Western Specialty:
Gray-crowned Rosy-Finch

Photo by © Thomas A. Blackman of San Diego, California:
Adult Gray-crowned Rosy-Finch at the type locality of subspecies Leucosticte tephrocotis umbrina,
This subspecies of the Gray-crowned Rosy-Finch is endemic to the Pribilof Islands, St. Matthew
Island, and Hall Island in the central Bering Sea. It is a large subspecies, ~52 grams, almost as
large as the subspecies of the Aleutian Islands (L. t. griseonucha) or an Evening Grosbeak
(Coccothraustes vespertinus). It differs from subspecies griseonucha in its blacker color, on both
the back and underparts.
Volume 44, Number 1, 2013

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Front cover photo by © Sophie Webb of Felton, California: Northern Gannet (Morus bassanus), Southeast Farallon Island, San Francisco County, California, 25 April 2012. It remained at least through February 2013 and is the first of this Atlantic species recorded in the North Pacific Ocean. Possibly the recent decrease of arctic ice allowed it to traverse the Arctic Ocean and enter the Pacific through the Bering Strait.

Back cover: “Featured Photo” by © Beth Hamel of Morgan Hill, California: Hairy Woodpecker (Picoides villosus), Golden Gate Park, San Francisco County, California, 26 October 2012. The yellow rectrices represent an unusual case of carotenism, affecting both the type and distribution of carotenoid pigment. Yet such carotenistic Hairy Woodpeckers have been noted repeatedly in coastal northern California.

Western Birds solicits papers that are both useful to and understandable by amateur field ornithologists and also contribute significantly to scientific literature. Send manuscripts to Daniel D. Gibson, P. O. Box 155, Ester, AK 99725; avesalaska@gmail.com. For matters of style consult the Suggestions to Contributors to Western Birds (at www.westernfieldornithologists.org/docs/journal_guidelines.doc).
A TWENTY-YEAR INVESTIGATION OF THE EFFECTS OF FIRE ON A COASTAL SAGE SCRUB BIRD COMMUNITY

DAVID J. MORIARTY, Biological Sciences Department, California State Polytechnic University, Pomona, California 91768; djmoriarty@csupomona.edu

ABSTRACT: From 1983 to 2003 I examined the effects of fire on the bird community of two 1.25-ha tracts of coastal sage scrub, Box Canyon and F Canyon, 0.4 km apart in a 31-ha reserve in Los Angeles County, California. Wildfire burned Box Canyon in 1981 and both sites in 1989. I observed 90 species in F Canyon, 80 in Box Canyon, of which 73 were seen in both. The same species were common throughout the 20-year period. F Canyon had more species per count than Box Canyon in both summer and winter. Immediately after the 1989 wildfire, observations of some species of open habitat increased, and observations of some species confined to shrubs decreased. Effects of the 1989 fire on the sites were of short duration. Differences between the sites in number of species attributed to the 1981 fire in earlier studies are confounded by differences between the sites.

Long-term studies provide insight into the organization and dynamics of avian communities (Holmes et al. 1986, Brawn and Robinson 1996, Herrera 1998). Understanding differences among sites in richness of bird species is important in fragmented habitats such as coastal sage scrub, which has been reduced by urbanization and whose biodiversity is the subject of concern (Westman 1981, McCaull 1994, Chase et al. 2000, Cox and Allen 2008). In a brief period, such as a single breeding season, differences in species richness between sites may represent random variation, be transitory, or may indicate a long-term difference (Chase et al. 2000). Long-term data address this ambiguity.

The effect of fire on birds of southern California’s coastal sage scrub has been examined with varying results and conclusions. Wirtz (1982) and Mendelsohn et al. (2008) reported increased species richness in chaparral and coastal sage scrub, respectively, but Moriarty et al. (1985) and Stanton (1986) reported richness in burned coastal sage scrub decreased from that at an unburned site. Mendelsohn et al. (2008) suggested discrepancies between their study and that of Stanton (1986) may have been due to differences.
between the sites they studied in San Diego and Los Angeles counties, respectively. Differences unrelated to fire may have confounded the results.

In this paper my objectives are (1) to describe species richness and community composition of birds at two sites in coastal sage scrub over 20 years, (2) to compare the two sites with respect to richness and composition and examine how these differences affect the conclusions of previous studies of the effect of fire at these sites (Moriarty et al. 1985, Stanton 1986), and (3) to describe the effect on richness and composition of a wildfire that burned both sites in the sixth year of the study.

METHODS

Study Sites

My study area was the 31-ha Voorhis Ecological Reserve in the San Jose Hills on the campus of California State Polytechnic University, Pomona, Los Angeles County, California (34° 03’N, 117° 49’W). I established two 1.25-ha sites at approximately 300 m elevation and 0.4 km apart, connected by contiguous vegetation. The first site (Box Canyon) was burned in a wildfire on 21 August 1981 (Moriarty et al. 1985). The second site (F Canyon) was not burned and was used as a control by Moriarty et al. (1985) and Stanton (1986). The sites are both south-facing canyons and appear similar in their topography and vegetation structure (Moriarty et al. 1985, Stanton 1986). A second wildfire of apparent accidental origin burned the entire reserve

Table 1  Ranges of Dates of Blocks of Counts and Number of Species Seen by Season at the Voorhis Ecological Reserve, Pomona, California, 1983–2003

<table>
<thead>
<tr>
<th>Dates</th>
<th>F Canyon</th>
<th></th>
<th>Box Canyon</th>
<th></th>
<th>Block total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Summer</td>
<td>Winter</td>
<td>Total</td>
<td>Summer</td>
<td>Winter</td>
</tr>
<tr>
<td>20 Jan 1983–</td>
<td>56</td>
<td>49</td>
<td>47</td>
<td>65</td>
<td>46</td>
</tr>
<tr>
<td>16 May 1984</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17 Oct 1986–</td>
<td>41</td>
<td>38</td>
<td>29</td>
<td>44</td>
<td>31</td>
</tr>
<tr>
<td>31 Dec 1988</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 Jul 1989–</td>
<td>39</td>
<td>46</td>
<td>37</td>
<td>57</td>
<td>38</td>
</tr>
<tr>
<td>11 Nov 1991b</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Dec 1992–</td>
<td>85</td>
<td>51</td>
<td>50</td>
<td>61</td>
<td>35</td>
</tr>
<tr>
<td>31 Aug 1996</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23 Jul 2000–</td>
<td>18</td>
<td>26</td>
<td>24</td>
<td>31</td>
<td>20</td>
</tr>
<tr>
<td>22 Jul 2001</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19 Oct 2002–</td>
<td>26</td>
<td>29</td>
<td>29</td>
<td>39</td>
<td>27</td>
</tr>
<tr>
<td>30 Dec 2003</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total (all blocks)</td>
<td>265</td>
<td>78</td>
<td>71</td>
<td>90</td>
<td>66</td>
</tr>
</tbody>
</table>

*aNumber of paired counts in each block.

bThe study area burned on 28 July 1989, two days before the start of the third count block.
Table 2  Numbers of Times Each Species Was Observed at the Voorhis Ecological Reserve, Pomona, California, 1983–2003, by Site and Season

<table>
<thead>
<tr>
<th>Species and residency status</th>
<th>F Canyon</th>
<th>Box Canyon</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Summer</td>
<td>Winter</td>
</tr>
<tr>
<td>1. Anna’s Hummingbird, Calypte anna, P</td>
<td>98</td>
<td>117</td>
</tr>
<tr>
<td>2. California Towhee, Melozone crissalis, P</td>
<td>121</td>
<td>100</td>
</tr>
<tr>
<td>3. Western Scrub-Jay, Aphelocoma californica, P</td>
<td>100</td>
<td>87</td>
</tr>
<tr>
<td>4. Northern Mockingbird, Mimus polyglottos, P</td>
<td>106</td>
<td>79</td>
</tr>
<tr>
<td>5. House Finch, Haemorhous mexicanus, P</td>
<td>104</td>
<td>75</td>
</tr>
<tr>
<td>6. Spotted Towhee, Pipilo maculatus, P</td>
<td>86</td>
<td>61</td>
</tr>
<tr>
<td>7. Wrentit, Chamaea fasciata, P</td>
<td>74</td>
<td>64</td>
</tr>
<tr>
<td>8. Mourning Dove, Zenaida macroura, P</td>
<td>89</td>
<td>39</td>
</tr>
<tr>
<td>9. California Quail, Callipepla californica, P</td>
<td>53</td>
<td>68</td>
</tr>
<tr>
<td>10. Cactus Wren, Campylorhynchus brunneicapillus, P</td>
<td>81</td>
<td>53</td>
</tr>
<tr>
<td>11. Bushtit, Psaltriparus minimus, P</td>
<td>31</td>
<td>38</td>
</tr>
<tr>
<td>12. California Thrasher, Toxostoma redivivum, P</td>
<td>58</td>
<td>44</td>
</tr>
<tr>
<td>13. Lesser Goldfinch, Spinus psaltria, P</td>
<td>31</td>
<td>31</td>
</tr>
<tr>
<td>14. Bewick’s Wren, Thryomanes bewickii, P</td>
<td>40</td>
<td>38</td>
</tr>
<tr>
<td>15. Northern Flicker, Colaptes auratus, P</td>
<td>10</td>
<td>36</td>
</tr>
<tr>
<td>16. Red-tailed Hawk, Buteo jamaicensis, P</td>
<td>20</td>
<td>43</td>
</tr>
<tr>
<td>17. Rufous-crowned Sparrow, Aimophila ruficeps, P</td>
<td>29</td>
<td>37</td>
</tr>
<tr>
<td>18. Yellow-rumped Warbler, Setophaga coronata, W</td>
<td>3</td>
<td>27</td>
</tr>
<tr>
<td>19. Phainopepla, Phainopepla nitens, S</td>
<td>58</td>
<td>1</td>
</tr>
<tr>
<td>20. White-crowned Sparrow, Zonotrichia leucophrys, W</td>
<td>7</td>
<td>45</td>
</tr>
<tr>
<td>21. Nuttall’s Woodpecker, Picoides nuttalli, P</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>22. Black Phoebe, Sayornis nigricans, P</td>
<td>15</td>
<td>14</td>
</tr>
<tr>
<td>23. Song Sparrow, Melospiza melodia, P</td>
<td>16</td>
<td>14</td>
</tr>
<tr>
<td>24. House Wren, Troglodytes aedon, P</td>
<td>18</td>
<td>11</td>
</tr>
<tr>
<td>25. Ash-throated Flycatcher, Myiarchus cinerascens, S</td>
<td>24</td>
<td>1</td>
</tr>
<tr>
<td>26. Ruby-crowned Kinglet, Regulus calendula, W</td>
<td>3</td>
<td>29</td>
</tr>
<tr>
<td>27. Black-headed Grosbeak, Pheucticus melanicephalus, S</td>
<td>15</td>
<td>1</td>
</tr>
<tr>
<td>28. American Kestrel, Falco sparverius, P</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>29. American Robin, Turdus migratorius, W</td>
<td>2</td>
<td>17</td>
</tr>
<tr>
<td>30. Brown-headed Cowbird, Molothrus ater, S</td>
<td>16</td>
<td>1</td>
</tr>
<tr>
<td>31. Cooper’s Hawk, Accipiter cooperii, P</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>32. Blue-gray Gnatcatcher, Polioptila caerulea, W</td>
<td>4</td>
<td>15</td>
</tr>
<tr>
<td>33. Western Kingbird, Tyrannus verticalis, S</td>
<td>8</td>
<td>1</td>
</tr>
</tbody>
</table>

(continued)
Table 2 (continued)

<table>
<thead>
<tr>
<th>Species and residency status</th>
<th>F Canyon Summer</th>
<th>Winter</th>
<th>Box Canyon Summer</th>
<th>Winter</th>
</tr>
</thead>
<tbody>
<tr>
<td>34. California Gnatcatcher, <em>Polioptila californica</em></td>
<td>11</td>
<td>5</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>35. Common Raven, <em>Corvus corax</em></td>
<td>4</td>
<td>7</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>36. Cedar Waxwing, <em>Bombycilla cedrorum</em></td>
<td>1</td>
<td>13</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>37. Black-chinned Hummingbird, <em>Archilochus alexandri</em></td>
<td>10</td>
<td>1</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>38. Wilson’s Warbler, <em>Cardellina pusilla</em></td>
<td>7</td>
<td>2</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>39. Cliff Swallow, <em>Petrochelidon pyrrhonota</em></td>
<td>8</td>
<td>0</td>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>40. Bullock’s Oriole, <em>Icterus bullockii</em></td>
<td>10</td>
<td>0</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>41. American Goldfinch, <em>Spinus tristis</em></td>
<td>3</td>
<td>7</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>42. Loggerhead Shrike, <em>Lanius ludovicianus</em></td>
<td>6</td>
<td>5</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>43. Hermit Thrush, <em>Catharus guttatus</em></td>
<td>5</td>
<td>8</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>44. Western Bluebird, <em>Sialia mexicana</em></td>
<td>0</td>
<td>8</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>45. Say’s Phoebe, <em>Sayornis saya</em></td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>46. Sharp-shinned Hawk, <em>Accipiter striatus</em></td>
<td>0</td>
<td>8</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>47. Western Meadowlark, <em>Sturnella neglecta</em></td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>48. Pacific-slope Flycatcher, <em>Empidonax difficilis</em></td>
<td>8</td>
<td>1</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>49. Dark-eyed Junco, <em>Junco hyemalis</em></td>
<td>1</td>
<td>4</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>50. Acorn Woodpecker, <em>Melanerpes formicivorus</em></td>
<td>3</td>
<td>6</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>51. Lazuli Bunting, <em>Passerina amoena</em></td>
<td>5</td>
<td>0</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>52. American Crow, <em>Corvus brachyrhynchos</em></td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>53. Northern Harrier, <em>Circus cyaneus</em></td>
<td>0</td>
<td>7</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>54. Hooded Oriole, <em>Icterus cucullatus</em></td>
<td>6</td>
<td>0</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>55. Turkey Vulture, <em>Cathartes aura</em></td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>56. Golden-crowned Sparrow, <em>Zonotrichia atricapilla</em></td>
<td>1</td>
<td>5</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>57. Cassin’s Kingbird, <em>Tyrannus vociferans</em></td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>58. White-tailed Kite, <em>Elanus leucurus</em></td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>59. Western Tanager, <em>Piranga ludoviciana</em></td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>60. Rock Wren, <em>Salpinctes obsoletus</em></td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>61. Greater Roadrunner, <em>Geococcyx californianus</em></td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>62. Fox Sparrow, <em>Passerella iliaca</em></td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>1</td>
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<tr>
<td>63. Western Wood-Pewee, <em>Contopus sordidulus</em></td>
<td>2</td>
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<td>0</td>
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<tr>
<td>64. Chipping Sparrow, <em>Spizella passerina</em></td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>65. Costa’s Hummingbird, <em>Calypte costae</em></td>
<td>0</td>
<td>0</td>
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<td>0</td>
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<tr>
<td>66. Yellow Warbler, <em>Setophaga petechia</em></td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>67. Violet-green Swallow, <em>Tachycineta thalassina</em></td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>68. Orange-crowned Warbler, <em>Oreothlypis celata</em></td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>69. Townsend’s Warbler, <em>Setophaga townsendi</em></td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
THE EFFECTS OF FIRE ON A COASTAL SAGE SCRUB BIRD COMMUNITY

Table 2 (continued)

<table>
<thead>
<tr>
<th>Species(^a) and residency status(^b)</th>
<th>F Canyon Summer</th>
<th>F Canyon Winter</th>
<th>Box Canyon Summer</th>
<th>Box Canyon Winter</th>
</tr>
</thead>
<tbody>
<tr>
<td>70. Allen’s Hummingbird, <em>Selasphorus sasin</em>, XS</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>71. Swainson’s Thrush, <em>Catharus ustulatus</em>, XM</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>72. Band-tailed Pigeon, <em>Patagioenas fasciata</em>, XP</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>73. Vaux’s Swift, <em>Chaetura vauxi</em>, XM</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>74. Purple Finch, <em>Haemorhous purpureus</em>, XP</td>
<td>0</td>
<td>0</td>
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<td>3</td>
</tr>
<tr>
<td>75. Lark Sparrow, <em>Chondestes grammacus</em>, XP</td>
<td>1</td>
<td>1</td>
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<td>0</td>
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<tr>
<td>76. Lawrence’s Goldfinch, <em>Spinus lawrencei</em>, XP</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>77. Prairie Falcon, <em>Falco mexicanus</em>, XP</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>78. Great Horned Owl, <em>Bubo virginianus</em>, XP</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>79. Spotted Dove, <em>Streptopelia chinenis</em>, XP</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>80. European Starling, <em>Sturnus vulgaris</em>, XM</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>81. House Sparrow, <em>Passer domesticus</em>, XP</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>82. Gray Flycatcher, <em>Empidonax wrightii</em>, XS</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>83. Red-winged Blackbird, <em>Agelaius phoeniceus</em>, XP</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>84. White-throated Swift, <em>Aeronautes saxatalis</em>, XM</td>
<td>0</td>
<td>0</td>
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<td>1</td>
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<tr>
<td>85. Golden Eagle, <em>Aquila chrysaetos</em>, XM</td>
<td>1</td>
<td>0</td>
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<tr>
<td>86. Lincoln’s Sparrow, <em>Melospiza lincolni</em>, XM</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>87. Oak Titmouse, <em>Baeolophus inornatus</em>, XM</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>88. Warbling Vireo, <em>Vireo gilvus</em>, XM</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>89. Savannah Sparrow, <em>Passerculus sandwichensis</em>, XM</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>90. Mountain Chickadee, <em>Poecile gambeli</em>, XM</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>91. Cassin’s Vireo, <em>Vireo cassinii</em>, XS</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>92. Northern Rough-winged Swallow, <em>Stelgidopteryx serripennis</em>, XS</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>93. Sage Sparrow, <em>Artemisiospiza belli</em>, XM</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>94. Rufous Hummingbird, <em>Selasphorus rufus</em>, XM</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>95. Plumbeous Vireo, <em>Vireo plumbeus</em>, XS</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>96. MacGillivray’s Warbler, <em>Geothlypis tolmiei</em>, XM</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>97. Common Poorwill, <em>Phalaenoptilus nuttallii</em>, XM</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

\(^a\)Listed from most to least frequently seen; those in \textbf{bold} are the 35 most common species used in some statistical analyses. Numbers in \textbf{bold} represent species seen significantly more often in F Canyon than in Box Canyon within a season; numbers underlined are species seen significantly more often within season in Box Canyon (\chi^2 goodness of fit to 1:1 ratio with exact probabilities, all \(P < 0.05\)).

\(^b\)Residency status determined from data: P, permanent resident; S, summer (April–September) resident; W, winter (October–March) resident; M, migrant; X, categorized not from the infrequent observations but from range maps (Sibley 2000) and personal observation.
The effects of fire on a coastal sage scrub bird community

including both sites on 28 July 1989. The fire was restricted mainly to the reserve. Adjacent undeveloped coastal sage scrub in the San Jose Hills, as well as developed areas, did not burn.

The region encompassing the Voorhis Ecological Reserve has cool, wet winters, dry, hot summers, and is prone to fire (Westman 1981, Minnich 1983). The dominant native shrubs at both sites were the California Sagebrush (Artemisia californica), California Buckwheat (Eriogonum fasciculatum), and Black Sage (Salvia mellifera). Large shrubs and trees were present, including Coast Live Oak (Quercus agrifolia), Western Sycamore (Platanus racemosa), Laurel Sumac (Malosma laurina), California Walnut (Juglans californica), Elderberry (Sambucus mexicana), and Toyon (Heteromeles arbutifolia). Prevalent exotic herbs were Mediterranean Mustard (Hirschfeldia incana), Black Mustard (Brassica nigra), Tocalote (Centaurea melitensis), Red Brome (Bromus rubens), Ripgut Grass (Bromus diandrus), and Horehound (Marrubium vulgare) (Moriarty et al. 1985, Stanton 1986, Clark 1990).

Bird Counts

Bird counts commenced on 20 January 1983, but I define 21 August 1981, the date of the first fire, as “day zero.” The 265 pairs of counts, of one count each in Box Canyon and F Canyon, were distributed in six blocks or periods of 1 to 3 years from 1983 to 2003 (Table 1). Within each block, paired counts were conducted approximately twice per week. Within a pair, each site was visited sequentially on one day, then the order of sites was switched on the next count day. Counts began shortly after sunrise, and entailed the observer standing quietly at a defined peripheral location that allowed an unobstructed view of the entire site. Birds flying over the sites were not recorded. Individual birds were not marked and density was not estimated, so analysis is restricted to presence/absence and numbers of species.

I define counts from April through September as summer (n = 135), those from October through March as winter (n = 130). These broad seasonal categories did not provide resolution to distinguish categories such as migrants or juveniles but did allow each commonly observed species to be categorized as a summer resident (observed in at least four of the six summer months, n = 12, Table 2) winter resident (observed in at least four of the six winter months; n = 16), or permanent resident (observed in at least four months of both seasons; n = 27). I categorized species not meeting any of these criteria (n = 42) (Table 2) on the basis of range maps (Sibley 2000) and personal observation. There were few observations of these 42 species on the 265 field days. Six were seen on 6 to 13 days, the remaining 36 on 5 or fewer days.

Statistical Analysis

Counts of the first block (1983–84, Table 1) were 50 min in duration; all later counts were 30 min in duration. For analyses involving the mean number of species per count, I adjusted the value for each count in the first block as an estimate of the number of species expected if the count had been for 30 min. As a basis for this adjustment, I made an additional 45 paired counts of 50 min duration between 7 November 2002 and 1 May 2003, recording the time a species was first seen. I used data from these 45 paired counts only for
the adjustment, not in any other analyses. In F Canyon, the mean number of species seen was $12.4 \pm 0.4$ (± SE) in 50 min, $1.8 \pm 0.2$ after the first 30 min. In Box Canyon, the mean number of species seen was $8.9 \pm 0.4$ in 50 min, $1.4 \pm 0.2$ after the first 30 min. I adjusted counts for F Canyon and Box Canyon separately because the number of species seen on these 45 paired counts in 50 min was higher in F Canyon (paired-sample $t = 7.77$, df = 44, $P < 0.001$). The number of species seen after 30 min was positively correlated with the total number of species seen in the 50 min count (Box Canyon, $r = 0.44$, df = 43, $P = 0.001$; F Canyon, $r = 0.26$, df = 43, $P = 0.04$). Therefore, I figured the adjustment for each count in the 1983–84 block by using ordinary least-squares linear regression to predict the number of species that would be seen after 30 min and subtracting that number from the total number seen in the count. For F Canyon, the adjustment function was adjusted number = total species seen – (–0.01 + 0.15 total species seen); for Box Canyon it was adjusted number = total species seen – (–0.41 + 0.20 total species seen). The phrase “adjusted number of species” indicates an analysis using the adjustment of the 1983–84 data. Data from the other five blocks were not adjusted because those counts were 30 min in duration.

I analyzed differences in adjusted number of species among count blocks and sites with split-plot ANOVA. Each count (whole unit) was split into the two sites (F Canyon and Box Canyon) as subunits. I tested the whole-unit effect of count block by using unexplained variation among counts as an error term, the subunit effects of site and site-by-count-block interaction by using unexplained variation within counts as an error term. I used Tukey’s honestly significant difference (HSD) test for multiple comparisons among count blocks and tested for a difference between the sites within each count block by separate paired-sample $t$ tests. Because analyses within a count are paired by date, I used the actual number of species per count rather than the adjusted number. I analyzed winter and summer data separately.

Because the data were not normally distributed, I assessed correlation in the number of species observed between count blocks within canyons and seasons by the nonparametric Spearman rank correlation. The concomitant loss of power was minimal because 95% of the Spearman values were significant at $P < 0.05$. I used the Fisher exact test to evaluate differences within canyons by season in the proportional use of sites in the count block before the 1989 fire (1986–88) and the count block after the fire (1989–91). Means are reported ± one standard error. For statistical analyses I used SAS software version 9.2 (SAS Institute, Inc., Cary, NC).

RESULTS

Bird Species Richness and Community Composition

Over the 20-year study I made 3753 observations representing 97 species and 12,619 individuals (Table 2). During the 16 months of the first count block (Table 1), 79 species were seen. The remaining 18 species were accumulated over the next 19 years. Ninety species were seen in F Canyon, 80 in Box Canyon. Seventy-three species (75%) were seen in both canyons. No commonly seen species was restricted to a single canyon. Of the 24 species seen in only one canyon, 12 of these were seen once, seven were
seen twice, three were seen three times, and two were seen five times. The California Gnatcatcher, listed as threatened by the U.S. Fish and Wildlife Service, was seen 19 times beginning in 1994.

A small number of species dominate the counts. The six most common species (Anna’s Hummingbird, California Towhee, Western Scrub-Jay, Northern Mockingbird, House Finch, Spotted Towhee) account for 36% of the 3753 observations. Addition of the next five species (Wrentit, Mourning Dove, California Quail, Cactus Wren, Bushtit) encompasses 50% of the observations. The 35 most commonly seen species (Table 2, in bold) account for 90% of the observations. Fifty-one species were seen on fewer than 5% of the 265 count days.

Numbers of species recorded in the six blocks of counts were significantly different in summer ($F_{5, 129} = 18.3, P < 0.0001$) and in winter ($F_{5, 124} = 21.8, P < 0.0001$). The first count block (1983–84) and the last count block (2002–03) were more similar to each other and had more adjusted species per count than the four count blocks in between (Figure 1). However, results of the Tukey HSD multiple-comparisons tests (Figure 1) indicate some overlap. For example, the 1992–96 block is always grouped with either the first or the last block in both canyons and in both seasons. Therefore, although the count blocks were a significant source of variation in the number of adjusted species observed, there was no block that was unique.

Figure 1. Mean adjusted species per count in F Canyon and Box Canyon, Voorhis Ecological Reserve, Pomona, California, in summer (top panel) and winter (lower panel) through six blocks of counts (Table 1), 1983–2003. Vertical bars at the means represent one standard error. Lower-case letters indicate groupings by the Tukey HSD test within a season, not between seasons. Results of paired-sample $t$ tests of the difference between F Canyon and Box Canyon for each count block in each season: NS, not significant ($P > 0.05$); *, $P < 0.05$; **, $P < 0.001$. The vertical line indicates the date of the fire (28 July 1989) that burned both sites and the surrounding reserve.
Site Differences

During the summer (Figure 1), the adjusted mean number of species per count was significantly higher at F Canyon (10.7 ± 0.25) than at Box Canyon (8.3 ± 0.23; \( F_{1,129} = 64.6, P < 0.0001 \)). There was no significant interaction between the site and count blocks \( (F_{5,129} = 1.9, P = 0.1) \). When count blocks are examined individually (Figure 1), the canyons were significantly different in all except the 1989–91 and the 2000–01 block. During the winter (Figure 1), the adjusted mean number of species per count was also significantly higher at F Canyon (9.9 ± 0.27) than at Box Canyon (6.7 ± 0.24; \( F_{1,124} = 120.9, P < 0.0001 \)). At this season, there was a significant \( (F_{5,124} = 16.8, P < 0.0001) \) interaction between site and count block but no significant difference in the 1989–91 and 2002–03 blocks (Figure 1). More species were seen in F Canyon than in Box Canyon on 214 (81%) of the 265 paired counts. The same number of species was seen on 21 counts (8%), and more species were seen in Box Canyon on the remaining 30 counts (11%). The ratio of 214:30 is significantly different from the 1:1 expected if the higher number of species seen was distributed randomly (sign test, \( P < 0.001 \)). In comparisons within seasons, F Canyon had more species observed than Box Canyon in all count blocks except in winter of the 2002–03 block (Table 1).

Of the 35 most common species, 16 were seen significantly more often in F Canyon than in Box Canyon (Table 2). Five of these (Spotted Towhee, Wrentit, Mourning Dove, Cactus Wren, California Thrasher) preferred F Canyon in both summer and winter. Nine species (Northern Mockingbird, California Quail, Bewick’s Wren, Red-tailed Hawk, Rufous-crowned Sparrow, White-crowned Sparrow, Nuttall’s Woodpecker, Ruby-crowned Kinglet, Blue-gray Gnatcatcher) preferred F Canyon only in the winter. The House Finch and Phainopepla preferred F Canyon only in the summer. Three species were seen significantly more often in Box Canyon (Table 2). The Bushtit preferred Box Canyon in the summer, whereas the Northern Flicker and Yellow-rumped Warbler preferred Box Canyon only in the winter. The remaining 16 species had no preference in either season (Table 2).

Within canyons and seasons, there was significant positive correlation between count blocks in the ranks of the 35 most common species in 57 of the 60 comparisons (Table 3). In other words, the species observed most often in one block were the species observed most often in the other blocks. The three exceptions to this all involved the count block immediately after the 1989 fire (1989–91) in F Canyon in the winter (Table 3). In summary, the general results of these correlations are that the same species occurred at similar relative frequencies over the entire 20-year study. The species in Table 2 are listed by decreasing number of total observations, and this order is generally representative of both sites, both seasons, and the count blocks.

Effects of the 1989 Wildfire

The mean adjusted number of species per count immediately after the fire (1989–91) at both sites and in both seasons was similar to that both before the fire and much later after the fire (Figure 1). The 1989–91 block was the only block in which there was no significant difference between F Canyon
and Box Canyon in the number of adjusted species per count in both summer and winter, although there was no significant difference in the summer of 2001–01 and the winter of 2002–03 as well (Figure 1). Examination of both seasons in Figure 1 suggests a tendency for a decrease in adjusted species per count in F Canyon and an increase in Box Canyon immediately after the fire, but statistical support for the trend is weak.

In addition to the only three nonsignificant rank correlations involving the count block immediately after the fire, correlations involving the 1989–91 count block are significantly weaker than correlations involving other count blocks (Wilcoxon rank-sum test, exact $P < 0.05$, $n = 35$). This indicates that of all the count blocks, the post-fire block was the most different. In F Canyon in the summer, the Wrentit and Cactus Wren (Table 4) were seen significantly more often before the fire (1986–88) than after the fire (1989–91), while the American Kestrel was seen significantly more often after the fire. In F Canyon in the winter, the Western Scrub-Jay, Spotted Towhee, Wrentit, California Quail, and Cactus Wren were seen significantly more often before the fire, while the House Finch and Lesser Goldfinch were seen significantly more often after the fire (Table 4). In Box Canyon in the summer, the only significant difference was the Rufous-crowned Sparrow, which was seen more often after the fire. In Box Canyon in the winter the Yellow-rumped Warbler and White-crowned Sparrow (both winter residents) were seen significantly more often after the fire (Table 4). Six species were only seen in the 1989–91 count block: the Rock Wren, White-throated Swift, Lark Sparrow, Golden Eagle, Cassin’s Vireo, and Prairie Falcon.

### Table 3  Spearman Rank Correlations of the 35 Most Common Species

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>F Canyon</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1983–84</td>
<td>0.77</td>
<td>0.26*</td>
<td>0.74</td>
<td>0.81</td>
<td>0.72</td>
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<tr>
<td>1986–88</td>
<td>0.90</td>
<td>0.23*</td>
<td>0.65</td>
<td>0.83</td>
<td>0.79</td>
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<tr>
<td>1989–91</td>
<td>0.45</td>
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<td>0.13*</td>
<td>0.36</td>
<td></td>
</tr>
<tr>
<td>1992–96</td>
<td>0.83</td>
<td>0.79</td>
<td>0.56</td>
<td>0.78</td>
<td>0.83</td>
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</tr>
<tr>
<td>2000–01</td>
<td>0.73</td>
<td>0.77</td>
<td>0.45</td>
<td>0.72</td>
<td>0.79</td>
<td></td>
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<tr>
<td>2002–03</td>
<td>0.76</td>
<td>0.77</td>
<td>0.37</td>
<td>0.77</td>
<td>0.80</td>
<td></td>
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<tr>
<td><strong>Box Canyon</strong></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>1983–84</td>
<td>0.46</td>
<td>0.62</td>
<td>0.53</td>
<td>0.35</td>
<td>0.40</td>
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</tr>
<tr>
<td>1986–88</td>
<td>0.61</td>
<td>0.67</td>
<td>0.59</td>
<td>0.61</td>
<td>0.58</td>
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</tr>
<tr>
<td>1989–91</td>
<td>0.78</td>
<td>0.65</td>
<td>0.36</td>
<td>0.47</td>
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<tr>
<td>1992–96</td>
<td>0.67</td>
<td>0.73</td>
<td>0.74</td>
<td>0.74</td>
<td>0.71</td>
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<tr>
<td>2000–01</td>
<td>0.46</td>
<td>0.64</td>
<td>0.60</td>
<td>0.67</td>
<td>0.79</td>
<td></td>
</tr>
<tr>
<td>2002–03</td>
<td>0.52</td>
<td>0.58</td>
<td>0.64</td>
<td>0.69</td>
<td>0.87</td>
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</tbody>
</table>

*See Table 2.

*In the matrix for each canyon, the lower left triangle contains summer correlations, the upper right triangle winter correlations. All correlations except the three marked with an asterisk (*) are significant ($P < 0.05$, $n = 35$).
## Table 4

Percentages of Counts in Which the 35 Most Common Species at the Voorhis Ecological Reserve Were Observed before (1986–88) and after (1989–91) the 1989 Fire by Site and Season

<table>
<thead>
<tr>
<th>Species</th>
<th>Summer</th>
<th>Winter</th>
<th>Summer</th>
<th>Winter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n = 23)</td>
<td>(n = 18)</td>
<td>(n = 19)</td>
<td>(n = 20)</td>
</tr>
<tr>
<td>Anna’s Hummingbird</td>
<td>65</td>
<td>68</td>
<td>94</td>
<td>80</td>
</tr>
<tr>
<td>California Towhee</td>
<td>83</td>
<td>89</td>
<td>78</td>
<td>30</td>
</tr>
<tr>
<td>Western Scrub-Jay</td>
<td>91</td>
<td>42</td>
<td>89*</td>
<td>20*</td>
</tr>
<tr>
<td>N. Mockingbird</td>
<td>43</td>
<td>63</td>
<td>39</td>
<td>10</td>
</tr>
<tr>
<td>House Finch</td>
<td>61</td>
<td>74</td>
<td>17*</td>
<td>75*</td>
</tr>
<tr>
<td>Spotted Towhee</td>
<td>61</td>
<td>32</td>
<td>50*</td>
<td>5*</td>
</tr>
<tr>
<td>Wrentit</td>
<td>96*</td>
<td>5*</td>
<td>72*</td>
<td>0*</td>
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<tr>
<td>California Quail</td>
<td>39</td>
<td>5</td>
<td>33*</td>
<td>0*</td>
</tr>
<tr>
<td>Mourning Dove</td>
<td>35</td>
<td>74</td>
<td>6</td>
<td>20</td>
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<tr>
<td>Bushtit</td>
<td>9</td>
<td>11</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>California Thrasher</td>
<td>35</td>
<td>16</td>
<td>22</td>
<td>0</td>
</tr>
<tr>
<td>Cactus Wren</td>
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<td>0*</td>
<td>39*</td>
<td>0*</td>
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<td>Lesser Goldfinch</td>
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<td>0*</td>
<td>60*</td>
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<td>Bewick’s Wren</td>
<td>22</td>
<td>16</td>
<td>39</td>
<td>20</td>
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<tr>
<td>Northern Flicker</td>
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<td>11</td>
<td>22</td>
<td>20</td>
</tr>
<tr>
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<td>5*</td>
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<td>Red-tailed Hawk</td>
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<td>35</td>
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<td>Yellow-rumped Warbler</td>
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<td>11</td>
<td>22</td>
<td>45</td>
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<td>Phainopepla</td>
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<tr>
<td>White-crn. Sparrow</td>
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<td>11</td>
<td>22</td>
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<tr>
<td>Nuttall’s Woodpecker</td>
<td>13</td>
<td>32</td>
<td>11</td>
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<td>House Wren</td>
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<td>Black Phoebe</td>
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<td>10</td>
</tr>
<tr>
<td>Brown-headed Cowbird</td>
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<td>16</td>
<td>0</td>
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</tr>
<tr>
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<td>32*</td>
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<td>15</td>
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<tr>
<td>Cooper’s Hawk</td>
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<td>5</td>
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<tr>
<td>Western Kingbird</td>
<td>0</td>
<td>16</td>
<td>0</td>
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</table>

* Asterisks (*) indicate a significant difference between 1986–88 and 1989–91 within the site and season (Fisher exact test, \( P < 0.05 \)).
DISCUSSION

Bird Species Richness and Community Composition

The Voorhis Ecological Reserve contains some species typical of urban habitats and others dependent on the reserve’s shrub habitat, but its avifauna is dominated by several common species that are generally found in urban habitats. While they use fragments of sage scrub, they are not shrub-obligate species (Soulé et al. 1988, Crooks et al. 2004). The six most common (Table 2) species (Anna’s Hummingbird, California Towhee, Western Scrub-Jay, Northern Mockingbird, House Finch, Spotted Towhee) fit this description. But some of the other common species, such as the Wrentit, California Quail, Cactus Wren, and California Thrasher, tend to be scrub specialists (Soulé et al. 1988, Bolger et al. 1991, Crooks et al. 2001).

Site Differences

One interesting result of this study was the consistent difference in the number of adjusted species per count between the sites, F Canyon averaging two to three more species than Box Canyon. The amount of difference fluctuated over the count blocks and by season, but F Canyon had a higher adjusted mean number of species per count in all blocks, and the fact that F Canyon had more species in 81% of the counts is notable.

I selected the sites after the 1981 fire because of their similar vegetation, physical similarity, close proximity, connection with continuous coastal sage scrub within the reserve, and because Box Canyon burned in the 1981 fire while F Canyon did not (Moriarty et al. 1985, Stanton 1986). Moriarty et al. (1985) and Stanton (1986) compared these two sites to assess the effect of the 1981 fire on avian species richness in coastal sage scrub. Both studies found significantly fewer species seen in Box Canyon than F Canyon and concluded that fire reduced avian species richness.

The conclusions of Moriarty et al. (1985) and Stanton (1986) are substantially mitigated by the long-term results I report here. The consistently higher number of bird species seen in F Canyon suggests that the sites are not equivalent and that F Canyon was not a “control” for the burned Box Canyon. The difference in the number of species per count attributed to fire effects was four by Moriarty et al. (1985), and 5.9 by Stanton (1986), but these differences may have been due, at least in part, to inherent differences between the sites. The long-term results (a difference of about three species) do not completely contradict the earlier (Moriarty et al. 1985, Stanton 1986) conclusions, but they certainly confound the conclusions to the point where an inference on the effect of fire on avian species richness in coastal sage scrub cannot be drawn from those studies. Furthermore, comparison of the count blocks immediately before and after the 1989 fire suggested the response to fire was different at the two sites and may also have varied by season.

This finding demonstrates the difficulty of selecting appropriate comparison sites for study of the effect of uncontrolled fires (Diamond 1986). I attempted to match a burned and unburned area with respect to size, aspect, topography, proximity, and vegetation in order to control for any effect except the fire. Yet the long-term data strongly suggest the sites differ. If multiple burned and
unburned canyons were available after the 1981 fire, such replication may have detected the effect of site, although such replication would have been approximate and may not have demonstrated the effect (Hargrove and Pickering 1992, Underwood 2009). Adequate replication of sites in field situations requires prior knowledge of perturbations and detailed analysis (Silva-Lugo and Tanner 2010), and these conditions could not be met at my study sites.

Given the two canyon’s similarity and proximity, what causes the effect? The data do not provide an answer to that question, but possibilities may be suggested. Perhaps the vegetation structure and/or composition differ in some way important to the birds that is not obvious to human observers. Perhaps predators such as Cooper’s Hawk spend more time in the Box Canyon area than F Canyon, resulting in smaller birds spending more time in F Canyon. The composition of the avian community at the two sites is similar. That is, the same species were observed in the two canyons at the same approximate relative frequency but more often in F Canyon than in Box Canyon. This suggests that the factors in which the sites differ may be subtle. It is possible that it was easier to detect species in F Canyon than in Box Canyon. There was nothing in the field experience that suggested such a bias, but it cannot be conclusively ruled out.

The increase in the number of species seen at both sites and in both seasons in 2002–03 (Fig. 1) is consistent with these possibilities. However, such an interpretation is predicated on the 2002–03 data representing a biological effect and not random variation, and distinguishing between these possibilities would require more long-term data. As seen above, conclusions based on short-term (1–2 years) data without adequate control are subject to error.

Effects of Wildfire

Having discussed the importance of site effects and lack of replication in comparisons before and after the fires, I stress that this discussion of the effect of the 1989 fire is descriptive, anecdotal rather than inferential. In contrast to the conclusions of Moriarty et al. (1985) and Stanton (1986) after the 1981 fire, the number of species did not decline after the 1989 fire. There was an increase in species after the fire in Box Canyon, paralleling the findings of Mendelsohn et al. (2008) after San Diego County’s Cedar Fire of 2003, but only during the winter.

The fire did appear to have some effect on the composition of the species. Not surprisingly, species associated with dense vegetation (e.g., Wrentit, California Quail, Spotted Towhee) were seen less often after the fire (Knick and Rotenberry 1995, Mendelsohn et al. 2008). The Cactus Wren was seen less often after the fire, presumably because of the destruction of the Opuntia cactus with which the bird associates. Some species were seen more often after the fire, apparently taking advantage of the more open habitat. These included ground-feeding species such as the House Finch, Lesser Goldfinch, Rufous-crowned Sparrow, Yellow-rumped Warbler, and White-crowned Sparrow. The American Kestrel was also more frequently seen after the fire, perhaps because prey was easier to detect. A few species such as the Golden Eagle, Prairie Falcon, and Lark Sparrow, perhaps responding to open habitat, were seen only within the first two years following the fire. Some of the most common species (e.g., Anna’s...
Hummingbird, California Towhee, Northern Mockingbird, Mourning Dove) did not show any significant change in their use of the sites after the fire. These four species are common in both shrub and urban habitat (Soulé et al. 1988, Crooks et al. 2004), and this flexibility may extend to using burned and unburned areas.

These apparent effects of the fire did not last long. By the start of the fourth count block, approximately three years post-fire, most of the effects described above were no longer apparent. The 1989 fire did not cause any long-lasting change to the bird community. The effects of fire on bird communities vary greatly, with the severity of the fire being critical to species’ responses (Smucker et al. 2005). In addition to severity, I suggest that the proximity of habitat suitable for common species also contributes to a fire’s effect on the community. In this study, adjacent undeveloped areas of coastal sage scrub habitat in the San Jose Hills did not burn. Many of the common species are also found in nearby urban areas (Mills et al. 1989, Crooks et al. 2004). Therefore, there were numerous potential refugia as well as sources of birds to repopulate the reserve. The appearance of the California Gnatcatcher in 1994 (five years post-fire) suggests recovery of the scrub (Atwood and Bontrager 2001). Results of this study largely parallel those of Mendelsohn et al. (2008) in low-elevation coastal sage scrub. But because of birds’ inconsistent response to fire (Smucker et al. 2005) and lack of replication in my study, it would not be appropriate to consider the effects I discuss here as general features of the response of coastal sage scrub birds to fire. Such replication may not be feasible, given the patchy distribution, dynamics, and disturbance of coastal sage scrub (Crooks et al. 2001, Cox and Allen 2008).

Long-term studies contribute to our understanding of avian community dynamics (Holmes et al. 1986), and suggest questions for future work. Studies of the breeding birds of the Voorhis Ecological Reserve could emphasize demographics (Brawn and Robinson 1996), particularly of the threatened California Gnatcatcher. Study of migrants or vagrants could address these species’ use of the reserve. Such research may help clarify bases of the differences between F Canyon and Box Canyon, as well as provide a baseline for comparison following any future fires.

ACKNOWLEDGMENTS

I am grateful to Patricia Farris, Cynthia Shannon, Arthur Davenport, Michelle Shaughnessy, Mary Haus, Kristen Schroeder, and Gail Drus for field support. Holly Vuong and anonymous reviewers improved the manuscript.

LITERATURE CITED


THE EFFECTS OF FIRE ON A COASTAL SAGE SCRUB BIRD COMMUNITY


Accepted 22 May 2012
ABSTRACT: This report covers the 115 records reviewed by the Nevada Bird Records Committee in 2011, of which 110 were endorsed. These 115 records cover sightings from 24 October 1971 through 26 November 2011, 37 in 2011, 20 antedating the formation of the committee in 1994. Three species are added to the Nevada list (and to the committee’s review list): the Iceland Gull (Larus glaucoides), Winter Wren (Troglodytes hiemalis), and Sedge Wren (Cistothorus platensis). The Northern Beardless-Tyranulet (Camptostoma imberbe) is removed from the Nevada list (and review list) because evidence to substantiate the record is insufficient. Ten species are removed from the review list because of the number of records or regularity of occurrence. The Nevada state list now stands at 488 species, of which 167 are on the review list.

The Nevada Bird Records Committee (NBRC) began 2011 with 66 records pending review. During the year, an additional 114 reports were received and added to the database. The committee completed reviews of 115 records during the year, so at the end of 2011, the queue contained 65 pending records. Since the founding of the NBRC in 1994, a total of 789 records have been reviewed, of which 726 have been endorsed.

At its founding in 1994, the committee decided not to review any sightings prior to that year but reversed that decision several years later. Fortunately, founding secretary James Cressman and his wife Marian continued to accumulate documentation for “pre-committee” records. That accumulated documentation has been provided to the current committee, and one of our long-term goals is to organize and review as many of those records as possible. Of the 114 “new” records received and added to the database in 2011, 15 precede the committee, dating back to 24 October 1971.

Of the 115 records reviewed by the committee in 2011, 37 were of birds found during 2011; 20 preceded the committee’s founding. Reviewed records thus extended from 24 October 1971 to 26 November 2011. Of the 110 endorsed records, 84 were supported by photographs. Five records, none supported by photographs, failed to gain endorsement. The endorsement rate for birds photographed and not photographed implies that records with photographs are more likely to be endorsed than are those with only written documentation, but records with only detailed written documentation can achieve committee endorsement as well.

The NBRC has six voting members and a nonvoting secretary. In 2011, the committee welcomed new member Jeanne Tinsman, who joined continuing members John Klicka, Tim Lenz, Carl Lundblad, Greg Scyphers, and Dennis Serdehely. The position of secretary continues to be held by Martin Meyers. At the close of 2011, Greg Scyphers rotated off the committee (term-limited) and was replaced by Will Richardson for 2012.

The NBRC’s website at http://gbbo.org/nbrc contains a statement of purpose, links to a downloadable submission form, the committee’s bylaws, the Nevada state checklist maintained by the NBRC, the review list, and answers to frequently asked questions. There is a link to a list of every submission to

**REVISIONS TO THE NEVADA STATE LIST IN 2011**

During the period covered by this report, three new species were added to the Nevada list, and one species was removed. Added were the Iceland Gull (*Larus glaucoides*), Winter Wren (*Troglodytes hiemalis*, on the basis of a good description antedating the split of the Pacific [*T. pacificus*] and Winter wrens; Chesser et al. 2010), and Sedge Wren (*Cistothorus platensis*).

Removed: the Northern Beardless-Tyrannulet (*Camptostoma imberbe*) was on the Nevada list on the basis of a bird banded at Pahranagat National Wildlife Refuge (NWR), 28 April 1973. Other than a band number and a one-line comment containing no details, there is no documentation for this record. It was never submitted to the committee (it antedates the formation of the committee by two decades.) After the NBRC exerted considerable effort to find additional information without success, a motion to delete the species was discussed and received unanimous agreement in September 2011.

These changes brought the count of species recorded in Nevada to 488 at the end of 2011.

**REVISIONS TO THE NEVADA REVIEW LIST IN 2011**

The only species the NBRC added during 2011 to the list of species it reviews were the three species new to Nevada, discussed above.

At the committee’s biennial meeting in September, it removed 10 species from the review list. Justification for removal from the review list included the total number of endorsed records, regularity of sightings, evidence of occurrence from similar nearby habitats in adjoining states, plus the personal experiences, knowledge, and judgment of the members. These species were removed: Eurasian Wigeon (*Anas penelope*), Thayer’s Gull (*Larus thayeri*), Acorn Woodpecker (*Melanerpes formicivorus*), Chestnut-collared Longspur (*Calcarius ornatus*), Magnolia Warbler (*Setophaga magnolia*), Chestnut-sided Warbler (*S. pensylvanica*), Black-throated Blue Warbler (*S. caerulescens*), Palm Warbler (*S. palmarum*), Lark Bunting (*Calamospiza melanocorys*), and Lawrence’s Goldfinch (*Spinus lawrencei*). There are currently 167 species on the Nevada review list, of which seven are exempt from review in some limited geographic area. Six of those seven exemptions are for very localized breeding populations. The seventh, the Broad-winged Hawk, is exempt in the Goshute Mountains, where multiple birds are observed annually in migration (Smith et.al. 2008).

**SPECIES ACCOUNTS**

For each species, the format is English name, *scientific name*, (total number of endorsed records of the species, number of records endorsed in this year’s report). Two asterisks after the total of records signify that the
number of records refers to a restricted review period, usually signifying that the species is no longer on the review list, was placed on the review list as a result of a perceived drop in population, or is exempt from review in some locations. Note that the total number of records for a species is not necessarily the total number of individual birds reported.

After the heading for the species is each record of that species reviewed in 2011, in this format: NBRC record number, name of each submitter, date or range of documented dates, and location (county in parentheses.) If the record involved multiple individual birds, the number follows the county. “(P),” “(V),” or “(A)” following a submitter’s name indicates that he or she provided a photo, video, or audio recording, respectively. Discussion of a particular sighting follows that sighting’s data, whereas that related to the species in general is at the end of the species account. If there are multiple records of the species, the records are ordered by date of first sighting.

Certain records in these accounts are noted as “establishing” records. The NBRC uses the term “establishing” record for the first NBRC-endorsed record for any species on the checklist of which there is not yet at least one endorsed record. Early in its history, the NBRC adopted an existing checklist (Titus 1996) based on numerous sources that constituted the most reliable information available at the time. All but 30 of the review species on the state list now have at least one endorsed record. The committee is pursuing documentation of these 30, and we have had some significant success in this quest. However, it will probably be a few years before we conclude that we have exhausted all possibilities. At that time, we will reevaluate the status of those species still without an endorsed record.


2010-067, Martin Meyers, 5 November 2010, Lemmon Valley (Washoe). Species removed from the review list September 2011.

GREEN-WINGED TEAL (EURASIAN) *Anas crecca crecca* (4, 1). 2011-028, Martin Meyers (P), 14 December 2006, Damonte Ranch Wetlands, Reno (Washoe). The NBRC’s bylaws permit, but do not require, reviews of rare subspecies of species otherwise common in Nevada, but only if the subspecies has previously been considered a full species by the AOU or is currently considered a full species by other similar international organizations.

BLACK SCOTER *Melanitta americana* (6, 2). 2010-077, Dennis Ghiglieri (P), Rose Strickland, Dennis Serdehely, Greg Scyphers (P), 14–15 November 2010, west shore of Pyramid Lake (Washoe).

2010-078, Dennis Ghiglieri (P), Rose Strickland, 14 November 2010, south end of Pyramid Lake (Washoe). This is the first time the NBRC has received documentation of two Black Scoters nearby on the same day.

LONG-TAILED DUCK *Clangula hyemalis* (4**, 1). 2011-006, Alan de Queiroz (P), Fred Welden (P, Figure 1A), Nancy Devon (P), Martin Meyers (P, Figure 1B), Fred Petersen (P), 3 February–14 May 2011, Virginia Lake, Reno (Washoe). The plumage changed during the bird’s stay. The bird alternated between feeding on the Truckee River near downtown Reno and sleeping on a pond in a city park farther upstream, occasionally it visited a city park several miles from either of those locations. This species has been on the review list only since 2007, when it was added because of a dearth of recent records.


TRICOLORED HERON *Egretta tricolor* (1, 1). 2011-064, Vincent Mowbray, Marian Cressman, Robert Rucker, 12–13 September 1992, Pahranagat NWR (Lincoln). This record established the Tricolored Heron on the Nevada state list.


WHITE-TAILED KITE *Elanus leucurus* (10**, 3). 2011-067, Vincent Mowbray, Mark Kasprzyk (P), 18 September 1982, Mormon Farm, Las Vegas (Clark). One member voted not to endorse this record, stating that he thought the bird was probably correctly identified but that some of the documentation was ambiguous and that the photograph was not completely convincing on its own.

HARRIS’S HAWK *Parabuteo unicinctus* (5, 1). 2011-016, David Henderson, 6 April 2011, Pahranagat NWR (Lincoln). An additional four records of Harris’s Hawk, one of an apparent family group, are awaiting committee review. The question of origin is the main issue with occurrences of this species, used frequently for falconry.

ZONE-TAILED HAWK *Buteo albonotatus* (13, 4). 2010-040, Eric Hough (P), Greg Scyphers (P), Diane Wong, 16 May–30 August 2010, Pahranagat NWR (Lincoln), 2 birds, at least one of which remained through the summer. Hough described the birds defending territory near a nest. He observed the birds during multiple surveys between 16 May and 14 June 2010, but they did not nest successfully.
2011-066, David Henderson, 17 August 2011, Pahranagat NWR (Lincoln). The NBRC endorsed four records of the Zone-tailed Hawk in 2011, representing a minimum of one adult and one immature bird, possibly as many as four different birds. As with the Common Black-Hawk, it is probably just a matter of time before breeding of the Zone-tailed Hawk is confirmed in Nevada.

BLACK RAIL *Laterallus jamaicensis* (0, 0). 2008-081, NOT ENDORSED. 5 May 2008, Ash Meadows NWR (Nye). Carl Lundblad submitted documentation of a bird only heard in response to a tape during a survey. Several members commented that the documentation was convincing, but only one member found it sufficient for an establishing record. Lundblad is a member of the committee and was confident of the identification but recognized that the documentation would fall short, and even voted against endorsement. Nonetheless, he submitted the sighting to place the data into the permanent record, where it belongs, even without committee endorsement.

UPLAND SANDPIPER *Bartramia longicauda* (2, 2). 2010-083, Vincent Mowbray, 20 May 1985, Corn Creek (Clark). This record established the Upland Sandpiper’s occurrence in Nevada. The record received two votes against endorsement on the first round but only one on the second. A vote of 5–1 is sufficient for endorsement.

2010-021, Carl Perretta, 13 May 2010, Hidden Valley (Clark). Interestingly, the voting on this record went the same way as that on 2010-083.

STILT SANDPIPER *Calidris himantopus* (5**, 1). 2011-042, Andrew Lee (P), 8 August 2011, Clark County Wetlands Park (Clark), 2 birds. This species had been exempt from review in southern Nevada until 2009, when the exemption was removed because of a lack of recent reports. There remains just one endorsed record from northern Nevada.


HEERMANN’S GULL *Larus heermanni* (8, 2). 2010-054, Rob Lowry (P), 17 October 2010, Washoe Lake (outside state park) (Washoe); bird in its second plumage cycle.

2011-017, David Shen (P), 3 April 2011, Walker Lake (Mineral). This adult represents the earliest spring record of Heermann’s Gull for Nevada; the other four spring records extend from 19 April through 3 June. The three fall records extend from 16 October through 28 October. Six of the eight records are from northern Nevada.

THAYER’S GULL *Larus thayeri* (11**, 2). 2011-002, Andrew Lee (P), Rick Fridell (P), Martin Meyers (P), Robert Wilkin (P), David Syzdek (P), 1 January–5 February 2011, Hemenway Harbor, Lake Mead NRA (Clark), 2 birds. Thayer’s Gull had been exempt from review in northwest Nevada until 2007. The exemption was removed in 2007 after several years with very few reports. Since that time, there have been endorsed records in the northwest every year, with multiple endorsed records in all but one of those years. The committee voted to remove Thayer’s Gull from its review list in September 2011. This record of two individuals together is the only committee-endorsed record for southern Nevada.

2011-007, Alan de Queiroz (P), Martin Meyers (P), Dennis Serdehely (P), Rob Lowry (P), 8–9 February 2011, Virginia Lake, Reno (Washoe).

ICELAND GULL *Larus glauicoides* (1,1). 2011-004, Fred Petersen (P), Martin Meyers (P, Figure 3), Greg Scyphers (P), Jon Dunn, Fred Welden (P), 24 January–9 February 2011, Paradise Park, Reno (Washoe). This third-cycle “Kumlien’s” Gull was found by Fred Petersen on 24 January 2011 and observed and photographed by numerous birders from Nevada and California during its stay. Originally found at Paradise Park in Reno, it alternated between that location and Sparks Marina, often being seen at Paradise Park in the morning and Sparks Marina in the afternoon. The one vote against endorsing this record was more concerned with the taxonomic issues.
than with the identification of this individual bird. As to the taxonomic issues regarding
the Iceland (including “Kumlien’s”) and Thayer’s Gulls, the committee’s position is to
follow the American Ornithologists’ Union’s current classification.

LESSER BLACK-BACKED GULL *Larus fuscus* (10,3). 2010-061, Martin Meyers (P), 29 October 2010, Sparks Marina (Washoe).
2010-065, Greg Scyphers (P), 1 November 2010, Carson City (Carson City).
2011-022, Andrew Lee (P), 21 April 2011, Hemenway Harbor, Lake Mead NRA (Clark). Of the ten Nevada records, three have been judged to represent repeated
occurrences of the same individual over three successive years. The first committee-

Figure 1. This Long-tailed Duck (2011-006) was observed and photographed at three
different locations around Reno from its initial discovery on 3 February 2011 to the
last sighting on 14 May 2011. During that time, it went through substantial plumage
changes, as seen in these photos, taken 7 February 2011 (A) and 14 May 2011 (B).

*Photos by Fred Welden (A) and Martin Meyers (B)*
endorsed Lesser Black-backed Gull arrived in Nevada during the winter of 2007–2008 (Meyers 2010). Since that time, there have been at least two documented in the state every year except 2011, when only one was found. Through 2011, sightings in the northern portion of the state (6) slightly outnumbered those in the south (4).

GLAUCOUS GULL *Larus hyperboreus* (7, 1). 2011-005, Martin Meyers (P, Figure 4), Jon Dunn, 26–29 January 2011, Sparks Marina (Washoe). This beautiful large gull showed up to accompany Nevada’s first Iceland Gull (see 2011-004 above), and many of the observers who came to see the Iceland Gull were able to enjoy this bird as a bonus. While the Iceland Gull alternated between Paradise Park and Sparks Marina, the Glaucous Gull was observed at Sparks Marina only.

BLACK-LEGGED KITTIWAKE *Rissa tridactyla* (3, 1). 2010-066, Greg Scyphers (P), Martin Meyers (P), 5 November 2010, The Willows, Pyramid Lake (Washoe). The two previous endorsed records for this species were from 1975 and 1995 (Meyers 2010). Several anecdotal reports precede the committee’s establishment, and we have some documentation for a few additional records from the late 1980s to the mid 1990s that we are reviewing. However, there is a gap of almost 15 years with no documented reports or even anecdotal reports preceding this 2010 record. We have documentation for two subsequent records for 2011 pending review.

LEAST TERN *Sternula antillarum* (12, 1). 2011-024, Andrew Lee (P), 3 May 2011, Clark County Wetlands Park (Clark). All endorsed records fall between 29 April and 20 July, and all but two are for the southern part of the state.

ARCTIC TERN *Sterna paradisaea* (5, 3). 2010-084, Paul Lehman, Shawnee Finnegan (P), 11 October 1990, Ash Meadows NWR (Nye).

2010-070, Greg Scyphers (P), 23 May 2010, Ash Springs (Lincoln).
Figure 3. This Kumlien’s Iceland Gull (2011-004) represents the first record of the Iceland Gull for Nevada. It was extensively documented (25 photos, three written descriptions, and additional opinions from experts were submitted.) The bird was found 24 January 2011 and remained until 9 February 2011, alternating between Paradise Park in Reno and Sparks Marina, Washoe Co. These photos were taken 25 January 2011.

Photos by Martin Meyers
PARASITIC JAEGER Stercorarius parasiticus (5, 1). 2010-073, Greg Scyphers (P), 14 September 2010, Clark County Wetlands Park (Clark).

GREAT GRAY OWL Strix nebulosa (0, 0). 2011-039, NOT ENDORSED. 6 July 2011, Mountain City (Elko). The documentation described a relatively brief sighting of a flying bird, viewed without binoculars at a distance reported as approximately 150 yards. Some details provided were consistent with the identification as this species, but the committee was unanimous in not endorsing what would have been an establishing record. The Great Gray Owl is on the Nevada list on the basis of a bird reported from Little Valley (Washoe County) in 1980 (Alcorn 1998). The committee has been unable to come up with any meaningful documentation for that record, but we have not yet given up hope of uncovering some. (See the note under “Revisions to the Nevada State List” above for discussion of related issues.)

RED-HEADED WOODPECKER Melanerpes erythrocephalus (1, 0). 2010-037, NOT ENDORSED. 26 June 2010, Great Basin National Park (White Pine). This record was documented rather thoroughly, but the details were obtained piecemeal in response to repeated requests. During the first round, that bothered some members, two of whom voted not to endorse the record. In the second round, the dissenting opinions from the first round convinced all members that the documentation was not fully satisfactory for such a rare sighting, despite the likelihood that the identification was correct.

Figure 5. This Philadelphia Vireo (2010-059) at Floyd Lamb Park, Tule Springs, Clark Co., 19–23 October 2010 (photo taken 21 October), is the second to be satisfactorily documented in Nevada. This cooperative bird pleased birders who had been waiting for 15 years since the state’s first record (1995-22), at Indian Springs, Clark Co., 23 September 1995.

Photo by Greg Scyphers

Figure 6. The Purple Martin has been satisfactorily documented to the NBRC only eight times. This bird (2011-030) was at Dyer, Esmeralda Co., 28 May 2011.

Photo by Greg Scyphers
Figure 7. This wonderful photo left no doubt in anyone’s mind about the identification of Nevada’s first recorded Sedge Wren (2011-101). The bird was found 15 October 2011 at a ranch in Dyer, Esmeralda, Co., and was gone by the next day.

*Photo by Greg Scyphers*

Figure 8. The fourth Yellow-throated Warbler (2011-001) to be endorsed by the NBRC was at Moapa National Wildlife Refuge, Clark Co., 2–16 January 2011 (photo taken 16 January).

*Photo by Greg Scyphers*
2011-032, Steve Ting (P), 4 June 2011, Verdi (Washoe). Species removed from the review list, September 2011.

YELLOW-BELLIED SAP SUCKER Sphyrapicus varius (6, 3). 2010-074, Greg Scyphers (P), 26 October 2008, Miller’s Rest Stop (Esmeralda).

2010-075, Greg Scyphers (P), 7 November 2008, Corn Creek (Clark).

2010-089, Greg Scyphers (P), 6 December 2010, Corn Creek (Clark).

LEAST FLYCATCHER Empidonax minimus (6, 1). 2011-037, Robert Williams (V), 18 June 2011, Ruby Valley (Elko). A beautiful close-up video of this bird, singing its “che-bek” song repeatedly, supports this record.

SULPHUR-BELLIED FLYCATCHER Myiodynastes luteiventris (2,2). 2011-060, Vincent Mowbray, Kevin Wallace, 13 June 1987, Corn Creek (Clark). Another of the pre-committee records from the data provided by the Cressmans, this record established the Sulphur-bellied Flycatcher on the Nevada list.

2010-041, Eric Hough, 27 July 2010, Pahranagat NWR (Lincoln). This record had trouble on its first two rounds, primarily because it would have represented an establishing record. In both of those rounds, two members believed the identification was probably correct but that the documentation was insufficient for a first record. However, 2010-041 was brought up for an additional review after 2011-060 was endorsed as the first state record. On that single round of reconsideration, it was endorsed unanimously.

SCISSOR-TAILED FLYCATCHER Tyrannus forficatus (6, 2). 2010-045, William Pratt, Greg Scyphers (P), James Hulsey (P), Jim Healy (P), Cathy Tobin, Michelle Tobin (P), 7 September–3 October 2010, Clark County Wetlands Park (Clark). Initially and again on 14 September 2010, this Scissor-tailed Flycatcher was reported from the Duck Creek section of the park. On 1 October 2010, what the committee judged to be the same individual was observed at the Henderson Bird Viewing Preserve. The distance between these two locations is less than one-half mile.

2011-026, Rose Strickland, Dennis Ghiglieri (P), 13 May 2011, Miller’s Rest Stop (Esmeralda).

PHILADELPHIA VIREO Vireo philadelphicus (2, 1). 2010-059, Joan Clarke, Rita Schlageter, Greg Scyphers (P, Figure 5), Martin Meyers (P), 19–23 October 2010, Floyd Lamb Park (Clark). The first Philadelphia Vireo the NBRC endorsed was found in 1995 (Cressman et al 1998). Nevada birders had been looking eagerly for another for 15 years before Clarke and Schlageter discovered the second.

PURPLE MARTIN Progne subis (8, 4). 2010-072, Greg Scyphers (P), 7 September 2009, Key Pittman WMA (Lincoln).


2011-030, Dennis Serdehely, Greg Scyphers (P, Figure 6), 28 May 2011, Dyer (Esmeralda).


WINTER WREN Troglodytes hiemalis (1, 1). 2010-079, Michael J. San Miguel, Jr., 9 November 2000, Corn Creek (Clark), one of the classic desert migrant traps. San Miguel originally reported his sighting as of an “Eastern” Winter Wren, then, after the split of the Pacific Wren and Winter Wren was announced (Chesser et al. 2010), provided his complete notes on the sighting to the committee. The record was endorsed on a 5–1 vote, the one negative voice expressing concern that this first state record was based on a single observer providing only written evidence. That’s an issue the committee’s bylaws so far do not address. Another Winter Wren found at Pahranagat NWR in 2011 (amazingly, on the exact same date 11 years later) was seen and documented by many observers; the NBRC’s review of that record will be published in its report for 2012.

SEDGE WREN Cistothorus platensis (1,1). 2011-101, Greg Scyphers (P, Figure
BROWN THRASHER *Toxostoma rufum* (11, 2). 2010-086, Peter Shen (P), Bonnie Dunman, Jeanne Tinsman, 4 December 2010–29 March 2011, Corn Creek (Clark).

2011-038, Paul Lehman, Barbara Carlson, 4 July 2011, Miller’s Rest Stop (Esmeralda). When this sighting was first announced, some expressed surprise at the mid-summer date. However, Nevada has endorsed records of the Brown Thrasher for every season—including a previous one for July (see http://gbbo.org/nbrc for specific dates.)


WORM-EATING WARBLER *Helmitheros vermivorum* (10, 1). 2011-010, Greg Scyphers (P), 26 September 2010, Pahranagat NWR (Lincoln). A submission for this species from the same general area on 8 October will be considered in the NBRC’s report for 2012, addressing the question of whether that sighting represents a continuation of 2011-010.

KENTUCKY WARBLER *Geothlypis formosus* (6, 1). 2010-071, Greg Scyphers (P), Carl Lundblad (P), 26 September–1 October 2010, Pahranagat NWR (Lincoln). The records of this species are evenly divided between spring (all May) and fall (all September, with the 2010 record extending to 1 October.)


2010-087, Greg Scyphers (P), 16 September 2010, Floyd Lamb Park (Clark).

2010-085, Carl Lundblad (P), 1 October 2010, Crystal Springs (Lincoln). Species removed from the review list, September 2011.


2011-054, Jeri Langham, 1 June 1980, Dyer (Esmeralda). Species removed from the review list, September 2011.


2011-048, John Brack (P), 22 October 1993, Miller’s Rest Stop (Esmeralda).


2011-057, Marian Cressman (P), 11 December 1996, Corn Creek (Clark).

2011-027, NOT ENDORSED. 1 September 2002, Lahontan Diversion Dam (Churchill). This record was submitted 9 years after the sighting and contained brief field notes which had been taken at the time. The documentation strongly suggested a correct identification, but several members concluded that other species (particularly the Orange-crowned Warbler, *Oreothlypis celata*) had not been satisfactorily eliminated. An additional factor in the decision was the date, 1 September being earlier by two and a half weeks than any other endorsed record of the Black-throated Blue Warbler in Nevada, and earlier than any fall record for California (Hamilton et. al. 2007). The record received a 4–2 vote on the first round and a 2–4 vote on the second and final round.

2010-088, Greg Scyphers (P), 17 October 2010, Pahranagat NWR (Lincoln).
2010-060, Rose Strickland, Dennis Ghiglieri (P), 25 October 2010, Miller’s Rest Stop (Esmeralda).

2010-069, Andrew Lee (P), Peter Shen (P), 13 November–5 December 2010, Floyd Lamb Park (Clark). Note that five of the eight records endorsed in 2011 are based on much earlier sightings. Species removed from the review list, September 2011.


2011-041, Scott Page, Gareth Pearson (P), 23 April 2006, Corn Creek (Clark). This record was documented with a single photograph (and almost no written description.) One member did not find that sufficient for endorsement, but the remainder of the members voted to endorse.

2010-080, Carl Lundblad (P), 1 October 2010, Pahranagat NWR (Lincoln).


YELLOW-THROATED WARBLER Setophaga dominica (4, 3). 2010-081, Bruce Sorrie, Barbara Fears, 22 April 1977, Kingston Campground (Lander).

2010-082, Michael Perrone, 24 October 1979, Duckwater (Nye).

2011-001, Bruce Lund (P), Richard Titus (P), Richard Saval (P), Martin Meyers (P), Greg Scyphers (P, Figure 8), 2–16 January 2011, Moapa NWR (Clark). This record is only the second of the Yellow-throated Warbler since the 1994 formation of the NBRC. This very cooperative bird remained for at least two weeks, permitting many Nevada birders to enjoy it.

PRAIRIE WARBLER Setophaga discolor (5, 2). 2010-044, Greg Scyphers (P), Jon Dunn, Carl Lundblad (P), 5–6 September 2010, Dyer (Esmeralda).

2010-064, James Stuart (P), Richard Saval (P), Joyce Marie Stewart (P), 31 October–3 November 2010, Red Rock Canyon National Conservation Area (Clark). The dearth of Nevada records of this species may seem surprising to California birders, but it should be noted that only about 5% of California’s records are from the interior (Hamilton et al. 2007).

BLACK-THROATED GREEN WARBLER Setophaga virens (2, 2). 2010-051, Andrew Lee (P), Richard Saval (P), Greg Scyphers (P), 30 September–2 October 2010, Floyd Lamb Park (Clark). This is the first record of the Black-throated Green Warbler to be submitted to the NBRC. Its unanimous endorsement establishes the species on the Nevada state list.

2010-068, Andrew Lee (P), 6 November 2010, Sunset Park, Las Vegas (Clark). After Lee documented Nevada’s first Black-throated Green Warbler in September, 2010, he went out and found another one in November!


2011-078, Dennis Serdehely, 21 September 2011, Miller’s Rest Stop (Esmeralda).

2011-079, Andrew Lee (P), 6 October 2011, Sunset Park, Las Vegas (Clark), 2 birds.


2010-076, Greg Scyphers (P), Carl Lundblad (P), 19 September 2010, Highland Park, Tonopah (Nye).

2011-077, Greg Scyphers (P), Martin Meyers (P), 17 September 2011, Dyer (Esmeralda), 2 birds. Species added to the review list in September 2007 and removed in September 2011.

Sparrow had been documented at this same well-known vagrant trap by Scyphers (2010-017) only one week before Fridell’s sighting (Meyers 2011). Excellent photos of both birds convinced all members of the committee that two different individuals were involved.

2010-057, Greg Scyphers (P), Martin Meyers (P), 24 October 2010, Key Pittman WMA (Lincoln). Some older field guides show the breeding range of the Grasshopper Sparrow as encompassing nearly the entire state of Nevada. All the field work for the Atlas of the Breeding Birds of Nevada (Floyd et al. 2007), however, revealed only two birds, one “possible breeder” in Lander County and one “probable breeder” in White Pine County. In July 2001, one year after field work for the atlas was completed, Walter Wehtje observed an adult carrying an object—perhaps a fecal sac—in Lincoln County (Floyd et al. 2007). If the Grasshopper Sparrow does breed in Nevada, it is extraordinarily rare. And, as the number of endorsed records shows, it is a very rare visitor at any time.

2010-058, Martin Meyers, 17 October 2010, Corn Creek (Clark).
2011-091, Paul Lehman, 30 October 2011, Pahranagat NWR (Lincoln).

SCARLET TANAGER Piranga olivacea (5, 1). 2010-056, Greg Scyphers (P), Martin Meyers (P), 24 October 2010, Pahranagat NWR (Lincoln). All but the single spring (23 May) record of the Scarlet Tanager for Nevada fall between 16 October and 26 November.


Baltimore Oriole Icterus galbula (5, 1). 2011-081, Rick Fridell (P), 16 September 2004, Corn Creek (Clark)

2011-045, Paul Lehman, Shawneen Finnegan (P), 14 October 1990, Indian Springs (Clark).
2011-049, Marian Cressman (P), 11 October 1992, Corn Creek (Clark).
2010-048, Greg Scyphers (P), Dennis Serdehely, 5–9 September 2010, Dyer (Esmeralda).
2011-059, Greg Scyphers (P), 22 May 2011, Dyer (Esmeralda), 2 birds, observed carrying nesting material, but the outcome of this attempt was not determined. This is the first known attempt of Lawrence’s Goldfinch to nest in Nevada. The 17 endorsed records represent 41 individual birds. Species removed from the review list, September 2011.

ACKNOWLEDGMENTS

The NBRC thanks everyone who contributed to the accounts contained in this report. All submissions, photos, advice, comments, and opinions are greatly appreciated. We apologize to anyone who may have been overlooked. Some of the contributors on this list are no longer with us, but their contributions are no less appreciated.

Tim Almond, Aaron Ambos, Rebecca Benedetti, Ned Bixler, John Brack, Barbara Carlson, Joan Clarke, G. Scott Clemson, James and Marian Cressman, Brian Day, Alan de Queiroz, Nancy Devon, Bonnie Dunman, Jon Dunn, Barbara Fearis, Shawneen Finnegan, Rick Fridell, Dennis Ghiglieri, Jim Healy, David Henderson,

Special thanks to the entire staff of the Great Basin Bird Observatory for their generous logistical support. Greg Scyphers and Dennis Serdehely reviewed early drafts of this report and contributed much-appreciated input. Kristie Nelson reviewed the first submitted draft thoroughly, and her comments were invaluable, as were those from Dan Gibson. Will Richardson performed the final review and made substantial improvements. Thank you to editor Philip Unitt for his help with this report’s final stages.

LITERATURE CITED


Accepted 18 October 2012
NESTING ECOLOGY AND NEST SUCCESS OF THE BLUE GROSBEAK ALONG TWO RIVERS IN NEW MEXICO

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ABSTRACT: From 1997 through 2008, we studied the nesting habits and nest success of the Blue Grosbeak (Passerina caerulea) along the middle Gila River (1997–2001) and the middle Rio Grande (2000–2008) in New Mexico. A riparian forest of cottonwoods grows along both rivers, but the forest along the Rio Grande is a much more intensively managed ecosystem, with an understory dominated by saltcedar (Tamarix spp.) and other non-native invasive plants, frequent wildfires, and large-scale attempts at remediation of the vegetation. Along the Gila River 100 (95%) of 105 nests were in native shrubs or trees, and the mean height of all nests was 3.4 m. Of 85 nests found along the Rio Grande, 54 (64%) were in saltcedar and 16 (19%) were in other non-native shrubs or trees. Mean nest height was 2.2 m, significantly lower than along the Gila River. Nests were typically found along edges along both rivers but were placed significantly farther from water along the Gila River. In spite of these differences in nest placement, the observed proportion of successful nests along the two rivers did not differ significantly: 28 (47%) of 60 nests along the Rio Grande, 36 (54%) of 67 nests along the Gila River. Overall, differences between the two sites in floristic composition and vegetation structure appeared to affect the placement of Blue Grosbeak nests more than they did nest success.

During the last three decades, much has been published on the ecological role and threatened status of riparian areas in arid and semi-arid southwestern North America (e.g., Johnson et al. 1977, 1987, Hunter et al. 1988, Howe and Knopf 1991, Finch and Yong 2000, Smith et al. 2009a). In particular, southwestern riparian areas are important to birds at lower and middle elevations, where they concentrate key resources such as water, shade, insects and fruits for food, and suitable nest sites (Carothers et al. 1974, Stamp 1978, Ohmart and Anderson 1982, Rosenberg et al. 1982, Hunter et al. 1988, Cartron et al. 2000). In turn, alteration or loss of riparian areas through river regulation, groundwater pumping, woodcutting, overgrazing, and the spread of non-native, invasive plants has reduced riparian bird species and communities (Unitt 1987, Knopf et al. 1988, Ohmart 1994, Cartron et al. 2000, Finch and Stoleson 2000).

In the Southwest, the Blue Grosbeak (Passerina caerulea) is one of many birds strongly tied to riparian areas. Range-wide, the species occupies a diversity of habitats (Ingold 1993), but in southwestern North America, it breeds only in riparian areas (Johnson et al. 1987). Like other riparian birds, including the Southwestern Willow Flycatcher (Empidonax traillii extimus) (e.g., Owen et al. 2005, Sogge et al. 2008), the Blue Grosbeak uses not only native vegetation (e.g., Powell and Steidl 2000) but also
areas now dominated by the invasive saltcedar (*Tamarix* spp.) (Hunter et al. 1988, Brown and Trosset 1989, Rosenberg et al. 1991, Ellis 1995). Beyond this finding, however, surprisingly little has been learned about the nesting habits of the Blue Grosbeak in southwestern riparian areas and how these habits may relate to anthropogenic changes in vegetation structure or floristic composition.

Here, we analyze data on Blue Grosbeaks nesting along two main rivers of New Mexico, the Gila River and the Rio Grande. The middle reaches of these two rivers have been altered to different degrees and in different ways, which, in turn, have been addressed by different management strategies. The middle Gila River in the southwestern part of the state is an unregulated river that nonetheless has been seriously degraded in several places by uncontrolled livestock grazing and by phreatophyte control (Boucher et al. 2003). To address local problems of the river deepening its channel, severe bank erosion, and loss of riparian vegetation, livestock grazing was discontinued within much of the riparian zone in the 1990s, followed by excavation and grading of the river banks and by planting of native vegetation. As a result, periodic flooding over the river’s bank was restored, and with it, sediment deposition and revegetation along the banks (Boucher et al. 2003).

Compared to that along the middle Gila River, the riparian forest along the middle Rio Grande is a much more intensively managed ecosystem (Crawford et al. 1998, Cartron et al. 2008, Smith et al. 2009a, b). Since the completion of Cochiti Dam in 1973, the river no longer floods over its bank at most locations. Saltcedar and Russian olive (*Elaeagnus angustifolia*), two non-native plants introduced as ornamentals or for erosion control, have spread along the river, replacing most of the original, native understory vegetation. The lack of flooding and the spread of saltcedar and Russian olive have contributed to heavy fuel loads that enabled stand-replacing wildfires during the last decade (Cartron et al. 2008). To reduce the risk of fire, the understory vegetation now has to be removed mechanically at regular intervals, but this practice also promotes the spread of other non-native plants such as kochia (*Kochia scoparis*).

Here we focus primarily on a comparison of the Blue Grosbeak’s nesting habits and nest success along the Rio Grande and the Gila River.

**MATERIALS AND METHODS**

**Study Areas**

Our study along the middle Gila River extended from 1997 to 2001, that along the middle Rio Grande from 2000 to 2008 (Figure 1). The Gila River study area is located in the Cliff–Gila Valley of Grant County, at elevations ranging from 1335 to 1420 m. It consisted of two disjunct sites (33° 1′ N, 108° 35′ W and 32° 46′ N, 108° 34′ W), of 50 ha and 25 ha both supporting a mosaic of brushy floodplain vegetation, narrow (width 10–200 m) patches of riparian forest, and fields along the Gila River and associated earthen irrigation ditches. Most patches of forest included in the study area consisted of stands of mature Fremont cottonwood (*Populus fremontii*) with a canopy >25 m (reaching 40 m in places). The canopy or mid-story veg-
Figure 1. Locations of study areas along the middle Gila River (1997–2001) and middle Rio Grande (2000–2008) in New Mexico. Black triangles represent sites of field work.
etation also included Goodding's willow (Salix gooddingii), boxelder (Acer negundo), velvet ash (Fraxinus velutina), Arizona walnut (Juglans major), Arizona sycamore (Platanus wrightii), Arizona alder (Alnus oblongifolia), and Russian olive. In the understory were shrubs such as three-leaf sumac (Rhus trilobata), false indigo (Amorpha fruticosa), and New Mexico olive (Forestiera neomexicana), and forbs and grasses. Along the river, flooding over the banks promotes an early stage of open vegetation consisting of coyote willow (Salix exigua), bluestem willow (S. irrorata), seepwillow (Baccharis salicifolia), and cottonwood saplings. Most of the Gila River study area was on private land (the U Bar Ranch), where the riparian zone is flanked by dry and irrigated pastures used for livestock grazing and hay farming. Also included in the study area were lands managed by The Nature Conservancy and the Gila National Forest.

The second study area was located along the middle Rio Grande from Cochiti Lake (35° 37′ N, 106° 19′ W, elevation 1608 m) in Sandoval County south approximately 235 km to the Bosque del Apache National Wildlife Refuge (33° 48′ N, 106° 54′ W, elevation 1372 m) in Socorro County (Figure 1). It consisted of 23 scattered sites representing a total of 454 ha along the river. Most of the 23 sites were narrow (width 50–250 m) patches of riparian vegetation, although the width of some of the sites in the south reached 400 m or more (maximum 600 m). The 23 study sites along the middle Rio Grande consisted of a mix of untreated cottonwood forest with a canopy of Rio Grande cottonwoods (Populus deltoides ssp. wislizenii) and understory typically dominated by saltcedar and Russian olive, burned areas with little or no forest canopy, and patches of vegetation from which the understory was cleared sometime during the study. Within two years, burned sites were colonized or re-colonized by non-native plants including not only saltcedar and Russian olive but also kochia, Siberian elm (Ulmus pumila), and tree of heaven (Ailanthus altissima) forming a dense shrub layer. Our study sites were variously under the administrative oversight of the Middle Rio Grande Conservancy District, the U.S. Bureau of Reclamation, the Bosque del Apache National Wildlife Refuge, and the city of Albuquerque’s Open Space Division. Land use adjacent to the riparian zone was mostly agricultural (pastures and crop fields).

Field Methods

Along both the Gila River and the Rio Grande, searches for Blue Grosbeak nests were part of a larger effort to study entire riparian bird communities, habitat associations, and responses to disturbance or management. We actively searched for nests from the second week of May through the middle of August. Along the Rio Grande, stands of mature cottonwood and their edges were thoroughly searched, as were the more open river banks. In some areas the river-edge vegetation consisted of tall, nearly impenetrable thickets of willow and/or Russian olive. Although searches for nests were limited to the edges of those thickets, Blue Grosbeaks appeared to largely avoid the thickets’ interior, unlike other species such as the Spotted Towhee (Pipilo maculatus). Along both rivers, we recorded nest height (m), nest substrate, nest-substrate height (m), distance between the nest and the trunk or main
NESTING ECOLOGY AND NEST SUCCESS OF THE BLUE GROSBEAK

stem of the nest plant (m), diameter at breast height of the nest plant (cm),
and distance to the nearest body of water (either the river or a riverside drain; m). Along the Gila River, we also measured the distance to the nearest edge.

Nests were monitored every 3–5 days with use of binoculars, pole-mounted mirrors or video cameras, or 15× spotting scopes. Nests that were abandoned or destroyed were examined for evidence (e.g., cowbird eggs, mammal hairs) of the cause of nest failure. We considered a nest successful if (1) the parents were observed feeding one or more fledged young Blue Grosbeaks; (2) the parents behaved as if dependent young were nearby in the vicinity of a now-empty nest that had not been parasitized; or (3) Blue Grosbeak nestlings were in the nest within one or two days of the estimated date of fledging. We considered a nest to have failed if (1) the nest’s contents disappeared before fledging of young was possible (depredation), assuming the young require 9–10 days for fledging (Stabler 1959), (2) the nest contained no grosbeak young but contained cowbird eggs or chicks, (3) the nest was deserted after eggs had been laid (desertion), or (4) the nest was abandoned prior to egg laying (abandonment).

Statistical Analyses

For all analyses we used the statistical software Centurion XV.II (Statgraphics). We used t tests to identify significant differences between the Gila River and Rio Grande datasets in nest height, nest plant height, diameter at breast height of the nest plant, distance between nest and trunk or main stem, and distance between nest and nearest body of water. We assessed differences in proportions of successful and unsuccessful nests with chi-squared tests.

RESULTS

We found a total of 190 Blue Grosbeak nests during our study, 105 (55%) along the Gila River and 85 (45%) along the Rio Grande. In both areas, some pairs initiated nesting in late May, eggs were typically recorded from early June through mid-August, and young fledged through at least the end of August. The peak of the nesting season appeared to be in July, when 61 (72%) of the 85 Rio Grande nests and 73 (70%) of the 105 Gila River nests were active. One nest along the Gila River and one nest along the Rio Grande were found after mid-August and the end of our active nest searches. The late nest along the Rio Grande was discovered on 5 September 2003. It contained two Blue Grosbeak eggs and two cowbird eggs and was deserted.

Nest Substrate and Nest Materials

Along the Gila River, Blue Grosbeaks built their nests in plants of at least 20 species (Table 1). Most (70%) nests were found in four native species of shrub or tree, primarily boxelder, followed in order of decreasing frequency by seepwillow, Goodding’s willow, and netleaf hackberry (Celtis reticulata). Only five nests were found in exotic vegetation, Russian olive or saltcedar. Atypical were nests built in plants such as stinging nettles (Urtica dioica), common sunflower (Helianthus annuus), and canyon grape (Vitis arizonica). Along the Gila River we recorded the nest materials in only a few
nests; these consisted of dried grasses, leaves, and, occasionally, also snake skin, used plastic flagging, and hair.

Along the Middle Rio Grande, nests were found in 10 species of plants (Table 1). Most (82%) nests were built in non-native shrubs or trees, primarily saltcedar and Russian olive (e.g., Figure 2). Only 15 (18%) nests were found in native plants, mainly Rio Grande cottonwood and coyote willow. Nest materials included leaves and twigs of saltcedar, leaves, shredded bark, cotton, seed pods, and twigs from cottonwood trees, grass, forb stems, horse

<table>
<thead>
<tr>
<th>Plant species</th>
<th>No. (%) nests</th>
<th>Nest height (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Middle Gila River</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boxelder</td>
<td>29 (28)</td>
<td>6.73 (3.88)</td>
</tr>
<tr>
<td>Seepwillow</td>
<td>17 (16)</td>
<td>2.04 (0.85)</td>
</tr>
<tr>
<td>Goodding’s willow</td>
<td>12 (11)</td>
<td>2.46 (1.23)</td>
</tr>
<tr>
<td>Netleaf hackberry</td>
<td>6 (6)</td>
<td>2.13 (0.39)</td>
</tr>
<tr>
<td>Fremont cottonwood</td>
<td>4 (4)</td>
<td>1.47 (0.67)</td>
</tr>
<tr>
<td>New Mexico locust</td>
<td>4 (4)</td>
<td>1.66 (0.87)</td>
</tr>
<tr>
<td><strong>Russian olive</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saltcedar</td>
<td>1 (1)</td>
<td>1.66 (0.87)</td>
</tr>
<tr>
<td>Wingleaf soapberry</td>
<td>1 (1)</td>
<td>0.5</td>
</tr>
<tr>
<td>Velvet ash</td>
<td>1 (1)</td>
<td>0.8</td>
</tr>
<tr>
<td>Canyon grape</td>
<td>1 (1)</td>
<td>2.0</td>
</tr>
<tr>
<td>Stinging nettles</td>
<td>1 (1)</td>
<td>1.3</td>
</tr>
<tr>
<td>Catclaw mimosa</td>
<td>1 (1)</td>
<td>1.7</td>
</tr>
<tr>
<td>Common sunflower</td>
<td>1 (1)</td>
<td>0.9</td>
</tr>
<tr>
<td>Wild rose (Rosa sp.)</td>
<td>1 (1)</td>
<td>0.9</td>
</tr>
<tr>
<td>Acacia (Acacia sp.)</td>
<td>1 (1)</td>
<td>0.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>105 (100)</td>
<td>3.36 (3.12)</td>
</tr>
<tr>
<td><strong>Middle Rio Grande</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saltcedar</td>
<td>54 (64)</td>
<td>2.12 (1.22)</td>
</tr>
<tr>
<td><strong>Russian olive</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rio Grande cottonwood</td>
<td>11 (13)</td>
<td>1.21 (0.64)</td>
</tr>
<tr>
<td>Coyote willow</td>
<td>7 (9)</td>
<td>6.64 (5.27)</td>
</tr>
<tr>
<td>Kochia</td>
<td>2 (2)</td>
<td>1.36 (0.85)</td>
</tr>
<tr>
<td><strong>Tree of heaven</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>White mulberry</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Siberian elm</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Desert olive</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Goodding’s willow</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>83 (100)</td>
<td>2.24 (2.24)</td>
</tr>
</tbody>
</table>

*See text for the scientific names of nest plants; names of introduced species are in bold type.
Measurements of Nests’ Characteristics

We pooled measurements of nests and nest plants for all years to maximize sample sizes and because there were no detectable annual differences in the five variables we measured (consensus t test, $P > 0.5$). Along the Gila River, observed nest height varied from 0.3 to 15 m, with a median of 2.1 m. Most (69%) nests were found at heights of $\leq 3$ m, but nest height varied considerably by substrate (Table 1). Nests in boxelder were significantly higher than nests in the other three main substrates combined ($t = 7.87$, df $= 1$, $P < 0.001$). Nests also found at heights substantially higher than the mean included those in Arizona sycamore (Table 1). Along the middle Rio Grande, nest height varied from 0.16 m (one nest in a saltcedar) to 15 m (one nest in a cottonwood), with a median of 1.7 m. Most (86%) nests were placed at heights of $\leq 3$ m. With the exception of those in cottonwoods, Blue Grosbeak nests were placed at mean heights of $\leq 2.5$ m in every species of nest plant observed (Table 1).

Nests were placed significantly lower along the Rio Grande than along the Gila River (Table 2). Additionally, nest plants were significantly shorter along the Rio Grande than along the Gila River, as they were in diameter at breast height. But the placement of the nest relative to the trunk or main stem did not differ. The mean distance of nests to water (either the river or a drain) was significantly smaller along the Rio Grande than along the Gila River. Of the 104 nests along the Gila River whose distance to the nearest
edge was recorded, 83 (80%) were placed ≤5 m from the nearest edge; 48 (46%) were ≤1 m from the nearest edge (Table 2). Although distance to the nearest edge was not quantified during field work along the Rio Grande, nests placed along edges were also common, if not typical, in that study area.

Nest Success

We were able to determine the outcome of 60 nests along the Rio Grande and 67 nests along the Gila River (Table 3). The observed proportion of successful nests along the two rivers did not differ significantly ($\chi^2 = 0.38$, df = 1, $P = 0.427$). The cause of nest failure remained unknown in many cases, especially along the Rio Grande (Table 3). Along the Gila River, however, more than half of all failures were caused by predation. Less frequently, nest failure was caused by weather or the nest failed to produce any Blue Grosbeak fledglings but instead fledged cowbirds. Along the Rio Grande, cowbird parasitism, predation, and weather were all responsible for some of the failures.

Along the Rio Grande, we were able to determine the outcome of 42 (78%) of the 54 nests in saltcedar, and of those 17 (45%) were successful, a proportion that was not significantly ($\chi^2 = 0.15$, df = 1, $P = 0.694$) different from that of nests in substrates other than saltcedar.

DISCUSSION

Several studies (Hunter et al. 1988, Brown and Trosset 1989, Rosenberg et al. 1991, Ellis 1995) have shown the Blue Grosbeak to readily occupy, and nest in, saltcedar-dominated riparian habitats. Our study was not designed

<table>
<thead>
<tr>
<th>Nest and nest-plant attributes</th>
<th>Middle Gila River</th>
<th>Middle Rio Grande</th>
<th>Result of t test ($P^a$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nest height (m)</td>
<td>3.4 ± 3.12</td>
<td>2.2 ± 2.2</td>
<td>0.006**</td>
</tr>
<tr>
<td>Nest-plant height (m)</td>
<td>7.2 ± 5.8</td>
<td>5.2 ± 3.3</td>
<td>0.006**</td>
</tr>
<tr>
<td>Diameter of nest plant at breast height (cm)</td>
<td>22.5 ± 38.9</td>
<td>8.5 ± 13.5</td>
<td>&lt; 0.001**</td>
</tr>
<tr>
<td>Distance from trunk or main stem (m)</td>
<td>0.9 ± 1.5</td>
<td>0.8 ± 2.2</td>
<td>0.9</td>
</tr>
<tr>
<td>Distance from water (m)</td>
<td>113.9 ± 177.8</td>
<td>67.1 ± 57.4</td>
<td>0.025*</td>
</tr>
<tr>
<td>Distance from edge (m)</td>
<td>4.7 ± 8.3</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

$^a$Levels of significance: *$P < 0.05$; **$P < 0.01$. 

to assess use of nest plants relative to their availability, but nesting Blue Grosbeaks did not seem to avoid saltcedar at any of the Rio Grande sites where it was dominant. Along the Rio Grande, we found the grosbeaks to nest not only in saltcedar-dominated vegetation but also to use saltcedar as the most frequent nest-supporting plant.

In riparian areas, Blue Grosbeak nests are typically found close to the ground (Bent 1968, Rosenberg et al. 1991, Averill 1996). Powell and Steidl (2000), however, showed that nests can also be built high in trees where the understory vegetation is sparse. Along both the Rio Grande and the Gila River, most nests were constructed at heights of ≤3 m above ground, many of them at heights of only 1 m or less. We also detected nests in trees, however, and as Powell and Steidl (2000) reported, they tended to be found where little to no understory vegetation was present. Along the Rio Grande, we found seven nests in cottonwoods. Of those, only four were at heights of ≥2 m, and these were at sites where the shrub layer had been cleared. Tree nests were particularly common along the Gila River, in boxelders and Arizona sycamores. As the main nesting substrate, boxelder substantially raised the mean height of Blue Grosbeak nests along the Gila River. If nests in boxelder are excluded, the mean heights of nests along the Rio Grande (2.24 m) and along the Gila River (2.07 m) were similar. Boxelder tends to cast considerable shade, and along the Gila River we found it in stands with few shrubs growing underneath its foliage. Paralleling our finding that Blue Grosbeak nests were significantly higher along the Gila River than along the Rio Grande, Stoleson and Finch (2003) reported that along the Gila River Southwestern Willow Flycatchers nested primarily in boxelder and at heights greater than reported for other populations of that bird.

Throughout much of its distribution, the Blue Grosbeak often nests along woodland edges adjacent to open areas (Ingold 1993), and an association between nests and wooded riparian edges has been noted in Arizona (e.g.,

### Table 3

<table>
<thead>
<tr>
<th>Observed Total Number of Blue Grosbeak Nests, Successful Nests, and Nests that Failed by Cause along the Middle Gila River (1997–2001) and the Middle Rio Grande (2000–2008), New Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observed number of nests</td>
</tr>
<tr>
<td>Number (%) of nests with known outcome</td>
</tr>
<tr>
<td>Observed number (%) of nests that succeeded</td>
</tr>
<tr>
<td>Observed number (%) of nests that failed</td>
</tr>
<tr>
<td>Observed number (%) of nests that failed because of predation</td>
</tr>
<tr>
<td>Observed number (%) of nests that failed because of cowbird parasitism</td>
</tr>
<tr>
<td>Observed number (%) of nests that failed because of weather</td>
</tr>
<tr>
<td>Observed number (%) of nests that failed from an undetermined cause</td>
</tr>
</tbody>
</table>
LaRue 2005) and in California (Gaines 1974, Riparian Habitat Joint Venture 2004). That association was also evident in both of our study areas. Along the Gila River, where we measured distances between nests and the nearest edges, that association was particularly pronounced. In contrast, close proximity to water did not characterize many of the nests along either the Gila River or the Rio Grande. This finding is congruent with that of other studies (e.g., Pequegnat 1951) showing that Blue Grosbeaks can nest in the absence of nearby water. We found the mean distance to water to be significantly higher along the Gila River, where the riparian zone tended to extend farther from the river channel and where most Blue Grosbeak nests were along the edges between the riparian forest and fields rather than along the edges between the riparian forest and river bank (Stoleson pers. obs.).

The differences between the Rio Grande and the Gila River we noted in the placement of Blue Grosbeak nests—in nest height, nest substrate, and distance from water—did not visibly translate into differences in nest success. Nest success was not significantly lower along the Rio Grande than along the Gila River despite the much greater representation of non-native plants in general and saltcedar in particular. Nesting in saltcedar was not associated with reproductive success lower than in other nests along the Rio Grande. Our study thus did not detect any direct harmful effect of saltcedar per se on the Blue Grosbeak’s nest success along the Rio Grande. This finding seems congruent with the fact that in terms of habitat quality, saltcedar cannot simply be dismissed as poor or unsuitable habitat. The quality of saltcedar as habitat for birds varies geographically; it is also better for some riparian species than for others (Sogge et al. 2008).

ACKNOWLEDGMENTS

We thank G. Bodner, K. Brodhead, P. Chan, J. Galloway, J. Garcia, B. Gibbons, J. Kelly, R. Hunt, M. Means, G. Sadoti, B. Trussel, H. Walker, H. Woodward, and numerous seasonal technicians for help recording nest and vegetation data. Access to study sites was provided by City of Albuquerque Open Space, the Middle Rio Grande Conservancy District, the U.S. Fish and Wildlife Service (Bosque del Apache National Wildlife Refuge), the Nature Conservancy, the Gila National Forest, Phelps Dodge Corporation, and the U Bar Ranch. Funding and additional support were provided by the Joint Fire Science Program, Ducks Unlimited, New Mexico State Parks, the U.S. Fish and Wildlife Service’s Bosque Improvement Initiative, the University of New Mexico, the U.S. Army Corps of Engineers, the Rocky Mountain Research Station’s Middle Rio Grande Ecosystem Management Group, the Gila National Forest, Phelps Dodge Corporation, the National Fish and Wildlife Foundation, and the Nature Conservancy. Special thanks also to Suzy Stephens, who drafted Figure 1, and to Steve Rothstein, Scott Durst, and two anonymous reviewers for their constructive and thoughtful comments on earlier drafts of the manuscript.

LITERATURE CITED


NESTING ECOLOGY AND NEST SUCCESS OF THE BLUE GROSBEAK


NESTING ECOLOGY AND NEST SUCCESS OF THE BLUE GROSBEAK


Accepted 5 October 2012
DISTRIBUTION AND MOVEMENT PATTERNS OF INDIVIDUAL CRESTED CARACARAS IN CALIFORNIA

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

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

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

The CBRC (2007) was initially reluctant to add the species to its list of California birds because of concerns that the 12 reports prior to 2000 may have represented escapees, but eight more records from 2001 to 2003, coinciding with a spate of records elsewhere in North America (Brinkley
and Lehman 2003), resulted in the addition of the Crested Caracara to California’s main list of naturally occurring species in 2004 (San Miguel and McGrath 2005) and acceptance of 49 records between September 1987 and October 2011 (Table 1). Of these 49, the CBRC concluded that 18 involved the same bird as in other records, resulting in 31 accepted individuals, but these decisions were haphazard, and a thorough vetting of this issue was needed (Pyle et al. 2011). We therefore assessed the date, location, age, molt status, and appearance of Crested Caracaras documented in California and found that these 49 accepted records could be confidently assigned to just 11 individuals. Our analysis not only resulted in a more conservative assessment of vagrancy to California, it greatly clarified the species’ patterns of occurrence and movement within the state.

METHODS

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

Age determination was based on a comparison of descriptions and photographs from each record to information presented in Pyle (2008). We categorize individuals as in their first cycle (fledging to beginning of second prebasic molt), second cycle (start of second to start of third prebasic molt), third cycle (start of third to start of fourth prebasic molt), or definitive cycle (individuals in definitive or “adult” plumage); we considered a bird’s age unknown when documentation was insufficient to determine its plumage cycle. In the first plumage cycle, Crested Caracaras are washed brown or buff overall, have pale streaks or tips to the upperpart feathers, lack distinct blackish bars on the nape and breast, and have thinner whitish rectrices that are more heavily barred brownish basally (Figure 3). During the first cycle most individuals undergo a limited preformative molt of scattered body feathers in their first winter and spring (Pyle 2005a), but this does not alter their appearance substantially. In definitive plumage, caracaras are blackish and white, lack pale streaks on the upperparts, have bold black and white bars on the nape and breast, and have broader rectrices with darker bars that diminish basally (Figure 3). In their second and third cycles the birds are variably intermediate in appearance between those in the first and...
Table 1  Records of the Crested Caracara in California between September 1987 and April 2012 Representing 12 Individuals

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

(continued)
Table 1  (Continued)

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

\(^{a}\)Identifying number of individual.  
\(^{b}\)1C, first cycle; 2C, second cycle; 3C, third cycle; DC, definitive cycle; U, unknown.
definitive cycles (Pyle 2008; Figure 3). Most in their second cycle but few in their third cycle, after completion of the third prebasic molt, are distinguishable from those in definitive plumage. The second, third, and definitive prebasic molts are complete; replacement of primaries and secondaries commences in the middle of each tract (at p4–p5 and s5, respectively), in western North America usually from February to April, and proceeds both distally and proximally from these molt centers until completed, usually from September to November (Pyle 2005b, 2008; Howell 2010). Within a cycle, the dark body feathering becomes increasingly bleached and brownish with wear in spring and summer, preceding replacement of body feathers from July through October.

RESULTS

We conclude that the most appropriate scenario accounting for the 60 caracara reports in California from September 1987 to October 2011 consists of 11 individuals, as outlined in Table 1 and accepted by the CBRC in January 2012 (Johnson et al. 2012). Clear patterns of vagrancy emerged when records were grouped according to this scenario. Eight of these 11 Crested Caracaras were first detected in their first or second cycle in the
fall and winter, and four of these were later detected in later plumages at expected ages in subsequent years, adding confidence to our determinations of age and individual status. Two were first detected in definitive plumage in the winter, and one bird was of uncertain age when first detected in spring. Under this scenario, six individuals remained in the state for periods ranging from 5 weeks to multiple years, including 11 years and counting in the case of one individual (ID #4; Table 1). This individual accounted for over half of all California reports as it traveled from Santa Barbara County in October 2001 to southern Oregon, back south to Marin and San Luis Obispo counties, then back north, finally settling in Del Norte County, California, from 2008 through 2012 (Figure 4). Most reports of adults, the age least expected to wander so far north naturally, pertained to birds (mainly ID #4) first detected in California in their first or second cycle, which then remained in the state to molt into definitive plumage (Table 1). Following the decision by the CBRC to accept 11 individuals, five additional records from December 2011 to April 2012 have been accepted which we conclude represent one additional individual (ID #12; Table 1, Figure 2).

At least six individuals (ID #1, 4, 9, 10, 11, and 12) moved north, usually
during their first or second years, after which some moved south in the fall and north in the spring, at times returning to the same location in successive years. For example, in the winter of 2005–2006 ID #4 returned to the same field, using the exact same perches in Santa Cruz County as it had used in September 2002 when it was in its second cycle (D. Suddjian pers. comm.). It also returned to or near other coastal locations in Marin, Sonoma, Mendocino, Humboldt, and Del Norte counties on different dates as it traveled up and down the coast. ID #10 tended to spend summer and fall in the same area of San Diego, disappeared in winter, perhaps to Mexico, and returned to the same spot in San Diego the following spring or summer. Similarly, along the south coast of Oregon an adult Crested Caracara was seen near Floras Lake on approximately the same date for three consecutive springs (Mlodinow et al. 2007), suggesting one bird retracing a similar route annually.

**DISCUSSION**

Our scenario greatly alters our interpretation of the patterns of occurrence and movement of the Crested Caracara in California, not only by reducing the total number of accepted individuals through April 2012 from 36 to 12, but by showing that most birds first arrive in California during their first or second fall or winter (as expected of wild vagrants) and subsequently may repeat their paths of migration. Three individuals were first detected in California in fall, eight during winter, and only one bird was first detected in remote Inyo County in spring; all birds previously thought to have shown
up in summer can be linked to previous arrivals. This is consistent with the caracara’s pattern of wandering elsewhere outside its core range (M.J. Iliff in litt.; see also Brinkley 2006, CBRC 2007). In Arizona, for example, its dispersal north and west of its breeding range during fall and winter has long been known (Phillips et al. 1964, Monson and Phillips 1981) and has increased notably in recent years (Stevenson and Rosenberg 2007, G. Rosenberg pers. comm.).

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

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

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

A: 2001 - 2003
- 28 Sep - 6 Nov 2002
- 16-27 Sep 2002
- 11-13 Aug 2002
- 09 Oct 2001; 24 Jan & 30 Apr 2002; 14-23 Jul 2002
- 05 May & 08 Aug 2002; 09 Dec 2002 - 05 Jan 2003
- 20 Oct 2001
- 04 Jul 2002

B: 2004 - 2006
- 13 Jun - 12 Jul 2005
- 19 Jul 2005
- 04 Sep 2004 – Jan 2005
- 02 May 2005
- 20-24 Aug 2004
- 16 Jul - 01 Aug 2004
- 03-07 May & 02-03 Aug 2005
- 01-02 Jun 2005

C: 2006 - 2012
- 31 Jan 2008 – May 2012+
- 23 Apr – 09 May 2006
- 17 - 20 Jun 2006
Under our scenario there are over 12 instances of 6 individuals moving substantial distances to the north, often in short periods of time (Figures 1, 2, 4); Pyle and Sullivan (2010) documented that ID #10 dispersed north well over 450 km in 25 days, including over 125 km covered within 24 hours (Table 1). ID #4 traveled extensively in California over 8 years, making one northward flight of over 800 km within 11 days in 2005 (Figure 4, Table 1). ID #12 traveled north at least 800 km in early 2012 (Figure 2). These movements provide additional evidence that these birds are naturally occurring vagrants arriving from Mexico or Arizona, having dispersed north or northwest into California before continuing moving in those directions. Even the relatively stationary bird in San Diego County (ID #9) could have first reached this locale through a significant northward dispersal in its first cycle. In addition, records from the northern tier of the United States and southern Canada represent distances of 3000 km or more from the species’ typical range. As many states in the intervening region across the continent have also documented the Crested Caracara, it seems reasonable to infer that some or most of these records represent genuine vagrants.

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

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

ACKNOWLEDGMENTS

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

LITERATURE CITED

DISTRIBUTION AND MOVEMENT PATTERNS OF CRESTED CARACARAS


Accepted 6 August 2012
CONSPECIFIC NEST AGGRESSION OF THE PACIFIC WREN ON VANCOUVER ISLAND, BRITISH COLUMBIA

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ABSTRACT: Five of the ten wren species in North America are known to destroy nests of conspecifics. These include the Cactus Wren (Campylorhynchus brunneicapillus), Bewick’s Wren (Thryomanes bewickii), Sedge Wren (Cistothorus platensis), Marsh Wren (Cistothorus palustris), and House Wren (Troglodytes aedon). However, none of the Winter Wren complex, recently split as the Winter Wren (Troglodytes hiemalis), Pacific Wren (T. pacificus), and Eurasian Wren (T. troglodytes), have been documented to do so in experiments or by observation of natural behavior. Here we present a detailed chronology of a nesting of the Pacific Wren—the first report of conspecific nest aggression in the Winter Wren complex. On 15 May 2011, in Victoria, British Columbia, Canada, a Pacific Wren approached another’s nest under video surveillance and removed two 9-day-old chicks. The nonparental adult returned to the nest, apparently attempting to kill and/or and remove the remaining two chicks, several times over 4.75 hours but was not successful. Although our findings are limited to a single event, they are consistent with those of other wrens.

Birds are known to destroy the nests and eggs or remove the young from nests of other species, as well as conspecifics, to reduce competition for nests, food, perches, and, in polygynous species, for the male’s parental care (Fox 1975, Verner 1975, Picman 1977a, Jones 1982). Within the order Passeriformes, members of the wren family (Troglodytidae) are particularly well known for nest destruction and infanticide. This behavior has been observed in both experimental and natural settings in the House Wren (Troglodytes aedon) (Pribil and Picman 1991), Marsh Wren (Cistothorus palustris) (Picman 1977a,b, Leonard and Picman 1987, Kroodsma and Verner 1997), Bewick’s Wren (Thryomanes bewickii) (Picman 1994), Cactus Wren (Campylorhynchus brunneicapillus) (Simons and Simons 1990), and Sedge Wren (Cistothorus platensis) (Picman and Picman 1980). Nest destruction has not been reported previously in the Winter Wren complex, recently split into three species, the Pacific Wren (Troglodytes pacificus), Winter Wren (T. hiemalis), and Eurasian Wren (T. troglodytes). Other North American wren species that have not been documented destroying nests are the Canyon Wren (Catherpes mexicanus), Carolina Wren (Thryothorus ludovicianus), and Rock Wren (Salpinctes obsoletus).

The Pacific Wren breeds in forests with dense undergrowth (Campbell et al. 1997), typically nesting in cavities built by other birds, crevices among the roots of upturned trees, and other spaces with relatively small entry holes. Occasionally, it builds its nest on ledges or in other more open areas (Campbell et al. 1997). Whatever the site, the construction is similar, resulting in an orb of grass and moss lined with plant down and fur. Hence the nature of the Pacific Wren’s nest sites has provided few opportunities for observation.

Here we describe in detail the first known instance of conspecific nest aggression in the Winter Wren complex.
STUDY AREA AND METHODS

On 1 April 2011, we observed the beginning of nest construction on a ledge in a carport adjacent to a riparian area within the Georgia Depression on southeastern Vancouver Island, British Columbia (48° 35′ 27″ N, 123° 25′ 38″ W, 60 m above sea level). The ledge was 2.9 m from the ground, and one to three Pacific Wrens had used it as a winter roost for at least 5 years. The area is a mix of suburban and rural housing, with typical lot sizes ranging from about 0.05 ha on one side of Graham Creek to 0.4–4 ha on the other. The creek is within undeveloped private property and a protected linear natural park a minimum of about 75 m wide, extending about 750 m along the creek in both directions from the nest. The riparian habitat consisted of a structurally and compositionally diverse mixed forest on the steep banks of the creek; the dominant species of trees included Douglas-fir (*Pseudotsuga menziesii*), Grand Fir (*Abies grandis*), Western Red Cedar (*Thuja plicata*), Red Alder (*Alnus rubra*), Big Leaf Maple (*Acer macrophyllum*), and Pacific Dogwood (*Cornus sericea*). A mixture of native and nonnative plants, including Sword Fern (*Polystichum munitum*), Indian Plum (*Oemleria cerasiformis*), Oregon Grape (*Mahonia aquifolium*), Vanilla Leaf (*Achlys* spp.), English Ivy (*Hedera helix*), and other herbs and forbs, contributed to a dense understory. The forest contained many downed trees with upturned roots and featured numerous natural cavities created by decay and primary cavity excavators such as woodpeckers, chickadees, and nuthatches. The Pacific Wren is a common year-round resident along this corridor.

Video and Audio Recording

We installed an Airlink 500W IP camera (Airlink101, Inc., Fremont, CA) 0.7 m from the nest, and the camera recorded video from a half hour before sunrise to approximately a half hour after sunset during nest building, courtship, egg laying, and rearing of the young (1 April–23 May 2011). The device recorded audio sporadically through the cycle. We reduced video recording during incubation, then resumed the pre-dawn to post-dusk schedule when the chicks hatched.

RESULTS

Nest Construction

The male (as determined by nest-building behavior) constructed the globular nest, apparently alone, for 7 days. During most of the construction, he was silent. As early as day 2, he produced vocalizations, including a chatter (http://youtu.be/z3dWt-6z5NU) that varied in syntax and quality from his typical song. He sang both adjacent to and from within the nest. When a female arrived, the male left the nest but could be heard chattering from nearby while the female inspected the nest. The number of females that visited the nest during this stage is unknown. During nest construction, visiting birds approached by flying to the wires at the same level as the nest or landed on the wooden siding of the house and approached the nest from below. On day
8 of construction, a female arrived at the partially completed nest carrying nest-lining material, indicating acceptance of the nest (Hejl et al. 2002). At this point, the nest was an open cup. When the female approached, the male left the nest but displayed nearby for about 1 minute. The female made two visits to the nest on this day with lining material, after which the male continued to work on the nest. Day 9 (9 April) was the last day that the male brought nesting material, but the female continued to line the nest and eventually to enclose the nest. The female first roosted in the nest on 14 April. During the night, she lost or plucked several feathers, some of which came out of the entry hole and rested on the outside of the nest. In the morning, the female retrieved the feathers and added them to the nest lining.

Egg Laying

Between 6:24 and 6:34 of 16, 17, and 18 April (4–16 minutes after sunrise), a presumed female arrived at the nest and stayed inside for approximately 30 to 60 minutes. A wren returned to the nest on the evenings of 18–22 April and stayed throughout the night but did not remain at the nest through the entire day. At night, it often ejected feathers through the nest opening. Each morning, the presumed female recovered the feathers and returned them to the nest. The length of time she stayed at the nest increased each day, from 28 minutes on 16 April to 5 hours and 7 minutes on 22 April. We checked the nest on 21 April, observing three eggs, after this, we left the nest undisturbed for the remainder of the cycle. Pacific Wrens are believed to lay an egg a day, although in Britain the Eurasian Wren may skip a day (Hejl et al. 2002). If the eggs were laid every 1 or 2 days, the earliest date for the first egg was April 16 (the date that behavior suggested the first egg was laid) and the latest April 19.

Incubation

The female began incubating on 23 April, before the clutch was complete. She was in the nest for a total of between 7 and 8 hours during the day and stayed on the nest through the night. During daylight hours, she left the nest frequently, typically after 11 to 33 minutes of incubating. Between 18 April and 24 May, the female roosted in the nest each night except for the night of 22 May. The male visited the nest periodically, displaying and singing during incubation.

While brooding the eggs, the female lost her tail and did not regrow it during the nestling period. The lack of a tail allowed us to distinguish the parental female from the other wrens seen at the nest.

Hatching and Rearing

All nestlings hatched in this final clutch of four eggs. The female began removing fecal sacs on 10 May.

In the Winter Wren complex, males generally feed nestlings less than the female does, although the male’s contribution increases as the nestlings age (Hejl et al. 2002). The male of this pair returned to visit the nest several times during incubation and nestling rearing, bringing food on only three occasions and successfully delivering it only twice, all on 11 May. The male
returned to the nest occasionally during the rearing period and could be observed looking into the nest. At no time did he attempt to enter the nest.

Veiga (1990) found that in the House Sparrow (*Passer domesticus*), bigamous males assist only the primary female in rearing of their young. The minimal paternal feeding of the young in the nest we video-recorded suggests that the parental male may have had another nest nearby.

Conspecific Nest Aggression

On 15 May, when the nestlings were 9 days old, they were attacked at length by a nonparental Pacific Wren. The three wrens visiting the nest could be distinguished by visible physical characteristics: the parental female had lost her tail and had no visible rectrices; the male had a normal tail; the intruding wren had a shortened fourth rectrix (R4) on the right side of the tail. Over 4.75 hours, the intruder attacked the nestlings seven times, the longest attack lasting 9 minutes. During the attacks, it removed two nestlings from the nest. There were several contacts between the intruder and the parental female during this period as well. The parental male was in the area and visited the nest on several occasions during and after the attacks. The chronology of the attacks was as follows:

6:19  A Pacific Wren other than the parents visited the nest. The parental female was at the nest feeding the young as the second bird approached. There was a physical altercation between the birds, after which both left the nest area.

6:24  The parental female returned with food and continued feeding the young.

6:28  The parental female returned with food but immediately left in the direction of the carport floor, possibly to chase the intruder.

6:31  The intruder returned to the nest. The young, sensing an adult at the nest, began begging for food. The intruder approached the nest opening slowly, then grabbed the nearest nestling with its foot, attempting to pull the chicks from the nest. The first nestling was able to retreat into the nest. The intruder then partially entered the nest, apparently pecking at the nestlings. Within 50 seconds, using its bill to grab the skin on the head of a nestling, the intruder was able to pull it through the opening (Figure 1). The nestling struggled and attempted to hang onto the nest with its feet as the adult pulled it away from the nest. Eventually, the nestling was supporting the full weight of the

![Figure 1. An intruding Pacific Wren successfully pulled a nestling from the nest by grasping the nestling’s skin in its bill.](image)
adult, clinging to the nest while the adult pulled away. After a few seconds, both dropped out of view of the camera. Video of this event can be viewed at http://youtu.be/tuHcGaa4FZ4.

6:37 The parental female returned to the nest without food and immediately left. She then quickly returned with food and began feeding the nestlings again every 3 to 5 minutes.

6:47 A Pacific Wren with an intact tail, presumably the parental male, visited the nest and looked inside. The parental female arrived while it was there and did not interact with the visitor, supporting the idea that this wren was the parental male, which then flew off while the female fed the young.

6:56 The intruder returned and entered the nest. Motion in the nest suggested that the adult was pecking the young. The parental female returned within 1 minute and fought with the intruder for 30 seconds before both fell out of view of the camera (Figure 2).

6:59 The intruder returned and began removing material from the top of the nest. When the parental female returned, the intruder chased her away (Figure 3).

7:01 The intruder returned, entered the nest, and attacked the young again for about 8 minutes. Nest lining material was ejected during this attack. The intruder left the nest at 7:09.

7:10 The parental female resumed feeding the young and retrieved the ejected nest lining material on subsequent visits.

7:48 The intruder returned, entered the nest again, and attacked the young.

7:50 When the parental female returned, the intruder again chased her away and immediately returned to the nest to continue the attack.

7:54 The intruder returned and removed a second nestling from the nest (Figure 4), then departed. We found the two removed nestlings dead on the ground, one immediately below the nest and the other about 1 meter away.

7:58 The parental female returned but left without feeding the remaining young.

8:01 The parental female returned with food. While the female removed a fecal sac, the intruder was approaching the nest.

8:04 The intruder entered the nest and attacked the young.

8:07 The parental female returned and was chased off by the intruder, which also left the area.

8:10 The parental female returned with food but left immediately in the direction of the carport floor, possibly to interact with the intruder.

Figure 2. The parental female (lower) pecked at the intruder’s wing when she found the intruder in the nest. The intruder and parent fought before leaving the view of the camera.
8:11 The intruder returned to the top of the nest. When the parental female arrived a few seconds later, the intruder once again chased her away and left the area.

8:14 The female returned, fed the young and settled into the nest for about 7 minutes, then resumed a schedule of feeding and brooding the young. She was absent from the nest for periods of up to 15 minutes.

8:41 A wren with a full tail, we presume the male, came to the nest, looked inside, and left.

9:12 The intruder returned to the nest and began a new attack, which continued uninterrupted for 9 minutes. Toward the end of this attack, the intruder began retrieving some of the nesting material that had been ejected and placed it in the nest. The intruder left at 9:21.

9:23 The parental female returned, fed the young and stayed on the nestlings for 6 minutes.

9:29 Normal parental care (feeding forays and brooding) by the female resumed over the next hour and a half, the female staying in the nest with the young for up to 10 minutes at a time. During this period, the female left the nest 15 times, returning 1.5 to 16 minutes after leaving.

10:56 The intruder returned. The parental female was in the nest and hunkered down over the remaining nestlings. The intruder left.

10:57 The intruder returned, started climbing around the outside of the nest, then departed.

11:00 The female left the nest and within a minute the intruder returned and entered the nest for a final brief attack of about 1 minute, then left.

11:04 The parental female returned with food.

11:22 The parental male came to the nest and looked into the opening before leaving.

11:43 The parental female came to the nest with food, but left without delivering it. She returned 2 minutes later and entered the nest with the food. Feeding by the female continued throughout the day, interspersed with periods in which she remained in the nest, brooding the two remaining nestlings.

18:22 The male visited the nest, looking into the entry hole at the young.
Fledging of Remaining Nestlings

The intruder made its final visit at 11:00 on 15 May. The nest was damaged during the attacks, with the entry hole significantly enlarged. There was no attempt by either parent to repair the nest. The parental female continued to attend to the remaining young, which successfully fledged on 23 May. The parental male visited the nest on several occasions between the attack and fledging. The parental female roosted in the nest on 23 May although there were no nestlings in it. The nestlings did not return.

Once the nest was empty, the male returned and renovated the nest, adding more material to the exterior, including repairing and building up the edge of the opening and partially obscuring it with moss and grasses. Although he courted from the nest for several days, he did not attract a female for a second brood.

We left the nest in place, and in early November two wrens began roosting on the top of it. They typically arrived within 1 minute of each other, sometimes virtually simultaneously. They used the site as a roost sporadically over the winter.

DISCUSSION

Using both video and audio recording devices, we have detailed conspecific aggression at a Pacific Wren nest on southern Vancouver Island, including the loss of two nestlings. Birds are known to destroy the eggs and nestlings of others, both heterospecific and conspecific. Infanticide by conspecific females is considered a form of resource competition (Hrdy 1979) or interference competition (Quinn and Holroyd 1989). The attackers do not typically receive nutrition from these attacks.

Good nest sites are critical for successful breeding. In polygynous species, secondary females may attempt to displace the primary female, or vice versa, through infanticide (Hansson et al. 1997, Veiga 1990). The displacement of competitors through such behavior may increase the aggressor’s access to parental investment by the male, food resources, and nest sites by causing the parental female to abandon the unsafe nest (Hansson et al. 1997). Polygynous males face a logical trade-off between a potential increase in reproductive output and exposure to nest failure through such nest destruction.

Within its range, the Pacific Wren is most abundant in western Washington and southwestern British Columbia. During the breeding season, coastal habitats adjacent to the Georgia Depression support the densest populations on Vancouver Island (Wolf and Howe 1990, Campbell et al. 1997). At our study site (~1.5 hectares), Pacific Wrens were abundant, with generally two, sometimes three, singing males defending adjacent territories. Habitat quality and the density of the local Pacific Wren population could influence both the mating system (i.e., polygyny) and level of competition for optimal nest sites and food resources. Although the Pacific Wren is usually monogamous, it may be polygynous in optimal habitats (Hejl et al. 2002). The scant attention the nestlings received from the parental male suggests that he probably had another nest nearby, possibly with the intruder.

Both population density and competition for resources can influence the prevalence of infanticide (Hrdy 1979). Freed (1987) found that Rufous-and-
White Wrens (*Thryophilus rufalbus*) remove nestlings from House Wren nests, and Alworth and Scheiber (1999) observed a female House Wren, in response to food shortage, usurp the territory of another House Wren during the nest-building stage. Food shortages can be caused by poor weather or by dense populations of birds competing for the same resources. Pacific Wrens forage on the forest floor, seeking food among leaf litter, decaying logs, and standing plants, and eat a wide variety of invertebrates including soft-bodied insects, insect larvae, and spiders (Hejl et al. 2002). At the nest we video-recorded, the female returned with food frequently, often several times within 5 minutes, suggesting that food was abundant in the area. We do not believe that the observed nest aggression was due to competition for food. As food was abundant, the need for additional support from the parental male also seems an unlikely reason for competition.

The Pacific Wren’s flexibility in using a variety of natural and artificial nest sites should reduce competition for suitable locations. Under normal environmental conditions, there should be multiple nest sites appropriate for the Pacific Wren in the observed male’s territory. The spring of 2011, however, was uncharacteristically cool and wet in Victoria. There were several extended periods of heavy rain. On the day of the nest attack, the area was receiving a downpour. The observed nest was inside a carport, sheltered from rain and wind. If the intruder’s nest had failed because of the weather or depredation, she may have been seeking a more protected and secure nest site. If she removed the young from the sheltered nest, the parental female might abandon the site, making it available for the intruder to use. In this case, though, only two of four young were removed, and the parental female retained the nest.

Although Pacific Wrens may rear more than one brood during a breeding season, neither the intruder nor the known parental female returned to use the subject nest after the two remaining young fledged. This could be because the parental female had lost young to an attacker, making it a higher-risk site for a second clutch. Interference competition may have successfully driven the parental female from the territory. Hejl et al. (2002) estimated renesting to begin within 4 to 6 days of a nest’s failing. Since a week had passed between the attack and the nest becoming available, the intruder may have already started another clutch, eliminating her interest in the site.

On the basis of this single observation we can only speculate about the factors responsible for the attacks, but they are consistent with those of other species—in this case, competition for an optimal nest site.

Video technology affords researchers the opportunity to observe behaviors that have previously been difficult to document. The use of non-invasive techniques such as video monitoring will likely continue to provide new insight into the behavior and life history of species that have previously been challenging to observe. The technology has its limitations, though, and it should be seen as an adjunct to, not a replacement for, more traditional observational methods.

LITERATURE CITED

Campbell, W. R., Dawe, N., McTaggart-Cowan, I., Cooper, J. M., Kaiser, G. W.,
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Accepted 4 July 2012
NOTES

FIRST RECORD OF A SURFBIRD IN THE HAWAIIAN ISLANDS

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On 9 April 2012, while I was monitoring Red-tailed Tropicbird (Phaethon rubricauda) nests on the cliffs near Halona Point along the southeastern coast of Oahu, Hawaii, a shorebird landed on a rocky ledge on the shoreline below me. The bird had a very distinctive tail pattern; the rectrices were bright white with broad black tips, which combined with other characters made it immediately obvious that it was a Surfbird (Aphriza virgata), a species not previously recorded in the Hawaiian Islands (Pyle and Pyle 2009). The bird was stocky, with short yellow legs and a short, thick (for a shorebird) bill that was orangish on the tomaiia and at the base of the mandible (Figure 1). The head, back, wings, and upper breast were mottled grayish brown, and the belly and lower breast were white with dark spots. It had a very prominent white wing stripe (Figure 2).

I observed the bird for about an hour, during which time it moved slowly along the shoreline to the east, foraging intermittently for small invertebrates, primarily mollusks, on the rocks and in small tide pools. It was not wary and allowed me to photograph it within about 8 m. The photographs show feathers on the back, breast, and wing coverts of mixed ages. Most feathers were of the formative or basic plumages, being plainer gray and having a narrow white fringe, but some of the scapulars were newer feathers of the alternate plumage, having a black center and a broader white fringe (Figure 1A). In addition, some of the wing coverts were much more worn and more brownish than others and probably were juvenile feathers (Figure 1B), indicating the bird was in its first spring (O’Brien et al. 2006, Pyle 2008). The distribution of alternate and juvenile feathers was asymmetrical; the right side of the bird contained more alternate scapulars (Figure 1A), and the left side had more juvenile wing coverts (Figure 1B). First-year shorebirds often undergo only a partial pre-alternate molt and do not make the northward migration, remaining on the wintering grounds during the breeding season (Johnson 1977, Johnson and Johnson 1983).

The Surfbird was seen again by others and me on 10 different days between 7 April and 10 July, always within the same 300-m length of shoreline. It apparently moved over a much larger area, however, as it was not detected in this area on several occasions, and on three occasions I saw it flying to or from the west, once beyond Koko Head, a distance of 1.5 km. The bird sometimes was seen in the company of several Ruddy Turnstones (Arenaria interpres), one or two Pacific Golden-Plovers (Pluvialis fulva), and a Wandering Tattler (Tringa incana).

An obvious question regarding this record is where the bird came from. The Surfbird nests in Alaska and the Yukon and winters on mostly rocky shorelines from southern Alaska to southern Chile (Senner and McCaffery 1997, O’Brien et al. 2006). During the nonbreeding season it is very rare away from the Pacific coast of the Americas but recorded far outside its usual range, as evidenced by spring records from interior California, coastal Texas, Alberta, and Pennsylvania (Hayman et al. 1986, Senner and McCaffery 1997, Davis 2012).

I had been visiting the area about once a week starting in late January to monitor tropicbird nests (VanderWerf and Young 2007), but I did not see the Surfbird before 9 April. Although the timing of the initial observation is consistent with the timing of the species’ northbound migration (Senner and McCaffery 1997), it seems unlikely that a bird of any age would leave a nonbreeding site on the mainland and fly a minimum of 3600 km to an island far from any known migration corridor. I think a more
Figure 1. First-year Surfbird near Halona Point, Oahu, Hawaii. The feathers are of mixed ages, including many formative feathers (plain gray with narrow white fringe), some first-alternate scapulars (black center with broader white fringe), and a few very worn, more brownish juvenal wing coverts. The alternate scapulars were more prevalent on the bird’s right side (A, white arrows, 9 April 2012), but the left side contained more juvenal wing coverts (B, white arrows, 13 May 2012).

Photos by Eric VanderWerf
parsimonious explanation for the bird’s occurrence in Hawaii is that it came from the breeding grounds the previous summer or autumn and was simply overlooked until I saw it in April. A regular migratory pathway from Alaska to the Hawaiian Islands and beyond is facilitated in the autumn by favorable atmospheric patterns, and these tail winds are used by several shorebirds breeding in the Arctic, such as the Wandering Tattler, Bristle-thighed Curlew (Numenius tahitiensis), and Bar-tailed Godwit (Limosa lapponica; Gill et al. 2008), which occasionally are accompanied by vagrant species (Pyle and Pyle 2009). Furthermore, the bird was not observed for a 60-day period from 13 May to 10 July either, and, given the steep cliffs and high waves that make shoreline access difficult along much of the southeastern coast of Oahu (Figure 3), it easily could have been overlooked during the winter.

I thank Peter Pyle for assistance in determining the bird’s plumage and age, Lance Tanino, Mike Ord, Peter Donaldson, Kurt Pohlman, David Kuhn, and Satoko Lincoln for providing information about their observations of the bird, Mike Lohr for bringing my camera on short notice, and Bob Gill, Peter Pyle, and Jack J. Withrow for comments on the manuscript.

LITERATURE CITED

Figure 3. Surfbird (in center foreground) near Halona Point, Oahu, Hawai'i, on 10 April 2012. Though far outside the Surfbird’s usual winter range, the rocky volcanic shoreline of southeastern Oahu provides foraging habitat not unlike that found along parts of the Pacific coast of North and South America.

*Photo by Eric VanderWerf*
COMMUNITY NESTING HABITATS AND WEIGHS AT FLEDGING OF WEDGE-TAILED SHEARWATERS ON TERN ISLAND, HAWAII

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The Wedge-tailed Shearwater (Puffinus pacificus) is a common seabird in the Hawaiian Islands, breeding from Kure Atoll in the northwest to offshore islets near Maui in the south (Richardson 1957, Harrison 1990, Whittow 1997, Spear and Ainley 1999, Pyle and Pyle 2009). The highest concentration of breeding Wedge-tailed Shearwaters is in the northwestern Hawaiian Islands, where Pyle and Pyle (2009) estimated over 228,000 pairs. The largest colonies are on Laysan (150,000 pairs), Nihoa (35,000 pairs), and Lisianski (20,000 pairs) (Harrison 1990, USFWS 2005, Pyle and Pyle 2009). In the southeastern Hawaiian Islands, the population of the Wedge-tailed Shearwater has been estimated at roughly 67,000 pairs, with the largest colonies on O‘ahu (30,550 pairs) and Ni‘ihau (25,000 pairs) (VanderWerf et al. 2007, Pyle and Pyle 2009). The goals of our study were to estimate the number of Wedge-tailed Shearwaters fledging in 2010 on Tern Island, the main island in the atoll of French Frigate Shoals, in the northwestern Hawaiian Islands, to identify common nesting habitats in relation to vegetation cover and soil type, and to investigate differences between natural and artificial nests in fledglings’ weight and date of fledging.

For one month (18 October–18 November 2010) we searched the entire island for chicks, checking every bush, burrow, building, pipe, and debris pile, and banding each chick with a uniquely numbered U.S. Geological Survey metal band. Additionally, we recorded information on nest type, soil type, and vegetation cover over the nest at time of capture. We categorized nests as natural burrows, natural ground nests, nest boxes/huts, other artificial sites, or unknown (Figures 1 and 2). Natural burrows consisted of burrows dug by Wedge-tailed Shearwaters in a natural setting without support or cover by man-made structures. Natural ground nests consisted of eggs laid on the bare ground, often under vegetation, without support or cover by man-made structures. Nest boxes/huts were man-made structures built for nesting of burrowing seabirds. Other artificial nests consisted of burrows or ground nests with support or cover by man-made structures. This category includes nests inside or under buildings, pipes, debris, or sidewalks. The category of “unknown” encompasses nests whose location could not be determined because the chick had become mobile and left its nest. Using stratified random sampling, we weighed 40 chicks (10 from each nest type) three times per week with a 1000-gram Pesola scale and monitored them for survival to assess differences in fledglings’ weight and departure date by nest type. We tested for statistical differences (α = 0.05) between nest types with a Mann–Whitney pairwise comparison in the program PAST, version 2.17b (Hammer et al. 2001).

We banded 410 chicks in 2010 and found only two banded chicks dead before fledging, representing an estimated maximum number of 408 chicks fledged. This is 259 chicks fewer than in 2009 (667 chicks) and the lowest number of fledglings since 2005 (364 chicks) (USFWS unpublished data). Since 1990, however, the
Figure 1. Common types of Wedge-tailed Shearwater nests on Tern Island. A, natural burrow; B, natural ground nest.
Figure 2. Common types of Wedge-tailed Shearwater nests on Tern Island. A, nest box/hut; B, artificial nest.
Wedge-tailed Shearwater population on Tern Island has increased slowly but steadily (USFWS unpublished data). As on most other islands where Wedge-tailed Shearwater nesting has been studied (Gallagher 1960, Shallenberger 1973, Byrd 1979, Byrd et al. 1983, Harrison 1990, Sievert 1996), the most common nest type on Tern Island was naturally dug burrows, which accounted for 62.0% \((n = 254)\) of all nests. This type was followed by artificial nests at 23.2% \((n = 95)\), natural ground nests at 7.1% \((n = 29)\), unknown nest sites at 4.9% \((n = 20)\), and artificial nest boxes at 2.9% \((n = 12)\). Humus was the most common soil type for natural burrow and ground nests, accounting for 85.9% \((n = 243)\) of all nests. Other soil types in which the shearwaters nested were fine sand and rock at 13.1% \((n = 37)\), all small rock at 0.7% \((n = 2)\), and sand at 0.4% \((n = 1)\). Although we took no standardized measurements, burrows dug in sand were apparently deeper than those in humus. No vegetation cover was the most common cover type for natural burrow and ground nests, accounting for 38.9% \((n = 110)\) of all nests, followed by Tree Heliotrope \((Heliotropium foertherianum)\) at 35.3% \((n = 100)\), Lepturus \((Lepturus repens)\) at 21.6% \((n = 61)\), native goosefoot \((Chenopodium sp.)\) at 2.12% \((n = 6)\), dead logs at 1.41% \((n = 4)\), and and Morning Glory \((Ipomoea pes-caprae)\) at 0.71% \((n = 2)\).

We found no significant differences by nest type in weight at initial banding, fledging, or maximum weight achieved (Mann–Whitney pairwise comparison, \(P > 0.05;\) Figure 3). But natural burrows and artificial nests differed in the chicks’ date of fledging and minimum recorded weights. Chicks in artificial nests fledged significantly later and had lower minimum recorded weights than those in natural burrows (Figure 3). Fledgling success was 100% from all types of nests except natural ground nests, from which we recovered two dead chicks before fledging (Table 1).

Proper conservation of burrow locations is essential for the long-term conservation of breeding colonies of the Wedge-tailed Shearwater, as most birds return to their natal island to breed and reuse burrows for nesting (Munro 1967, Shallenberger 1973). On Mānana island, off O‘ahu, out of 32 Wedge-tailed Shearwaters banded by Shallenberger (1973), 14 returned to the same burrow the following year to nest, 11 were in burrows less than 3 meters away, and 6 nested on the surface close to their burrow from the previous year. As we noted, ground nesting can be problematic for Wedge-tailed Shearwaters, as ground nests were the only nest type at which we found dead chicks. In another study on Tern Island, Sievert (1999) found ground-nesting Wedge-tailed Shearwaters to have a success rate of only 2% because they were more exposed to a hot microclimate than were chicks in shaded burrows. Exposure to the tropical sun on Tern Island increases incubating adults’ stress from heat and water loss, making the adult more likely to abandon the egg during the day (Howell and Bartholomew 1961, Sievert 1996).

For conservation of the Wedge-tailed Shearwater on Tern Island, we recommend maintenance of existing nesting burrows and locations. Efforts should focus on conservation of areas with humus soil type and revegetation of bare areas with Tree Heliotrope and Lepturus. Conserving and restoring nesting habitat for the Wedge-tailed Shearwater may in turn help conservation efforts for the Tristram’s Storm-Petrel \((Oceanodroma tristrami;\) McClelland et al. 2008), a near-threatened \((BirdLife International 2008)\) species of conservation concern \((USFWS 2002)\), by reducing burrow-nesting seabirds’ competition for nest sites \((McClelland et al. 2008)\).

This study was made possible by funding from the U.S. Fish and Wildlife Service. We especially thank Keith Burnett, Patricia Jackson, Dan Rapp, Sarah Youngren, and all other Tern Island biologists who helped record data for this study. The findings and conclusions in this article are those of the authors and do not necessarily represent the views of URS, the University of California, San Diego, or the U.S. Fish and Wildlife Service.
Figure 3. Comparison by nest type of weights and dates of departure of Wedge-tailed Shearwater fledglings on Tern Island, French Frigate Shoals, 2010. NB, natural burrows; NG, natural ground nests; ANB, artificial nest boxes; AN, artificial nests. Asterisks indicate a significant difference between means of fledglings in artificial nests and natural burrows (Mann–Whitney pairwise comparison, \( P = 0.037 \)) and in date of fledging (Mann–Whitney pairwise comparison, \( P = 0.037 \)).

LITERATURE CITED


### Table 1
Weights and Dates of Departure of Wedge-tailed Shearwater Fledglings on Tern Island, French Frigate Shoals, 2010

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SAS Institute, Inc. 2001. JMPIN, version 4.0.4. SAS Institute, Inc., Cary, NC.


Accepted 9 November 2012
NOTES

AN APPARENT LONG-DISTANCE FLIGHT BY A DUSKY GROUSE IN MONTANA

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Two closely related species (previously regarded as several subspecies of the Blue Grouse, see Zwickel and Bendell 2005) constitute the genus *Dendragapus*, the Dusky Grouse (*D. obscurus*) of inland mountains and the Sooty Grouse (*D. fuliginosus*) of coastal mountains. The ability of these birds to fly long distances is poorly known because observations of such behavior are at best serendipitous. In eastern Oregon, Anthony (1903) witnessed flights of both adult and immature Dusky Grouse from a mountain ridge to a nearby mountain slope and estimated the distance at “fully a mile and a half” (2.4 km). He noted that the flights were of “gradually descending” trajectory and seldom sustained enough “to carry the birds to the top” of the mountain to which they were flying even though the latter was 400 feet lower than the ridge. In coastal British Columbia, Zwickel and Bendell (2004, 2005) concluded that level flight in excess of approximately 2 km was unlikely for the Sooty Grouse because “few islands more than approximately 2 km from a source population are inhabited.” Furthermore, these authors described an instance “in which a hen that flew out over a lake came down in the water after approximately 150 m.” To our

Figure 1. The probable path of a Dusky Grouse flying across the Gallatin River Canyon. Assuming relatively level flight, the bird likely launched somewhere near point A, elevation 2288 m. It then passed point B (where we were standing, elevation 2303 m) and continued onward for an uncertain distance. The upper portion of the figure shows topography between points A and B, with vertical lines at intervals of 0.5 km.
knowledge, there are no additional reports concerning the ability of either species to fly significant distances. Here, we describe the flight of a Dusky Grouse that appeared to be substantially longer than these previous estimates.

Our observation was made on the morning of 18 September 2008 from the crest of an unforested ridge in Gallatin County, southwestern Montana (Figure 1). The ridge is situated above the canyon of the Gallatin River, and the elevation at the river’s level is approximately 1642 m. Weather conditions at the time provided unlimited visibility under full sun, and there was no wind. Initially, we noticed an unidentified bird flying toward us from the west in apparent sustained level flight. When first seen the bird was at a distance of about 2 km and on a plane essentially even with our elevation. We assumed it was a raptor, but as the bird got closer the flap-and-glide flight pattern of a grouse became apparent. When the grouse neared us, it flared, gained a few meters of altitude, passed over the ridge on which we were standing, and began a downslope glide out of sight to the northeast. Given that long ascending flight by this species is very unlikely (Caswell 1954, Zwickel and Bendell 2004, 2005, pers. obs.), the point from which the bird launched was presumably at a relatively high elevation on the west side of the canyon. Thus the shortest possible distance for a level flight across the canyon at our elevation was approximately 4.6 km (Figure 1). The bird’s path may have been along a gradual descent. If so, the grouse would have taken flight from a higher elevation, and the distance traversed would then exceed 5 km.

Our observation suggests that Dusky Grouse are capable of longer sustained flights than previously thought. Notably, flights of ≥10 km are relatively common among the near relatives of this species, the Sharp-tailed Grouse (*Tympanuchus phasianellus*; Connelly et al. 1998), Greater Prairie-Chicken (*Tympanuchus cupido*; Johnson et al. 2011), and Greater Sage-Grouse (*Centrocercus urophasianus*; Schroeder et al. 1999). It seems likely that flights such as the one we describe played a role in the Dusky Grouse’s colonization of isolated mountain ranges such as the Big Snowy and Judith Mountains in central Montana.

We thank Oscar W. Johnson for his extensive review and assistance with text and graphics. Fred Zwickel and James Nygard offered helpful comments preparatory to the writing of this paper. We are grateful to reviewers Michael Schroeder and Daniel D. Gibson for constructive suggestions that improved the manuscript.

LITERATURE CITED


Accepted 15 October 2012
NOTES

MELANISTIC ADULT MALE NORTHERN HARRIER WINTERING IN IDAHO

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Melanism (dark coloration) is a condition resulting from a greater than normal expression of the eumelanin pigments in the plumage (Gill 1990). The dark coloration can be advantageous to raptors by increasing the feathers’ resistance to bacterial degradation (Goldstein et al. 2004). Conversely, abnormally dark pigmentation can reduce success in pairing by disguising key species-identification cues (Garcia 2003) and decrease lifetime reproductive success by increasing mortality (Krüger and Lindström 2001).

Polymorphism in color, of which melanism is one example, occurs in at least 3.5% of avian species worldwide and in 22% of raptors of the family Accipitridae (harriers, hawks, eagles, kites, and Old World vultures; Galeotti et al. 2003). Galeotti et al. (2003) reported that polymorphism is more prevalent in species that are terrestrial, occupy diverse habitats, carnivorous, active day and night, or nomadic, suggesting that polymorphisms are under selective pressure.

Mundy et al. (2004) traced melanism in the Parasitic Jaeger (Stercorarius parasiticus) and Snow Goose (Chen caerulescens) to mutations within the melanocortin-1 receptor (MC1R) gene, finding the degree of melanism is correlated with the number of copies of the mutated allele. Manceau et al. (2010) illustrated how convergent phenotypes, such as those due to melanism, can arise via different mechanisms even in closely related species. It would therefore be unwise to assume melanism occurs the same way in all raptors, even though the selective pressures may be similar.

We report a new observation of a melanistic Northern Harrier (Circus cyaneus hudsonius) in southwest Idaho. While surveying for raptors from a vehicle we observed a melanistic adult male Northern Harrier (Figure 1) on 9 January 2012 at 13:23 at approximately 43.358° N, 116.314° W, along the boundary of the Morley Nelson Snake River Birds of Prey National Conservation Area and the U.S. National Guard’s Orchard Training Area. The bird was perched on the ground in a dense stand of Big Sagebrush (Artemisia tridentata; >25% ground cover) approximately 5 m west of the road. As our vehicle approached, the bird flushed from the ground and flew west approximately 100 m to land once again within dense sagebrush. The bird lacked the distinctive white rump patch expected on all age and sex classes of this species (Figure 1; Smith et al. 2011). For definitive identification and photographs we approached the bird again.

We observed the low, buoyant flight style and strong dihedral expected for this species (Clark and Wheeler 2001). Characteristics identifying the bird as an adult male included black wing tips, dark trailing edge to the wing, and a black-tipped tail (Clark

Figure 1. Melanistic adult male Northern Harrier in southwestern Idaho, 9 January 2012.

Photos by Robert A. Miller
and Wheeler 2001). The bird had a yellow iris, characteristic of an adult (Hamerstrom 1968 via Smith et al. 2011).

Simmons (2000) reported melanism in at least eight of the world’s 16 species of harriers, including the Northern Harrier and its Old World representative, the Hen Harrier (C. c. cyaneus). However, the distribution of melanistic harriers is generally localized and often near the edge of the species’ natural range (Simmons 2000).

We are aware of three previous reports of melanistic Northern Harriers: an adult male in California (Howell et al. 1992), an adult female in Montana (Olson and Osborn 2000), and a juvenile male in Utah (Liguori 2009). Most likely, the bird we observed had developed a new mutation within the MC1R gene or related pathway, resulting in its unique plumage (Mundy et al. 2004). Alternatively, genes for melanism may be maintained within a small fraction of the western population of the Northern Harrier, consistent with the three previous observations. The bird might even have been a long-distance vagrant from a population where melanism is more prevalent, though no such population is known.

This observation was made while we were working on a project supported by a Bureau of Land Management Challenge Cost Share Award, the Boise State Raptor Research Center, the Great Basin Landscape Conservation Cooperative, and a Graduate Science, Technology, Engineering, and Mathematics Fellows in K–12 Education Fellowship from the National Science Foundation to Paprocki (DGE-0742554). We thank J. Holderman and K. Warner for logistical support and J. Heath and B. Clark for comments on the manuscript.

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Accepted 18 September 2012

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IN MEMORIAM

GALE MONSON, 1912–2012

For many western ornithologists the most prominent event of 2012 was not the centennial celebrations of the statehood of Arizona and New Mexico. It was the passing of Gale Monson, who would have celebrated his centennial year on 1 August 2012. The patriarch of Arizona ornithology died peacefully on 19 February 2012 in Albuquerque with one of his daughters and his caregiver at his side.

In addition to the 1964 classic *The Birds of Arizona*, which he co-authored with Allan Phillips and Joe Marshall, and the 1981 *Annotated Checklist of the Birds of Arizona*, co-authored with Allan, Gale’s written contributions number about 192 articles, mostly on birds, but a significant number also on another animal on which he was an authority, the desert bighorn sheep. But the written word was only part of his legacy, and perhaps not his greatest contribution.

From his home state of North Dakota with a B.S. in biology he came to Arizona in July of 1934 for his first professional job, surveying ranges for grazing on the Papago (Tohono O’odham) Indian Reservation for the U.S. Bureau of Indian Affairs. After that stint he worked for the U.S. Soil Conservation Service, surveying wildlife around Arizona until hiring on with the U.S. Fish and Wildlife Service in 1940. Between then and 1946 he spent half his time managing wildlife refuges in Arizona and New Mexico and the other half in the U.S. Army, receiving a Bronze Star in 1945 for service in Kunming, China.

From 1946 to 1962 Gale managed four national wildlife refuges in southwestern Arizona: Havasu, Kofa, Cabeza Prieta, and Imperial. During his last seven years of federal service he was in Washington, D.C., working on issues affecting refuges. After his retirement from the U.S. Fish and Wildlife Service in October 1969 he and his wife, Sally, moved to Tucson.

Settling in Tucson afforded Gale an opportunity to use his professional skills along with his gentle and giving nature for the good of the wildlife of Arizona, as well as for all the people fortunate enough to cross his path. Gale’s knowledge of Arizona’s wildlife was frequently tapped by local conservation leaders seeking his expertise for their causes and by local amateur naturalists who just liked getting out with him.

Gale’s life spanned an important period in Arizona ornithology. Fortunately, his constitution was a wonderful match for the age. His science acumen was shaped to a large degree by his youthful days immersed in the nature of his family farm in North Dakota. This experience set in him a tone of reverence for nature that was evident when he stepped afield, and likely rivaled that of John Muir. In his early teens he was influenced by a traditional field ecologist, O. A. Stevens, and later by the developing science of wildlife management and Aldo Leopold. These inspirations along with his
intellect and work ethic made him an outstanding naturalist who observed and recorded with accuracy and detail the natural world around him.

During his later years Gale witnessed a dramatic increase in public interest in birds, from casual birdwatchers to budding scientists wanting to dig deeper into birds’ lives and habits. A deluge of numerous unknown individuals reporting species in new places had Gale scrambling to ensure that the integrity of Arizona’s avian records was not being compromised. In time he embraced this new guild of birder, but it was not without very close scrutiny and frequent expressions of doubt. But in the end it was his ability to share nature with others and to be open to new possibilities that bridged the generations of ornithologists.

Gale’s retirement job as weekend supervisor at the Arizona-Sonora Desert Museum afforded many people a chance encounter with this friendly distinguished gentleman. I was the recipient of one of these happenstances in February 1973 after trapping and returning an Aplomado Falcon that had been stolen from the museum. I will always remember the unselfish interest he took in my studies of raptors, helping me secure funds from Tucson Audubon Society with a personal visit to the home of Edward Chalif, then president of the society. That first encounter with Gale was the beginning of three decades of field adventures, phone conversations, and letters…my relationship with the mentor of a lifetime!

I learned so much about Gale from reading his journals—not, unfortunately, until last August, after his passing. They document 70 years of his life, from age 12 through 92. He wrote in books of various shapes and sizes, a literature that took up six feet of bookshelf and weighs 178 pounds (yes, I weighed the totality). Although not part of Gale’s 192 scientific publications, they offer a unique glimpse of the origins and maturity of a man…a carefree boy, a student and career man, a father and husband…the span of an incredible life. The entire collection of Gale’s journals is now housed at the Special Collections Library, University of Arizona.

The centennial birthday party last August so many of us were anticipating was not meant to be, so on 18 March 2012 about 100 friends and family gathered in Tucson to share memories. Since there was not enough time for all attendees to share their tales about Gale, Bill Broyles and I decided to gather the stories into a book.1 The 243-page volume is a collection of stories from 50 contributors about one of the most intriguing and influential naturalists of our time.

This past fall I found myself wondering about Gale’s greatest contribution. After reviewing his personal journals, reading all the stories about Gale in the lives of others for the book, remembering the times we walked in nature together and talked about birds and life…after all this, I am left with the clear notion that his written scientific contributions are dwarfed by his wonderful ability to see a bigger picture, to embrace the human lives around him, to share his natural world, and in doing so spawn a legion of associates who carry on with the elements of life that fascinated him. He was the model mentor.

Richard L. Glinski

1Counting Birds with Gale Monson by Bill Broyles and Richard L. Glinski is available from the Arizona Field Ornithologists; please visit their website (www.AZFO.org) or contact Janet Wittzman (jlwittzman@aol.com). 100% of the money raised by the sale of this book goes to the Gale Monson Research Grant fund established by Arizona Field Ornithologists to assist studies of Arizona’s avifauna.
BOOK REVIEW


The latest addition to the Peterson Field Guides series, The Young Birder’s Guide to Birds of North America is written especially for children 8–12 years old. In many ways it is a simplified field guide, aiming to ease kids into birding without overwhelming them. The real success of this book, however, is in Thompson’s light-hearted writing style, which kids will find fun, engaging, and full of tidbits of information. The value of this book is not as much to help aspiring young birders become great at bird identification but to ignite a spark of interest in birds and bird watching.

The original version of this book was published in 2008 and limited in scope to eastern North America. For this version, 100 species from western North America were simply added to give it a broader geographic range. I wonder why the publisher chose to create a guide to all of North America rather than creating a new regional guide for western North America. However, given that this is meant as a first field guide for kids, the important birds to cover are those most likely to be seen in backyards, towns, and local parks. Considering this book covers only 300 species, this is achieved remarkably well.

The Young Birder’s Guide is dense with information, with a full page for each species (with the exception of a handful of similar, closely related species that share a page) arranged in taxonomic order. This layout, combined with the lack of a “quick index” page pointing to the major groups of birds, will likely make it difficult for the user to find and identify an unknown bird. Still, each page is attractive and fun to read. Every species account includes one or two photographs, which are generally well chosen. An exception is the photograph for the female Costa’s Hummingbird (p. 178), which shows a female Anna’s Hummingbird. Line drawings by Julie Zickefoose and Michael DiGiorgio are beautiful, fun to look at, and often informative. The best parts of the species accounts are the “Wow!” inserts, containing some random tidbit of information about each species. Some of them are just for laughs; for example, the insert for the Cinnamon Teal (p. 61) informs the reader that the spice does not, in fact, come from ground-up ducks. Most, however, are informative and fascinating.

The range maps used are the standard Peterson maps, which are fundamentally flawed in that they do not show range during migration.

Most young readers, like most adult field-guide users, will skip right to the species accounts and begin flipping through the pages. One hopes, however, that the young birder whose interest has been sparked by the species accounts will eventually turn to the 38 pages of introductory material. These sections are filled with great tips on getting started, how to look at a bird, how to use binoculars, how to get involved, etc. The back content is useful as well, including a resources page, a very nice glossary, and an index.

In order to field-test this guide with its intended audience, I lent it to a small sample of kids. The group of 5- to 7-year-olds, not surprisingly, flipped through looking at the pictures and happily pointed out the birds they knew. I also handed it to a group around 11–13 years old, none of whom had shown the least interest in nature, and they used it in a surprising way. They hardly seemed to notice the photograph but flipped through, reading the captions for the line drawings and the little “Wow!” blurbs. I could see a new world opened to those kids, and they were excited to learn about something completely different. One girl spent about 20 minutes going through the book page by page, enthralled, and remaining oblivious when her friends moved on to other topics of conversation.
BOOK REVIEW

This, then, is the strength of this book. Thompson’s fun writing style, great pictures, and interesting facts are all perfectly tailored to get kids interested in birds. This is a book for kids who have never thought to look at birds and kids who are just getting started in birding. Once the beginner gets a little more advanced, and starts to wonder why he or she can’t identify all the birds in the neighborhood by using this book, then it’s time to move on to another field guide. By then, it will have accomplished exactly what it aimed to do: create a new birder.

Lauren Harter

THANK YOU TO OUR SUPPORTERS

The board of Western Field Ornithologists and the editorial team of *Western Birds* thank the following generous contributors who gave to WFO’s publication, scholarship, and general funds in 2011. The generosity of our members in sustaining WFO is an inspiration to us all.

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WFO PRESIDENT’S MESSAGE: STATE OF THE ORGANIZATION

The beginning of my term seems an ideal time to report on the overall health of WFO and on our plans for the future.

During the past year, WFO’s board of directors commissioned an independent review of our finances and also took a close look at how well we are positioned to meet our primary goal of promoting field ornithology throughout our region. As part of that process, we spent an entire day prior to the Petaluma conference reviewing the status of the organization and beginning work on long-term and short-term plans. The key conclusions from the financial review and our planning session:

1. WFO’s financial health is good. We have adequate cash on hand, and our finances are well managed.
2. While our annual membership dues cover the costs of publishing Western Birds, we depend on income from annual conferences, special field trips, and donations to cover the rest of the organization’s expenses.
3. Our membership level is stable, but we feel we are reaching only a small fraction of the people whose interests should make them ideal WFO members.
4. We should do more to promote Western Birds as a unique and welcoming outlet for publications on field ornithology.
5. To adapt to the digital era, we ought to offer electronic (in addition to physical) versions of our publications (e.g., Western Birds, Rare Birds of California).

Over the course of the year I will share with you the specific actions WFO will take to address these issues.

As one example of the changes we are making, we decided to reward our members by giving them first access to spots on our special field trips and early registration for our annual conferences. The most popular workshops and field trips at our recent conferences filled in the first few weeks of registration, and our special field trips to Cuba (2010 and 2013) and to the south-central Sierra Nevada (2011) filled within days. From now on, WFO members will get early access to all such events. Life members and patrons will be able to register one week in advance of other WFO members, and other WFO members will be able to register one week in advance of the general public. Of course, this early access is dependent on our having current email addresses for members. If you are not sure we have your current email address, please send it to me (erpfromca@aol.com).

We are also looking at a number of ways to reach out to people who would benefit from joining WFO but may not know about us. That’s where all of you can help. Send me your ideas about reaching these potential members. Best of all, take the time to tell your friends and acquaintances about us. When I meet people I think might be interested in WFO, I give them my 30-second “elevator speech,” the gist of which is that WFO is for scientists with an interest in birding or field ornithology, and for birders with an interest in the science of birds.

I look forward to the coming year and hope to see many of you at our next annual conference (Olympia, Washington, 22–25 August).

Ed Pandolfino
On 3 January 2009, at Russian Gulch State Park in Mendocino County, California, LeValley encountered a female Hairy Woodpecker (Picoides villosus) with yellow outer rectrices. He and others hypothesized that the bird had acquired the yellow adventitiously through staining. Yet on 1 November 2010, LeValley was surprised to find what appeared to be a different female Hairy Woodpecker with yellow outer tail feathers at Little River, approximately 6.5 km south of the previous sighting. This bird remained in the area for much of the winter and was photographed in November 2010 and January 2011 (upper photo on this issue’s inside back cover). On 25 December 2011, a male Hairy Woodpecker with yellow outer tail feathers was photographed at the same location.

When LeValley spread the word about these birds he received reports of a number of other sightings in Mendocino County. John Sterling had seen a bird matching this description at MacKerricher State Park on 18 March 2010. Becky Bowen observed a pair of Hairy Woodpeckers, both showing yellow outer tail feathers, along a trail between Highway 101 and Virgin Creek Beach on 2 January 2011. LeValley photographed the male on 2 January 2011 (lower photo on this issue’s back cover), and multiple observers reported seeing it and/or the female on various dates through 2012. Other reports came from the Navarro River estuary, where Tim Bray photographed a male near a nest cavity on 19 April 2011 and Matt Coleman photographed a female on 28 April 2011. LeValley received reports from other coastal counties in California as well. Sean Brophy photographed a yellow-tailed male in Carlotta, Humboldt County, on 26 December 2010; Beth and Tom Hamel found another, a female that had been present at least since 12 March 2011 (J. Morlan pers. comm.), at Golden Gate Park, San Francisco, on 26 December 2012 (photo on this issue’s outside back cover); Steve Shunk photographed one at Point Lobos State Park, Monterey County, on 8 January 2009. Preceding these birds by nearly a decade was a pair with yellow outer tail feathers at Mountain Lake, San Francisco, on 9 July 2000 (Andrew Rush; J. Morlan pers. comm.).

LeValley also received photos of yellow-tailed Hairy Woodpeckers from outside of California. Sandy Shanks photographed one in Port Townsend, Washington, on 2 November 2012, and Shirley Powell photographed a juvenile at Kawortha Lakes in Ontario, Canada, on 27 July 2012. A yellow-tailed male had reportedly visited the feeder for years and was accompanied by the juvenile during the summer of 2012.

Hairy Woodpeckers with yellow outer rectrices apparently have not been reported in the literature previously (Jackson et al. 2002, Pyle 1997). Birds with yellow instead of red crowns occur from time to time (Putnam 1998), and exposure to tannins, soot, or pitch can stain the white feathers of the Hairy Woodpecker brown (Jackson et al. 2002). The subjects of our paper, however, with the exception of one individual (back cover), exhibited yellow only on the outer tail feathers. The confinement of yellow to the outer tail feathers and the apparent persistence of this plumage pattern from year to year suggest the aberration results not from staining but from carotenism.
Carotenism is an environmental or genetic disorder affecting the normal expression of carotenoid pigments (red, yellow, and orange) in the integument of birds and other animals. The environmentally induced form in birds results from the intake or lack thereof of certain carotenoid-containing foods just prior to or during molt. It affects only birds normally pigmented with carotenoids. Carotenism can result from (1) a change in the normal distribution or extent of carotenoid pigments, (2) an increase or decrease in carotenoid concentration, (3) a change in type of carotenoid pigment, or (4) the total absence of carotenoids (Davis 2007). Abnormal yellow coloration has also been called xanthochroism, xanthochromism, xanthism, and flavism. Although those terms indicate yellow coloration, they obscure the mechanism responsible for the abnormality. That is, abnormal yellow coloration often results not from a change in carotenoids but from the absence of dark melanin, which reveals the presence of carotenoid pigmentation (Harrison 1966, Hailman 1984). The absence of melanin, however, is more aptly termed amelanism (Davis 2007).

A review of the literature and unpublished photos suggests that carotenism most commonly involves a change in the expression of carotenoid pigment type, whereby one color replaces another. Examples include yellow instead of red hind crowns in the Hairy Woodpecker (Putnam 1998), orange instead of yellow tail tips in the Cedar Waxwing (*Bombycilla cedrorum*; Mulvihill et al. 1992), orange instead of yellow lores in the White-throated Sparrow (*Zonotrichia albicollis*; Brooks 1994), red instead of orange plumage in the Baltimore Oriole (*Icterus galbula*; Flinn et al. 2007), and yellow instead of red plumage in the Northern Cardinal (*Cardinalis cardinalis*; McGraw et al. 2003). In the Cedar Waxwing, White-throated Sparrow, and Baltimore Oriole, the anomalies have been shown or suggested to result from environmental factors alone, through consumption of rhodoxathin-containing honeysuckle fruit just prior to and during molt. The aberration in the Northern Cardinal, however, is thought to result from a genetic mutation that disrupts the normal metabolic pathway for carotenoid expression. Genetic mutation would seem a reasonable explanation for the yellow instead of red hind crown in the Hairy Woodpecker as well.

Expression of carotenoid-based colors where none are normally present is less common. Examples include pink flushes in the plumage of the Ring-billed Gull (*Larus delawarensis*; Hardy 2003), yellow or orange-buff underparts in the White-throated Sparrow (Brooks 1994), and red underparts and rump in the Rose-breasted Grosbeak (*Pheucticus ludovicianus*; Pittaway and Iron 2006). Hairy Woodpeckers with yellow outer tail feathers would fall into this category. This plumage anomaly involves both a change in the normal distribution of carotenoid pigments (from hind crown alone to hind crown and tail feathers) and a change in carotenoid pigment type (from red pigments alone to red and yellow pigments). That the yellow is restricted to the outer tail feathers, which don’t normally show carotenoid-based color, suggests a genetic mutation is likely responsible for this pattern. Likewise, that the plumage pattern seems to persist in individuals for years also implies the aberration results from a mutation rather than from an effect of diet prior to and during molt. We know of no other case involving manifestation of two carotenistic effects presumably triggered by a genetic mutation. Furthermore, most cases involving a change in carotenoid pigment type result in a change in color in normally carotenoid-colored areas. This case, however, resulted in a new color in a normally uncolored area.

The yellow-tailed Hairy Woodpeckers from coastal northern California could conceivably be attributable to a single mutant parent and its mutant progeny. However, the birds from Washington and Ontario suggest this genetic anomaly can arise independently. More information is needed to evaluate the cause, heritability, and persistence of this fascinating coloration. Please send reports and photos of such birds to the authors.

We thank Joseph Morlan and Steve Shunk for comments on a draft of this note.
LITERATURE CITED


Wing your way to...

OLYMPIA, WASHINGTON

22–25 AUGUST 2013


This conference will feature workshops on fall warblers (Jon Dunn and Kimball Garrett), sapsuckers (Steve Shunk), gull identification (Mike Donahue), dragonfly identification (Dennis Paulson), wilderness first aid (Heath Wakelee), and eBird (Brian Sullivan). John Marzluff will give the keynote talk on corvids. Two afternoon science sessions will begin with a plenary talk by Dennis Paulson. And, of course, we will offer a full set of field trips (including pelagics) and both photo and bird-sounds sessions.

Registration will open in early May; please watch www.westernfieldornithologists.org/conference.php for more details. Join us in Olympia!
Female yellow-tailed Hairy Woodpecker (*Picoides villosus*) at Little River Headlands, Mendocino County, California, 1 November 2010.

Photo by Ron LeValley

Male yellow-tailed Hairy Woodpecker (*Picoides villosus*) at MacKerricher State Park, Mendocino County, California, 2 January 2011. Note the presence of the normally colored hind crown.

Photo by Ron LeValley