph Grinnell and James Dixon collected and observed Willow Flycatchers on trips to Mono Lake in mid-June of 1916 and 1937, after most migrants had passed through the region (unpublished records at WFVZ; Grinnell and Dixon field notes at the Museum of Vertebrate Zoology; Unitt 1987). Further information on breeding Willow Flycatchers in the Mono Basin is sparse, with only a few recorded observations of breeding behavior after 1940, none of which were along Rush Creek (Gaines 1992). From May through August 1991, Jones and Stokes (1993: appendixes D and E) conducted extensive bird surveys along lower Rush Creek and detected no Willow Flycatchers. A small population located on the Owens River west of Bishop, Inyo County (75 km southeast of Mono Lake), represents the closest recently confirmed breeding on the Sierra Nevada's eastern slope (M. Whitfield pers. comm.).

Sierra Nevada populations of the Willow Flycatcher, in general, have decreased drastically over the last 50–60 years (Craig and Williams 1998, Serena 1982). Several authors have pointed out that habitat loss, water diversions, and grazing on breeding grounds affect Willow Flycatcher productivity adversely, contributing to population declines in the western United States (Sedgwick 2000, Craig and Williams 1998, Gaines 1992, Serena 1982).

Over the decades of water diversions and grazing, it is difficult to assess habitat conditions on lower Rush Creek quantitatively, for vegetation sampling in the riparian zone has been undertaken only since rehabilitation's onset. However, it is agreed that the lower Rush Creek riparian zone carries significantly more riparian vegetation today than in 1987, at the beginning of restoration (Kauffman et al. 2000, McBain and Trush 2003). Using 1929 photographs of lower Rush Creek as the basis for a pre-1941 baseline of 262 acres of riparian vegetation, McBain and Trush (2003:83) reported a loss of 132.6 acres of riparian vegetation from 1941 to 1989, and a gain of 37.5 acres from 1989 to 1999. Kauffman et al. (2000:254) stressed that, "while the re-watering of the creek is essential for this recovery, it is likely that the cessation of livestock grazing also greatly contributed to the successful establishment and growth of the riparian-obligate species, particularly the willows."

Along lower Rush Creek, territorial male Willow Flycatchers sing frequently and vociferously throughout the mornings, less often in the afternoons (McCreedy pers. obs.). Advertising song is much more common before nest initiation, though unmated males especially may sing through August (Bombay et al. 2000, Sedgwick 2000). There are, however, no recent reports of territorial Willow Flycatchers along Rush Creek prior to our detections of them in 2000 (Heath et al. 2001, Gaines 1992). Willow Flycatchers were reported as absent along lower Rush Creek in 1985 (Jones and Stokes 1993: appendix E), and surveyors did not detect them there near the beginning of rehabilitation in 1991 (Jones and Stokes 1993: appendix E).

The absence of Willow Flycatchers during the 1991 bird surveys along lower Rush Creek, the riparian corridor's easy accessibility, and the dramatic increase in riparian vegetation spurred by the restoration of streamflow and the moratorium on grazing suggest that Willow Flycatchers were absent when restoration began and reoccupied lower Rush Creek some time during the past decade.

Distances to water of the lower Rush Creek nest sites and territories differ from those reported elsewhere in California. In a summary of California Willow Flycatcher data, Craig and Williams (1998) reported that water is always present in territories of *E. t. brewsteri*, while nests of *E. t. extimus* nests average a distance of 21 m to water. In the northern and central Sierra Nevada King and King (2003) found open water to cover 4% of ground cover within 5 m of 10 Willow Flycatcher nests, and Bombay et al. (2003) found standing water or saturated soils to cover an average 44% of 87 territories. In addition, King and King (2003) reported complete soil saturation at all nest sites.

For nine nests and six territories along lower Rush Creek (2001–2002), the average distance from a nest to surface water was 129 m, and the average distance from a territory to water was 86 m. Although our study did not assess soil saturation directly, distances of nests and territories to saturated soil along lower Rush Creek would be shorter than distances to surface water. Through our study, however, stream flows in the study area were tightly regulated by releases from water impoundments upstream. Past channelization of Rush Creek and below-average peak flows kept surface water confined to the streambed even during nest-site selection, which coincides with Rush Creek's yearly peak flow. Although low-lying pockets of saturated soil exist away from the streambed, they are often small and isolated, particularly around several of the flycatcher territories (McCreedy pers. obs.). In addition, in a ranking of Rush Creek's and nearby Lee Vining Creek's 13 riparian plant communities, McBain and Trush (2003:42) put the "Narrowleaf Willow–Rose" and "Rose" patch types (which contain the Willow Flycatcher territories on lower Rush Creek) in eight and ninth place, respectively, closer to the dry end of the spectrum. Across the lower Rush Creek corridor, where soil is more saturated, Woods' Rose gives way in understory dominance to young willows.

In the six territories along lower Rush Creek (2001–2002), the average cover of willow was 24%, and the average cover of rose was 64%. All nine nests were in Woods' Rose. In contrast, in an unpublished 1997 U. S. Forest Service protocol for surveying for Willow Flycatchers, J. H. Harris described

Willow Flycatcher habitat in the central and southern Sierra Nevada as "willow-dominated," with "moist meadows with perennial streams and smaller spring-fed or boggy areas with willow or alder." More recently in the Sierra Nevada, Bombay et al. (2003) linked nest and territory selection to riparian shrub cover (98% of riparian shrub cover was willow at the territory scale, and 99% was willow at the nest scale). King and King (2003) found 10 of 10 nests built in Mountain Alder (*Alnus incana*), and nine of these nests were completely surrounded by Lemmon's Willow (*Salix lemmonii*). In addition, the U. S. Forest Service's current survey protocol for the Willow Flycatcher does not include dry, monotypic stands of rose among its five general types of Willow Flycatcher habitat in central and northern California (Bombay et al. 2000:26–27).

The habitat along lower Rush Creek may most closely recall King's (1955) report on a wide range of nest substrates for Willow Flycatchers in the Palouse Hills of southeastern Washington, encompassing a spectrum of mesic to xeric habitats. Thirty-six percent of the Palouse Hills nests were built in *Rosa* spp., in what King referred to as "upland prairie remnants." The Palouse Hills nests averaged a distance of 37 m to standing water. Though we are reluctant to label the riparian Rush Creek rose fields as "xeric" (as did King for his upland habitats), the average distance from nests to water along lower Rush Creek is over three times that in the Palouse Hills.

The dynamics that created this anomalous breeding habitat are worth further discussion. Starting in 1941, diversions of four of Mono Lake's tributaries dropped the lake's level 45 feet by 1982 (Ridenhour 1997). As the lake's level fell, Rush Creek's gradient sharpened. Cutting and deepening of the creek's channel resulted, compounded by releases of large volumes of water during years of heavy snow (Stine 1991). Lower Rush Creek's historic riparian vegetation became isolated on terraces above the riparian corridor's descending groundwater table, and it was no longer subject to flooding during years of heavy runoff. At least 80% of lower Rush Creek's collapsed riparian forest died. Woods' Rose and Narrowleaf Willow survived best on these terraces, outcompeting drought-intolerant riparian obligates. Often, the rose and willow on these terraces stood over 100 m from the current streambed. Recent restoration of consistent streamflow through lower Rush Creek has recharged the riparian corridor, halting the terraces' slow change to sagebrush scrub, and the surviving Woods' Rose and Narrowleaf Willow were in the best position to recolonize and dominate the recharged riparian corridor (J. Bair and B. Tillemans pers. comm.).

Aerial photographs of Rush Creek taken in 1929, before diversion of water to Los Angeles, show large patches of Woods' Rose, though in locations different from today's (McBain and Trush 2003:37). Contemporary passive restoration of lower Rush Creek has resuscitated this component of the riparian habitat, which is now used by an increasing population of Willow Flycatchers. In addition, groundwater recharge is sufficient to support small stands of the riparian-obligate Yellow and Shiny Willows within each Willow Flycatcher territory; these taller trees are important for song and foraging perches (McCreedy pers. obs.). Additional unoccupied areas of this rose–willow mix exist along lower Rush Creek, across the Mono Lake

Basin, and at lower elevations throughout the eastern Sierra Nevada. If the Willow Flycatcher's productivity and survivorship along lower Rush Creek remain high, this population may provide a source for the reoccupation of other riparian areas in the region. Continued monitoring of its productivity, site fidelity, and territory and nest-site selection will instruct us on this species' likely reoccupation and population expansion on recovering lower Rush Creek.

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NOTES

CONSPECIFIC COLLISION MORTALITY IN CASPIAN TERNS

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Many species of birds fly in flocks numbering in the hundreds or even thousands of individuals. Such flocks make highly coordinated maneuvers when flying to or from feeding grounds and roosts or even during panic flights to escape aerial or terrestrial predators. How movements within a flock are coordinated, preventing collisions and possible injury to flock members, remains largely unknown. Although collisions of migrating birds with buildings and television towers result in mortality of thousands of birds annually (Stoddard 1962, Kemper 1964, Banks 1979, Gill 1990:587), fatal collisions among conspecifics are reported much less commonly. We report here a case of a fatal collision between two Caspian Terns (*Sterna caspia*) in southern California.

During June and July 2001, we made weekly visits to the nesting colony on North Island at the Bolsa Chica State Ecological Reserve in coastal Orange County, California. In addition to 92 pairs of Caspian Terns, the breeding species at Bolsa Chica included 459 pairs of Elegant Terns (*S. elegans*), 18 pairs of Royal Terns (*S. maxima*), 259 pairs of Forster's Terns (*S. forsteri*), and 89 pairs of Black Skimmers (*Rynchops niger*). On 14 July most of the Caspian Tern pairs were tending half-grown chicks and made repeated aggressive flights at us, calling loudly, during the time we were near their nests or chicks. While checking nests and recording their contents we observed a wing-to-wing collision between two of the adult Caspian Terns, one of which was making a diving attack on us. The collision was accompanied by a sharp snap not unlike the breaking of a dry stick, and one of the two individuals fell to the water at the edge of the island. This tern appeared to be injured and unable to fly. When we captured it, we found it to have a compound fracture of the distal ulna and radius of the right wing, a fatal injury. The other participant in the collision did not show any sign of injury and flew away apparently unharmed. As no similar collision has occurred during our regular breeding-season visits to this colony from 1985 to 2004 this has to be considered a rare event and not a significant source of mortality in Caspian Terns or the other species nesting at Bolsa Chica. We have not found mention of a similar collision in any other tern species.

Similar fatal collisions of conspecifics have been reported for the Common Swift (*Apus apus*; Joy 1930), Chimney Swift (*Chaetura pelagica*; Conner 1981), Laysan Albatross (*Phoebastria immutabilis*; K Larson pers. comm.), and Long-tailed Duck (*Clangula hyemalis*; Abraham and Wilson 1997). Larger-scale collision mortality involving hundreds of individuals has been recorded for the Eared Grebe (*Podiceps nigricollis*; Jehl 1998). This last case was associated with the start of nocturnal migration flights by masses of birds or when they were disoriented by bright lights while in flight. Unlike grebes, swifts and terns are particularly agile flyers. Evidently even strong flyers may, on rare occasions, be subject to conspecific collision mortality.

We are indebted to the California Department of Fish and Game for permission to study the birds nesting at Bolsa Chica.

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FIRST RECORD OF THE MANX SHEARWATER FOR MEXICO

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On 6 February 2003 we observed a Manx Shearwater (*Puffinus puffinus*) from a promontory at La Bufadora, Baja California, Mexico. We had set up our spotting scopes approximately 50 meters above the Pacific Ocean and were looking west with the sun at our backs at a few northbound Black-vented Shearwaters (*Puffinus opisthomelas*) approximately 400 meters from shore. San Miguel noticed a different looking shearwater and brought it to McGrath's attention. Both observers jointly identified the bird as a Manx Shearwater. The bird was visible for about a minute before disappearing to the north. San Miguel sketched it immediately following our observation (Figure 1). The following description combines the field notes from both observers.

The shearwater appeared identical in size and flight behavior to the accompanying Black-vented Shearwaters. Its flight was direct with few arcs and was characterized by quick wing beats and brief intermittent gliding. The dorsal surface was uniformly black, except for two small white ovals on the sides of the rump and a small white crescent that ran up the neck to the auricular area. The ventral areas were completely white, except for narrow black wing margins. While looking through San Miguel's scope (Swarovski EL 80 mm, 20–60x zoom), McGrath observed the bird as it banked and showed completely white undertail coverts. The contrast between the black dorsal surface and the ventral surface was pronounced, and there was no visible mottling between these two areas. The black crown and face extended to about the eye line,

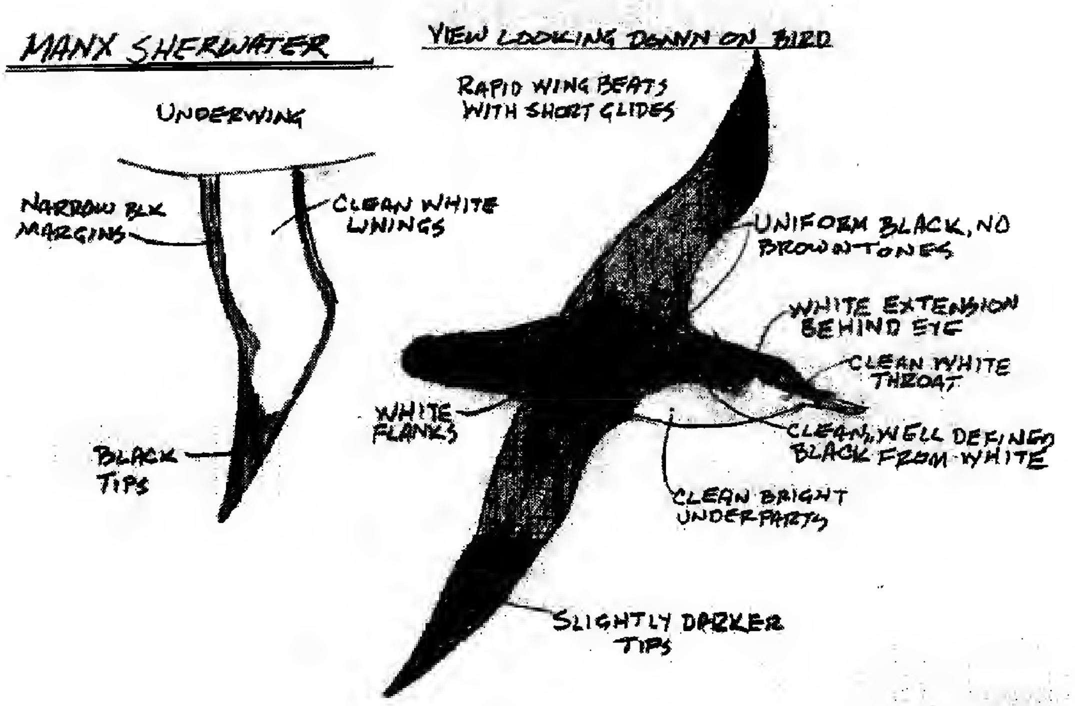

Figure 1. Manx Shearwater at La Bufadora, Baja California, 6 February 2003.

Sketch by Mike San Miguel

and the throat was pure white. The breast, sides, and flanks were also white, and the under wing coverts were clean white with sharply contrasting and well-defined black wing margins (black pigmentation did not extend into the linings).

Direct comparison with Black-vented Shearwaters immediately before and after we were looking at the Manx Shearwater assisted in the identification. Black-vented Shearwaters are brownish above and have variably smudgy dark throats, black vents, dingy white under parts, and smudgy wing linings. These differences were all evident as we were viewing the birds. Although a small fraction of Black-vented Shearwaters have partially or mostly white vents (Roberson 1996, McGrath pers. obs.), such birds are easily distinguished from the Manx by the other features noted above.

Although there are no records from northern Baja California for Townsend's Shearwater (*P. a. auricularis*), and no records anywhere near the peninsula for Newell's Shearwater (*P. a. newelli*), we considered and eliminated both of these taxa. Townsend's Shearwater breeds in the Revillagigedo Islands and disperses along the continental shelf from southern Baja California Sur to Central America (Howell and Webb 1995). Newell's Shearwater breeds only in the main Hawaiian Islands but disperses after breeding mostly east and south of Hawaii into the Equatorial Countercurrent (Spear et al. 1995). Newell's favors warm, deep tropical waters (Ainley et al. 1997) and is unlikely as a vagrant near the shore of northern Baja California. Thorough reviews of the identification of these species were provided by Howell et al. (1994) and Roberson (1996). The best distinguishing feature is the undertail covert pattern, with Townsend's showing all-dark undertail coverts (although some individuals show uneven patchy sections of white on the proximal undertail coverts), Newell's showing an intermediate pattern of white proximal undertail coverts and black on the distal and lateral coverts (Howell et al. 1994). In the Manx Shearwater the undertail coverts are all white. Since this bird showed all-white undertail coverts, Townsend's is easily eliminated. Distinguishing the Manx from Newell's Shearwater requires more care. In strong sun, it is possible that the undertail coverts can appear whiter as a result of the sun's glare making a Newell's Shearwater appear all white on the undertail (Howell et al. 1994).

There are also five reports of the Little Shearwater (*Puffinus assimilis*) for the North Pacific Ocean: two unsubstantiated sight records for Alaska (Gibson et al. 2003), two records for Midway [one of a specimen (Clapp and Woodward 1968) currently being reevaluated (P. Pyle pers. comm.)], and one of a bird photographed on Monterey Bay 29 October 2003. The last has been accepted by the California Bird Records Committee (San Miguel and McGrath 2005). The Little Shearwater is much smaller than the Manx, with proportionately shorter wings and faster more direct flight, appearing almost like that of an alcid (McGrath pers. obs.).

North of the international border, the California Bird Records Committee has accepted at least 79 records of the Manx Shearwater records since the first on 25 July 1993 (Erickson and Terrill 1996). The frequency of records appears to be increasing. Roughly two-thirds are from fall, and most are from the central California coast, especially Monterey Bay. The popularity of fall pelagic boat trips to that location and the fact that these trips spend considerable time in the nearshore waters favored by Manx Shearwaters probably has much to do with these patterns. There are 11 accepted records for southern California (from San Luis Obispo County south) (Table 1), and the distribution of records is much more even seasonally, with five records in March or April, four records in September or October, and two records January or February.

Prior to our observation, the Manx Shearwater was unrecorded in Mexico, but there is a specimen of a carcass from Dangriga, Belize, in February 1990 (Howell and Webb 1996). The sighting of a Manx Shearwater off Costa Rica on 2 November 1997 (Faulkner 2002) is the only other Central American report for this species. But both of these records are from the Carribean, not the Pacific.

The pattern of southern California sightings suggests that the Manx Shearwater may be a regular visitor off the Pacific coast of Mexico, particularly from September

Table 1 California Manx Shearwater Records South of Monterey County

Date	Number of birds	Location	Reference
2 Oct 1994	2	Morro Bay, San Luis Obispo Co.	Howell and Pyle (1997)
14 Apr 1996	1	Pt. Piedras Blancas, San Luis Obispo Co.	McCaskie and San Miguel (1999)
19 Jan 1997	1	~7 n. mi. SW Morro Bay, San Luis Obispo Co.	Rottenborn and Morlan (2000)
28 Apr 1999	1	Pt. Piedras Blancas, San Luis Obispo Co.	McKee and Erickson (2002)
19 Sep 1999	1	Off Emma Wood State Beach, Ventura Co.	Rogers and Jaramillo (2002)
17 Mar 2001	1	~5 n. mi. NW Pt. Vicente, Los Angeles Co.	Garrett and Wilson (2003)
23 Feb 2002	1	~4.5 mi. NW Palos Verdes Peninsula, Los Angeles Co.	Cole and McCaskie (2004)
4 Mar 2002	1	Off San Clemente Island, Los Angeles Co.	Cole and McCaskie (2004)
8 Sep 2002	1	Off Santa Maria River mouth, Santa Barbara Co.	Cole and McCaskie (2004)
17 Mar 2003	1	Off Pt. Vicente, Los Angeles Co.	San Miguel and McGrath (2005)
25 Oct 2003	1	2–3 mi. off Oxnard, Ventura Co.	San Miguel and McGrath (2005)

through April. The absence of records to date may reflect the low number of observers in Mexico, the lack of organized pelagic trips, and/or the difficulty of detecting this species among massive numbers of Black-vented or Townsend's Shearwaters normally present in Mexican waters during the periods when the Manx might be expected.

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NOTEWORTHY AVIFAUNAL RECORDS FROM THE BAJA CALIFORNIA PENINSULA, MEXICO

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We traveled to the Baja California Peninsula in April 2001, adding 11 biogeographically or seasonally noteworthy records, 10 of which are supported with specimens. Specimens collected were deposited in the ornithological collection of the Museo de Zoología "Alfonso L. Herrera," Facultad de Ciencias, Universidad Nacional Autónoma de México, in Mexico City.

We visited the following four localities (Figure 1) on the specified dates. Vegetation types follow Rzedowski (1978) and León de la Luz and Coria (1992).

Sierra de las Tinajas, 6 km west of Ejido José Saldaña (31° 49.73′ N, 115° 25.91′ W); canyon on east slope; 250 m elevation; 5–8 April 2001. The contiguous mountain area is rocky and steep. In the floor of the canyon the most abundant plant species are creosote bush (*Larrea tridentata*), ocotillo (*Fouquieria splendens*), and palo verde (*Cercidium microphyllum*), with other shrubs and grasses.

Río La Bocana, 15 km west-southwest of Cataviña (29° 42.17′ N, 114° 50.04′ W); 380 m elevation; 10–13 April 2001. This site is a dry wash approximately 4 m wide. The surrounding granitic hills are well-vegetated with cardón (*Pachycereus pringlei*), círio or boojum tree (*Idria columnaris*), cacti (*Opuntia* spp.), mesquite (*Prosopis* spp.), catclaw (*Acacia greggii*), and agave (*Agave* spp.).

Rancho Monte Alto, 15 km northwest of San Javier (25° 55.87′ N, 111° 37.25′ W); 400 m elevation; 16–19 April 2001. This is a high plateau on the west slope of the Sierra de la Giganta; the surrounding rocky slopes lack vegetation. Dominant plants on the plateau include *Prosopis* spp., *Acacia* spp., *Cercidium* spp., *Jatropha* spp., *Pachycereus pringlei*, and *Larrea tridentata*. Stagnant water in some seasonal streambeds supports palms (*Washingtonia* sp., *Erythea* sp.) and some riparian shrubs.

Rancho San Dionisio, 20 km northwest of Santiago (23° 33.35′ N, 109° 51.94′ W); 450–710 m elevation; 22–27 April 2001. This ranch lies along the Río San Dionisio on the eastern slope of the Sierra de la Laguna. The river is perennial but holds very little water in the dry season. Vegetation is tropical low forest, including *Bursera* spp., *Prosopis* spp., *Acacia* spp., *Ferocactus townsendianus*, *Pachycereus* spp., *Ficus palmeri*, *Pithecellobium* sp., *Jatropha* spp., and riparian vegetation. There are some palms (*Erythea brandegei*) and introduced mango trees (*Mangifera indica*). Our upper study area is located 2 km west of the ranch (23° 33.23′ N, 109° 53.50′ W). The vegetation is quite similar to that of the ranch site but with more abundant figs and other tropical trees.

Magnificent Frigatebird (*Fregata magnificens*). On 19 April we observed an adult female flying west, high over Rancho Monte Alto. Magnificent Frigatebirds are known to soar over the central and southern Baja California Peninsula with some frequency, particularly in the southern Cape District (Wilbur 1987, Howell and Webb 1992, Clark and Ward 1993, *N. Am. Birds* 57:260).

Band-tailed Pigeon (*Patagioenas fasciata vioscae*). This pigeon breeds at high altitudes in the Sierra de la Laguna, to which this subspecies is endemic. Lamb (1926)

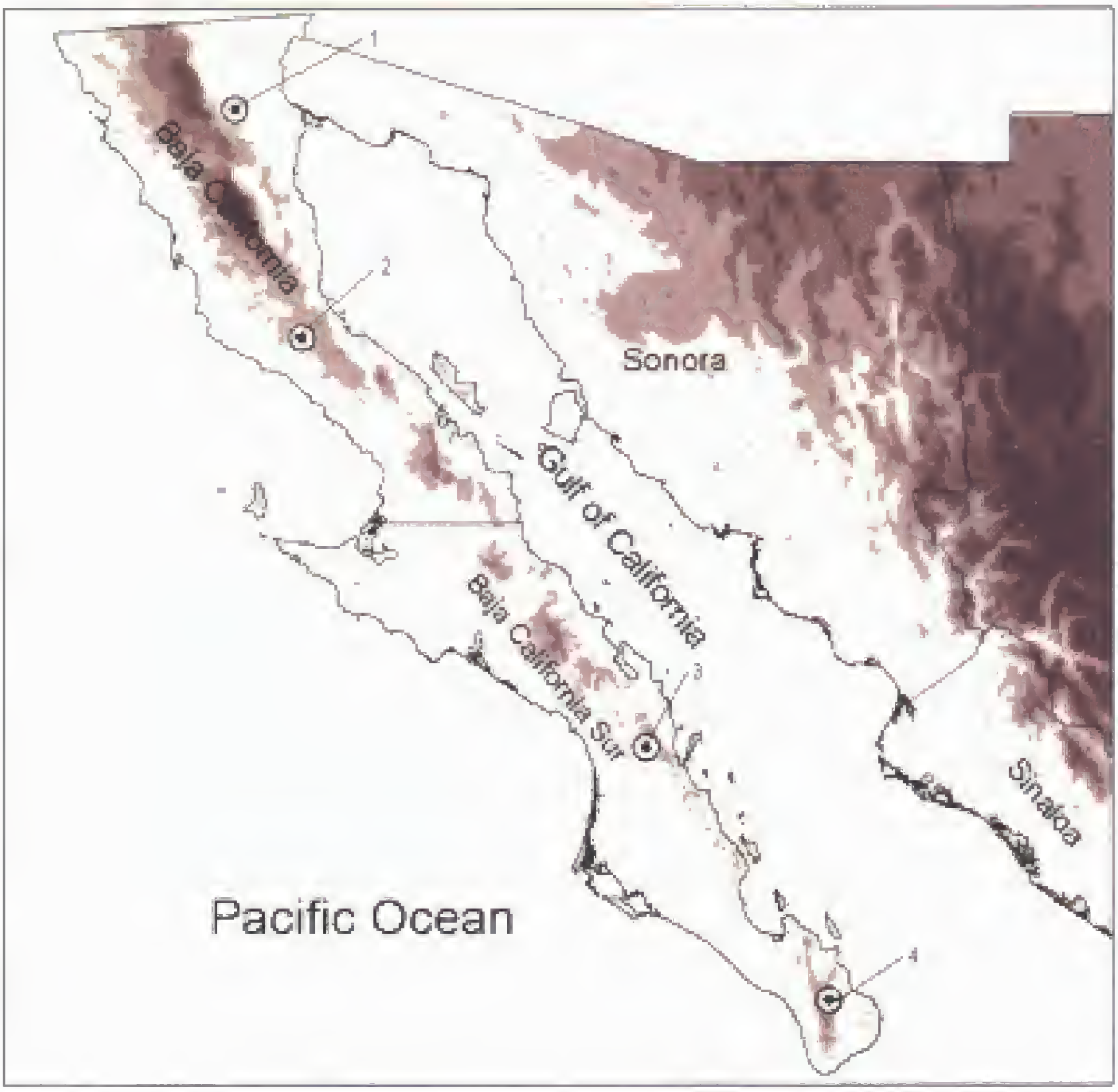

Figure 1. Localities mentioned in the text: (1) Sierra las Tinajas, (2) Río Bocana, (3) Rancho Monte Alto, and (4) Rancho San Dionisio. Underlying topographic map is from CONABIO (www.conabio.gob.mx).

and Banks (1967) described its apparently routine movements down into foothills where grapes and other fruits are grown. We found groups of up to 15 at Rancho San Dionisio, all of them in fig trees, and collected an unsexed subadult on 26 April 2001 (MZFC 16128). We did not observe any nests or nesting behaviors.

Elf Owl (*Micrathene whitneyi sanfordi*). This subspecies is endemic to the Cape District and the deserts on the east side of peninsula north to around latitude 28° N (Howell and Webb 1995). We recorded up to three per night at Rancho Monte Alto, collecting two apparently not in breeding condition (MZFC 16190, unsexed; 16291, female, largest ovule 0.5 mm). We also recorded two at Rancho San Dionisio, at 450 m elevation.

Xantus's Hummingbird (*Hylocharis xantusii*). We observed up to 20 of this Baja California Sur endemic daily at Rancho Monte Alto, collecting two females (MZFC 16154, largest ovule 0.7 mm; MZFC 16071, juvenile) and one male (MZFC 16276, testes 2 x 1 mm). Apparently no individual was in breeding condition.

Anna's Hummingbird (*Calypte anna*). On 16 April 2001, we collected a female (MZFC 16151) at Rancho Monte Alto, south of the species' principal range. Anna's Hummingbird is being recorded in Baja California Sur with increasing frequency (e.g., Howell and Webb 1992, Howell and Webb 1995, Whitmore and Whitmore 1997, Hamilton and Erickson 2001, Erickson et al. 2001), including several recent records from the southern Cape District in fall and winter and confirmed breeding in Guerrero Negro during winter/spring 2003/2004 (*N. Am. Birds* 58:286,438-439).

Acorn Woodpecker *(Melanerpes formicivorus angustifrons)*. We collected two immatures, one male (MZFC 16122, testes 4 × 2.2 mm) and the other unsexed (MZFC 16289), and observed another seven at Rancho San Dionisio. This subspecies, endemic to the Sierra de la Laguna, typically occurs in pine and pine–oak forests, but pines and oaks are not found at this location. According to local people this woodpecker arrives during the winter, suggesting a seasonal altitudinal migration as proposed by Banks (1967). Howell and Webb (1995) questioned the dark color of the irides: "eyes whitish (dark in *angustifrons* of BCS?);" we verified that all individuals (observed and collected) had brown irides.

Gray Flycatcher (*Empidonax wrightii*). We observed an apparent spring migrant in the Sierra de las Tinajas on 7 and 8 April. The species winters commonly in Baja California Sur, so an adult of undetermined sex collected at Rancho Monte Alto on 17 April (MZFC 16065) may have wintered locally.

Western Kingbird (*Tyrannus verticalis*). We observed this species commonly and collected three individuals in the Sierra de las Tinajas: two males (MZFC 15990, testes 2 × 3 mm and MZFC 16012, 6.5 × 3.4 mm), and one of undetermined sex (MZFC 15997). Western Kingbirds breed commonly in northeastern Baja California (e.g., Patten et al. 2001), and tall trees at this location may constitute nesting habitat suitable for this species.

Nashville Warbler (*Vermivora ruficapilla*). We collected two in the Sierra de las Tinajas (MZFC 16021, 16300), where the species is a fairly common spring transient (Patten et al. 2001). The species' status in Baja California Sur is murkier (most of the population migrates via the east side of the Gulf of California, avoiding the southern peninsula), but we observed a probable spring migrant at Rancho Monte Alto on 18 April.

Yellow-breasted Chat (*Icteria virens*). On 26 April we collected an immature of unknown sex at Rancho San Dionisio (MZFC 16148). Breeding is known south to Comondú, although a singing bird at San José del Cabo 3 August 1988 "suggests that nesting might occur farther south" (Erickson et al. 2001).

Pine Siskin (*Carduelis pinus*). An immature male collected 18 April 2001 at Rancho Monte Alto (MZFC 16175, testes 1.8 × 1.4 mm) furnished the first record of an apparent spring migrant in Baja California Sur. The species otherwise is an irregular, and typically rare, winter visitor to Baja California Sur (Unitt et al. 1992, Wurster et al. 2001).

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THE COMMON EIDER REACHES CALIFORNIA

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Late in the morning of 5 July 2004 Charles E. and Barbara Vaughn found an adult male Common Eider (*Somateria mollissima*) swimming in the ocean off Battery Point at Crescent City, Del Norte County, California. They quickly notified interested persons about their find, enabling local birders such as Alan Barron and Ron LeValley to see and photograph it that afternoon. The eider was then widely seen through 18 July, during which time it ranged over about 3 miles from Battery Point northwest to Castle Rock.

Male Common Eiders in breeding plumage are relatively easy to identify, and the Crescent City bird was no exception. It was a large, heavy-bodied, black and white duck, with eyes set high on the sides of its face. The head was mostly white, with black on the crown extending down to just below the eyes. A pale greenish wash was visible on the nape at close range. Photos also show a black "V" marking on the chin. The long, wedge-shaped bill was orange with a whitish tip, and the legs and feet were the same bright orange as the bill. When on the water, the body appeared white with black sides and rear end. Although the bird appeared to be a strong flier, it stayed close to the water's surface as sea ducks typically do. It looked mostly white but with a black belly, rear end, and flight feathers (primaries and secondaries); the upper and under wing coverts were white. When McCaskie observed the bird at close range on 6 July, he saw no obvious signs of missing flight-feathers, but the primaries appeared worn and dark grayish. A handful of dark-tipped feathers on the scapulars seemed to be traces of eclipse plumage. When last seen on 18 July, this duck had acquired noticeably more dark-tipped eclipse plumage feathers. The record (CBRC record 2004-101) was unanimously endorsed by the California Bird Records Committee and is the first substantiated record for a Common Eider on the Pacific coast south of British Columbia. What may have been this same male, molting into eclipse plumage, was photographed at Port Angeles, Washington, 3–13 August 2004 (S. Mlodinow pers. comm.), shortly after the California bird disappeared.

The Common Eider breeds along the arctic coasts of Europe, Asia, and North America, south to the northern British Isles and the Netherlands in Europe, to the southern Chukchi Peninsula and the Commander Islands in Asia, to the Aleutian Islands in western North America, and to New Hampshire in eastern North America. In winter most Common Eiders remain within the species' breeding range, but some move south to northwestern France and Kamchatka in the Old World and to southeastern Alaska and New York in the New World.

At least six subspecies of Common Eider are generally recognized (Palmer 1976, Cramp 1977). In the Atlantic Ocean and adjoining waters, *S. m. borealis* occurs from northeastern Canada to Spitsbergen, *dresseri* occurs to the south from Labrador to Maine, and *sedentaria* is resident within Hudson and James bays. In the Pacific and northward, *v-nigrum* occurs from Victoria and Banks Islands in northern Canada west through coastal Alaska to northeastern Siberia. Away from North America, *mollissima* occurs around the North Sea from the British Isles to Scandinavia, and *faeroeenis* is resident at the Faeroe Islands. Males of *v-nigrum* differ from those of the other subspecies in having an orange bill and a black "V" on the throat. The Common Eider in Crescent City, which appeared to be an adult male, had an orange bill and a black "V" on the throat, so was evidently the expected *v-nigrum*.

Figure 1. The Crescent City Common Eider on an inshore rock near Battery Point on 6 July 2004. The dark markings on the scapulars are evidently the first of the dark-tipped feathers of eclipse plumage to emerge. The black "V" on the chin is also partially visible, showing the bird to be of the expected subspecies *v-nigrum*.

Photo by Mike San Miguel

Birds from the Atlantic populations (*borealis* and/or *dresseri*) have wandered south along the coast to as far as Florida and inland to the Great Lakes, with vagrants recorded in Wisconsin, Illinois, and Nebraska. The Pacific population (*v-nigrum*) rarely reaches extreme southeastern Alaska and has been recorded on the coast of British Columbia only four times (Campbell et al. 1990, Mlodinow 1999), but vagrants have been found inland in southern Canada, North and South Dakota, Kansas, Minnesota, and Iowa (A.O.U. 1998, Mlodinow 1999). An eider reported as a Common at San Francisco on 12 December 1982 was inadequately documented (Roberson 1993), and was in fact published as a King Eider (*S. spectabilis*) (*Am. Birds* 37:333).

The King Eider, nesting farther north than the Common, is found on the Pacific coast south of Alaska almost annually, with 36 California records endorsed by the California Bird Records Committee through 2003 (McKee and Erickson 2002; unpubl. data), including one from as far south as Imperial Beach/Coronado, San Diego County (an adult male 4 December 1982–25 January 1983; Morlan 1985). In addition, Steller's Eider (*Polysticta stelleri*), also nesting farther north than the Common, has reached California on three occasions, with one female as far south as Bodega Bay, Sonoma County, 27 October 1991–2 May 1992 (Patten et al. 1995). As often happens among related birds nesting over a range of latitudes, these two more northerly eiders tend to move south of their normal ranges more than does the more southerly Common Eider.

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EXPANSION OF THE BREEDING RANGE OF THE ACORN WOODPECKER EAST OF THE SIERRA NEVADA, CALIFORNIA

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Resident and breeding Acorn Woodpeckers (*Melanerpes formicivorus*) were first found on the east side of the Sierra Nevada in Lassen County, California, in 1959 (McKeever and Adams 1960). Currently, that area is the only published site of breeding and residence of this species in the eastern Sierra. In Inyo County, California, approximately 416 km south of Lassen County, the Acorn Woodpecker has been considered a regular vagrant and possible resident (Garrett and Dunn 1981, Small 1994), but long-term residence and breeding have never been confirmed. Here we provide evidence of Acorn Woodpecker residence in native oak (*Quercus*) habitats near Independence, Inyo County, as well as the first county breeding records for the species.

Inyo County is separated by the Sierra Nevada from most of California's native oak populations and the Acorn Woodpecker populations closely associated with those oaks. However, stands of three native oak species, the Black Oak (*Q. kelloggii*), the Interior Live Oak (*Q. wislizenii*), and the Canyon Live Oak (*Q. chrysolepis*), thrive along streams and at springs on the east face of the Sierra Nevada from north of Independence at Division Creek to Inyo County's southern border.

Grinnell and Miller (1944) reported what was then "the only trans-Sierra record" of one female Acorn Woodpecker "from Carroll Creek at 5500 feet, near Lone

Pine, Inyo County, September 8 [1911]." Garrett and Dunn (1981) described the Acorn Woodpecker as "apparently regular in small numbers in winter at the Mt. Whitney Fish Hatchery near Independence INY, and . . . possibly resident here." Small (1994) agreed that Acorn Woodpeckers "may be resident in a small isolated grove of live oaks at the Mt.Whitney Fish Hatchery near Independence." Koenig et al. (1995) considered the Acorn Woodpecker to be absent "from all eastern deserts" of California, but also a "good colonizer, regularly found outside its normal range," including "near Independence, Inyo Co., CA." The most recent American Ornithologists' Union Checklist (1998) acknowledges the Lassen County population of Acorn Woodpeckers but does not mention the Inyo County population.

There are 34 records (in addition to those we report here) throughout Inyo County from 8 September 1911 through 29 April 2004 (T. and J. Heindel pers. comm.). Sixteen of these records are from oak woodlands on the eastern slope of the Sierra Nevada, mostly near Independence. Fifteen records are of single birds at or near desert oases east of Big Pine and in the area of Death Valley during the months of May/June and September/October. Two records are from the city park in Bishop. One unusual sighting is from the summit of Mt. Barnard (4264 m), 11 September 2003.

From January 2002 through August 2003 we searched for Acorn Woodpeckers near Independence, within the limited distribution of the Black Oak and Interior Live Oak, at elevations of approximately 1220 to 1950 m. We returned regularly to the locations where we found Acorn Woodpeckers, seeking proof of breeding and continuous residence.

At Seven Pines (9 km west of Independence) a family group of five or six adult Acorn Woodpeckers remained in a mixed stand of Black Oak and Jeffrey Pine (*Pinus jeffreyi*) throughout our observation period. There we observed adult males and females feeding nestlings at a nest cavity in a Black Oak on 28 May 2002 and one or two fledged juveniles on 8 June 2002. This group nested a second time in 2002, and we saw adults feeding nestlings at the same cavity on 15 July, with at least one nestling fledging on 3 August. These woodpeckers stored Black Oak acorns in mature Jeffrey Pines, near their nest tree. During the winter of 2002–03, we often saw these birds flycatching from perches high in the Jeffrey Pines. The Seven Pines group nested again in 2003; we observed a nestling at a cavity in a different Black Oak on 21 June and a fledged juvenile on 9 August.

At Tub Springs (2 km north of Seven Pines), we found three adult Acorn Woodpeckers on 20 July 2002 and observed one or more adults feeding an unknown number of vocal nestlings on 3 August 2002. The nest cavity was in a Black Oak trunk.

In summer 2002 we surveyed a stand of Interior Live Oak mixed with other native and exotic trees on private property 2 km east of the Mt. Whitney Fish Hatchery. Acorn Woodpeckers were present from our first day of observation on 21 July until the end of our study period over one year later. We observed as many as seven adult Acorn Woodpeckers and ultimately found two nests separated by about 150 m. At one nest, a cavity in a Siberian Elm (*Ulmus pumila*), we saw a nestling on 29 June 2003 and a fledged juvenile on 6 July 2003. At the other, excavated in a native Red Willow (*Salix laevigata*), we saw adults feeding a nestling on 6 July 2003. Woodpeckers at both these nests stored acorns in nearby Black Locust (*Robinia pseudoacacia*) trees.

Acorn Woodpeckers were usually present in the Interior Live Oaks and exotic trees at the Mt. Whitney Fish Hatchery. We found eleven adults there on 14 April 2002. Although we witnessed breeding behavior there, including copulation and cavity excavation, we never found nestlings or fledglings and thus were unable to confirm successful breeding. At the hatchery, as at the site 2 km to the east, the woodpeckers stored acorns in Black Locust trees.

In the summer of 2003, we also observed two or more adult Acorn Woodpeckers in appropriate breeding habitat at McGann Springs (7.5 km north of Seven Pines), Charley Canyon (5.5 km north of Seven Pines), Sardine Springs (3 km north of Seven

Pines), a private residence 1 km east of the Mt. Whitney Hatchery, and the Bright Ranch (2 km west of the hatchery). The woodpeckers had stored acorns in Black Oak trees at McGann Springs, Sardine Springs, and Bright Ranch.

During our study, Acorn Woodpeckers were well distributed in the range of native Black Oak and Interior Live Oak trees near Independence, Inyo County. They were present throughout the year, bred successfully, and stored acorns for winter consumption.

Elsewhere in the eastern Sierra, Acorn Woodpeckers occupy an extensive isolated stand of Black Oak in the area of Janesville and Susanville, Lassen County (McKeever and Adams 1960). Although there are no current population estimates or surveys of Acorn Woodpeckers for this area, a small part of the oak stand is included in the Honey Lake Christmas Bird Count circle. Acorn Woodpeckers are recorded annually on that count, with a high of 34 birds observed. On the basis of these data, the population in the entire stand could be well into the hundreds (T. Manolis pers. comm.).

Ornithologists in Kern County report no known breeding populations of the Acorn Woodpecker on the east side of the Sierra in Kern and southwestern Inyo counties (S. Steele, M. Heindel, K. Levinson, pers. comm.). Susan Steele (pers. comm.), however, found Acorn Woodpeckers in Indian Wells Canyon, Kern County, in January, March, May, and June 2002, and in August 2003. On 3 March 2002, four birds were working on storage holes in a dead pine tree. The granary contained about 100 acorns. Indian Wells Canyon, on the east slope of the Sierra Nevada near Inyokern, Kern County, hosts a stand of the Canyon Live Oak.

Confirmation of breeding Acorn Woodpeckers in Inyo County, combined with known and potential breeding in Lassen and Kern counties, indicates that this oak-woodland species has colonized isolated oak woodlands along the eastern base of the Sierra Nevada, well outside the species' core range.

We are grateful to Walt Koenig for sharing data, literature, and inspiration, and for editorial assistance; to Chris Howard for an excellent aerial photo of the Sierra foothills near Independence; to Tim Manolis and Kimball Garrett for sharing data and providing constructive suggestions; to Susan Steele, Matt Heindel, and Kelli Levinson for sharing their knowledge of Acorn Woodpeckers in Kern County; to Keith and Jane Bright, Bob and Elva Newman, Lloyd and Evelyn Crouchman, Tom Van Sant, and the late Neel Bell, for welcoming us into their "territories" and enthusiastically sharing woodpecker anecdotes; and to Tom and Jo Heindel for their data and editorial assistance and for more than a decade of mentoring Inyo County birders.

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BOOK REVIEWS

Ecology and Conservation of Birds of the Salton Sink: An Endangered Ecosystem, by W. David Shuford and Kathy C. Molina (eds.). 2004. Studies in Avian Biology No. 27, Cooper Ornithological Society. vii +169 pages, many black-and-white and color illustrations, maps, figures, tables. Softback, $17.00. ISBN 1-891276-37-9.

From the viewpoint of a conservationist elsewhere in North America, the Salton Sink in southern California is paradoxical: at once alarmingly familiar and bewilderingly foreign to one's experience. Economic development pressures, agricultural and urban needs for water, demands for recreation unrelated to wildlife, and the inevitable pushes and pulls of politics all battle relentlessly against ecological requirements for habitat preservation. These factors are commonplace in conservation, although not always as rife with competing interests as here. The utterly unfamiliar aspect is an astonishing diversity of ecological resources that need to be conserved. No fewer than 227 species—132 waterbirds and 95 primarily migrant landbirds—representing 50 families are analyzed, discussed, or at least listed in this important publication. The myriad habitats of the Salton Sea and the physiographic "sink" in which it lies are a critical haven for countless millions of nesting, migrating, and wintering bird species. *Ecology and Conservation of Birds of the Salton Sink* connects the complex bird communities to their equally complex ecosystem with rich scientific detail.

A collective monograph, it emerged from two symposia: one sponsored by the Western Field Ornithologists in 1997, the second hosted by the Cooper Ornithological Society in 2000. Particularly, it consists of proceedings of the 2000 conference published by the two organizations with financial support from PRBO Conservation Science and the U.S. Environmental Protection Agency. The meetings were designed to assess what was known and what had yet to be learned about the Salton Sea's avifauna, as well as to point the way toward effective conservation action. The stated purposes of the monograph are similar: first, to augment recent efforts to establish baseline data about the region's birds with additional depth and long-term perspective; second, to emphasize the sink's importance to avian populations as well as its connectivity to other important habitats throughout the Colorado River delta region, the arid West, and the entire Pacific Flyway. Considering the region's significance on the continental level, it is jolting to read the editors' statement that "few published accounts of recent faunal investigations exist for this area." Indeed the only book-length ornithological treatment is *Birds of the Salton Sea: Status, Biogeography, and Ecology* by Patten, McCaskie, and Unitt (University of California Press, 2003; reviewed in *Western Birds* 35:114–117).

The scarcity of ecological studies is a testament to the new monograph's value. It represents the work of 35 authors, including editors Shuford and Molina, who are among the most notable recent investigators of the region's ecology. The editors open the contributions with an overview of the area's geographic and ecological setting, environmental issues, and conservation challenges. Three chapters provide historical, ornithological, and biogeographical background before and since the accidental birth of the sea by massive flooding from 1905 to 1907. Six research reports analyze the status and ecology of the sea's vagrant pelagic and subtropical waterbirds; its large numbers of breeding cormorants, herons, ibises, and larids; the hundreds of thousands of wintering waterfowl; and a remarkable total of 27 regularly occurring shorebird species. Two chapters discuss landbird migrants at nearby desert riparian habitats and waterbird communities in the Colorado River delta to the south in Mexico. Two papers examine Burrowing Owls in the surrounding Imperial Valley. Two contributions revisit the sea's most memorable horrors: 150,000 Eared Grebes killed by unknown causes in 1992, and 10,000 American White Pelicans killed by botulism in 1996.

Finally, the editors summarize what they see as the next essential steps for research and conservation. While persisting in their labors toward an effective management plan, the editors realistically admit that the massive scale of proposed projects and competing goals might leave restoration of the Salton Sea "an unsolvable conservation conundrum."

Worrisome undercurrents of that kind mark most of the monograph: the urgency of conservation measures and uncertainty about what the most effective measures will be. We learn of a formidable array of problems confronting the sea: an inadequate and inconsistent water supply, direct habitat destruction, excessive salinity, eutrophication, chemical contamination, avian disease, exotic plants and animals, and human disturbance. In the face of such complexity, maintaining a balance among the varying ecological requirements for different species is a daunting challenge. Under the best possible circumstances, an acceptable ecological future will not be easy to sustain. *Ecology and Conservation of Birds of the Salton Sink* addresses the difficulties admirably, presenting extensive data and thoroughly considered interpretations with clarity. Such collections of papers are typically bedeviled by woefully uneven—and let us speak its rightful name—literary quality. Here the authors, the referees, and the editors can take pride in so few annihilations of the English language, so few departures into superfluous statistics, and so much specialized ornithology made lucidly accessible to nonspecialists.

Two misgivings must be mentioned. First, breeding landbirds in the surrounding sink and Imperial Valley receive scant treatment overall, dismissed summarily in fewer than three pages except for two entire chapters allocated to a single species, the Burrowing Owl. Though waterbirds are rightly the highest conservation priorities at the sea itself, are the sink's other nesting landbirds not worthy of serious attention as well? And second, more than a dozen project reports, environmental impact statements, and results of scientific studies prepared by and for public agencies are cited disconnectedly in varying contexts throughout the monograph. It is tantalizing not to find the governmental story told in a coherent chronicle enabling us to grasp the whole process of fact-finding and recommendations by the Salton Sea Authority, the U.S. Bureau of Reclamation, the U.S. Fish and Wildlife Service, and consultants such as Tetra Tech, Inc.

These concerns should not detract from the overriding success of *Ecology and Conservation of Birds of the Salton Sink* in pure education, an essential basis for any meaningful conservation action. A panorama of unique biodiversity unfolds page by page, beckoning us to act on its behalf—and "us," according to the editors, should include scientists themselves. Shuford and Molina urge researchers who study the sink "to engage in political, judicial, and regulatory processes ... to get into the trenches in conservation battles." Perhaps more important is a broad-based conservation constituency far beyond southern California that might be mobilized if the sea's story were told more widely. In the hands of science and environmental reporters and editors across the media, this publication could spark interest across the continent. If wide publicity has worked for old-growth forests or seashores, why not for this extraordinary ecological gem?

Pondering the sea's future brings a classic image of the sink to mind from Aldo Leopold's essay "The Green Lagoons." In 1922 he climbed a cottonwood in the Colorado River Delta and peered northwestward "where a white streak at the foot of the Sierra hung in perpetual mirage. This was the great salt desert." Leopold never went back because, he said, "To return not only spoils a trip, but tarnishes a memory." The analogy eight decades later is obvious: Will the region's precious avifaunal diversity fade into a mirage, no more than a treasured memory? *Ecology and Conservation of Birds of the Salton Sink* offers ample inspiration for working hard to prevent that fate.

Paul Hess

Ridgway's *Ornithology of the Fortieth Parallel* [1877] Revisited: Updated with Contemporary Place Names and Species Nomenclature, edited and published by Clarence D. Basso. 2004. 76 pages; front and back cover illustrations. Spiral bound. Available from Clarence D. Basso, 2545 Carville Drive, Reno, NV 89512.

Early Twentieth Century Ornithology in Malheur County Oregon, edited by Noah K. Strycker. 2003. Oregon Field Ornithologists, Special Publication No. 18. 210 pages; black-and-white photographs and line drawings throughout. Paperback. ISBN 1-877693-34-0. Available from Oregon Field Ornithologists, P. O. Box 10373, Eugene, OR 97440.

In this "golden age of field guides," as Eric Salzman has termed it, there is a temptation to focus all of one's bibliographic interest on contemporary books. In just the first half of the first decade of the 21st century, we have seen the publication of several major "general" field guides, several dozen excellent "specialty guides" to specific taxa, and scores of bird-finding and other regional guides. Meanwhile, the technical ornithological literature continues to proliferate. The report in last week's *Science* is a bit stale, last year's *Auk* is old news, and *The Sibley Guide* is starting to show its cracks. This caricature pursued just a little further, the twentieth century might be looked back upon as quaint and irrelevant, and the nineteenth as positively fossilized.

Enter the subject matter for this review. The stated goal of both volumes reviewed here is to make accessible to the modern reader the unpublished or long-out-of-print field notes of ornithologists working in the late nineteenth and early twentieth centuries. And, as it turns out, both books concern themselves with ornithological activities in the northern Great Basin. Thus similar goals, similar avifaunas. Similarly successful? Not at all. I'll look briefly at the less successful undertaking and then examine in greater detail the merits of its more successful counterpart.

At first glance, *Ridgway's Ornithology of the Fortieth Parallel Revisited*, edited by Clarence D. Basso, would seem to be the more compelling volume. After all, Ridgway was so significant a figure—especially from the vantage point of western field ornithologists—that his name remains etched in the consciousness of the modern birder. And there is an undeniable mystique about this particular work: it was Ridgway's debut, the work of a brilliant teenager and tag-along on the fabled U.S. Geological Survey Exploration of the Fortieth Parallel.

Basso's "revisiting" of Ridgway's notes has as its subtitle "Updated with Contemporary Place Names and Species Nomenclature." In fact, the "species nomenclature" is a mess. One can probably figure out what is meant by "Royal Tern, *Sterna caspia*"—indicated without comment on three occasions (pp. 35, 52, 69). But what of "Solitary Vireo, *Vireo solitarius*" (p. 13) and "Cassin's Vireo, *Vireo plumbeus*" (p. 53)? Or "Common Teal, *Anas cyanoptera*" (p. 46) and "Green-winged Teal, *Anas crecca*" (p. 56)? What is the "California Valley Jay, *Cyanocitta californicus*" (p. 9)? And what possibly could have been intended by "Wandering Tattler, *Heteroscelus incanus*," said to be "rather common" in Utah (p. 59)?

The presentation of this volume is so sloppy and unreliable as to render it virtually useless. And that's a pity, because much of what Ridgway recorded in the Great Basin could be of considerable relevance to the modern ornithologist. We read in these pages of Black Rails and Black Swifts, of Sharp-tailed Grouse and Greater Sage-Grouse, of White-winged Crossbills and Yellow-billed Cuckoos – all of which are absent from or seriously declining in the Great Basin of the 21st century. It would be fascinating to compare Ridgway's notes with the current crop of survey data coming out of Nevada and Utah. But the present volume is sadly inappropriate for this endeavor.

My other gripes include the following: (1) the book is organized, as it were, alphabetically by species name. Thus, for example, within the Buena Vista Canyon account (pp. 10–13), "Water Pipit" follows "Solitary Vireo," which follows "Scrub Jay," which follows "Rufous-sided Towhee," which follows "Ridgway's Sparrow," whatever that is; (2) there are no acknowledgments, there is no analysis, and there is no context; but (3) there are hundreds of mysterious numerological asides (viz., unexplained three-digit numbers that follow many of the species accounts) and hundreds more typos.

By contrast, *Early Twentieth Century Ornithology in Malheur County, Oregon*, edited (extensively but not high-handedly) by Noah K. Strycker, is wonderful. The bulk of this special publication of Oregon Field Ornithologists is a previously unpublished 1915 manuscript of Edward A. Preble, who conducted extensive fieldwork in Malheur County. Shorter excerpts (reprinted) from the works of Malheur County biologists Morton E. Peck and H. E. Anthony provide additional perspective on turn-of-the-20th-century ornithology in southeastern Oregon. And brief explanatory chapters by Strycker provide essential modern context.

Here is the short list of the many virtues of Strycker's edited volume: (1) the rationale and methods for the book are clearly laid out; (2) the editorializing, although copious, is unobtrusive and always clearly indicated; (3) notes on population change are commendably brief and informative; (4) apparent errors are identified and corrected; and (5) the copy-editing is nearly flawless.

Its weaknesses? Well, the copy editing is nearly flawless, not flawless. The back-end materials (species lists, references, etc.) seem to have been approached perfunctorily. And the layout and design are Spartan—probably a reflection of the shoestring budget typically available to regional ornithological studies such as this one. (Note, though, that spartan design is preferable to the grotesque over-design employed with tragic results in too many modern bird and nature publications.) But these are quibbles, and this is a fine book.

Early Twentieth Century Ornithology in Malheur County, Oregon is genuinely useful. The avifauna of the northern Great Basin is dynamic and potentially unstable, and Strycker's volume helps us to make sense out of the ornithological complexity of the region. Consider the following five species: Greater Sage-Grouse, Northern Bobwhite, Eastern Kingbird, Veery, and American Goldfinch. They're a pretty diverse bunch, but all five species represent management and conservation challenges of one sort or another for biologists working on the ground in the Great Basin in the 21st century. And all five are treated in such a way here—directly through the reproduction of Preble's field notebook and indirectly through Strycker's commentary—as to have consequences for the decision-making of modern managers.

At some level, though, we are dealing here with rather arcane subject matter. Should this book be read more widely? Does it hold any interest for researchers working outside southeastern Oregon in particular, or the Great Basin in general? I believe so. First, it is a fine model for future endeavors in the same genre. Obviously, any work of the "historical ornithology" of a local region will have its own particular and peculiar style; but *Early Twentieth Century Ornithology in Malheur County, Oregon* sets a fine standard at a rather general level. Second, in this era of ornithological instant gratification (rare bird alerts by Internet, tour guides who find lifers for you, and DNA analysis of records that committees can't resolve quickly enough), there is something cathartic, something civilized, about spending an unhurried weekend afternoon with long-dead ornithologists who were just as smart and just as inquisitive as we are.

Ted Floyd

FEATURED PHOTO

EFFECT OF PLUMAGE WEAR ON THE IDENTIFICATION OF FEMALE RED-WINGED AND TRICOLORED BLACKBIRDS

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Among the more difficult bird-identification problems in western North America—at least in Oregon, California, and northern Baja California—is how to distinguish the Red-winged Blackbird (*Agelaius phoeniceus*) and Tricolored Blackbird (*A. tricolor*), especially females. None of the major field guides covers the problem thoroughly. The National Geographic Society guide covers the issue best in text, but in no guide are there illustrations of the difference wrought by the most critical factor: feather wear.

The four photos on this issue's back cover compare the females of the two species in both fresh and worn plumage. The species are more easily distinguished in fall or winter when in fresh plumage. The fresh female of the Red-winged has rich chestnut and buff edges on the upperpart feathers, including the wing coverts and tertials. The shade and relative amount of chestnut and buff vary greatly among the Red-winged Blackbird's subspecies: 19–25, according to various studies (Ridgway 1902, van Rossem 1926, Power 1970, Dickerman 1974, Oberholser 1974, Browning 1990). At least nine of these subspecies occur in the western United States, seven in California. The Red-winged Blackbird in the upper left corner of this issue's back cover, photographed at Ramer Lake, Imperial County, California, is *A. p. sonoriensis*, in which the buff edges are broad and pale. In western North America, the opposite extremes are found in *A. p. caurinus* of the Pacific Northwest, in which most of the edges are a beautiful deep chestnut, and in *A. p. mailliardorum* of coastal central California, in which the edges are narrow and dull, leaving the upperparts largely black (Ridgway 1902, van Rossem 1926, pers. obs. of specimens in San Diego Natural History Museum). Although first-year male Red-winged Blackbirds have considerable (if variable) white streaking distinguishing them from older males, in female Red-winged Blackbirds first-year and older birds are essentially identical.

The monotypic Tricolored Blackbird is most similar to subspecies *mailliardorum* of the Red-winged. The edges on the feathers of both the upperparts and underparts are medium gray and diffuse. The edges of the newly grown tertials and wing coverts are somewhat brownish, as seen in the upper right image on the back cover, of a female Tricolored at Lakeside, San Diego County, California, 12 August 2004. On this date many of the birds from this colony were just finishing molt, with the outermost primary or two still growing in. Even in subspecies *mailliardorum* of the Red-winged, there is some contrast between the chestnut edges on the scapulars and the dull buff edges on the rest of the upperpart feathers. Also, even in this darkest western subspecies of the Red-winged, the whiter edges on the throat feathers make for underparts more contrasting than in the Tricolored. Though present only on females more than one year old, any hint of pink on the throat identifies the Red-winged.

After fledging, these blackbirds molt only once per year, in late summer (Jaramillo and Burke 1999). Among about 600 specimens of the Red-winged and Tricolored from western North America, I see no evidence for any significant molt of body feathers in spring. On the basis of studies in Quebec and Ohio, however, Greenwood et al. (1983) reported some molt of Red-winged Blackbirds in spring, especially frequent and extensive in one-year-old females. Thus, as in the Marsh Wren (*Cistothorus palustris*), there may be geographic variation in the presence or absence of spring molt (Unitt et al. 1996). In the West, the Red-winged and Tricolored are in fresh plumage in the fall only. Through the winter and spring the feather edges, be they gray, buff, or chestnut, wear off, leaving the bird looking drabber and blacker as summer approaches. This process also obliterates the most obvious differences between the Red-winged and Tricolored, as well as among the subspecies of the Red-winged. In the two lower photos on the back cover, of females in worn plumage, perhaps the most obvious difference remaining is the white tips of the median wing coverts of the Tricolored, on the right (photographed in Kern County on 1 May 2004). In the Red-winged, on the left, these edges are duller and narrower. But the difference is not entirely consistent; by late spring some Tricolored Blackbirds are so worn that even their broader edges on the median coverts are lost. And some Red-wingeds retain edges as broad and white as in the average Tricolored.

In most subspecies of the Red-winged the worn females can be distinguished from the worn Tricolored by some white streaks still remaining on the belly. But in subspecies *mailliardorum*, *californicus* (occurring in California's Central Valley), and *aciculatus* (restricted to South Fork Valley and Walker Basin, Kern County, California), the belly of the worn female is as uniformly black as in the Tricolored. Jaramillo and Burke (1999) concluded that in the range of these subspecies worn females cannot be distinguished except by wing formula. Another source of possible confusion is that in the juvenile plumage of the Tricolored the belly is completely streaked.

One difference evident in the photos is the thicker bill of the Red-winged versus the thinner bill of the Tricolored. The subspecies of the Red-winged, however, vary greatly in bill shape. In the western United States, the thinnest-billed subspecies is *aciculatus*, in which bill length divided by bill depth is about 2.1 (van Rossem 1926). The thickest-billed is *fortis*, occupying the Great Plains and Rocky Mountains, in which this figure is about 1.6 (Ridgway 1902). Photographed on 27 May 2004 at Butterbredt Spring on the desert slope of Kern County, the worn Red-winged shown on the back cover is not at a nesting site reported for any subspecies; on the basis of its largely black belly and fairly thick bill it is probably a wanderer of *californicus*, in which bill length divided by bill depth is about 1.8. In *aciculatus* the bill is as long and thin as in the Tricolored, in which bill length divided by bill depth is about 2.0 (Ridgway 1902). In *mailliardorum*, the subspecies of the Red-winged most similar to the Tricolored, this figure is about 1.9, so of marginal value in the field. Pyle (1997: table 11), measuring bill depth from the tip of the nares, a method different from van Rossem's (1926), gave the following ranges for bill length divided by bill depth: 1.94–2.51 in the female Red-winged (all subspecies pooled?), 2.41–3.00 in the female Tricolored.

The Red-winged and Tricolored Blackbirds differ in wing shape, the Tricolored having a more pointed wing than even the northern, migratory subspecies *arctolegus* of the Red-winged. In the Red-winged, primary 9 (the outermost) is shorter than primary 6, whereas in the Tricolored it is longer (Jaramillo and Burke 1999). In the folded wing this difference is visible in the gap between primary 6 and primaries 7 and 8, which make up the wing tip. In the Tricolored this gap is about 5 mm, whereas in the Red-winged it is less than 1 mm. But in the field, where all the primaries cannot be counted, distinguishing the gap between primaries 6 and 7 in the Tricolored from the gap between primaries 5 and 6 in the Red-winged is probably impossible. Complications are variable breakage of the primary tips when the birds are in worn plumage and the schedule of wing molt, which may extend at least from early July to the end of September (specimens in San Diego Natural History Museum).

In the field, some worn female blackbirds are better identified by behavior than by plumage. At the time of year when they are most similar, their profound differences in nesting biology identify them readily. The Red-winged follows a strategy more or less traditional for a songbird, with each male advertising a territory and defending it from other males—though each male may have a harem of several females nesting within its territory. The Tricolored Blackbird, on the other hand, follows the model of colonial seabirds. Males maintain no individual territories, and females may nest barely out of pecking distance of each other. Unfortunately, the Tricolor's intensely social habits put it at risk. Numbers throughout the species' range have declined seriously, especially in coastal southern California (Beedy and Hamilton 1999). Accurate identification of blackbirds is no longer an academic question for ornithologists and birders. It has become a skill vital to the conservation of a bird following an evolutionary path unique among North American passerines.

For more on the Red-winged and Tricolored Blackbirds from the perspective of coastal southern California, see http://www.sdnhm.org/research/birdatlas/focus/blkbirds.html, an article I wrote for the San Diego County bird atlas newsletter.

Thanks to Jack Daynes, Peter LaTourrette, and Bob Steele for contributing the photos. Jack Daynes made several field trips especially for this article, attempting to photograph both the Red-winged and Tricolored Blackbirds in fresh plumage. Peter LaTourrette worked with me patiently while we struggled to recruit photos as comparable as possible of each species. Thanks to Alvaro Jaramillo and Peter Pyle for their thoughtful reviews. And thanks to Peter LaTourrette and Joseph Morlan for suggesting this topic in the first place.

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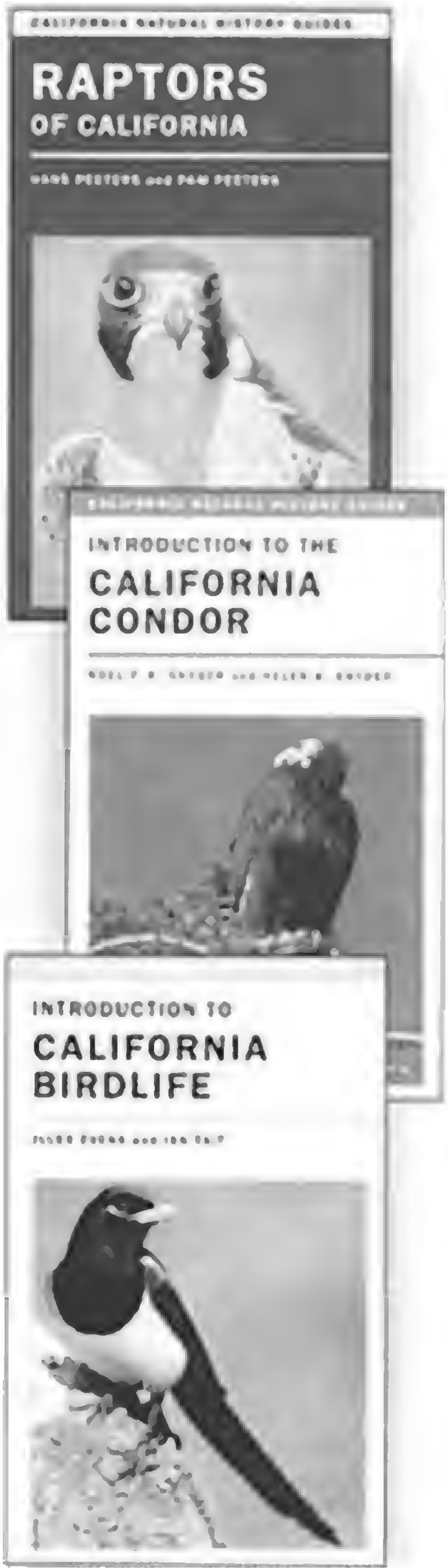
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Compiled by Philip Unitt

Pileated Woodpecker

Sketch by Narca Moore-Craig

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Philip Unitt

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WESTERN FIELD ORNITHOLOGISTS
30th ANNUAL MEETING

Students, beginners, practiced birders, experts, professionals, and amateurs.... There is something for everyone: Field ornithology, field trips, experts' identification panels, poster and paper sessions, evening programs, vendors of books, optics, and art, at one of the great birding spots on the central California coast.

Radisson Hotel, 3455 Skyway Drive, Santa Maria, California 93455

Make your reservations with the hotel as soon as possible. September/October is a popular time of year in the Santa Maria valley. The hotel has set aside a block of rooms at the guaranteed price of $89.00 per night for a double room. For reservations call 805-928-8000 or 866-292-4676 or 800-333-3333. Please refer to Western Field Ornithologists when making your reservation..

Waller County Park, a "trap" for migratory passerines, is directly across the street!

CALL FOR PAPERS

As always, WFO is interested in your research. Share it with our members! The guidelines for submission of abstracts for presentation at the meeting are on the WFO website, www.wfo-cbrc.org. Spoken presentations are scheduled for the afternoons of Friday, 30 September, and spoken presentations and poster sessions are scheduled for Saturday, 1 October 2005. All are welcome to submit their papers and posters. Abstracts will be published with the meeting program and then published on the WFO website. If you do not have access to the WFO website, please drop a note or call Catherine Waters (12079 Samoline Avenue, Downey, CA 90242, 562-869-6718) and she will mail you the submission guidelines. Questions? Contact Jay Withgott, **withgott@nasw.org, or Ted Floyd, tedfloyd@aba.org.**

For further details on the meeting, see www.wfo-cbrc.org
or contact Catherine Waters at 562-869-6718
or robcatwaters@earthlink.net.

We look forward to seeing you in Santa Maria!

WESTERN BIRDS

World Wide Web site:
www.wfo-cbrc.org

Quarterly Journal of Western Field Ornithologists

Membership dues, for individuals and institutions, including subscription to *Western Birds*: Patron, $1000.00; Life, $500 (payable in four equal annual installments); Supporting, $60 annually; Contributing, $40 annually; Family $35; Regular U.S. $30 for one year, $55 for two years, $80 for three years. Dues and contributions are tax-deductible to the extent allowed by law.

Send membership dues, changes of address, correspondence regarding missing issues, and orders for back issues and special publications to the Treasurer. Make checks payable to Western Field Ornithologists.

Back issues of *Western Birds* within U.S. $35 per volume, $9 for single issues, including shipping and handling. Outside the U.S. $45 per volume, $12 for single issues, including shipping and handling.

The California Bird Records Committee of Western Field Ornithologists revised its 10-column Field List of California Birds in February 2002. The last list covered 613 accepted species; the new list covers 619 species. Please send orders to WFO, c/o Robbie Fischer, Treasurer, 1359 Solano Drive, Pacifica, CA 94044. California addresses please add 8.25% sales tax.
Quantity: 1–9, $1.50 each, includes shipping and handling; 10–39, $1.30 each, add $2.00 for shipping and handling; 40 or more, $1.15 each, add $4.00 for shipping and handling.

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