

## The Changing Seasons

*Autumn 1982, a "lackluster" season that wasn't, with some thoughts on lingering identification problems*

*Paul Lehman*

**I**N MANY SECTIONS OF the continent it was judged to be one of the poorest fall migrations for numbers of individuals in years. Such comments as "slow season", "warbler migration one of poorest in recent years", "... one of the most lackluster in recent memory", "birding was not particularly exciting", and "one of the duller ornithological seasons in recent years" can be found in a number of regional reports coast to coast. Why was this the case? The relatively sharp decline in numbers *actually observed* in only one year was certainly largely the result of weather factors. Throughout most of the continent, September and October 1982 were characterized by the passage of few significant cold fronts. Without these fronts large concentrations of migrants were rarely detected. Instead, the rather mild, uneventful weather resulted in a more sustained movement of migrants southward. That there actually were birds out there somewhere, is supported by the large, sometimes exceptional, numbers of migrants noted in several regions in late August (*e.g.*, Niagara-Champlain, Hudson-Delaware, Middle Atlantic Coast, Appalachian, and Middlewestern Prairie) following the passage of an early, vigorous cold front. Many migrants may have passed through early, before many birders devote much of their time looking for passerines (*i.e.*, in September and October). In some areas, the next significant front did not pass through until early November. The relative lack of September and October cold fronts was also likely to blame, in large part, for the poorer hawk flight noted in many areas. Adding to the lower numbers of migrants noted throughout many parts of the continent

was a flight of winter finches that could only be described as poor to abysmal.

Much of the West Coast also encountered fewer passerine migrants than usual. However, in this part of the continent, particularly coastal California, the passage of (usually weak) cold fronts in early fall is not as important a factor in determining the number of migrants present as it is to the East. Instead, it is usually the presence of coastal fog which concentrates migrants along the immediate vicinity of the coast, where most observers are. This fall, these fogs were "the exception rather than the rule," and "the normally-occurring West Coast migrant landbirds appeared low in numbers, with no large concentrations noted" (Guy McCaskie).

However, it should be pointed out that not all areas were quite so unanimous in their dismay at the low numbers of landbird migrants this fall. For example, banding station results in the Appalachian Region were mixed, comments ranged from "dull" to "outstanding" in the Southern Great Plains, excellent numbers of Broad-winged and Swainson's hawks were noted in Texas, a notable tower kill occurred in Florida in late September, and significant flights were recorded during September and October in Ontario and the Northern Great Plains (see account of the spectacular movement of birds through the Red River Valley in North Dakota). Observers should also take into account the potential weekend bias that may exist because of the concentration of effort on weekends and the more limited coverage almost all areas receive the other five days of the week. Another potential misconception may exist when, despite a heavy nocturnal migra-

tion, many fewer migrants are seen in the area the following day. An excellent example of this occurred in the Ontario Region this fall: thousands of thrushes (primarily Swainson's) were noted over Kingston the night of September 10-11 and Sudbury September 27-28, yet *none* were found the following morning. If the night calls had gone unnoticed, the thrush migration would have been seriously misjudged.

The mild weather of late fall and early winter over much of the continent (in contrast to the predictions of some climatologists regarding the effects of certain Mexican volcanoes, etc.) resulted in a large number of late-lingering individuals (particularly vireos and warblers) being reported in some areas, many setting record late dates for states and regions. The Quebec, Ontario, Middlewestern Prairie, and Northern Prairie regions reported an unusually large number of late lingerers. Particularly impressive were three Yellowthroated Warblers in Ontario during mid- and late November (one all the way north at Moosonee!), and a Bobolink in northern Illinois on December 7.

**M**AJOR WEATHER DISTURBANCES are necessary in many areas, and some regions as a whole, to produce a significant per cent of their landbird "fallouts." One particularly good example of this is the West Indies Region, where the passage of upper-level troughs (low pressure systems) in fall influences avian "fallout" and produces rare occurrences that might not occur in fair weather. These lows must knock down numbers of over-ocean migrants, in addition to carrying some individuals from the mainland coast eastward with

them This displacement to the east is best exemplified by the now-annual occurrence in fall of numbers of North American passerines in Britain, almost all associated with the passage of upper-level troughs which move west to east across the North Atlantic.

Two regions reported on the various disastrous effects on birds of hurricanes. Observers in the West Indies note that the passage of hurricane *David* in August 1979 resulted in a poor environment for birds in the Dominican Republic, that many species are still lower in numbers in other areas, that any dead trees with nesting cavities were blown down, and that many people were forced to kill native birds for food for extended periods. In Hawaii, this autumn saw the passage of hurricane *Iwa*, which resulted in much damage to the islands of Kauai and Oahu, with as yet unknown effects on several endangered species whose very small populations could well be dealt a *coup de grace* by such an event.

#### IRRUPTIONS AND TRENDS

**D**ESPITE LOW OBSERVED numbers of many migrants during much of the season and a virtual absence of most winter finches, several species did occur in record-breaking numbers over large areas. Double-crested Cormorant appears to be increasing in many areas from the Canadian Prairies and Wyoming to the East Coast, with particularly large numbers reported from the Great Lakes and Hudson-Delaware Region. Probably as a result of these larger numbers, a smaller but still significant increase was noted in the populations at inland lakes to the south (*e.g.*, in the Appalachian, Central Southern, and Southern Atlantic Coast regions).

Possibly the result of more careful observation is the upsurge in Ross' Goose sightings east of the species' "normal" range. Following the recent increase in numbers noted in winter along the western Gulf Coast, it is now found regularly in small numbers during November in western Iowa and Missouri, six were in North Dakota, one was in eastern Montana, and Wyoming recorded its first ever. Farther east, Ross' Geese are now recorded annually in Quebec; more unusual presently were singles in New Jersey and Delaware. In the West, the species is being recorded regularly away from the principal wintering areas of the Central Val-

ley and Salton Sea in California it winters regularly in New Mexico, and small numbers may prove to be of annual occurrence along the lower Colorado River in Arizona.

Pleasing is the continued spread of the White-tailed (Black-shouldered) Kite in the South. Three sightings (all of pairs) were made in Louisiana, two or three were in southern Mississippi including a first state record, one was in southern Alabama, and four individuals were at a nesting locality in southeast Oklahoma. Wyoming also recorded its first ever.

The Goshawk flight throughout much of the central and eastern section of the continent was excellent, with particularly outstanding counts in the Canadian Prairies, Northern Great Plains, Minnesota and Wisconsin, Middlewestern Prairie Region, Ontario, and Appalachians. The high proportion of adults in all areas pointed to food pressure rather than breeding success as the cause, a diagnosis supported by the Canadian Prairies' report of low numbers of grouse and hares.

Pectoral Sandpiper appeared in unprecedented numbers throughout much of the West and Hawaii, as well as locally to the east (*e.g.*, North Dakota, Central Southern Region, Appalachians) and the Virgin Islands. Perhaps associated with the excellent flight in the Pacific states were eight Sharp-tailed Sandpipers in northern California and, more unusual, single individuals inland in eastern British Columbia and eastern Washington.

Undoubtedly several of the *Larus* gulls continue to increase in numbers and expand their ranges. However, an increase in observer awareness and interest is likely one principal factor resulting in the status reassessment of at least two species. The increase in reports of Lesser Black-backed Gulls along the East Coast and in the eastern Great Lakes Region continues unabated. During the autumn of 1982, reports included at least fifteen from the Lake Ontario and Erie area, six in the New York City region, and a single-day count of five along the Chesapeake Bay Bridge-Tunnel. The species has become so numerous in the Middle Atlantic Coast Region that only pre-October individuals are mentioned in that report. One in Louisiana was more unusual. Subadults are now also being reported fairly regularly. One can only surmise that the flood gates may really open for

this species in the near future when more observers become adept at identifying immatures. The California Gull once thought to be accidental east of the Great Plains, also continues to be reported in increasing numbers. This season, single reports came from Illinois, northern Texas, and Long Island. At the other extreme of its range, several were reported again from around Anchorage. This increase seems certainly the result of increased observer awareness, and the species may prove to be a very rare but regular visitor in the East.

The significant increase over the past several autumn seasons in inland reports of Sabine's Gull continued this year. The regional reports list a total of 46 inland sightings in 1982. It is hard to believe that such a striking bird was "overlooked" until now. Rather, perhaps an increase in coverage of the species' preferred inland habitat of sewage ponds, large lakes, reservoirs, and rivers has occurred. The more thorough checking, and continued creation of these habitats throughout much of the interior is probably also a leading cause in the recent increase in sightings of scoters, Greater Scaup, Oldsquaw, jaegers, Glaucous and Thayer's gulls, and Black-legged Kittiwake. Particularly impressive numbers of Parasitic Jaegers and Black-legged Kittiwakes were recorded this fall from the Great Lakes. Forty-two Parasitics were seen in Ontario (primarily in Lake Ontario and southern Lake Huron) and fifty were along the New York shore of Lake Ontario. Smaller numbers were reported from the other lakes (including fewer than normal in the Western Great Lakes Region), along with several Pomarines. Black-legged Kittiwakes staged an invasion into the eastern Great Lakes, with at least 219 seen between southern Lake Huron and Lake Ontario. Of these, five were reported as adults. It would be interesting to see what the age ratio is of inland kittiwakes and Sabine's Gulls (only three Sabine's seen this season were reported as adults). I would guess that over 95% are immatures, and encourage age information to be given in reports when an adult is involved. Increased coverage of the Great Lakes shore (as well as observations from northeastern hawk lookouts) is also documenting a regular inland fall passage of Brant, impressive this season in Ontario.

On the negative side, the news is still gloomy for the Bewick's Wren and Log-

gerhead Shrike in large parts of the Midwest and East. Reports come in of the continued decline in many areas of Horned Grebes and Piping and Snowy plovers.

#### POTPOURRI

**A** NEW BIRDING FRONTIER, of sorts, has been opened up in Alaska. This one does not primarily involve the recording of Asiatic migrants strays, as is the practice in the western Aleutians or islands in the Bering Sea. Small, isolated Middleton Island in the Gulf of Alaska is recording a significant number of "eastern" North American vagrants and Asiatic species well east of the Aleutians, as well as documenting the timing and abundance of more regular trans-Gulf migrants, and producing late dates for a number of species for the state. While it probably won't produce nearly the volume or variety of species as the Farallon Islands off San Francisco, it is no less important to a regional understanding of migration. Middleton was censused in 1982 for an extended period for the second consecutive autumn and produced such Asiatics as Garganey, Polynesian (Gray-tailed) Tattler, and Red-throated Pipit, and such eastern or southern strays as Mockingbird, Red-eyed Vireo, Philadelphia Vireo, and Purple Finch.

Peregrine Falcons and Merlins are frequently noted migrating up to several miles offshore, where they are often seen to catch migrant passerines and other species. In some areas, individuals are seen regularly even farther offshore, such as at Cox's Ledge off Rhode Island. These birds are probably taking a short-cut from coastal Massachusetts and Rhode Island to Long Island and points south. This fall, two reports extended the pelagic habits of the Peregrine even farther offshore: one landed on the mast of a ship approximately forty miles west of Key West, and another was seen 400 miles east of Kure Atoll, Hawaii. The latter bird remained for a day perched on the ship's mast and was seen to catch and eat two storm-petrels.

Relatively little is known about the "almost stealthy departure" of the more southerly-breeding warblers in fall. Most probably head south during August, but this year's thorough coverage during August at Cape May, New Jersey, produced some revealing information.

Spectacular numbers of pelagic birds were recorded in Monterey Bay, California, during the second half of September. Such *single-day* counts there as 20,000 Pink-footed Shearwaters, seven Flesh-footed Shearwaters, 3000 New Zealand (Buller's) Shearwaters, and 40 South Polar Skuas are astonishing. Also found was yet another Streaked Shearwater and up to 32 Craveri's Murrelets (at the northern limit of their range). Interestingly, boat trips in early October recorded very few birds. The annual assemblage of thousands of storm-petrels in Monterey Bay this fall included a number of Least Storm-Petrels (also at the northern limit of their range), as well as several of the almost-annual Wilson's Storm-Petrels. Monterey Bay continues to be the only consistent locality for this species in the northeastern Pacific Ocean.

In Alaska, several Fork-tailed Storm-Petrels were seen well inland. However, this was eclipsed by the Black Guillemot that was collected after it flew from a snow bank into a truck some 800 kilometers from the nearest point in its normal range.

An active Killdeer nest was found in Minnesota in late November, "with snow as a background."

Purple Martin roosts of incredible proportions were found in late summer in Maryland and Virginia.

**B**IRDERS HAVE ALWAYS enjoyed watching shorebirds during the fall. However, only recently have some observers begun to look more closely at the timing of their migrations and at the age classes involved during different periods (*e.g.*, see Hudson-Delaware Region report). Recent advances in the ability to age shorebirds in the field have added to this study. Telling juveniles and adults apart in fall is rather easy in

some species (*e.g.*, all "peep," both dowitchers, and several plovers) In fact, the fall adult and juvenal plumages of a number of species (particularly "peep" and dowitchers) are so different that observers unaware of these differences may believe that separate species are involved when seeing adults and juveniles together. While these studies are fairly recent, significant and surprising data are already being produced. For example, different flyways are not only characterized by differences in species composition and abundance, but the timing of fall arrivals in the same species may be significantly different in ways that many will find unexpected.

During the past four years of study it has become evident that most juvenile shorebirds begin to arrive in numbers earlier along the Pacific Coast than along the Atlantic. Data from southern California show juvenile "peep" and dowitchers arriving significantly earlier than on western Long Island, even though the latter location is farther north. This phenomenon is true not only for those species which breed solely in the western Arctic (Long-billed Dowitcher, Western Sandpiper), but also those which breed in eastern Canada (Short-billed Dowitcher, Semipalmated and Least sandpipers). For a comparison between these two areas see Table 1. Why these differences exist is not immediately apparent, although they may be related to climatic differences between nesting regions and their possible effects on the timing of egg-laying and southward departure. (Once migration is initiated, many shorebirds may migrate long distances non-stop. Therefore, up to several thousand miles may be covered in only a few days, reducing the importance of such distances as a cause for varying arrival dates.)

Another interesting comparison can be seen between two areas located much closer together, Jamaica Bay on

**Table 1. A comparison of arrival dates for juveniles of several species of shorebirds, 1979-1982.**

Species	Jamaica Bay, New York <sup>1</sup>		Southern California	
	Average	Earliest	Average	Earliest
Semipalmated Sandpiper <sup>2</sup>	2nd week Aug.	Aug. 11 <sup>3</sup>	4th week July	July 22
Western Sandpiper	3rd/4th week Aug.	Aug. 16	4th week July	July 22
Least Sandpiper	4th week July/ 1st week Aug.	July 26	4th week July	July 22
Short-billed Dowitcher	2nd week Aug.	Aug. 8	1st week Aug.	July 27
Long-billed Dowitcher	4th week Sept.	—	3rd week Sept.	—

<sup>1</sup>Data from T.H. Davis with thanks.

<sup>2</sup>Now proving to be regular in small numbers in fall in western states.

<sup>3</sup>A study at Long Pt., Ont., in 1967 and 1969 recorded no juveniles earlier than Aug. 10.

western Long Island and Chincoteague National Wildlife Refuge in coastal Virginia. Significant differences in the abundance and arrival dates of several species and subspecies of shorebirds appear to exist. The eastern breeding subspecies of Short-billed Dowitcher, *griseus*, dominates at Jamaica Bay, while the northcentral and northwestern Canadian breeding subspecies, *hendersoni*, is much more numerous and arrives earlier at Chincoteague than on Long Island. Western Sandpipers are significantly more numerous at Chincoteague than at Jamaica Bay (and in the remainder of the Northeast). These suggest that Jamaica Bay is used primarily by birds originating east of Hudson Bay, while Chincoteague may be visited more by birds originating farther west in the Arctic (Tom Davis, *pers comm.*).

#### RARITIES

I WILL NOT ATTEMPT to list all of the outstanding rarities of the season, since a quick perusal of the bold-faced species in the reports will accomplish that. However, I can't resist listing some of my favorites: Roadside Hawk and Golden-crowned Warbler in Texas, Siberian Accentor in southcentral Alaska, Mongolian Plover and Sooty Tern in southern California, Swallow-tailed Kite in New Mexico, Wilson's Plover in Oklahoma, Anhinga and Wheatear in Minnesota, Williamson's Sapsucker in Louisiana, Mountain Bluebird in New Jersey, and Rock Wren in Florida. The report of a Common Redpoll on Midway Island, Hawaii, and the resulting visions conjured up of this bird sitting in swaying palm trees was too much to handle. A Kentucky Warbler on Alaska's north slope and a continuing Laughing Gull at Churchill, Manitoba, certainly set new latitudinal records. The Great Lakes area produced a nice assortment of alcids, including a Common Murre at Quebec City, single Thick-billed Murre and Razorbill on Lake Ontario, and an Ancient Murrelet on Lake Michigan (with another in Alberta). A White-faced Storm-Petrel was seen well off the Massachusetts coast, giving additional evidence that the species may be somewhat regular at the edge of the continental shelf. In a single ten-day period in late October/early November a Gray Kingbird was in Ottawa, single Scissor-tailed Flycatchers were in Min-

nesota, Ontario, and Quebec, and two Ash-throated Flycatchers were in Ontario. Mild temperatures and a persistent, strong flow of air from the south or southwest from Texas and the southern Great Plains to the Great Lakes and eastern Canada may have been a contributing factor resulting in this "coincidence" of records. Four Golden-winged Warblers together in northern Arizona for an extended period may well have been a family group and the result of local breeding—remarkable! Lastly, it was good to hear that the Eurasian Skylark returned to Point Reyes for its fifth year, showing that some vagrants do, in fact, live another year to repeat their mistakes.

#### SOME THOUGHTS

TWO OF THE MORE interesting records this season involved single Marbled Murrelets in Colorado and Massachusetts, both obviously for first state records. Both of these individuals were of the Asiatic race, *Brachyramphus marmoratus perdix*. There are three previous records for Marbled Murrelet in North America east of the immediate vicinity of the breeding grounds: from eastern California, Quebec, and Indiana. All of these birds were also of the Asiatic race (see *AB* 35(6):911-912). *This is an excellent example of how vagrants should NOT be assumed to originate from the populations closest to the site of observation.* Another example of this can be found with the White Wagtail. Now split into two separate species, a white wagtail of unknown species (field criteria for separating immatures has yet to be worked out) was present in southern California this fall (and is currently wintering there). Records of this species "group" along the West Coast south of Alaska were, until recently, assumed to involve individuals from the regularly-occurring Alaskan population *M.a. ocellaris*, and were published as such. However, of the approximately fourteen such records to date, probably only one or two are of this species, while four or five are definitely of the northeast coastal Asiatic species *M. lugens* (Black-backed Wagtail), and seven cannot be identified to species (see: Morlan, Joseph. 1981. Status and Identification of Forms of White Wagtail in Western North America. *Continental Birdlife* 2(2):37-50). The amazing record from the Outer Banks in North

Carolina in May 1982 was also of Black-backed Wagtail. Yet another example of this maxim can be found this season with *Plegadis ibis*; one in Quebec was not automatically assumed to be a Glossy, but was properly left unidentified.

The fallacy of assuming that vagrants originate from the closest resident populations is well exemplified by the Biddeford Pool, Maine, *Myiodynastes* flycatcher during November 1977 which was first assumed by many to be a Sulphur-bellied, but upon closer inspection turned out to be North America's first Variegated Flycatcher.

Using more caution and looking more closely at individuals out of range should be extended to those that are *unseasonal*. *They should NOT be assumed to be of the "normally"-occurring species.* A November pewee in Indiana which lacked sufficient details was properly left unidentified as to species. Other examples which come to mind include: *Plegadis ibis*, godwits (in very late fall and winter, Black-tailed is more likely than Hudsonian), *Chaetura* swifts (are there any documented winter records of Chimney? Vaux's is much more likely), hummingbirds (*e.g.*, most very late fall and winter  $\phi$  *Archilochus* hummingbirds should be left as such since Black-chinned is more likely than Ruby-throated at this season almost everywhere; the field identification of these two species is still being debated), *Myiarchus* and *Empidonax* flycatchers (a number of recent late fall and winter records in the East have been of western species), orioles, grosbeaks, and buntings.

One important reason to identify many birds to *subspecies*, if possible, can be seen in the previous example of the white wagtails in which taxonomic changes result in former subspecies becoming full species. More importantly, much information valuable to the study of bird distribution is lost when subspecific data are ignored. For example, "Baltimore" and "Bullock's" orioles (whose taxonomic status is still being debated) should continue to be identified in the field and reported separately. "Dark-" and "light-phase" Western Grebes, separated by differences in the distribution of black and white about the eye and lores and by bill color (greenish-yellow in dark-phase, orange-yellow in light-phase), provide another example . . . and the species may be split in the future. Have *any* of the past rec-

ords of Western Grebes outside the species' normal range involved light-phase individuals? Other examples of species which show distinct geographical variation include the Yellow-bellied/Red-breasted Sapsucker complex, Eastern Bluebird, Hermit Thrush, Solitary Vireo, Rufous-sided Towhee, and Fox Sparrow.

Another reason to pay closer attention to subspecies relates to more accurate field identification of the *species* involved. For example, observers unaware of the significant plumage differences in the races of Swainson's Thrush may mistake the russet-backed West Coast race (*C. u. ustulatus*) for a Veery. For an excellent discussion of this overall topic see: Phillips, Allan R. 1975. Why Neglect the Difficult? *Western Birds* 6(3):69-86.

A particularly enlightening discussion of subspecies in this season's reports was given by the editors of the Quebec Region in their treatment of Bean Goose and Barn Swallow. It is hoped that similar types of discussions, which teach the reader much, appear regularly in the regional reports.

#### SELECTED PREJUDICES (. . . or, "GAG ME WITH A GRAY-CHEEKED")

**I** MUST ADMIT THAT I get an unsettling feeling when reading many winter (particularly Christmas Bird Count) reports of a number of species, including

Broad-winged and Swainson's hawks, Semipalmated Sandpiper, Northern Phalarope, Sabine's Gull, Common and Least terns, Chimney Swift, Ruby-throated Hummingbird, Swainson's Thrush, Gray-cheeked Thrush, Veery, and Bobolink. You may be wondering why this subject is being discussed in the *Changing Seasons* report for the fall migration period. It is because the fall season is a very important period that should be used to document late occurrences of the above-mentioned species (and several others not listed) and assist in more accurately assessing their status in North America past dates of "normal" occurrence.

Some comments on several of the above-mentioned species:

**Broad-winged Hawk** — winters regularly only in southern Florida and, in very small numbers, in California.

**Swainson's Hawk** — winters regularly only in southern Florida. (There are only three certain winter records for California.)

**Northern Phalarope** — while a very few individuals may linger casually into December and, exceptionally, early January, particularly at more southerly latitudes, this species winters regularly in North America only in very small numbers near San Diego. *Red Phalarope* is the expected of the two species from November onwards.

**Common Tern** — this species is reported, sometimes in significant numbers, regularly in winter along the Gulf

Coast and, to a lesser extent, along the southern Atlantic and Pacific coasts, casually to the north. The relative abundance of this bird, I believe, should be carefully assessed throughout the southern states where it is now reported regularly in numbers, particularly after the beginning of January when most late-lingering transients will have departed.

**Swainson's Thrush, Gray-cheeked Thrush** (especially) and **Veery** — these species are recorded regularly on Christmas Bird Counts (but, interestingly, very rarely before or after) All late fall and winter records need to be *thoroughly* documented, and a review of all past records is needed. Most probably pertain to Hermit Thrushes. It is my belief that a significant number of the well-documented records which do exist will turn out to be of sick, injured, or crippled individuals unable to migrate and that do not survive past December or early January. A late Gray-cheeked Thrush was documented this season in Florida in early November.

Over the next several years observers can do much to better our understanding of these species' status in North America during the late fall and winter by reporting the last dates they observe them to their regional editors. This in addition, of course, to reporting all truly unseasonal occurrences with substantiating details.

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#### Abbreviations frequently used in Regional Reports

ad.: adult, Am.: American, c.: central, C: Celsius, CBC: Christmas Bird Count, Cr.: Creek, Com: Common, Co.: County, Cos.: Counties, *et al.*: and others, E.: Eastern (bird name), Eur.: European, Eurasian, F: Fahrenheit, *fide*: reported by, F.& W.S.: Fish & Wildlife Service, Ft.: Fort, imm.: immature, I.: Island, Is.: Islands, Isles, Jct.: Junction, juv.: juvenile, L.: Lake, m.ob.: many observers, Mt.: Mountain, Mts.: Mountains, N.F.: National Forest, N.M.: National Monument, N.P.: National Park, N.W.R.: Nat'l Wildlife Refuge, N.: Northern (bird name), Par.: Parish, Pen.: Peninsula, P.P.: Provincial Park, Pt.: Point, not Port, Ref.: Refuge, Res.:

Reservoir, not Reservation, R.: River, S.P.: State Park, sp species, spp.: species plural, ssp: subspecies, Twp.: Township, W.: Western (bird name), W.M.A.: Wildlife Management Area, v.o.: various observers, N,S,W,E,: direction of motion, n., s., w., e.,: direction of location, > : more than, <: fewer than, ±: approximately, or estimated number, ♂: male, ♀: female, ∅: imm. or female, \*: specimen, ph.: photographed, †: documented, ft: feet, mi: miles, m: meters, km kilometers, date with a + (*e.g.*, Mar. 4+): recorded beyond that date. Editors may also abbreviate often-cited locations or organizations.

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