

# C.F.O. Journal

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Cover Drawing. Solitary Vireo by Beth Lapin.

Beth is a CFO member, and is the zoologist for the Colorado Natural Heritage Inventory in Denver. Her illustrations have also appeared in Amphibians and Reptiles in Colorado and Threatened and Endangered Plants of Colorado.

DISTRIBUTION AND NESTING REQUIREMENTS OF MONTANE  
FOREST OWLS IN COLORADOPart IV: Spotted Owl (STRIX OCCIDENTALIS)

By Bruce Webb

5657 Cazadero Way, Sacramento, CA 95822

In the summary provided by Bailey and Niedrach (1965) the Spotted Owl reports are widely distributed. Many of these reports are near major cities and towns. The only Colorado report involving young owls was 1 September 1942 when Gadd (1942) reported two young birds on display in a roadside zoo at Hartsel, Park County. Historical records of Spotted Owls are summarized in Figure 1.

Historically there were four Colorado reports of Spotted Owls during the May through August breeding season which had locations described specifically enough to attempt followup. The Colorado Bird Distribution Latilong Study (Kingery and Graul, 1978) lists Spotted Owl as rare and accidental in northern latilong blocks 4, 10 and 12. This reflects the fact that in the previous 15 years there were only reports from northern Colorado, and no reports from the southern portion of the state. Personnel at Mesa Verde National Park list the Spotted Owl as a permanent resident of the park's canyon country without citing specific records.

Survey and nesting results

I surveyed suitable habitat in the area around Hartsel several times without success. Aside from this early report, no nests or young have been found in Colorado. At each of the possible breeding localities I surveyed intensively on foot using the standard night survey method (Forsman, 1976; Gould, 1974). Additionally, I conducted daylight searches to look for possible roost sites in locations with canyon walls. In each of these historical localities no Spotted Owls were found during the 1978 and 1979 survey seasons.

At Mesa Verde National Park in late June and early July 1978, my daylight and night survey did not reveal any Spotted Owls. However, during resurvey work on 18-19 May 1979, I heard two different Spotted Owls calling. The first, I heard distantly calling from within the Navajo Canyon while I played taped calls from Navajo Canyon overlook. My initial impression was that the owl was slowly moving in my direction from a point near the junction of Navajo Canyon and Spruce Tree Canyon. The series of events on evening of 18 May are as follows: Sunset occurred at 2015 hours. At 2020 several species of birds completed their dusk singing. At 2036 three Poor-wills (Phalaenoptilus nuttallii) were calling continuously. At 2049 a distant Spotted Owl called twice giving four hoot series. Finally between 2115 and 2332 I made visual contact using a flashlight. Several times I observed the owl as close as 6 m. It perched on the sandstone canyon rimrocks as well as on pinyon and juniper snags.

From Navajo Canyon, I immediately drove to Cliff Canyon, which is

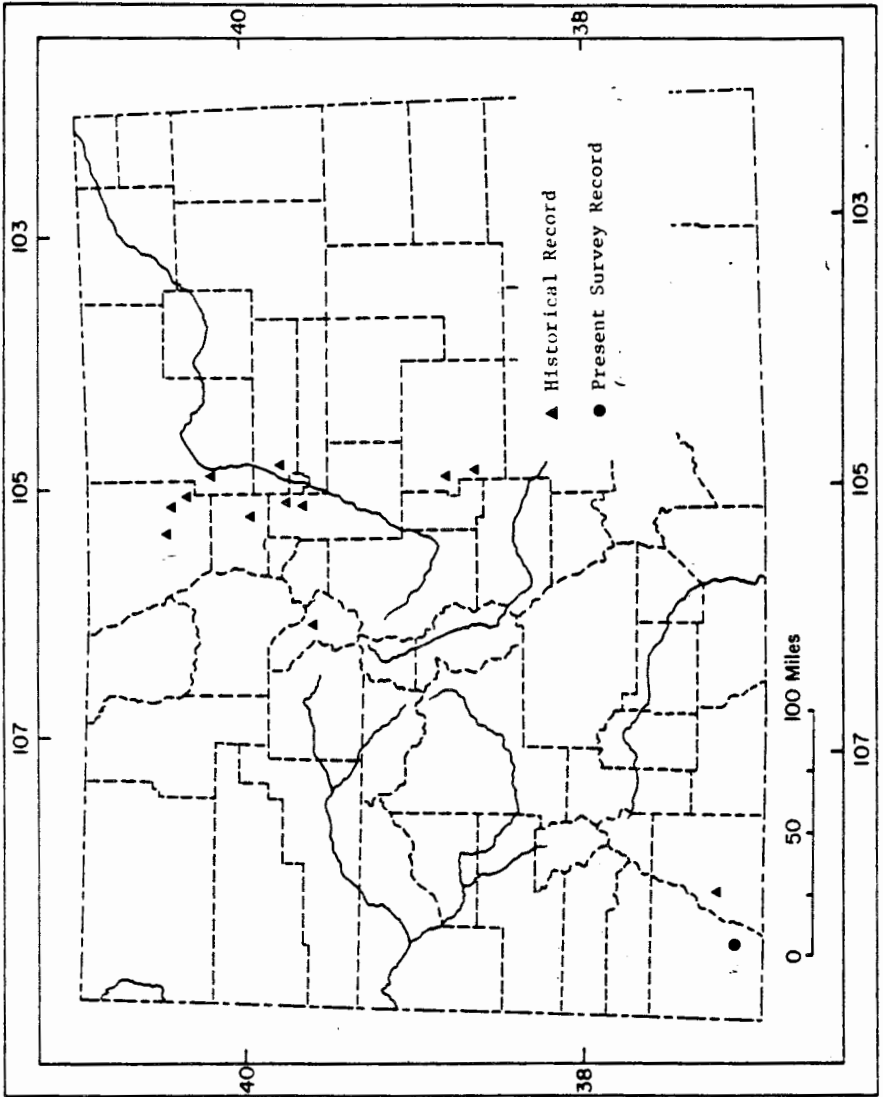


Figure 1. Historical and present survey distributional records of spotted owl in Colorado.

2 km by straight line distances across a pinyon-juniper mesa. Here I found another Spotted Owl calling the moment I got out of my vehicle. Initially it was giving a five hoot series of calls from the vicinity of House of Many Windows Ruins Overlook. Later it flew across a 0.5 km expanse of pinyon-juniper habitat to resume calling in the vicinity of Balcony House ruin. Still later it flew south toward the widest expanse of Cliff Canyon. There within 300-400 m of the calling Spotted Owl was a calling Great Horned Owl.

On 11 June I returned to Mesa Verde National Park and positioned myself at Cliff Canyon View Point. On this occasion, I did not play tapes in order to hear if and when the Spotted Owl would call spontaneously. By 2100 hours the sky was becoming quite dark. At 2205 the moon rose. At 2300 the Spotted Owl first started calling spontaneously and continued intermittently until 0211 on 12 June.

On the evening of 12 June I surveyed in the Park at Rock Canyon adjacent to Weatherhill Mesa. No Spotted Owls were heard in this Canyon.

At dawn on the morning of 19 May, my vocal imitation of the Spotted Owl's calls elicited a response from a Spotted Owl which was at its day roost in the east-facing wall of Cliff Canyon. On 14 June, most of the day was spent descending the canyon and attempting to approach the roost site. The sandstone cliff walls in the area of the roost were too unsafe to climb. The area below the roost was devoid of any evidence of owl nesting such as prey carcass fragments, white defecation stains or regurgitated pellets.

The steep-walled, narrow canyon and mesa habitat typical of the park is restricted in distribution to portions of western Colorado. I identified and surveyed several areas topographically similar to Mesa Verde for Spotted Owls. These areas include: Colorado National Monument in March 1978 and June 1979; Unawep Canyon from Whitewater to Uravan in March 1978; Golden Gate Canyon on 13 June; Black Canyon of the Gunnison Rim and East Portal on 10 and 18 June 1978; Escalante Canyon on 9 June 1979; Curecanti Needle overlook of Blue Mesa Reservoir on 17 July 1979; by boat up the Gunnison River from Morrow Point on 18 July 1979; East Portal on 18 July 1979; and Loughill Mesa west of Ridgway on 19 July 1979.

Four supplemental Spotted Owl reports which were received in response to my requests for information lacked convincing or substantiating identification details. I surveyed the area in the vicinity of Difficult Campground, southeast of Aspen, Pitkin County on 4 June 1979. Because the habitat was a mixture of spruce-fir and aspen groves near a willow (*Salix* sp.) lined river bottom, I felt that it was unlikely breeding habitat for Spotted Owls.

I surveyed the area in the vicinity of Ridgway, Ouray County, near Loughill Mesa on 19 July 1979, after interviewing the reporter who claimed to hear a Spotted Owl near his home. The habitat in the vicinity consisted of some pinyon-juniper woodland and one prominent

mesa, but no canyons. Although the habitat appeared marginally suitable for Spotted Owls, the conditions under which the owl was heard were very poor.

Two additional reports were received too late to personally followup. The report from near Tennessee Pass, Lake County, was of a bird distantly observed and heard. However, it was not described with sufficient detail to rule out misidentification with Great Horned Owl. The report from near Yeoman Park Campground, Eagle County, was by an observer unfamiliar with the calls of Great Horned Owl.

### Discussion

At Canyonlands National Monument in eastern Utah, the Spotted Owl is found as a permanent resident in the moist cool canyon bottoms (T.C. Wylie, pers. comm.). This type of mesa and canyon habitat is restricted in distribution to parts of western and southwestern Colorado. Colorado National Monument and Mesa Verde National Park, in particular, are topographically similar to Canyonlands. Even within this seemingly suitable habitat, Spotted Owls were rare. It is likely that a greater understanding of Spotted Owl requirements could come from studying this subspecies in parts of its range where it is more common, such as Arizona, New Mexico or Utah.

Most canyons surveyed provided numerous encounters with the ubiquitous Great Horned Owl, but no Spotted Owls. Marshall (1942) felt that the possible absence of Great Horned Owl favored the occurrence of Spotted Owl, for he had never heard or seen the two together. In Mesa Verde, I heard both Great Horned and Spotted Owls calling simultaneously.

This race of Spotted Owl (*Strix occidentalis lucida*) generally is associated with the presence of woodrats (*Neotoma spp.*). Pellet analyses in New Mexico, Arizona and Utah have shown these to be the primary prey species (Ligon 1926; Marshall 1942; Kertell 1977). In Colorado, there are several woodrat species found in the southwestern and montane regions (Armstrong 1972). During daylight surveys through Queen's Canyon and adjacent Williams Canyon, woodrat workings were common on the rock faces.

The apparent absence of Spotted Owls in these known historical localities, in conjunction with several out-of-habitat instances of wandering Spotted Owls, led to the suspicion that the Spotted Owl may not be a permanent resident in parts of its Colorado range. Wandering by young Spotted Owls in autumn in California (Gould 1977) and Oregon (Forsman et al. 1977) is known. Such vagrancy presumably could be responsible for the widespread distribution and establishment of territories in marginal habitat in part of its range. In Colorado the vagrancy pattern seems to indicate that winter and spring are the periods of wandering. This pattern is more typical of birds which are known to leave their preferred breeding habitat to spend winter further south (i.e., migratory summer residents). This is not to suggest that all Colorado Spotted Owls leave in winter. Those found

in the cliff canyon habitat such as Mesa Verde probably are permanent residents. Canyon habitats along the Colorado Front Range, which provided many of the earlier reports, yet were surveyed in this study without success, may not support Spotted Owls in all years. Colorado is at the northern range limit of Strix occidentalis lucida (A.O.U. Checklist 1957). Habitat requirements become marginal at some point along the range limits. Thus, wandering by vagrant Spotted Owls in Colorado may be indicative of the subspecies at the northern part of its range.

Radio-telemetry studies could prove fruitful in documenting small versus large scale movements of individual Spotted Owls. Any easily capturable vagrants such as the bird at Rocky Mountain Arsenal in June 1975 should be captured and monitored with a radio transmitter. Efforts such as this will be the only way to determine the resident versus migratory status of Spotted Owl populations in Colorado. Also, radio-telemetry could be used on Spotted Owls at Mesa Verde National Park to determine habitat utilization patterns such as canyon bottoms versus pinyon-juniper mesas and also provide information on overlap between Spotted and Great Horned Owls.

#### Protocol for locating diurnal roost/nest sites of Spotted Owls

This technique is based serendipitously on the behavioral response of one Spotted Owl found at Mesa Verde National Park. Assuming that other Spotted Owls would respond in a similar manner, this protocol should enable an observer to pinpoint a roost, or possibly a nest site in difficult canyon terrain.

1. When an owl's presence is established, as by nocturnal surveying, the actual roost site and potential proximity to a nest can be determined by calling to or playing tapes of Spotted Owl calls at dawn through early morning hours.
2. After prolonged playing of prerecorded calls the Mesa Verde Spotted Owl began calling vigorously in response from its protected roost site in a cavern on the east-facing wall of Navajo Canyon. Because I was positioned 400-500 m across the Canyon, the exact spot was impossible to approach or locate by calls alone.
3. By continuing this elicitation for approximately 30 minutes of tape playing, various passerines, such as Scrub Jays (Aphelocoma coerulescens) and Ash-throated Flycatchers (Myiarchus cinerascens), in the vicinity of the owl became highly agitated. They swarmed in front of the roost hole in the distant cliff face; thus pinpointing the exact spot.
4. It is generally assumed that the male Spotted Owl roosts in close proximity to the incubating female (Ligon 1926). This territorial response elicited at dawn might enable investigators to locate nest sites of this typically nocturnal species during daylight hours.



## ACKNOWLEDGEMENT

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SPOTTED OWL: Sketch by Tim Manolis of Sacramento.

## SEASONAL REPORT--SPRING 1982 (MARCH 1 - MAY 31)

by Barry G. Knapp

4695 Osage Drive, Boulder, CO 80303

This report follows the tri-partite scheme suggested by Robert Andrews in his Spring 1980 report, and adhered to by the seasonal report compilers since then.

If it is the compiler's privilege to muse about how the CFO should use the mass of raw data which is available to us for these reports, then I shall now exercise that privilege: It occurs to me that the second part of this report may not be necessary or useful. Why should we continue to publish data for patterns of occurrence that are already "sufficiently well-established"? This is the kind of data which is ideally suited to computer analysis. It cries to be amassed in a large computer data base, so that sophisticated statistical analyses may be made of it. It is impossible for a human being to perform these analyses while scanning down a page of admittedly highly selected and abbreviated observations. So why publish it? Parts I and III are certainly interesting and humanly useful, but I have my doubts about Part II.

Part I

Summary of possibly new extreme arrival and departure dates. (Lane and Holt, 1979, A Birder's Guide to Eastern Colorado; Halsey, 1981, "New extreme dates for Lane and Holt's Book," CFOJ, Vol. 15, No. 3, pp. 72-74.)

<u>Species (County)</u>	<u>Date of Observation</u>	<u>Previous Extreme Date</u>	<u>Average Date</u>
<u>Arrivals</u>			
Northern Phalarope (Boulder)	21 March	5 May	13 May
Williamson's Sapsucker (Jefferson)	14 March	24 March	9 April
Tree Swallow (Jefferson/Douglas)	13 March	31 March	12 April
Grace's Warbler (Pueblo)	17 April	no data	no data
Green-tailed Towhee (Baca)	24 March	23 April	29 April
Chestnut-collared Longspur (Yuma)	20 March	6 April	9 April
<u>Departures</u>			
Whistling Swan (Park)	15 April	13 April	1 April
Glaucous Gull (Arapahoe)	2 May	no data	no data

Part II

Species whose pattern of occurrence is sufficiently well established that attention to individual reports is unwarranted.

Species	Total Birds	Dates	County or Location
Little Blue Heron	1	15 May	El Paso
Cattle Egret	26	22 Apr.-May	Denver, Greeley
Ross' Goose	1	10-18 Apr.	El Paso
Mississippi Kite	1	23 May	Ft. Collins
Broad-winged Hawk	13	15-25 May	Front Range Corridor
Osprey	8	15 Apr.-June	Craig; Front Range
Peregrine Falcon	9	17 Apr.-15 May	So. Park; Frt. Rnge.
Whooping Crane	13	20 Mar.-10 Apr.	Monte Vista NWR
American Golden Plover	1	1 May	Prospect Res.
Ruddy Turnstone	2 (more?)	4 May-15 May	E. Colorado
Whimbrel	23	2 May-21 May	E. Colorado
Knot	3	15 May- "late May"	Longmont, Pueblo
Dunlin	no data	15 May-17 May	Longmont
Black-necked Stilt	12	1 May-25 May	N. Park to Cheraw
Cassin's Kingbird	2	25 May	Grand Junction
Scissor-tailed Flycatcher	1	16 May	Chatfield SP
Eastern Phoebe	1	3-5 May	Bonny Res.
Least Flycatcher	1	26 April	Fort Morgan
Wood Thrush	1	1 May	Barr Lake SP
Veery	23	20 May-1 June	E. Colorado
Black-and White Warbler	3	1-15 May	Boulder
Worm-eating Warbler	1 or 2	6-24 May	Boulder
Nashville Warbler	9	8-18 May	Front Range; Bonny kes.
Northern Parula Warbler	5	18 Apr.-28 May	Front Range
Magnolia Warbler	5	15 May-31 May	Front Range
Black-throated Blue Warbler	5	9 May-31 May	Winter Park; Front Range
Townsend's Warbler	6	30 Apr.-15 May	Front Range
Blackburnian Warbler	1	28-30 May	Boulder
Chestnut-sided Warbler	2	9-22 May	Boulder, Loveland
Bay-breasted Warbler	1	29-30 May	Boulder
Blackpoll Warbler	7	14-23 May	Boulder; Bonny Res.
Palm Warbler	2	1-15 May	Denver
Hooded Warbler	2	9-15 May	Boulder, Denver
Bobolink	25	10-16 May	Mountains; Plains
Scarlet Tanager	1	21 May	Wheatridge
Summer Tanager	2	15-17 May	Aurora; Ft. Morgan

Part II (cont'd)

Species	Total Birds	Dates	County or Location
Dickcissel†	1	2 May	Boulder
White-winged Crossbill	3+	17 Apr., ??	Boulder (mts.)
Grasshopper Sparrow	2	22 Apr., 9 May	Morgan, Crowley
Sage Sparrow	1	4 May	Delta
White-throated Sparrow	1	3-5 May	Bonny Res.
Fox Sparrow	2	8-18 May	Routt, Summit

†Indicates an extra-limital observation, where the species is relatively more common in another part of the state.

Part III

Observations warranting individual discussion, or constituting possible latilong status changes. Many of these reports have been received second- and third-hand, and it is to be expected that some errors of details, mistaken reports, or even mistaken identifications have been perpetuated here; one purpose of this section is to call attention to reports which bear further investigation.

Red-necked Grebe - 1 winter plumage, 10 April at Big Johnson Res., El Paso Co., latilong 19 (RB).

Western Grebe (white-faced race) - 2 pr., 6-10 April, Big Johnson Res., El Paso Co. (RB); 1 pr., 17 April, CFI Lakes, Pueblo Co. (RB); 1 pr., 17 April, Minnequa Res., Pueblo, Co. (?) (RB).

Ross' Goose - 1, 9-20 April, Durango (KS). First record in Durango latilong.

Greater Scaup - 1, 19 March, Campion, Larimer, or Weld Co. (DB, DF). FAC reports this as a first latilong record, though the Ft. Collins latilong has it as M; perhaps the sighting was in the Greeley latilong, which would be a first. Also reported at Broomfield, 21 March (WB) and Chatfield, 25 March (FJJ). Perhaps Denver latilong should be changed from A to M.

Northern Goshawk - 1, 24-25 March, Cottonwood Canyon, Baca Co. (RB et al.). First record for latilong 27 (Springfield).

Black Rail - 1, 9 April and subs., Fort Collins Gravel Pits, Larimer Co. (DP).

Pectoral Sandpiper - 2, 3-5 May, Cheraw (SL). This report of a regular migrant included only because the American Birds regional editor (HK) received no Spring 1982 reports of this species.

White-rumped Sandpiper - 14, 24 May at Chatfield, Jefferson/Douglas Co. (WB); and an unreported number at CFI Lakes, Pueblo Co., "late May" (DG). Infrequently reported.

Hudsonian Godwit - Two different birds sighted at different locations on the same day, 1 May; Cherry Creek Res., Arap. Co. (TM), and Lake Meredith, Crowley Co. (RB et al.), the latter a first latilong record (Las Animas). The date might be early, too.

Part III (cont'd)

Laughing Gull - 1, 15-16 May, Chatfield SP, Jefferson/Douglas Co. (FJJ et al.); 5, 22 May, Boulder Res., Boulder Co. (JH et al.).

Common Tern - 2, 6 May, Hart's Basin, Montrose Co. (MJ). First report in latilong 16 (Montrose).

Flammulated Owl - 1 calling, "end of May", Todd's Gulch (Larimer Co.?) (KC, fide KR).

Boreal Owl - 4 territorial males, 12 February-late March, Cameron Pass, Larimer Co. (KR, DP).

Whip-poor-will - 1, 13 May, Hannah Ranch, El Paso Co. (JRW). A daytime discovery, observation well-described, but call not heard.

Eastern Wood Pewee - 3 well-described observations of individual birds (all calling): 3 May, Drake, Larimer Co (SL); 12 May, Lake Henry, Crowley Co (VT) - new to latilong 20; and 20 May, Loveland, Larimer Co. (DB, UF).

Vermilion Flycatcher - no fewer than four sightings of this species which bred for the first time in Colorado in 1981: 9 April, Commanche National Grasslands, Las Animas Co. (DB, DF) - first report in latilong 27; 25 April, John Martin Res., Bent Co. (MJS) - first record for latilong 20; 2-3 May, Alamosa NWK, Alamosa Co. (JK); and "April or May," Pueblo Res., Pueblo Co. (DS).

Blue Jay x Steller's Jay - one of these was again reported from the Grand Lake area (BP, "2 or 3 times in March", fide WJ). It may be meet to note a report, 31 May and into June, of a Blue Jay at an elevation of 8900 feet in a lodgepole pine situation, Coal Creek Canyon, Jefferson Co. (PH).

White-necked Raven - 2, 25 May, Alamosa (SL) - first record in latilong 25.

Varied Thrush - 1, 15 May, Chasteen's Grove, Loveland, Larimer Co. (CC et al.).

Philadelphia Vireo - 1, 13-16 May, Myron Stratton home, Colorado Springs (RB) - first record in latilong 19.

Golden-winged Warbler - 1 female, 11-15 May, CU Campus, Boulder (TMs, BK, SL, many observers); 1 male, 19 May, CU Campus, Boulder, (TMs, MM); 1 male, 19 May, Lakewood (JJC); 1 male singing, west Boulder, 24 May (SW). A banner year!

Blue-winged Warbler - 1, 23 May, Gregory Canyon, Boulder (KH, PO, Ch); 1, 28 May, west Boulder (SW).

Grace's Warbler - 3, 17 April (early), Rye, Pueblo Co. (Rb et al.).

Mourning Warbler - 1 male, 28-30 May, CU Campus, Boulder (SL, TMs, MM, PO, etc.). Well observed, for this elusive species.

Canada Warbler - 1 male, 20 May, CU Campus, Boulder (SL, DL).

Painted Redstart - 1, 29 May, Pawnee National Grassland, Weld Co. (PB). The report is believable, but lacks key details. This would be the first record for the Greeley latilong.

Scott's Oriole - 1 adult male, 15-16 May, Cheyenne Canyon, Colorado Springs (AD et al., photographs) - first record in latilong 19. Several more likely breeding pairs were discovered in the Grand Junction area in late May (RF, RL, DFO); the summer 1982 seasonal report should have more information on these.

Great-tailed Grackle - This evidently expanding species showed up in some new areas in the spring of 1982: Hanna Ranch near Fountain,

Part III (cont'd)

El Paso Co (RB, JRW) 13 May into June, possibly 5 different birds, breeding - change latilong 19 to 6; Pagosa Springs (MJ) 18 April; Durango (DBC) 22 May; and Del Norte (SL) 25 May.

Common Grackle - 2 birds each day, 27 April, 2 May, Delta (MJ) - first record for latilong 15.

Hepatic Tanager - 1 male, 14 or 15 May, Bonny Res., Yuma Co. (DW, JW, DFO) - first record for latilong 14.

American Goldfinch x Pine Siskin hybrid - this report, "April and May" is from Lake Eldora, Boulder Co. (GS) and needs looking into.

Baird's Sparrow - three interesting reports of this species: a singing individual, 3 May, at 8900 feet in a mountain meadow, Coal Creek Canyon, Jefferson Co. (PH); and two reports of flocks, each of 5 birds, of this usually solitary species, on the same day, 15 May, at widely separated locations, Grand Junction (MF, Grand Junction Spring Count); and Longmont (CC, DB, FAC Spring Count).

Golden-crowned Sparrow - 1, 8-10 March, Bear Creek Res., Jefferson Co. (MJS, BPr).

Chestnut-collared Longspur - 300, 23 March, Pritchett (RB et al) - "first record in latilong 27" (but Pritchett is in latilong 28 - BK).

Initialed observers and contributors: Pamela Bent (Pb), Dave Bolton (LB), Winston Brockner (WB), Richard Bunn (RB), Kevin Cook (KC), John and Joyce Cooper (JJC), Camille Cummings (CC), Alice Dennis (AD), Denver Field Ornithologists (DFO), Durango Bird Club (DBC), Darrell Fargo (DF), Mary Fischer (MF), Ron French (RF), Foothills Audubon Club (FAC), Dave Griffiths (DG), Carol Hack (CH), Jeanne Halsey (JH), Paula Hansley (PH), Kathy Hawkins (Kk), Mark Janos (MJ), Dave Jasper (DJ), Frank and Jan Justice (FJJ), Jon Kauffeld (JK), Hugh Kingery (HK), Barry Knapp (BK), Ron Lambeth (KL), Diane Larson (DL), Steve Larson (SL), Tim Manolis (TMs), Thompson Marsh (TM), Mike Middleton (MM), Peter Ostrenko (PO), Dave Palmer (DP), Betty Pollack (bP), Bill Prather (bPr), Ron Ryder (RR), Mary Jane Schock (MJS), Gail Shickley (GS), Dave Silverman (DS), Kip Stransky (KS), Van Truan (VT), Doug Ward (DW), Judy Ward (JW), Sue Ward (SW), Jim and Rosie Watts (JRW).

BIRD UTILIZATION OF A PONDEROSA  
PINE FOREST AFTER A FIRE

by Steve Aulenbach  
1323 Scrub Oak Circle  
Boulder, CO 80303  
and  
Maureen O'Shea-Stone  
711 20th Street, Apt. A  
Boulder, CO 80302

### Introduction

On March 13, 1982 a forest fire burned approximately two hectares (five acres) of ponderosa pine forest in the Bow Mountain area of Boulder County, Colorado. The fire presented an opportunity to study the impact of a fresh burn on bird activities. While many studies have examined bird activities in an area during the early stages of fire recovery, few have addressed the immediate impact of fire on bird utilization in such an area. We were specifically interested in determining if the bird utilization of an area changes soon after a fire.

Bock and Lynch (1970), investigating the early stages of fire recovery in Sierra Nevada conifer forests, found that the burn site was used by a larger number of breeding bird species than the control site. The number of individual birds on each site was, however, almost equal. Their extensive three year study began six years after the fire. Lawrence (1966), working in the Sierra Nevada foothills, obtained similar results in his study of a chaparral community. During the first four years of recovery, the burned study plot was used by more species of resident birds as well as by more individuals than the control plot. Lowe et al. (1978) found a different pattern in Arizona ponderosa pine forests; fewer species used the burn site four years after the forest fire had taken place.

We hypothesized that the bird utilization pattern after the Bow Mountain fire would be similar to that found by Bock and Lynch (1970) and Lawrence (1966). For the purposes of this study we defined utilization by the number of species and by the number of individual birds of all species present in an area. We anticipated that the fire would have an immediate impact on bird utilization. Because pre-burn data concerning bird utilization of our study area was not available, change in utilization was inferred by comparing a burned plot with a similar, unburned plot.

### Study Area

The study area is located in the foothills ponderosa pine zone of the front Range. Both the impact plot and the control plot were on private property in the Bow Mountain residential area of Boulder County, Colorado (1/4 SW, section 11, T1N, R71W).

The fire started in an open patch of forest and was carried southwest by winds into a gully. After burning up this gully, and reaching



its greatest intensity, the fire crowned in a group of seven mature ponderosa pines (A. MacMurry, personal communication). The fire also burned northeast through a flatter section of the forest. In this area, the fire was much cooler, burning only the ground cover and the lower branches of trees.

The burn occurred on a steep, southwest facing slope. The study plot included the bottom of the gully, where most of the vegetation was burned; the sides of the gully, where the crowned-out ponderosa pines were; and the flat areas on either side of the gully, where the trees were partially burned. Other than a pile of burnt pine limbs, reclamation activities had not modified the site prior to this study.

When sampling began on April 12, there was little unburned ground vegetation present on the study site. The ponderosa pine (Pinus ponderosa) in the area could be grouped into two size classes. There were 19 trees with a diameter at breast height (dbh) ranging from 6 to 27 cm with a mean of 17 cm. The second size class consisted of 70 pine seedlings with a dbh < 2 cm. Thirty-five of these seedlings were scattered evenly throughout the site and 35 were densely clustered in one corner of the site. The remaining identifiable vegetation on the site included three large Mountain Maples (Acer glabrum) and a clump of Chokecherry (Prunus virginiana), all in the bottom of the gully, and a large number of charred Wax Current (Ribes cereum) bushes scattered along the sides of the gully.

The control area was located 60 meters north of the burn area. The site was selected for several reasons in addition to its proximity to the burn plot. One of these was that it contained a gully of similar steepness and depth. Another was that slope, aspect, and local topography matched the burn plot. The control site also contained approximately the same number and sizes of pines as the burn site did. These characteristics allowed control over non-fire related factors that may have otherwise influenced the avifauna.

As in the burn, the pines of the control site may be grouped into two size classes. Twenty of the trees had a dbh of 3 to 23 cm with a mean of 10.5 cm. Thirty seedlings were scattered over the site. Three Douglas Fir (Pseudotsuga menziesii) seedlings (all < 45 cm tall) were also on the site. Small shrubs of Ribes cereum were thick along the gully sides, and in the bottom of the gully was a small group of Snowberry (Symphoricarpus sp.).

Marr (1961) describes such an area as "...the stands are open with a few shrubs (Ribes cereum), a sparse ground cover of bunch grasses..., and a few herbs...The trees are often clumped in groups of a few individuals separated by openings with a sparse cover of herbs in a parkland type of landscape." The ground cover of the control area was composed of vegetative grasses and was difficult to classify. The identifiable grasses in the control area were Red Three-Awn (Aristida longisetata), (Agropyron sp.), (Leucopoa kingii), and Common Crabgrass (Nigitona sp.). Oregon-grape (Mahonia repens), a geranium (Geranium

sp.), Pasque Flower (Pulsatilla patens), and Sandlily (Leucocrinum montanum) were the major recognizable herbs in the ground cover.

### Field Methods

Rectangular sampling sites of 45 × 25 meters were established. Preliminary sampling indicated that a site of this size enabled us to make observations with the degree of detail we required. Each site had a permanent observation post from which the observer could easily watch all points within the marked site.

Sampling began on April 12, four weeks and two days after the fire, and continued through May 6. Preliminary sampling sessions were conducted to determine the period of maximum bird activity. Evenings were by far a more active time and all subsequent data were collected during sampling sessions from approximately 6:30 p.m. to 8:00 p.m. Each sampling period was ten minutes long. Bird species, number of individuals of each species, individual behavior, wind direction, wind speed, percent cloud cover, and ground and air temperatures were recorded. Birds were included in the observations only if they were seen in the site during a sampling session. In some cases birds observed within the site were actually identified by their call.

### Treatment of Data and Results

The species list and total number of individuals observed by site is shown in Figure 1. We tested for a difference between the total number of species observed in each site during the sampling sessions. We also tested for a difference between the total number of individuals observed in the burn site and in the control site while sampling. The Mann-Whitney U test was used to analyze the data. The null hypothesis was that the two samples came from populations having the same distribution (Sokal and Rohlf, 1981).

Based on 45 sampling periods (23 in the control, 22 in the burn), a significant difference between the number of species in each area was detected ( $Z = 4.86$ ,  $p < 0.001$ ). The total number of birds observed in each area was also found to be significantly different ( $Z = 4.93$ ,  $p < 0.001$ ). This implies a distinct preference in the birds' utilization of the areas.

### Discussion

Our results demonstrated a significant difference in bird utilization of the two sites. In comparing the sites, the number of species and the number of individual birds using the sites were found to be different. There was also an interesting dissimilarity in the observed species composition of each plot. For example, the Pygmy Nuthatch, Downy Woodpecker, White-breasted Nuthatch, and the Mountain Chickadee were only observed in the unburned control site. Species such as the Red-breasted Nuthatch, Chipping Sparrow, Yellow-rumped Warbler, Rufous-sided Towhee and the Common Flicker were seen only in the burn plot.

Three species, the Robin, Steller's Jay, and Dark-eyed Junco were common to both areas but occurred in markedly different proportions (Figure 1).

These dissimilarities in area utilization may have been caused by any number of factors. One of these factors may have been that the birds were drawn to the burn because it was warmer than the surrounding forest. Ground and air temperatures recorded during observation periods were consistently higher on the blackened burn site than on the control site.

We believed that part of the burn's attraction was its small size. Bendell (1974) suggested that small burns may be used by animals because the unburned forest is near enough to retreat to for cover. We did note that the typical pattern was for the birds to come into the burn, forage, and leave. Nests were not observed in the burn area.

The differences in area usage may also have been due to differences in resource availability. Grinnell (1928; in Bock and Lynch, 1970) noted that because of their mobility, birds easily respond to changes in habitat or food availability. Bendell (1974) suggested that birds may be drawn to a burned area by prey displaced or exposed by the fire.

Foraging was by far the most frequent activity observed in the burn. Robins, the most common species observed, were often seen feeding on both live and dead worms in the burn plot. It is interesting to note that burn-site Robins often fed in large groups of three to twelve individuals. However, in the control site, Robins were rarely seen feeding but were instead sitting in the crowns of trees calling and sometimes fighting with others that flew into sight. This suggested to us that the normal spatial arrangements of the Robins may have broken down in the burn site because of a superabundant food supply, yet remained normal in the unimpacted area.

The Steller's Jay was the second most common species observed. During early sampling sessions, Jays, like the Robins, fed on the ground of the burn site. Several days later, the Steller's Jays were observed to be feeding solely on the limbs of burned trees. This may indicate that the supply of fire-exposed ground prey had been exhausted and as a result the birds switched to prey on the trees. Another possibility is that some nutritive value of the charred bark attracted the Jays.

### Summary

Our question was whether bird utilization of an area changes after a fire. We felt this change would probably occur and would be characterized by an increase in the number of species and an increase in the number of individuals using the area. We inferred from our data this indeed was the case.

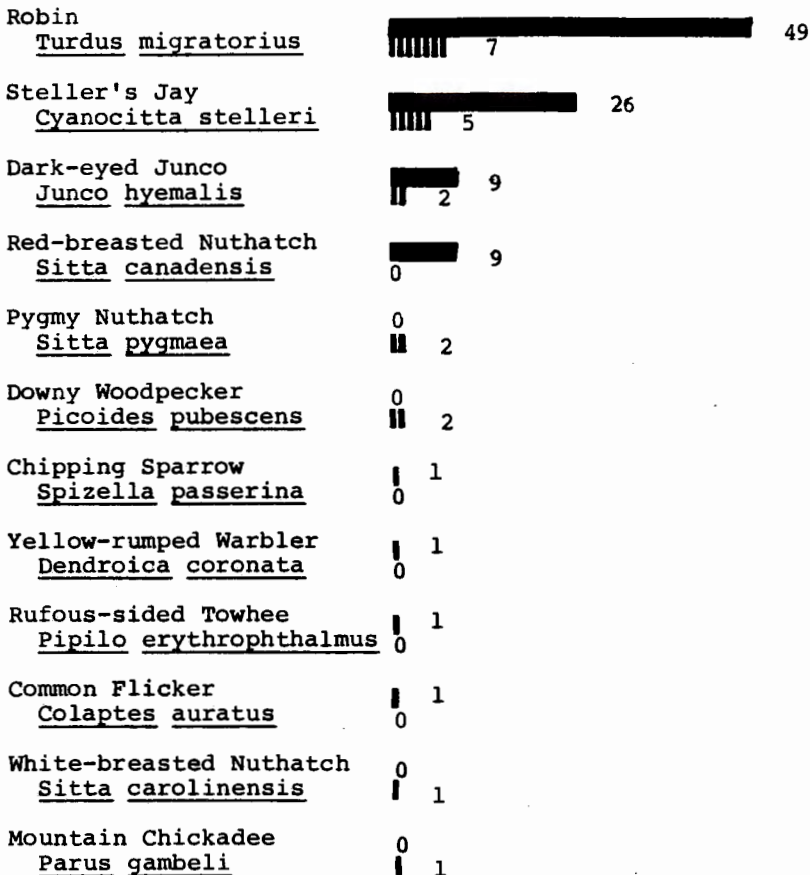


Figure 1. Total number of individuals of each species from all censuses by area. Solid bars=burn area; striped bars=control area.

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## ANNOUNCEMENT OF THE TWENTY FIRST ANNUAL CONVENTION

The Colorado Field Ornithologists' 1983 convention plans are well underway. Last fall, the board decided to hold it in Denver and extended a formal invitation to the Denver Field Ornithologists and the Denver Audubon Society to join us. The invitation was enthusiastically accepted by both groups, and we are delighted to have them as cosponsors.

A joint committee has been formed consisting of three representatives from each group, which is handling the convention's planning and financing on an equal basis. The joint committee met in December and decided to hold the convention on Memorial Day weekend, May 27-29, 1983, at Regis College in Denver. The College will provide economical housing and food service for the convention guests. The convention will open with registration on the evening of Friday, May 27, and close on the afternoon of Sunday, May 29. Activities will include field trips, a paper session, and the banquet with a presentation by Perry Conway, a nationally known wildlife photographer.

Registration forms will be distributed in April, and be sure to register early for this convention, which should be the largest yet.

## FIELD TRIP

SATURDAY, MAY 14

The Bigger, Better, Boulder Birding Bonanza (search for spring warblers and other migrants). Meet at Varsity Pond on the University of Colorado campus at 7 a.m. For more information contact either Peter Gent (H 494-1750) or Betsy Webb (W 575-3911).

