WESTERN BIRDS

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A CHECKLIST OF THE BIRDS OF OREGON

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The official state bird list for Oregon has not been updated since 1940 when Gabrielson and Jewett published their monumental work, Birds of Oregon. Since that time many additional birds have been recorded in Oregon. Others have significantly changed their status and distribution. The need for a revision of the official state list has prompted the publication of this paper.

In early 1978 the Oregon Bird Records Committee was formed to consider the records of rare and unusual birds from within the State, including the adjacent ocean from shore to a distance of 100 miles. The primary functions of the Committee are to review bird records; to accept those with sufficient documentation; to maintain a permanent file for photographs, tape recordings, sonograms and written documentation of rare bird observations; and to make this material available for research and review.

The Oregon Bird Records Committee is a committee of the Oregon Field Ornithologists (OFO). This statewide organization was created to upgrade the standards of Oregon birding and to provide a medium for publishing the results of field studies conducted within the state. A quarterly journal, Oregon Birds, is published by OFO to meet this commitment. At the present time OFO, in cooperation with the Audubon Society of Portland, is preparing a long-overdue revision of Birds of Oregon.
OREGON CHECKLIST

The present bird list includes 415 species documented by an identifiable photograph on file with the Oregon Bird Records Committee or a specimen deposited in a museum to substantiate their occurrence in Oregon. Also included are 12 species whose presence on the official list is based upon a sight record only. These are so designated in the list. All sight records have been carefully reviewed and accepted by the Oregon Bird Records Committee. Written documentation of these sightings is available from the Committee Secretary.

All species on the list have been investigated and are believed to have reached the state under their own power, except those that were deliberately introduced and have established viable breeding populations. The latter species are noted in the list as having been introduced.

NOMENCLATURE

Nomenclature and classification essentially follows the AOU Check-list (1957) as corrected (1962) and as amended (1973, 1976). In several instances the list deviates from the AOU Check-list to conform to recently published scientific evidence. These changes are expected to be endorsed by the AOU in future revisions. Shorebird classifications follow those recommended by Jehl (1968).

KEY TO THE LIST

Within the list species are coded as follows:

N — Nested successfully at least twice.
pN — Presumed to nest.
X — Irregular, casual or accidental.
E — Extirpated.
S — Sight record only.
I — Introduced. (Includes those which have reached the state as a result of being introduced elsewhere.)

Those species for which the Oregon Bird Records Committee seeks documentation are preceded by an asterisk (*). Birds with no asterisk are known to occur with some regularity in Oregon, and no documentation is requested for sightings of these species. Any bird which is not on the list and is seen within the state needs careful documentation.

Please send any documentation of sightings or requests for information to: Oregon Bird Records Committee, P.O. Box 10373, Eugene, OR 97440.
A CHECKLIST OF THE BIRDS OF OREGON

GAVIIDAE
Common Loon
Gaavia immer
* Yellow-billed Loon X
Gaavia adamsii
Arctic Loon
Gaavia arctica
Red-throated Loon
Gaavia stellata

PODICIPEDIDAE
Red-necked Grebe N
Podiceps grisegena
Horned Grebe pN
Podiceps auritus
Eared Grebe N
Podiceps nigricollis
Western Grebe N
Aechmophorus occidentalis
Pied-billed Grebe N
Podilymbus podiceps

DIOMEDEIDAE
* Short-tailed Albatross X
Diomedea albatrus
Black-footed Albatross
Diomedea nigripes
* Laysan Albatross X
Diomedea immutabilis

HYDROBATIDAE
Fork-tailed Storm-Petrel N
Oceanodroma furcata
Leach's Storm-Petrel N
Oceanodroma leucorhoa
* Wilson's Storm-Petrel S
Oceanites oceanicus

PELECANIDAE
White Pelican N
Pelecanus erythrorhynchos
Brown Pelican
Pelecanus occidentalis

PHALACROCORACIDAE
Double-crested Cormorant N
Phalacrocorax auritus
Brandt's Cormorant N
Phalacrocorax penicillatus
Pelagic Cormorant N
Phalacrocorax pelagicus

FREGATIDAE
* Magnificent Frigatebird X
Fregata magnificens

ARDEIDAE
Great Blue Heron N
Ardea herodias
Green Heron N
Butorides striatus
Cattle Egret
Bubulcus ibis
Great Egret N
Casmerodius albus
Snowy Egret N
Egretta thula
* Louisiana Heron X
Hydranassa tricolor
Black-crowned Night Heron N
Nycticorax nycticorax
* Least Bittern pN
Ixobrychus exilis
American Bittern N
Botaurus lentiginosus
OREGON CHECKLIST

**THRESKIORNITHIDAE**

- White-faced Ibis  N  
  *Plegadis chihi*

**ANATIDAE**

- Mute Swan  I  *Cygnus olor*
- Whistling Swan  *Olor columbianus*
- Trumpeter Swan  N  *Olor buccinator*
- Canada Goose  N  *Branta canadensis*
- Brant  *Branta bernicla*
- Emperor Goose  X  *Philacte canagica*
- White-fronted Goose  *Anser albinus*
- Snow Goose  *Chen caerulescens*
- Ross' Goose  *Chen rossii*
- Fulvous Whistling-Duck  X  *Dendrocygna bicolor*
- Mallard  N  *Anas platyrhynchos*
- Black Duck  X  *Anas rubripes*
- Gadwall  N  *Anas strepera*
- Pintail  N  *Anas acuta*
- Green-winged Teal  N  *Anas crecca*
- Baikal Teal  X  *Anas formosa*
- Blue-winged Teal  N  *Anas discors*
- Cinnamon Teal  N  *Anas cyanoptera*
- Northern Shoveler  N  *Anas clypeata*
- European Wigeon  *Anas penelope*
- American Wigeon  N  *Anas americana*
- Wood Duck  N  *Aix sponsa*
- Canvasback  N  *Aythya valisineria*
- Redhead  N  *Aythya americana*
- Ring-necked Duck  N  *Aythya collaris*
- Greater Scaup  *Aythya marila*
- Lesser Scaup  N  *Aythya affinis*
- Tufted Duck  X  *Aythya fuligula*
- Common Goldeneye  *Bucephala clangula*
- Barrow's Goldeneye  N  *Bucephala islandica*
- Bufflehead  N  *Bucephala albeola*
- Oldsquaw  *Clangula hyemalis*
- Harlequin Duck  N  *Histrionicus histrionicus*
- King Eider  X  *Somateria spectabilis*
- White-winged Scoter  *Melanitta deglandi*
- Surf Scoter  *Melanitta perspicillata*
- Black Scoter  *Melanitta nigra*
- Ruddy Duck  N  *Oxyura jamaicensis*
- Hooded Merganser  N  *Lophodytes cucullatus*
- Common Merganser  N  *Mergus merganser*
- Red-breasted Merganser  *Mergus serrator*

**CATHARTIDAE**

- Turkey Vulture  N  *Cathartes aura*
- California Condor  E  *Gymnogyps californianus*

**ACCIPITRIDAE**

- White-tailed Kite  N  *Elanus leucurus*
- Goshawk  N  *Accipiter gentilis*
- Sharp-shinned Hawk  N  *Accipiter striatus*
- Cooper's Hawk  N  *Accipiter cooperii*
- Red-tailed Hawk  N  *Buteo jamaicensis*
OREGON CHECKLIST

Red-shouldered Hawk N
  Buteo lineatus
Swainson’s Hawk N
  Buteo swainsoni
Rough-legged Hawk
  Buteo lagopus
Ferruginous Hawk N
  Buteo regalis
Golden Eagle N
  Aquila chrysaetos
Bald Eagle N
  Haliaeetus leucocephalus
Marsh Hawk N
  Circus cyaneus

PANDIONIDAE
Osprey N
  Pandion haliaetus

FALCONIDAE
  * Gyrfalcon X
    Falco rusticolus
  Prairie Falcon N
    Falco mexicanus
  Peregrine Falcon N
    Falco peregrinus
  Merlin N
    Falco columbarius
  American Kestrel N
    Falco sparverius

TETRAONIDAE
Blue Grouse N
  Dendragapus obscurus
Spruce Grouse N
  Canachites canadensis
Ruffed Grouse N
  Bonasa umbellus
White-tailed Ptarmigan 1
  Lagopus leucurus
  * Sharp-tailed Grouse E?
    Pedioctes phasianellus
Sage Grouse N
  Centrocercus urophasianus

PHASIANIDAE
Bobwhite 1
  Colinus virginianus
California Quail N
  Lophortyx californicus
Mountain Quail N
  Oreortyx pictus

Ring-necked Pheasant 1
  Phasianus colchicus
Chukar 1
  Alectoris chukar
Gray Partridge 1
  Perdix perdix

MELEAGRIDIDAE
  Turkey 1
    Meleagris gallopavo

GRUIDAE
  Sandhill Crane N
    Grus canadensis

RALLIDAE
  Virginia Rail N
    Rallus limicola
  Sora N
    Porzana carolena
  * Yellow Rail X
    Coturnicops noveboracensis
  * Common Gallinule X
    Gallinula chloropus
  American Coot N
    Fulica americana

HAEMATOPODIDAE
Black Oystercatcher N
  Haematopus bachmani

RECURVIROSTRIDAE
Black-necked Stilt N
  Himantopus mexicanus
American Avocet N
  Recurvirostra americana

CHARADRIIDAE
Semipalmated Plover
  Charadrius semipalmatus
Killdeer N
  Charadrius vociferus
Snowy Plover N
  Charadrius alexandrinus
  * Mongolian Plover X
    Charadrius mongolus
  * Mountain Plover X
    Charadrius montanus
Lesser Golden Plover
  Pluvialis dominica
Black-bellied Plover
  Pluvialis squatarola
OREGON CHECKLIST

SCOLOPACIDAE

* Hudsonian Godwit  X  Limosa haemastica
* Bar-tailed Godwit  X  Limosa lapponica
Marbled Godwit  Limosa fedoa
Whimbrel  Numenius phaeopus
Long-billed Curlew  N  Numenius americanus
Upland Sandpiper  N  Numenius longicauda
* Spotted Redshank  X  Tringa erythropus
Greater Yellowlegs  Tringa melanoleuca
Lesser Yellowlegs  Tringa flavipes
Solitary Sandpiper  Tringa solitaria
Willet  N  Catoptrophorus semipalmatus
Spotted Sandpiper  N  Actitis macularia
Wandering Tattler  Tringa incana
Ruddy Turnstone  Arenaria interpres
Black Turnstone  Arenaria melanocephala
Wilson’s Phalarope  N  Phalaropus tricolor
Northern Phalarope  Phalaropus lobatus
Red Phalarope  Phalaropus fulicarius
Common Snipe  N  Capella gallinago
Short-billed Dowitcher  Limnodromus griseus
Long-billed Dowitcher  Limnodromus scolopaceus
Surfbird  Aphriza virgata
Red Knot  Calidris canutus
Sanderling  Calidris alba
* Semipalmed Sandpiper  Calidris pusilla
Western Sandpiper  Calidris mauri
* Rufous-necked Sandpiper  S  Calidris ruficollis
* Long-toed Stint  X  Calidris subminuta
Least Sandpiper  Calidris minutilla
Baird’s Sandpiper  Calidris bairdii
Pectoral Sandpiper  Calidris melanotos
* Sharp-tailed Sandpiper  X  Calidris acuminata
Rock Sandpiper  Calidris ptilocnemis
Dunlin  Calidris alpina
* Curlew Sandpiper  S  Calidris ferruginea
* Stilt Sandpiper  X  Micropalma himantopus
* Buff-breasted Sandpiper  Tryngites subruficollis
* Ruff  X  Philomachus pugnax

STERCORARIIDAE

Pomarine Jaeger  Stercorarius pomarinus
Parasitic Jaeger  Stercorarius parasiticus
Long-tailed Jaeger  Stercorarius longicaudus
South Polar Skua  Catharacta maccormicki

LARIDAE

Glaucous Gull  Larus hyperboreus
Glaucous-winged Gull  N  Larus glaucescens
Western Gull  N  Larus occidentalis
Herring Gull  Larus argentatus
Thayer’s Gull  Larus thayeri
California Gull  N  Larus californicus
Ring-billed Gull  N  Larus delawarensis
Mew Gull  Larus canus
OREGON CHECKLIST

Franklin's Gull  
*Larus pipixcan*

Bonaparte's Gull  
*Larus philadelphia*

* Little Gull  X  
*Larus minutus*

Heermann's Gull  
*Larus heermanni*

Black-legged Kittiwake  
*Rissa tridactyla*

* Red-legged Kittiwake  X  
*Rissa brevirostris*

Sabine’s Gull  
*Xema sabini*

Forster’s Tern  N  
*Sterna forsteri*

Common Tern  
*Sterna hirundo*

Arctic Tern  
*Sterna paradisaea*

* Least Tern  X  
*Sterna albifrons*

Caspian Tern  N  
*Sterna caspia*

Black Tern  N  
*Chlidonias niger*

ALCIDAE

Common Murre  N  
*Uria aalge*

* Thick-billed Murre  X  
*Uria lomvia*

Pigeon Guillemot  N  
*Cepphus columba*

Marbled Murrelet  pN  
*Brachyramphus marmoratus*

* Xantus’ Murrelet  X  
*Endomychura hypoleuca*

* Craveri’s Murrelet  X  
*Endomychura craveri*

Ancient Murrelet  
*Synthliboramphus antiquus*

Cassin’s Auklet  N  
*Ptychoramphus aleuticus*

* Parakeet Auklet  X  
*Cyclorrhynchus psittacula*

Rhinoceros Auklet  N  
*Cerorhinca monocerata*

* Horned Puffin  X  
*Fratercula corniculata*

Tufted Puffin  N  
*Lunda cirrhata*

COLUMBIDAE

Band-tailed Pigeon  N  
*Columba fasciata*

Rock Dove  I  
*Columba livia*

* White-winged Dove  X  
*Zenaida asiatica*

Mourning Dove  N  
*Zenaida macroura*

CUCULIDAE

* Yellow-billed Cuckoo  N  
*Coccyzus americanus*

TYTONIDAE

Barn Owl  N  
*Tyto alba*

STRIGIDAE

Screech Owl  N  
*Otus asio*

Flammulated Owl  N  
*Otus flammmeolus*

Great Horned Owl  N  
*Bubo virginianus*

Snowy Owl  X  
*Nyctea scandiaca*

* Hawk Owl  S  
*Surnia ulula*

Pygmy Owl  N  
*Glaucidium gnoma*

Burrowing Owl  N  
*Athene cunicularia*

* Barred Owl  N  
*Strix varia*

Spotted Owl  N  
*Strix occidentalis*

Great Gray Owl  N  
*Strix nebulosa*

Long-eared Owl  N  
*Asio otus*

Short-eared Owl  N  
*Asio flammeus*

* Boreal Owl  X  
*Aegolius funereus*

Saw-whet Owl  N  
*Aegolius acadicus*

CAPRIMULGIDAE

Poor-will  N  
*Phalaenoptilus nuttallii*

Common Nighthawk  N  
*Chordeiles minor*
OREGON CHECKLIST

APODIDAE
Black Swift
Cypseloides niger
Vaux's Swift N
Chaetura vauxi
White-throated Swift N
Aeronaeus saxatalis

TROCHILIDAE
Black-chinned Hummingbird N
Archilochus alexandri
Costa's Hummingbird X
Calypte costae
Anna's Hummingbird N
Calypte anna
Broad-tailed Hummingbird X
Selasphorus platycercus
Rufous Hummingbird N
Selasphorus rufus
Allen's Hummingbird N
Selasphorus sasin
Calliope Hummingbird N
Stellula calliope

PICIDAE
Common Flicker N
Colaptes auratus
Pileated Woodpecker N
Dryocopus pileatus
Acorn Woodpecker N
Melanerpes formicivorus
Lewis' Woodpecker N
Melanerpes lewis
Yellow-bellied Sapsucker N
Sphyrapicus varius
Williamson's Sapsucker N
Sphyrapicus thyroideus
Hairy Woodpecker N
Picoides villosus
Downy Woodpecker N
Picoides pubescens
Nuttall's Woodpecker X
Picoides nuttallii
White-headed Woodpecker N
Picoides albolaratus
Black-backed Three-toed Woodpecker N
Picoides arcticus
Northern Three-toed Woodpecker N
Picoides tridactylus

TYRANNIDAE
Eastern Kingbird N
Tyrannus tyrannus
Tropical Kingbird X
Tyrannus melancholicus
Western Kingbird N
Tyrannus verticalis
Cassin's Kingbird X
Tyrannus vociferans
Scissor-tailed Flycatcher X
Muscicora forficata
Ash-throated Flycatcher N
Myiarchus cinerascens
Black Phoebe N
Sayornis nigricans
Say's Phoebe N
Sayornis saya
Willow Flycatcher N
Empidonax traillii
Least Flycatcher X
Empidonax minimus
Hammond's Flycatcher N
Empidonax hammondii
Dusky Flycatcher N
Empidonax oberholseri
Gray Flycatcher N
Empidonax wrightii
Western Flycatcher N
Empidonax difficilis
Western Wood Pewee N
Contopus sordidulus
Olive-sided Flycatcher N
Nuttallornis borealis

ALAUDIDAE
Horned Lark N
Eremophila alpestris

HIRUNDINIDAE
Violet-green Swallow N
Tachycineta thalassina
Tree Swallow N
Iridoprocne bicolor
Bank Swallow N
Riparia riparia
Rough-winged Swallow N
Stelgidopteryx ruficollis
Barn Swallow N
Hirundo rustica
Cliff Swallow N
Petrochelidon pyrrhonota
Purple Martin N
Progne subis
OREGON CHECKLIST

CORVIDAE

Gray Jay N  
_Prisoreus canadensis_

* Blue Jay X  
_Cyanocitta cristata_

Steller’s Jay N  
_Cyanocitta stelleri_

Scrub Jay N  
_Aphelocoma coerulescens_

Black-billed Magpie N  
_Pica pica_

Common Raven N  
_Corvus corax_

Common Crow N  
_Corvus brachyrhynchos_

Northwestern Crow  
_Corvus caurinus_

Piñon Jay N  
_Gymnorhinus cyanocephalus_

Clark’s Nutcracker N  
_Nucifraga columbiana_

PARIDAE

Black-capped Chickadee N  
_Parus atricapillus_

Mountain Chickadee N  
_Parus gambeli_

Chestnut-backed Chickadee N  
_Parus rufescens_

Plain Titmouse N  
_Parus inornatus_

Bushtit N  
_Psaltriparus minimus_

SITTIDAE

White-breasted Nuthatch N  
_Sitta carolinensis_

Red-breasted Nuthatch N  
_Sitta canadensis_

Pygmy Nuthatch N  
_Sitta pygmaea_

CERTHIIDAE

Brown Creeper N  
_Certhia familiaris_

CHAMAЕIDAE

Wrentit N  
_Chamaea fasciata_

CINCLUDAE

Dipper N  
_Cinclus mexicanus_

TROGLODYTIDAE

House Wren N  
_Troglodytes aedon_

Winter Wren N  
_Troglodytes troglodytes_

Bewick’s Wren N  
_Thryomanes bewickii_

Long-billed Marsh Wren N  
_Cistothorus palustris_

Canyon Wren N  
_Catherpes mexicanus_

Rock Wren N  
_Salpinctes obsoletus_

MIMIDAE

Mockingbird  
_Mimus polyglottos_

Gray Catbird N  
_Dumetella carolinensis_

* Brown Thrasher X  
_Toxostoma rufum_

* California Thrasher S  
_Toxostoma redivivum_

Sage Thrasher N  
_Oreoscoptes montanus_

TURDIDAE

American Robin N  
_Turdus migratorius_

Varied Thrush N  
_Ixoreus naevius_

* Wood Thrush S  
_Hylocichla mustelina_

Hermit Thrush N  
_Catharus guttatus_

Swainson’s Thrush N  
_Catharus ustulatus_

Veery N  
_Catharus fusciscens_

Western Bluebird N  
_Sialia mexicana_

Mountain Bluebird N  
_Sialia currucoides_

* Wheatear X  
_Oenanthe oenanthe_

Townsend’s Solitaire N  
_Myadestes townsendi_

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OREGON CHECKLIST

SYLVIIDAE

Blue-gray Gnatcatcher  
_Poliopitla caerulea_
Golden-crowned Kinglet  
_Regulus satrapa_
Ruby-crowned Kinglet  
_Regulus calendula_

MOTACILLIDAE

* White Wagtail  
_Motacilla alba_
Water Pipit  
_Anthus spinoletta_

BOMBYCILLIDAE

Bohemian Waxwing  
_Bombycilla garrulus_
Cedar Waxwing  
_Bombycilla cedrorum_

PTILOGONATIDAE

* Phainopepla  
_Phainopepla nitens_

LANIIDAE

Northern Shrike  
_Lanius excubitor_
Loggerhead Shrike  
_Lanius ludovicianus_

STURNIDAE

Starling  
_Sturnus vulgaris_

VIREONIDAE

Hutton’s Vireo  
_Vireo huttoni_
Bell’s Vireo  
_Vireo bellii_
Solitary Vireo  
_Vireo solitarius_
Red-eyed Vireo  
_Vireo olivaceous_
Warbling Vireo  
_Vireo gilvus_

PARULIDAE

* Black-and-white Warbler  
_Mniotilta varia_
* Prothonotary Warbler  
_Protonotaria citrea_

Golden-winged Warbler  
_Vermivora chrysoptera_
Tennessee Warbler  
_Vermivora peregrina_
Orange-crowned Warbler  
_Vermivora celata_
Nashville Warbler  
_Vermivora ruficapilla_
Virginia’s Warbler  
_Vermivora virginiae_
Northern Parula  
_Parula americana_
Yellow Warbler  
_Dendroica petechia_
Magnolia Warbler  
_Dendroica magnolia_
Cape May Warbler  
_Dendroica tigrina_
Black-throated Blue Warbler  
_Dendroica caerulescens_
Yellow-rumped Warbler  
_Dendroica coronata_
Black-throated Gray Warbler  
_Dendroica nigrescens_
Townsend’s Warbler  
_Dendroica townsendi_
Hermit Warbler  
_Dendroica occidentalis_
* Chestnut-sided Warbler  
_Dendroica pensylvanica_
Bay-breasted Warbler  
_Dendroica castanea_
Blackpoll Warbler  
_Dendroica striata_
* Prairie Warbler  
_Dendroica discolor_
Palm Warbler  
_Dendroica palmarum_
* Ovenbird  
_Seiurus aurocapillus_
Northern Waterthrush  
_Seiurus noveboracensis_
MacGillivray’s Warbler  
_Oporornis tolmiei_
Common Yellowthroat  
_Coastilypis trichas_
Yellow-breasted Chat  
_Icteria virens_
* Hooded Warbler  
_Wilsonia citrina_
Wilson’s Warbler  
_Wilsonia pusilla_
American Redstart  
_Setophaga ruticilla_
PLOCEIDAE
House Sparrow N
Passer domesticus

ICTERIDAE
Bobolink N
Dolichonyx oryzivorus
Western Meadowlark N
Sturnella neglecta
Yellow-headed Blackbird N
Xanthocephalus xanthocephalus
Red-winged Blackbird N
Agelaius phoeniceus
Tricolored Blackbird N
Agelaius tricolor
* Orchard Oriole X
Icterus spurius
* Hooded Oriole X
Icterus cucullatus
Northern Oriole N
Icterus galbula
* Rusty Blackbird X
Euphagus carolinus
Brewer’s Blackbird N
Euphagus cyanocephalus
* Great-tailed Grackle X
Quiscalus mexicanus
* Common Grackle S
Quiscalus quiscula
Brown-headed Cowbird N
Molothrus ater

THRAUPIDAE
Western Tanager N
Piranga ludoviciana
* Scarlet Tanager X
Piranga olivacea
* Summer Tanager X
Piranga rubra

FRINGILLIDAE
Rose-breasted Grosbeak X
Pheucticus ludovicianus
Black-headed Grosbeak N
Pheucticus melanocephalus
* Blue Grosbeak X
Guiraca caerulea
* Indigo Bunting X
Passerina cyanea
Lazuli Bunting N
Passerina amoena
* Painted Bunting X
Passerina ciris
* Dickcissel X
Spiza americana
* Brambling X
Fringilla montifringilla
Evening Grosbeak N
Hesperiphona vespertina
Purple Finch N
Carpodacus purpureus
Cassin’s Finch N
Carpodacus cassinii
House Finch N
Carpodacus mexicanus
Pine Grosbeak N
Pinicola enucleator
Gray-crowned Rosy Finch N
Leucosticte tephrocotis
Black Rosy Finch N
Leucosticte arata
Common Redpoll X
Carduelis flammea
Pine Siskin N
Carduelis pinus
American Goldfinch N
Carduelis tristis
Lesser Goldfinch N
Carduelis psaltria
Red Crossbill N
Loxia curvirostra
White-winged Crossbill X
Loxia leucoptera
Green-tailed Towhee N
Pipilo chlorurus
Rufous-sided Towhee N
Pipilo erythrophthalmus
Brown Towhee N
Pipilo fuscus
* Lark Bunting X
Calamospiza melanocorys
Savannah Sparrow N
Passerculus sandwichensis
Grasshopper Sparrow N
Ammodromus savannarum
Vesper Sparrow N
Poecetes gramineus
Lark Sparrow N
Chondestes grammacus
Black-throated Sparrow N
Amphispiza bilineata
Sage Sparrow N
Amphispiza belli
Dark-eyed Junco N
Junco hyemalis

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OREGON CHECKLIST

Tree Sparrow  
Spizella arborea
Chipping Sparrow  N
Spizella passerina
* Clay-colored Sparrow  X
Spizella pallida
Brewer’s Sparrow  N
Spizella brewerii
* Black-chinned Sparrow  X
Spizella atragularis
Harris’ Sparrow  
Zonotrichia querula
White-crowned Sparrow  N
Zonotrichia leucophrys
Golden-crowned Sparrow  
Zonotrichia atricapilla
White-throated Sparrow  
Zonotrichia albicollis

Fox Sparrow  N
Passerella iliaca
Lincoln’s Sparrow  N
Melospiza lincolnii
* Swamp Sparrow  X
Melospiza georgiana
Song Sparrow  N
Melospiza melodia
* McCown’s Longspur  S
Calcarius mccownii
Lapland Longspur  
Calcarius lapponicus
* Chestnut-collared Longspur  X
Calcarius ornatus
Snow Bunting  
Plectrophenax nivalis
* McKay’s Bunting  X
Plectrophenax hyperboreus

ACKNOWLEDGMENTS

We wish to thank the other members of the Oregon Bird Records Committee, Alan Contreras, David Fix, Jeff Gilligan, David Irons, Larry McQueen, Eleanor Pugh and Steve Summers, all of whom critically reviewed the checklist and made suggestions for its improvement. We are especially indebted to the Committee Secretary, Clarice Watson, for her generous assistance and encouragement.

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TIME OF DAY AND DESERT BIRD CENSUSES

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WILBUR W. MAYHEW, Department of Biology, University of California, Riverside, California 92521

Many recent quantitative studies of avian population ecology have used strip transect methods to estimate bird densities (see Emlen 1971, 1977). These methods, and indeed all census methods, suffer from complications and limitations, some of which pertain to the observation conditions (e.g., weather and time of day). Traditionally the bias introduced by diurnal variations in bird detectability has been met by limiting censusing to early morning "when birds are most active" (Pettingill 1970). However, recent findings that detectability may vary inversely with time of day in winter, but directly with time of day in summer (Anderson and Ohmart 1977, Shields 1977), or in some species (Robbins 1981), emphasize the need for further studies.

Since 1978 we have been intensively censusing bird communities along a 2600-m altitudinal gradient in California's Santa Rosa Mountains, using the narrow strip transect method (Merikallio 1946, 1958). In order to sample all of our transects monthly, we have had to census at various times of day. Our early results suggested that, in the open desert habitats of our study region, time of day had little influence on census results, provided air temperature was below about 35 C. Indeed, midday censuses seemed to yield density estimates comparable to those obtained at sunrise. To examine this further, we censused two desert habitats ten times each, twice daily — once around sunrise and once at midday — between 25 March and 9 April 1980.

MATERIALS AND METHODS

The two 50-m wide transects we censused are part of a series of 32 strip transects established at the University of California's Philip L. Boyd Deep Canyon Desert Research Center, located near Palm Desert, California. Both transects lie on an alluvial fan (elevation 250 m) that spreads northward from the base of the Santa Rosa Mountains (Figure 1). One transect (No. 8; desert woodland habitat) is 1.3 km long and follows the sandy bed of a dry desert wash. The dominant plants on this transect are Palo Verde (Cercidium floridum), Smoke Tree (Dalea spinoza), Desert-willow (Chilopsis linearis), Desert-lavender (Hyptis emoryi), Chuparosa (Beloperone californica) and Cheesebush (Hyptoclea salsola). The other transect (No. 1B; scrubland habitat), located to the west of transect 8, follows a paved one-lane road (3-m wide) for 1.5 km across the broad alluvial fan. Dominant plants on this transect include Creosote Bush (Larrea tridentata), Burrobrush (Ambrosia dumosa), Sweet Bush (Bebbia juncea), Cheesebush and several species of cacti. A few scattered Palo Verde and Smoke Trees also occur on transect
DESERT BIRD CENSUSES

1B. Plant cover averages approximately 14% on transect 1B and 23% on transect 8 (Zabriskie 1979 and pers. comm.).

Both transects were walked twice daily, once within 2 h of sunrise and again at midday (starting times relative to sunrise are given in Appendices 1 and 2). All transect counts were made by Weathers on calm sunny days. He used all available cues to detect birds and advanced with frequent pauses at speeds averaging 1.7 km/h. Following Emlen (1979), we assumed that in these open habitats few species would show detectability attenuation inside the 25-m boundary. Hence, no density adjustments were made for difficult to detect species.

RESULTS

From the number of birds seen during sunrise and midday censuses (Appendices 1 and 2), we calculated species richness, mean number of species seen, density, and species diversity (Table 1). Significant diurnal differences in these measures of community structure existed only for the desert woodland habitat, in which density was lower and diversity higher at sunrise than at midday. In the more open scrubland habitat, midday and sunrise censuses were comparable. In both habitats a few species exhibited diurnal density changes (Appendices 1 and 2). Although some of these changes were due to variations in detectability, most seemingly resulted from localized

<table>
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<tr>
<th></th>
<th>Desert Woodland Habitat</th>
<th>Scrubland Habitat</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sunrise</td>
<td>Midday</td>
</tr>
<tr>
<td>Species richness*</td>
<td>25 (11)</td>
<td>25 (11)</td>
</tr>
<tr>
<td>Number species/census</td>
<td>11.90 ± 1.66</td>
<td>11.90 ± 1.45</td>
</tr>
<tr>
<td>Density (birds/40 ha)</td>
<td>594 ± 177*</td>
<td>719 ± 149</td>
</tr>
<tr>
<td>Diversity†</td>
<td>0.85 ± 0.03*</td>
<td>0.80 ± 0.05</td>
</tr>
</tbody>
</table>

Values are mean ± standard deviation.

†Simpson’s index of diversity: \[ D = 1 - \sum_{i=1}^{s} (P_i)^s. \]

*Total species (resident species).

*Significantly different from midday value (p < 0.02; paired t statistic).
Figure 1. View of Deep Canyon study site, near Palm Desert, California. Location of the desert woodland transect (No. 8) is indicated by the dashed line. The solid line denotes the scrubland transect (No. 1B). Photograph taken from 1100-m elevation looking northeast.
movements by birds. For example, more Gambel’s Quail were encountered in the scrubland habitat at sunrise than at midday, whereas the opposite was true for the desert woodland habitat. This circumstance was due to quail leaving their nighttime desert wash roosts at dawn and traveling across the scrubland transect to drink at a nearby stream. After drinking, they returned to the dry desert wash. Similar localized movements may be responsible for higher midday densities of two other desert woodland residents, the Mourning Dove and House Finch. Like the quail, these species require free water and probably left the transect early in the day to drink. Resident birds not dependent upon free water did not show significant diurnal variations in density.

![Graph](image)

Figure 2. Maximum daily air temperature (above) and mean bird density in two desert habitats (below). Bird density was determined by averaging sunrise and midday transect counts.
In contrast with the pattern seen in resident species, winter visitors were more numerous in the desert woodland at sunrise than at midday. This resulted from greater numbers of sparrows being recorded at sunrise (Appendix 1). In the desert woodland, Brewer’s, White-crowned and Golden-crowned sparrows tended to rest in dense bushes at midday and thus were less detectable at that time. Some White-crowned Sparrows probably left the desert wash for the scrubland habitat at midday, however, as their numbers increased there then.

During this study, bird density changed conspicuously with time of year (Fig. 2). In the desert woodland habitat, bird density decreased from around 800 to 330 birds/40 ha within 2 weeks. This decrease, which paralleled an increase in maximum air temperature, was due mainly to the emigration of winter visitors and House Finches. The early April peak in scrubland bird density resulted from beginning those censuses earlier in the day and consequently encountering more Gambel’s Quail (Appendix 2). When Gambel’s Quail are omitted from the calculations, scrubland bird density follows the desert woodland pattern.

DISCUSSION

The belief that early morning is the best time of day to census birds is widespread. Empirical studies, however, have yielded conflicting results. In some studies (Dawson 1981, Skirven 1981), bird density was independent of time of day, whereas in others (e.g., Robbins and Van Velzen 1967, Järvinen et al. 1977) it decreased with time since sunrise. Although sunrise may be the best time to census densely vegetated habitats (i.e., those in which detecting birds depends heavily on sound cues), in more open habitats other times of day may be equally satisfactory. Indeed, we found that due to local bird movements, the relative density of birds in desert woodland was actually higher at midday than at sunrise (Table 1). If we had limited censuses in this habitat to around sunrise, bird density would have been underestimated by an average of 17%. In three species (Gambel’s Quail, Mourning Dove and House Finch), the underestimation would have been closer to 100%. Clearly, one cannot assume a priori that sunrise censuses provide the best results in all habitats. Furthermore, in the absence of diurnal effects, limiting censusing to a single time of the day is unnecessary and inefficient.

Number of censuses required

Often, bird community structure is expressed by density, species diversity, and species richness estimates derived from transect data. The number of times that a transect must be censused to obtain reliable estimates of these parameters is thus of crucial importance. Presumably, this will vary with habitat type and season. In mature Honey Mesquite (Prosopis juliflora), Anderson and Ohmart (1977) found that a minimum of four censuses of
single transects 0.8 to 1.6 km long was necessary to obtain reliable estimates of bird species diversity and richness, but that a single census was adequate for determining density. In the open desert habitats we studied, single censuses also provided reasonable estimates of density. Indeed, total bird density changed so rapidly throughout our study that calculating a mean density from multiple censuses seems inappropriate.

In Figure 3 we present mean density estimates based on our unpublished censuses of six different desert woodland transects (including data for transect 8). These data confirm the pattern seen in Figure 2, and indicate that during the breeding season density varies markedly. A similar seasonal pattern has been found for birds in a northern hardwood forest by Holmes and Sturges (1975). Likewise, Weber and Theberge (1977) found that bird density in southern Ontario, Canada, changed 53% in 7 weeks. Such rapid changes in bird density suggest that, for a variety of habitats, the precision of density estimates probably improves little after the first census.

Bird species diversity (calculated from the data in Appendices 1 and 2) shows greater variability in the scrubland than in the desert woodland habitat (Table 2). Consequently, whereas only two or three censuses are needed to adequately estimate diversity in the desert woodland, four or five are required in the scrubland.

Figure 3. Seasonal change in total bird density (birds/40 ha) in desert woodland habitat at Deep Canyon Desert Research Center, Palm Desert, California. Values are means ± SE for the indicated number of transect counts. Data from six different transects.
### Table 2. Bird species diversity (Simpson’s Index) calculated from sunrise and midday census data.

<table>
<thead>
<tr>
<th>Census Number</th>
<th>Desert Woodland</th>
<th>Scrubland</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sunrise</td>
<td>Midday</td>
</tr>
<tr>
<td>1</td>
<td>0.86</td>
<td>0.72</td>
</tr>
<tr>
<td>2</td>
<td>0.86</td>
<td>0.81</td>
</tr>
<tr>
<td>3</td>
<td>0.78</td>
<td>0.78</td>
</tr>
<tr>
<td>4</td>
<td>0.83</td>
<td>0.70</td>
</tr>
<tr>
<td>5</td>
<td>0.85</td>
<td>0.80</td>
</tr>
<tr>
<td>6</td>
<td>0.89</td>
<td>0.80</td>
</tr>
<tr>
<td>7</td>
<td>0.87</td>
<td>0.82</td>
</tr>
<tr>
<td>8</td>
<td>0.86</td>
<td>0.87</td>
</tr>
<tr>
<td>9</td>
<td>0.83</td>
<td>0.83</td>
</tr>
<tr>
<td>10</td>
<td>0.90</td>
<td>0.83</td>
</tr>
</tbody>
</table>

Mean ± SD: 0.85 ± 0.03 ±0.80 ± 0.05 0.72 ± 0.14 0.71 ± 0.09

*Significantly different from sunrise, p < 0.01 paired t statistic.

Species richness, in terms of residents, changed by only one or two species after the fourth census in both habitats (Appendices 1 and 2). Based on more extensive censusing, however, we know that two species not detected during this study are resident in very low numbers in the desert woodland habitat: the Roadrunner, *Geococcyx californianus*, and Abert’s Towhee, *Pipilo aberti*. Similarly, the Poor-will (*Phalaenoptilus nuttallii*) is a low density resident in the scrubland. Failure to detect these species during this study reflects their low density and patchy distributions and, in the case of the Poor-will, nocturnal habits. This finding suggests that in these habitats several transects should be censused to estimate reliably species richness. Based on more extensive data, Anderson and Ohmart (1977) recommended censusing four different transects three times each to obtain adequate estimates of density, species diversity, and species richness in mature Honey Mesquite habitat. This recommendation seems reasonable for our more open habitats as well.

Because a multitude of factors affects bird census results (see Ralph and Scott 1981), our findings do not necessarily apply to other desert habitats. For example, in the Sonoran Desert, Grue et al. (1981) found bird density to be 32-49% lower at midday than at sunrise. Clearly, the prudent course is to assume that each situation is unique and to determine empirically the best time of day to census birds.
In desert scrubland, sunrise and midday strip transect censuses produced comparable estimates of species diversity, species richness, and density. In desert woodland, species diversity averaged 6.3% higher and density 17.4% lower at sunrise than midday. Lower sunrise density in the desert woodland resulted from about half the resident Gambel's Quail, Mourning Doves and House Finches leaving this habitat at dawn to drink at nearby water sources. Thus, in our study area, restricting censusing to around sunrise is inappropriate in the desert woodland and unnecessary in the desert scrubland.

In the open desert habitats we studied, density was estimated adequately from a single census, but reliable estimates of species diversity and richness required 4-5 censuses.

ACKNOWLEDGMENTS

We thank J. Michael Scott, Robert D. Ohmart and Charles van Riper III for critically reading the penultimate manuscript, and Debra L. Weathers for providing valuable technical assistance. Our research was supported by funds from the University of California Agricultural Experiment Station. This is contribution No. 2 from the University of California Natural Land and Water Reserve System.

LITERATURE CITED


APPENDIX 1. Number of birds recorded during sunrise and midday censuses in desert woodland habitat

<table>
<thead>
<tr>
<th>Census number</th>
<th>Sunrise</th>
<th>Midday</th>
<th>( \bar{x} ) (SD)</th>
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<tbody>
<tr>
<td>Start time (hrs. post sunrise)</td>
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<td>2</td>
<td>3</td>
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<tr>
<td>0.3</td>
<td>1.0</td>
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<table>
<thead>
<tr>
<th>Residents</th>
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<tbody>
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<td>Cooper's Hawk</td>
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<td>Accipiter cooperii</td>
</tr>
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<td>1</td>
</tr>
<tr>
<td>0.1 (0.32)</td>
</tr>
<tr>
<td>1</td>
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</tr>
<tr>
<td>Gambel's Quail</td>
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<td>1.2 (0.63)</td>
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<td>( \bar{x} ) (SD)</td>
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### Winter Visitors

<table>
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<tr>
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<th>Sunrise</th>
<th>Desert woodland habitat</th>
<th>Midday</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Start time (hrs. post sunrise)</strong></td>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td><strong>House Wren</strong> Troglydytes aedon</td>
<td>1</td>
<td>0.1 (0.32)</td>
<td>0.0 (0.00)</td>
</tr>
<tr>
<td><strong>Bewick's Wren</strong> Thryomanes bewickii</td>
<td>1 2 1 1</td>
<td>0.5 (0.71)</td>
<td>2 1 1 2</td>
</tr>
<tr>
<td><strong>Ruby-crowned Kinglet</strong> Regulus calendula</td>
<td>1</td>
<td>0.1 (0.32)</td>
<td>1</td>
</tr>
<tr>
<td><strong>Phainopepla</strong> Phainopepla nitens</td>
<td>19 29 32 24 21 20 21 14 14 4</td>
<td>19 8 (7.97)</td>
<td>15 28 23 18 19 23 25 14 16 2</td>
</tr>
<tr>
<td><strong>Lesser Goldfinch</strong> Carduelis psaltria</td>
<td>1</td>
<td>0.1 (0.32)</td>
<td>4 10</td>
</tr>
<tr>
<td><strong>Brewer's Sparrow</strong> Spizella breweri</td>
<td>2 2</td>
<td>0.4 (0.84)</td>
<td>0.0 (0.00)</td>
</tr>
<tr>
<td><strong>White-crowned Sparrow</strong> Zonotrichia leucophrys</td>
<td>12 12 18 7 23 9 13 13 14 3</td>
<td>12.4 (5.54)</td>
<td>6 1 3 8 7 3 7 6</td>
</tr>
<tr>
<td><strong>Golden-crowned Sparrow</strong> Zonotrichia atricapilla</td>
<td>3 1</td>
<td>0.4 (0.97)</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>34 42 51 36 44 30 38 27 29 7</td>
<td>33.8 (11.98)</td>
<td>19 38 24 32 27 31 28 21 24 3</td>
</tr>
</tbody>
</table>

### Migrants

<table>
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<tr>
<th>Census number</th>
<th>Sunrise</th>
<th>Desert woodland habitat</th>
<th>Midday</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Start time (hrs. post sunrise)</strong></td>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td><strong>Western Flycatcher</strong> Empidonax difficilis</td>
<td>0.0 (0.00)</td>
<td>1</td>
<td>0.1 (0.32)</td>
</tr>
<tr>
<td><strong>Orange-crowned Warbler</strong> Vermivora celata</td>
<td>1 2 2 4</td>
<td>0.9 (1.37)</td>
<td>1 1</td>
</tr>
<tr>
<td><strong>Black-headed Grosbeak</strong> Pheucticus melanocephalus</td>
<td>1</td>
<td>0.1 (0.32)</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1 2 2 4 1</td>
<td>1.0 (1.33)</td>
<td>2 1 1</td>
</tr>
</tbody>
</table>
### Desert woodland habitat

<table>
<thead>
<tr>
<th>Census number</th>
<th>Sunrise</th>
<th>Midday</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Start time (hrs. post sunrise)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>0.3</td>
<td>1.0</td>
<td>1.3</td>
<td>1.0</td>
<td>0.3</td>
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#### Summer Visitors

<table>
<thead>
<tr>
<th>Species</th>
<th>Sunrise</th>
<th>Midday</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ash-throated Flycatcher</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><em>Myiarchus cinerascens</em></td>
<td>0.1 (0.32)</td>
<td>0.2 (0.63)</td>
</tr>
<tr>
<td>Violet-green Swallow</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><em>Tachycineta thalassina</em></td>
<td>0.1 (0.32)</td>
<td>0.1 (0.32)</td>
</tr>
<tr>
<td>Hooded Oriole</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><em>Icterus cucculatus</em></td>
<td>0.2 (0.42)</td>
<td>0.3 (0.48)</td>
</tr>
<tr>
<td>Scott's Oriole</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><em>Icterus parisorum</em></td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Northern Oriole</td>
<td>0.0 (0.00)</td>
<td>1</td>
</tr>
<tr>
<td><em>Icterus galbula</em></td>
<td>1</td>
<td>0.2 (0.42)</td>
</tr>
<tr>
<td>Total</td>
<td>2</td>
<td>4</td>
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#### Unidentified birds

<table>
<thead>
<tr>
<th>Group</th>
<th>Sunrise</th>
<th>Midday</th>
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<tbody>
<tr>
<td>Hummingbirds</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td><strong>7</strong></td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Others (mainly sparrow size)</td>
<td>7</td>
<td>19</td>
</tr>
<tr>
<td><strong>12</strong></td>
<td>19</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>18</td>
<td>30</td>
</tr>
<tr>
<td>Total of all individuals</td>
<td>109</td>
<td>131</td>
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<tr>
<td>Total of all species</td>
<td>12</td>
<td>14</td>
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</table>

*Values are mean (standard deviation). To convert to birds/40 ha multiply by 6.3.

†Significantly different from sunrise value p<0.05; paired t statistic.
APPENDIX 2. Number of birds recorded during sunrise and midday censuses in desert scrubland habitat

<table>
<thead>
<tr>
<th>Census number</th>
<th>Sunrise</th>
<th>Midday</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start time (hrs. post sunrise)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>1.5</td>
<td>2.0</td>
<td>0.6</td>
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Residents

<table>
<thead>
<tr>
<th>Species</th>
<th>Sunrise</th>
<th>Midday</th>
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<tbody>
<tr>
<td>Gambel’s Quail</td>
<td>Lophortyx gambeli</td>
<td>1</td>
</tr>
<tr>
<td>Mourning Dove</td>
<td>Zenaida macroura</td>
<td>1</td>
</tr>
<tr>
<td>Costa’s Hummingbird</td>
<td>Calypte costae</td>
<td>2</td>
</tr>
<tr>
<td>Say’s Phoebe</td>
<td>Sayornis saya</td>
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</tr>
<tr>
<td>Verdin</td>
<td>Wariparus flaviceps</td>
<td>1</td>
</tr>
<tr>
<td>Cactus Wren</td>
<td>Campylorhynchus brunneicapillus</td>
<td>2</td>
</tr>
<tr>
<td>Mockingbird</td>
<td>Mimus polyglottos</td>
<td>1</td>
</tr>
<tr>
<td>Black-tailed Gnatcatcher</td>
<td>Polioptila melanura</td>
<td>1</td>
</tr>
<tr>
<td>Loggerhead Shrike</td>
<td>Lanius ludovicianus</td>
<td>2</td>
</tr>
<tr>
<td>House Finch</td>
<td>Carpodacus mexicanus</td>
<td>13</td>
</tr>
<tr>
<td>Black-throated Sparrow</td>
<td>Amphispiza bilineata</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
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</table>
## Appendix 2 (continued)

<table>
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<th>Start time (hrs. post sunrise)</th>
<th>Scrubland habitat</th>
<th>Midday</th>
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<td>Sunrise</td>
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</tr>
<tr>
<td>1</td>
<td>1.5</td>
<td>2.0</td>
<td>0.6</td>
</tr>
<tr>
<td>2</td>
<td>0.0</td>
<td>1.25</td>
<td>1.0</td>
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<tr>
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<td>1.5</td>
<td>1.5</td>
<td>0.3</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Winter Visitors</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Ruby-crowned Kinglet</td>
<td></td>
<td>3</td>
<td>0.3 (0.95)</td>
</tr>
<tr>
<td><em>Regulus calendula</em></td>
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<tr>
<td>Phainopepla</td>
<td>4</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td><em>Phainopepla nitens</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lesser Goldfinch</td>
<td>1</td>
<td>0.1 (0.32)</td>
<td>1</td>
</tr>
<tr>
<td><em>Carduelis psaltria</em></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Savannah Sparrow</td>
<td>0.0 (0.00)</td>
<td>1</td>
<td>0.1 (0.32)</td>
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<td><em>Passerculus sandwichensis</em></td>
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<td></td>
</tr>
<tr>
<td>Brewer's Sparrow</td>
<td>1</td>
<td>0.1 (0.32)</td>
<td>1</td>
</tr>
<tr>
<td><em>Spizella breweri</em></td>
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</tr>
<tr>
<td>White-crowned Sparrow</td>
<td>6</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td><em>Zonotrichia leucophrys</em></td>
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<td></td>
</tr>
<tr>
<td>Total</td>
<td>4</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>Migrants</td>
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<tr>
<td>Orange-crowned Warbler</td>
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<td>0.0 (0.00)</td>
<td>1</td>
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<tr>
<td><em>Vermivora celata</em></td>
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<td></td>
</tr>
<tr>
<td>Chipping Sparrow</td>
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<td>0.1 (0.32)</td>
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<tr>
<td><em>Spizella passerina</em></td>
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<td></td>
</tr>
<tr>
<td>Total</td>
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<td>0.1 (0.32)</td>
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Appendix 2. continued

<table>
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<th>Sunrise</th>
<th>Midday</th>
</tr>
</thead>
<tbody>
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</tr>
<tr>
<td></td>
<td>1.5</td>
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Summer Visitors

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<th>Census Number</th>
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<th>Sunrise SD</th>
<th>Midday Mean</th>
<th>Midday SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Violet-green Swallow</td>
<td>3</td>
<td>0.3 (0.95)</td>
<td></td>
<td>0.2 (0.63)</td>
<td></td>
</tr>
<tr>
<td>Tachycineta thalassina</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hooded Oriole</td>
<td></td>
<td>0.0 (0.00)</td>
<td>1</td>
<td>0.1 (0.32)</td>
<td></td>
</tr>
<tr>
<td>Icterus cucullatus</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scott's Oriole</td>
<td></td>
<td>0.0 (0.00)</td>
<td>1</td>
<td>0.1 (0.32)</td>
<td></td>
</tr>
<tr>
<td>Icterus parisorum</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern Oriole</td>
<td></td>
<td>1</td>
<td>0.1 (0.32)</td>
<td>0.0 (0.00)</td>
<td></td>
</tr>
<tr>
<td>Icterus galbula</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
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<td>3</td>
<td>1</td>
<td>0.4 (0.97)</td>
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</tbody>
</table>

Unidentified birds

<table>
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<th>Census Number</th>
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<th>Sunrise SD</th>
<th>Midday Mean</th>
<th>Midday SD</th>
</tr>
</thead>
<tbody>
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<td>Hummingbirds</td>
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<td>1</td>
<td>1</td>
<td>0.3 (0.48)</td>
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<tr>
<td>Others (mainly sparrow sized)</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Total of all individuals | 30 | 27 | 45 | 74 | 86 | 36 | 42 | 24 | 33 | 39 | 43 | 6.0 (20.45) | 37 | 45 | 81 | 49 | 34 | 59 | 40 | 24 | 22 | 44.0 (17.30) |

Total of all species | 9 | 7 | 5 | 6 | 9 | 10 | 9 | 9 | 8 | 8.2 (1.69) | 9 | 8 | 9 | 10 | 12 | 8 | 10 | 10 | 9 | 6 | 9.1 (1.69) |

*Values are mean (standard deviation). To convert to birds/40 ha multiply by 6.3.

1Significantly different from sunrise value p<0.05; paired t statistic.

Accepted 5 February 1982
Gambel's Quail

Sketch by Narca Moore
PHENOLOGY AND STATUS OF THE SHOREBIRDS IN NORTHERN UTAH

TEX A. SORDAHL, Department of Biology and the Ecology Center, Utah State University, Logan, Utah 84322 (current address: Department of Biology, Luther College, Decorah, Iowa 52101)

Although the marshes associated with Bear Lake, the Bear River and the Great Salt Lake are noted for providing habitat for large concentrations of waterbirds, the status of the shorebirds (Charadrii) has not been well-documented in northern Utah. Because of their location in the arid Great Basin, these extensive marshes may be a critical staging area for many migratory shorebirds; in addition, they support substantial breeding populations of several species. As human demand for the limited water resource increases, information about the seasonal use of the wetlands by shorebirds becomes more urgent for consideration in water management decisions. This paper presents new information on the phenology of migration and nesting, and on the numerical status, of shorebirds in northern Utah.

In connection with their work on the birds of Utah, Behle and Perry (1975) summarized the status of shorebirds based on published and unpublished records from 1852 to 1 October 1974, and Hayward et al. (1976) similarly provided another review. I began making observations on shorebirds in northern Utah (in Cache Valley and at the Bear River Migratory Bird Refuge) in the fall of 1973. From that time through spring 1980, while conducting behavioral research on Willets, American Avocets and Black-necked Stilts, I kept notes on the species and numbers of shorebirds present during my field work. I have records for 375 days, the majority of which are from 1975, 1977 and 1978. A few of these records have been reported as sightings in American Birds.

Unless otherwise indicated, all records reported here are from the Barrens, near Amalga, Cache County, Utah. The Barrens consists of shallow ponds and channels with extensive salt flats and mud flats. Its vegetation is mostly desert saltgrass (Distichlis stricta) and samphire (Salicornia spp.). The Barrens is approximately 205 ha in size. Thus the numerical data given convey a rough idea of shorebird densities; however, the breeding densities of Willets and Long-billed Curlews cannot be gauged in this way because they nested in surrounding agricultural fields. All records presented in this paper are based on direct personal observations, unless otherwise noted. Thus in some cases the span of dates given for copulations, nests with eggs, hatching, or flightless young could be extended further by calculations employing literature values for incubation period or fledging age.

I recorded 32 shorebird species at the Barrens. Of these, 8 nest there: American Avocet, Black-necked Stilt, Killdeer, Snowy Plover, Common Snipe, Long-billed Curlew, Willet and Wilson’s Phalarope. A ninth species, the Spotted Sandpiper, may occasionally breed at the Barrens. Behle and Perry (1975) listed 37 shorebird species for the state. Of those, I did not observe 6 species: Black Oystercatcher (Haematopus bachmani), Mountain Plover (Charadrius montanus), Bar-tailed Godwit (Limosa lapponica),
Upland Sandpiper (*Bartramia longicauda*), Wandering Tattler (*Heteroscelus incanus*) and Red Phalarope (*Phalaropus fulicarius*). I recorded one species (Curlew Sandpiper) that is not on their list (but see species account below).

The records presented here extend the dates of occurrence listed by Behle and Perry (1975) for 14 species; these species are indicated by an asterisk (*). Some of these may winter in small numbers in the southern part of the state (Behle and Perry 1975, Hayward et al. 1976). Although I did not examine the relationship critically, it appeared that more migrants were present and more sightings of uncommon species were made under certain meteorological conditions — especially low, heavy cloud cover associated with precipitation (see also Beason 1978). I have attempted to follow the conventions used by Behle and Perry (1975:4-5) for seasonal status and relative abundance. Five species are given status or abundance designations that differ from those of Behle and Perry (1975); these species are indicated by a double asterisk (**).

**RECURVIROSTRIDAE**

**AMERICAN AVOCET, Recurvirostra americana.** Common summer resident. Present 24 March-27 October, with a maximum of 361 recorded during spring migration, and an estimated breeding population of 85 pairs.

Copulations observed 24 March-23 June. Nests with eggs 14 April-18 July. Hatching 17 May-18 July. Latest clutch initiation 22 June. Flightless young until 15 August. By 13 June many birds start to molt into gray head of basic plumage, beginning around the eyes and on the forehead; replacement of remiges also begins by mid-June for many individuals.

**BLACK-NECKED STILT, Himantopus mexicanus.** Common summer resident. Present 27 March-6 October, with a maximum of 85 recorded during spring migration, and an estimated breeding population of 25 pairs.


**CHARADRIIDAE**


**KILLDEER, Charadrius vociferus.** Common summer resident; a few can be seen in parts of Cache County throughout the winter (J.T. Mundahl pers. comm.) and may be permanent residents, but none are present at the Barrens in winter. Present at the Barrens 19 March-13 October. Maximum of 150 recorded in late March. Estimated breeding population of 20 pairs.

Combining my observations at the Barrens with those of J.T. Mundahl (pers. comm.) elsewhere in Cache County provides the following information on breeding phenology. Migrants arrive about the first week of March. Copulations observed 6 March-2 July. Nests with eggs 29 March-15 July. Flightless young 4 May-3 August. Some flocking apparent in late June.

**SNOWY PLOVER, Charadrius alexandrinus.** Uncommon summer resident. Present 27 March-3 September. Maximum of 20 recorded in mid-April. Estimated breeding population of 5-8 pairs.

Nests with eggs 23 May-1 June. Flightless young 28 June-6 August.

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American Avocet on nest, May 1979, Utah.  

Photo by Tom Bledsoe
UTAH SHOREBIRDS

*LESSER GOLDEN PLOVER, Pluvialis dominica. Uncommon transient. Three spring sightings — one bird in basic plumage on 7 April 1979, one bird in alternate plumage on 20 May 1978, and one bird in basic plumage (but with a few black breast feathers) on 20 June 1977. Three fall sightings of 3 birds in basic plumage. 23 September-6 October 1978: probably the same individuals each day.

**BLACK-BELLIED PLOVER, Pluvialis squatarola. Uncommon transient. Approximately as common as Semipalmed Plover, but more common than Lesser Golden Plover. Spring occurrence 23 April-25 May, with a maximum of 8 recorded: 10:1 ratio of alternate:basic plumage. Fall occurrence 7 August-28 September, with a maximum of 11 recorded; 10:1 ratio of basic:alternate plumage.

SCOLOPACIDAE
Calidridiniae

RED KNOT, Calidris canutus. Rare transient. Two spring records — one bird in alternate plumage on 5 May 1975, and a flock of 4 birds in alternate plumage on 6 and 7 May 1978. One fall record — a bird in basic plumage (but with some rusty color on the breast) on 14 July 1975. Behle and Perry (1975) cited 2 specimens for the state, taken at the Bear River Migratory Bird Refuge in July 1948 and at St. George on 12 September 1965; they also listed sight records in northern Utah on 8 May 1954, 11 May 1968 and 10 May 1973. Hayward et al. (1976) noted one additional specimen, collected in Box Elder County in May 1933.

*SANDERLING, Calidris alba. Uncommon transient. Spring occurrence 27 April-25 May; maximum number recorded, 12. One early fall record, of several birds on 25 July 1975. Most spring birds were in pre-alternate molt, with two-thirds of them being in predominantly basic plumage.

SEMIPALMATED SANDPIPER, Calidris pusilla. Probably rare transient. Status is uncertain because of the difficulty of distinguishing C. pusilla from the more common C. mauri in the field (Phillips 1975, Prater et al. 1977), especially in the fall (Ouellet et al. 1973). On three occasions I saw one or more birds at extremely close range that I identified as C. pusilla — 28 April 1975, 4 May 1977 and 8 May 1979. Behle and Perry (1975) cited two spring sight records from Utah, on 6 May 1945 and 7 May 1967. Hayward et al. (1976) reported a total of 4 Utah specimens, taken in September 1872, 13 June 1936 and 7 September 1965.

*WESTERN SANDPIPER, Calidris mauri. Common transient. Spring occurrence 3 April-17 May, but sightings of Calidris sp. on 29 March and 8 June 1978 were probably of this species: maximum number recorded, 30. Autumn occurrence 25 June-20 September; maximum number recorded, 287.

*LEAST SANDPIPER, Calidris minutilla. Common transient. Spring occurrence 7 April-22 May; maximum number recorded, 100. Autumn occurrence 3 July-6 October; maximum number recorded, 22.


PECTORAL SANDPIPER, Calidris melanotos. Uncommon transient. Spring occurrence 3 April-4 May, based on three records: maximum number recorded. 2. Autumn occurrence 3 September-6 October: maximum number recorded. 67.


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* DUNLIN, Calidris alpina. Uncommon transient. Spring occurrence 22 April-2 June; maximum number recorded, 7. All birds seen were in alternate plumage. No fall records.


One autumn record, of a bird in pre-basic molt on 16 August 1978. Behle and Perry (1975) reported two fall sight records for northern Utah, on 26 July 1932 and 5 September 1968.

Gallinagininae

COMMON SNIPE, Capella gallinago. Common summer resident; winters in some parts of Cache County, at least during some years, but not at the Barrens. Occurrence at the Barrens 25 March-14 September. Flocks of ca. 20 birds seen nearby in late February. Winnowing at the Barrens 29 March-19 April. Estimated breeding population of 5 pairs.

Winegardner (1976) reported the following on breeding schedule in Cache County: winnowing 16 March-20 July; pair formation begins ca. 1 April; establishment of territories 1-15 April; territories, usually ca. 9 ha, occupied continually until about 15 June.

SHORT-BILLED DOWITCHER, Limnodromus griseus. Uncommon transient. Because of time constraints and the difficulty of distinguishing the two species of Limnodromus, I usually recorded the number of birds under the inclusive heading “dowitches.” See L. scolopaceus.

** LONG-BILLED DOWITCHER, Limnodromus scolopaceus. Common transient. Spring occurrence 26 March-8 June; maximum number recorded, 250. Autumn occurrence 8 July-6 October; maximum number recorded, 308.

Tringinae


Because mine is only the second state record for this species, and the first for northern Utah, it is appropriate to provide details of the sighting. Using 7 x 35 binoculars I observed the 2 birds from 1600-1800 at distances of 40 to 100 m. It was sunny and clear, and the sun was behind me. The birds stood quietly, preened, and once flew in a wide semi-circle before landing nearby. Their long bills were light-colored at the base and slightly upturned, but the birds were distinctly smaller and much more reddish on the underparts than Marbled Godwits, which I never recorded at the Barrens later than 14 May; the latest spring date given by Behle and Perry (1975) for Marbled Godwits in Utah is 26 May. The reddish color of the underparts extended to the belly and undertail coverts, and was marked by dark bars. Both while preening and in flight the birds exhibited a dorsal white wing stripe and a black tail with white at its base. The black on the tail formed a terminal band which was sharply delineated from the white at the base of the tail. Identification of this species in alternate plumage is not difficult; the field marks noted above distinguish the Hudsonian Godwit from all species with which
it might conceivably be confused, including the Long-billed Dowitcher, Marbled and Bar-tailed godwits, Willet, and even the Palearctic Black-tailed Godwit (Limosa limosa).

*MARbled GODWIT, Limosa fedoa. Common transient. Spring occurrence 22 April-14 May; maximum number recorded, 50. D.M. Forsythe (pers. comm.) recorded spring arrival in Cache County on 20 April 1967. Autumn occurrence 23 June-3 September; maximum number recorded, 68.

WHIMbREL, Numenius phaeopus. Rare transient. Three spring records — 3 birds on 18 April 1977, 1 on 15 May 1977, and 1 on 11 May 1978. D.M. Forsythe saw 1 in Cache County on 7 May 1965 (Hayward et al. 1976). Several previous records for Utah span the dates 22 March-14 June, and include one fall record for 27 August (Behle and Perry 1975).

**LONG-BILLED CURLEw, Numenius americanus. Common summer resident. Present 29 March-15 August, with a maximum of 70 recorded during fall migration, and an estimated breeding population of 5-10 pairs in fields surrounding the Barrens. Nests with eggs 4-25 May. Flightless young 2-20 June. Last birds seen in fall are young-of-the-year.

D.M. Forsythe (pers. comm.) recorded spring arrival in Cache County on 22 March 1968. Two nests in Cache County were active from at least 3 May to 23 May, when hatching occurred at one nest (Forsythe 1972). For inferences about the phenology of the population, see Forsythe (1970:214).

*GREATER YELLOWLEGS, Tringa melanoleuca. Common transient. Spring occurrence 24 March-8 May; maximum number recorded, 40. Autumn occurrence 13 June-6 October; maximum number recorded, 9.


SOLITARY SANDPIPER, Tringa solitaria. Uncommon transient. Spring occurrence 6-11 May, based on five sightings of at least 2 individuals. A specimen was taken in Cache County on 28 April 1937 (Hayward et al. 1976). Autumn occurrence 29 July-9 September, based on seven sightings of at least 8 individuals; maximum number recorded, 3.

The notion that this species may nest in Utah (Hayward et al. 1976) is almost certainly erroneous (see Palmer 1967).

SPOTTED SANDPIPER, Actitis macularia. Common summer resident in northern Utah, but uncommon at the Barrens. Most commonly seen in northern Utah around alpine lakes and impoundments of mountain streams. Habitat at the Barrens apparently is not preferred for nesting, although similar habitat at the Bear River Migratory Bird Refuge supports a small breeding population (pers. obs.; some young fledge by mid-June). A maximum of 4 birds was recorded in a single census at the Barrens. Song-flights and courtship behavior were observed in mid-June 1978, but nesting was not confirmed. Recorded dates of occurrence, 14 May-28 June and 19 July-3 September, suggest that the small numbers of Spotted Sandpipers seen at the Barrens are transients there.

**WILLET, Catoptrophorus semipalmatus. Common summer resident. Present 1 April-9 September, with a maximum of 127 recorded during fall migration, and an estimated breeding population of 10-15 pairs in fields surrounding the Barrens.

Copulations observed 19 April-3 June. Nests with eggs 1 May-18 June. Flightless young 25 May-10 July, and fledged young by 19 June. Last birds seen in fall are
young-of-the-year. Most birds have departed by mid-August. For inferences about the phenology of the population, see Sordahl (1979:552).

Arenariinae

RUDDY TURNSTONE, Arenaria interpres. Occasional. One in alternate plumage seen on 5 June 1976. Previous Utah records are all from the northern part of the state. Behle and Perry (1975) reported 1 specimen taken on 4 August 1930 in Box Elder County, and sight records on 3 June 1944, 29 April 1962 and 24 August 1973. Hayward et al. (1976) reported three additional sight records, all from Box Elder County: 2 birds in late May 1932; 3 birds in alternate plumage on 17 May 1933; and 1 bird on 28 May 1944.

Phalaropodinae

*WILSON’S PHALAROPE, Phalaropus tricolor. Common summer resident. Present 21 April-3 September (1 very early female just beginning the pre-alternate molt was present for 1 day, 26 March 1978). Maximum of 579 recorded during fall migration; maximum spring numbers, ca. 300. Estimated breeding population of 70-80 pairs. Early spring sex ratio favors females. Spring birds are in alternate plumage; autumn birds are in pre-basic molt, and most are in predominantly basic plumage.

Copulations observed late April. Nests with eggs 18 May-8 June. Flightless young 16-26 June. Flocking prior to fall migration is noticeable by the 4th week of June.

*NORTHERN PHALAROPE, Phalaropus lobatus. Common transient, but less common than *P. tricolor. Spring occurrence 28 April-25 May; maximum number recorded, 100. Autumn occurrence 2 July-6 October; maximum number recorded, 280. Spring birds are in alternate plumage; autumn birds are in pre-basic molt, and most have nearly completed it.

ACKNOWLEDGMENTS

I am grateful to Jack B. Parson and other members of the Barrens Company Hunting Club for permitting me to conduct research on their land. My research was supported by a Utah State University Research Fellowship and by grants from the Frank M. Chapman Memorial Fund of the American Museum of Natural History and from Sigma Xi, The Scientific Research Society.

I thank Keith L. Dixon and William H. Behle for helpful suggestions on the manuscript, and John T. Mundahl for sharing his Killdeer observations.

LITERATURE CITED


Accepted 26 December 1981
NOTES

A SANDWICH TERN IN CALIFORNIA

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For at least 9 days during May 1980 a Sandwich Tern (Sterna sandvicensis) was present near Imperial Beach, San Diego Co., California. All sightings were made at the Elegant Tern (S. elegans) breeding colony located in the saltworks at the south end of San Diego Bay. I first saw the Sandwich Tern the afternoon of 11 May with a group of about 150 Elegant Terns, 50 Forster's Terns (S. forsteri) and 6 Least Terns (S. albafrons) which were foraging in an outer evaporating pond on numerous small (2-10 cm) fishes, mostly Topsmelt (Atherinops affinis) and Longjaw Mud suckers (Gillichthys mirabilis).

The Sandwich Tern periodically landed on the dike with the largest Elegant Tern breeding group, carrying a fish in its bill, and attempted to stand among the incubating birds or with other small groups of Elegant Terns on the dike. The Elegant Terns never allowed the Sandwich Tern the same proximity as other Elegant Terns and consistently drove it off if it approached closer than about 0.5 m. It went from group to group, and several times after being driven off it swallowed its fish, flew off to catch another, and tried again. After about 45 minutes the bird left the saltworks and headed out towards the bay.

Hoping to see the tern again when it came to roost, I returned to the same spot that evening. About 1815 it reappeared. The scenario was much as before and I observed the bird until dusk.

The Sandwich Tern was next seen the morning of 13 May by Michael Evans and myself. Shortly past 0900 we observed the bird making fish offering displays to individual Elegant Terns in a manner generally similar to that of male Elegant Terns. The Sandwich Tern would approach an Elegant Tern obliquely or perpendicularly in an upright posture with a small fish held crosswise in its bill. The Sandwich Tern's wings were held out from the body at the carpal joints, with the primaries slightly drooped. The crest was held erect, the neck vertical and the head horizontal, with the bill nearly parallel to the ground. The tail angled down at the tip but would occasionally raise to approximately horizontal as the tern made distinct vertical flicking motions with its bill. The stance would change to nearly parallel to and slightly behind the Elegant Tern to which the Sandwich Tern was offering as the Elegant Tern rejected the offering and walked away. If the Sandwich Tern persisted in offering and followed the Elegant Tern, the Elegant Tern would drive it off with the bill using a threat gaping posture typical of many tern species. We observed this behavior nearly 40 minutes until the tern flew out of sight.

The bird was also seen at about noon on 13 May by Guy McCaskie and again that evening by McCaskie, Elizabeth Copper and Jon Dunn. As far as is known, the last sighting was made the morning of 20 May when I saw the bird standing on the dike about 2 m from a group of six Elegant Terns. Within just a few minutes it flew off and was not seen again.

A description of the tern by another observer is on file with the California Bird Records Committee and the record, the first for California, has been accepted by the committee.

Western Birds 12: 181-182, 1981
The Sandwich Tern (with its subspecies sandvicensis, acutilavida and eurygnatha) has a wide distribution, breeding at the Black and Caspian seas in western Asia, locally from northern Europe to North Africa, along the southern United States coast from Virginia to Texas, the Caribbean coast of Mexico, the Bahamas, Curaçao and the Atlantic coast of South America south to Argentina. Beyond its typical breeding range the Sandwich Tern winters commonly in North Africa (although it is rarer towards eastern North Africa: Etchecopar and Hue 1964). West Africa (Brown 1979), south to South Africa and across the Indian Ocean very spottily to northwest India. In the western hemisphere beyond its typical breeding range the Sandwich Tern winters along the Caribbean coast of Central America and Colombia and in the Pacific from Tehuantepec, Oaxaca, Mexico (Peterson and Chalif 1973) south to Peru (Junge and Voous 1955, Meyer de Schauensee 1966, Blake 1977).

It should be noted that the San Diego saltworks were also visited by a few Royal Terns (S. maxima). Buckley and Buckley (1972) indicate that the Sandwich Tern often associates closely with the Royal Tern, a species which shares much of the Sandwich Tern’s African and Neotropical distributions. Like the Elegant Tern and often associated with Elegant Terns, the Royal Tern can be seen at various times of the year from Peru (Ashmole and Tovar-S. 1968) north along the Pacific coast and Gulf of California to San Francisco, California (Cogswell 1977).

Thus, the three tern species (Elegant, Royal and Sandwich) occur together at least casually on the Pacific coast from Peru north to Central America (Blake 1977) giving Sandwich Terns ample opportunity to come in contact with Elegant and Royal terns. Considering that all three species are highly social, one could conclude that the Sandwich Tern in San Diego had become disoriented during the spring migration and followed the next most similar species, Elegant and Royal terns.

LITERATURE CITED


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PREY-INDUCED MORTALITY OF A PIED-BILLED GREBE

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On 9 January 1977 James A. Gast of Arcata, California, picked up a dead Pied-billed Grebe (*Podilymbus podiceps*) at the mouth of Maple Creek, Humboldt County, California. Because there are relatively few documented cases of natural mortalities in birds, I present some information on this one.

The grebe, a robust male, weighed 564 g, and had a wing chord of 142 mm. A Prickly Sculpin (*Cottus asper*) protruded outward between the bird’s mandibles (Figure 1). The sculpin, a female, was 131 mm standard length (tip of snout to base of caudal fin), 153 mm total length, and weighed 42.4 g (preserved wet weight). It had large ovaries weighing 5.3 g, with maturing ova which caused the abdomen to bulge. The preopercular spine of each gill cover protruded slightly and appeared to be lodged in the gular skin of the grebe just posterior to the base of the mandibles. The entire gular region was examined for hemorrhaging, or obvious internal injuries. As none were discovered, I assumed the cause of death to be suffocation. Both bird and fish were in fresh condition.

Whether an intact prey item can be ingested by a predator is determined by such factors as the greatest circumference and flexibility of the prey, the width and height of the predator’s gape, the elasticity of the gular area and esophagus, and the presence or absence on the prey of outward-projecting structures which could hinder ingestion. The greatest width, height and circumference of the sculpin’s head were 28 mm, 21 mm and 80 mm respectively. These dimensions probably did not exceed the elasticity of the gular area of the grebe, a species which has both anatomical and behavioral traits for handling large, spiny prey.

![Figure 1. Dead Pied-billed Grebe with dead Prickly Sculpin protruding from its mandibles.](image)

*Photo by Robert A. Behrstock*
Sculpins, including *Cottus asper*, are known foods of Pied-billed Grebes (Palmer 1962). Zusi and Storer (1969), in reviewing some literature on food habits of grebes, suggested that the stout bill and heavy jaw musculature of these birds evolved to deal with heavy-bodied prey such as crawfish, frogs and fishes. Such prey items are subdued by repeated pinching and beating prior to ingestion. Wetmore (1924) stated that the pectoral and dorsal spines of a Channel Catfish (*Ictalurus punctatus*), and the claws of a large crayfish were removed prior to ingestion by a Pied-billed Grebe. Apparently, an attempt was made to swallow this fish before it was adequately subdued. The sculpin’s expanded gill covers and their outward-projecting preopercular spines prevented both ejection or further ingestion, eventually causing the grebe to suffocate.

The grebe is specimen 4077 in the museum of the Department of Wildlife, Humboldt State University (HSU), Arcata, California. The sculpin is specimen 31000-28B in the Fisheries Collection, Department of Fisheries (HSU). I thank James A. Gast for turning over his unusual find, and James R. Koplín for commenting on this manuscript and encouraging my interest in fish-eating birds.

LITERATURE CITED


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CORRIGENDA

*Western Birds* 12(2), 1981 (Breeding Avifaunas of the New York Mountains and Kingston Range): p. 80. under Rufous-sided Towhee, change “*Larrea*” to “*Garrya*”; p. 81, under section B. add “Hepatic Tanager (NU). A female was sitting on a nest and a male was nearby.”

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AN ALBINISTIC BAND-TAILED PIGEON IN EVERGREEN, COLORADO

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At 1230 on 26 August 1980, while making counts of Band-tailed Pigeons (Columba fasciata) at an artificial bait site, I observed an albinistic bandtail near Evergreen, Jefferson County, Colorado. This pigeon was with four normally-colored bandtails and landed in a tree approximately 40 m from my vehicle. I viewed the aberrant pigeon through a 15-60x spotting scope and recorded its general appearance. The feathers on the head, back and dorsal side of the wings and tail were buff-yellow to cream-colored (Smithe 1975). The tip of the tail was lighter but the terminal band was indistinct. The nape was purple-iridescent but the neck crescent was absent. The breast feathers were buff-colored. The pigeon had spectrum yellow legs and feet but a glaucous bill, and appeared similar in size to another nearby immature bandtail.

The buff-yellow plumage of this bandtail was almost certainly caused by loss of pigment or schizochroism (Harrison 1963). In Rock Doves (C. livia), "yellow" plumage refers to a dilute erythrich form. Both the normal eumelanin and phalomelanin pigment concentrations were probably reduced in the plumage of the observed pigeon. It could be classified as a nonmelanic schizochroic (Harrison 1966).

From May through August 1979 and 1980, I observed between 10 and 1500 Band-tailed Pigeons per day, at least four days per week, as part of a study to evaluate census methods. Despite the large number of pigeons observed, only this single bandtail with abnormal plumage was recorded.

Braun et al. (1979), handling over 30,000 bandtails, found only 18 birds with plumage abnormalities. Most aberrant pigeons in their report exhibited partial albinism (feathers with white blotching or patches of white feathers). Two of the 18 birds were classified as nonmelanic schizochroics. Entirely pale bandtails, such as the one I observed, appear to occur infrequently in wild populations.

This note is a contribution from Federal Aid to Wildlife Restoration Project W-88-R.

LITERATURE CITED


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1Address all inquiries to Wildlife Research Center, 317 West Prospect, Fort Collins, Colorado 80526.
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