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RANGE EXPANSION OF THE GLAUCOUS-WINGED GULL INTO INTERIOR UNITED STATES AND CANADA

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Historically, the Glaucous-winged Gull (*Larus glaucescens*) has been considered an almost strictly coastal species in North America, only occasionally straying very far inland. It breeds along the Pacific coast and on nearby inland lakes from Alaska south to northwestern Oregon and winters from the Bering Sea south to southern Baja California and the Gulf of California (A.O.U. 1983, Verbeek 1993). In the most recent monograph on the species, Verbeek (1993) considered this species regular in small numbers in Sonora, casual in winter in eastern Washington, Idaho, Montana, Utah, Arizona, New Mexico, and central California, casual in migration in Alberta, and accidental in Yukon, Manitoba, and Oklahoma.

Verbeek (1993) gave no information on historical changes in distribution. Much earlier, however, the species had been shown to have spread in winter from the coast inland along the Columbia River system into eastern Washington (LaFave 1965) and adjacent Oregon [e.g., *American Birds* (AB) 29:91, 1974]. Fischer (1988) and Tove and Fischer (1988) believed that records for Utah in the mid 1980s represented the beginning of expansion of the winter range into the eastern Great Basin.

Here we extend the study of the Glaucous-winged Gull's inland expansion to all interior western states and provinces (except Yukon) and, less completely, to inland portions of Pacific coastal states and provinces (except Alaska). Our data considerably modify the species' status in some of the regions listed by Verbeek (1993) and add Saskatchewan, eastern Oregon, Nevada, southeastern California, Colorado, and Illinois to his range. We present evidence for a recent, ongoing, potentially widespread and permanent range expansion into the interior of western North America. We also discuss factors that may account for this spread and compare them to dispersal theory.

METHODS

We thoroughly searched *Audubon Field Notes*, *American Birds*, and *National Audubon Society Field Notes* from 1950 through 1993. We contacted local authorities (see Acknowledgments for names) and records committees in all states and provinces west of the Mississippi River and some to the east, as well as museums known to house inland Glaucous-winged Gull specimens. We reviewed state and provincial monographs, but relied on our contacts to provide local publications not otherwise available to us.

INLAND EXPANSION

In the following discussion, each individual is considered one "record"; see the Appendix for details and citations. The terms "vagrancy" and "vagrant" are used loosely for individuals occurring inland from this species' "normal" Pacific coast range.

Interior Records

We have accumulated 97 records for interior states and provinces, distributed as follows: Nevada (28, two of which were seen also in Arizona), Idaho (23), Utah (14), Alberta (14), Arizona (5, including two seen also in Nevada), Colorado (5), Montana (4), New Mexico (2), Saskatchewan (1), Manitoba (1), Oklahoma (1), and Illinois (1). Although some of these records may represent misidentifications (see caveat in Appendix), nine are supported by specimens, at least 19 by photos, and eight by archived written descriptions accepted by records committees, so the species' occurrence inland is well documented. We also have many records from inland locations in coastal states and provinces; these are too numerous to list in the Appendix, but some are cited in the text.

According to local authorities, the species has not been reported in Arkansas, Iowa, Kansas, Louisiana, Minnesota, Missouri, Nebraska, New York, Ontario, South Dakota, Texas, or Wyoming. Documentations for Michigan and North Dakota records have not been accepted by state records committees.

History of Winter Expansion

The earliest record for interior states and provinces was in 1912 at Capron, Oklahoma. Thus vagrancy is not entirely recent. No further records were forthcoming until the mid 1950s, with single birds collected along the Colorado River in Arizona in 1954 and 1956. [Additional reports from Colorado in 1956 (two sightings), Montana in 1955, and New Mexico in 1954 and 1955 were during this same early period; although these are not accepted by us or by regional authorities, neither have they been formally rejected by records committees.] This early period of vagrancy continued slowly, with sightings at Bear Lake, Alberta, in 1958 and 1959, near St. Paul, Alberta, in 1960, at Coeur d'Alene, Idaho, in 1963 and 1965, at Churchill, Manitoba, in 1964 (June), and at Valleyview, Alberta, in

1966, bringing to 10 the number of individuals accepted for inland states and provinces prior to 1971.

Significantly, the Glaucous-winged Gull began to invade eastern Washington during the same early period, occurring first in the Potholes Reservoir region on 22 April and 4 May 1954 (adults; Weber 1981), the same year as in Arizona, and then at Spokane from 5 to 28 February 1956 [three birds photographed; *Audubon Field Notes* (AFN) 10:268; LaFave 1965], on 9 February 1957 (AFN 11:282; LaFave 1965), on 16 February 1961 (two immatures; AFN 15:346; LaFave 1965), and on 27 January 1962 (AFN 16:351). Meanwhile, the species began to be seen along the Columbia River in southeastern Washington (e.g., an adult at O'Sullivan Dam, 16 January 1959; LaFave 1965).

About 1971 vagrancy seems to have begun slowly escalating (Figure 1). Nevada recorded its first Glaucous-winged Gulls in 1971, and one to four were seen each winter through 1977–78. Thereafter came a near hiatus (only six birds), probably due to poor coverage or non-reporting. Beginning in 1991–92, however, from one to three have been recorded annually. In Idaho, after the two initial sightings in 1963 and 1965, the species was

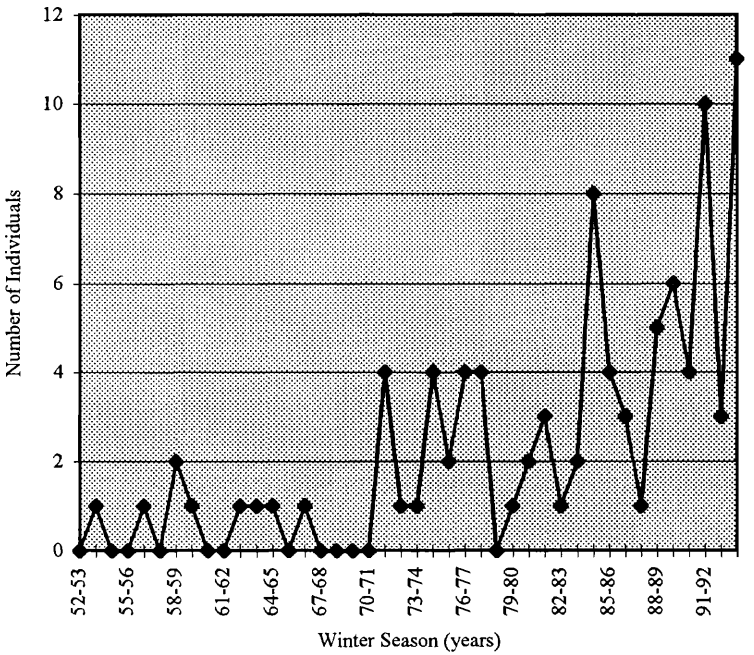

Figure 1. Annual distribution of individual Glaucous-winged Gulls (n = 93) in interior states and provinces during winters 1952–53 to 1993–94. Five June–August records were placed in the previous winter.

recorded only five times until 1986–87. Since then it has been of nearly annual occurrence, with five individuals in 1993–94. In Alberta, where this gull is only a transient, escalation seems to have started in the early 1980s.

As would be expected in an expanding species, areas farther from the Pacific coast had their firsts in later years: Colorado, 1981; Utah, 1983; Montana, 1985; New Mexico, 1990; Saskatchewan, 1991; Illinois, 1992. Fischer (1988) suggested that the nine birds recorded in the winters of 1984–85 and 1985–86 around Great Salt Lake, Utah, represented "a real change in status" and "the beginning of expansion of the winter range into the eastern Great Basin." The first records for southeastern Oregon, where habitat and observers are scarce, were at Farewell Bend, Malheur Co., 16 November 1987 and at Malheur National Wildlife Refuge, 19 December 1988 (Gilligan et al. 1994). Far to the south, small numbers have occurred with some regularity at Puerto Peñasco, Sonora, since about 1982, when seven were seen on 12 February (AB 36:319; S.M. Russell in litt.)

Meanwhile, in eastern Washington and adjacent Oregon, the species had become a regular winter visitor by the winter of 1974–75 (AB 27:797, 29:718; Weber 1981), about the same time it reappeared in Idaho after a nine-year absence. For example, 10 were at Umatilla, Oregon, on 23 November 1974 (AB 29:91). This pattern has continued, for example, with eight birds at Pasco, Washington, and two at nearby Richland on 4 December 1985 (AB 40:305), until today the species not only receives relatively little notice in winter but has been termed "common" along some sections of the Columbia River in eastern Oregon (Gilligan et al. 1994).

The Glaucous-winged Gull appears to be on the increase also in far inland California. The first record we can find for the Central Valley was of an immature at Sacramento 9–20 December 1969 (AB 24:535). Thereafter the species was rarely reported until fall 1985, when 14 were found (AB 40:330). At least 11 were present in the winter of 1986–87 (AB 41:224) and eight in 1987–88 (AB 42:316), bringing the total to at least 51 in 19 years (AB). It now occurs annually in such numbers that it no longer receives notice in *American Birds/National Audubon Society Field Notes* (NASFN). This species seems to be increasing also at its only other regular far-inland California locality, the Salton Sea, where a minimum of 74 birds have been found, mostly in late winter and spring, and it has been reported during all but three years since spring 1965 (AB; Garrett and Dunn 1981). We doubt that coverage of the Salton Sea has improved much in the last 30 years, yet after 18 winters when no more than three were seen in one year, 10 appeared in 1982–83 as the result of a fish die-off (AB 37:338), five in 1989–90 (AB 44:329), and 10 in 1993–94 (NASFN 48:248). Elsewhere in the far interior of the state, we note the following Siskiyou Co. localities and years of occurrence (AB): Tule Lake (1977, 1991), Lower Klamath National Wildlife Refuge (1983), and Yreka (1989). There are also four records from the California side of Lake Tahoe (9 January 1962, AFN 16:361; 20 December 1972, AB 26:651; 17 January 1975, AB 29:727; and 26 November 1975, AB 30:121) and one from Bridgeport Reservoir, Mono Co. (20 June 1987, AB 42:1337), a Great Basin outpost only about 37 miles from a Nevada record at Walker Lake. Although these California data may, as suggested for the Central Valley, "reflect observer effort" (AB

41:324), we suggest that the apparent increase is part of the larger pattern discussed in this paper.

Figure 1 depicts the annual increase in number of records from interior states and provinces. Possibly the current spread was initiated in the 1950s, or even earlier. However, that the population remained stable at a very low level for at least 18 years through winter 1970–71 suggests that the sudden (though small) increase in 1971–72 is a more accurate starting point. Concomitantly, the early 1970s saw an escalation also in the Central Valley of California and in eastern Washington and Oregon. The peak in winter 1984–85 is due to a special study of rare gulls in Utah (Fischer 1988, Tove and Fischer 1988) and hence may not be significant in regard to the timing of escalation. If we disregard these particular Utah records, the strong upward trend starting just after a low in 1987–88 appears more significant. From data in Figure 1 we calculate that the average number of records per year for the winters of 1953–54 through 1970–71 (18 years) was 0.5; for 1971–72 through 1983–84 (13 years), 2.23; and 1984–85 through 1993–94 (10 years), 5.5. Ten-year averages yield similar results.

Inland Breeding

The Glaucous-winged Gull has also extended its breeding range inland, to islands in the Columbia River of eastern Washington and Oregon. At Miller Rocks, Sherman Co., Oregon, four pairs were seen in 1974, adults each year through at least 1987, and adults nearby through 1994. Chicks were found in 1977, and three nests, with one, two, and three eggs, in 1978. At Little Memaloose Island, near The Dalles, Oregon, three pairs were seen in 1974, adults in 1978, and a nest with three eggs in 1981. Also in 1981, a nest with three eggs was noted on Island 20 at Richland, Washington, 548 kilometers upstream from the mouth, and adults were seen in a gull colony on Three-mile Island. These data, summarized from Gilligan et al. (1994) and Conover and Thompson (1984), demonstrate little increase in population numbers since 1974 but do show a rather rapid spread upstream. In addition, hybrids between Glaucous-winged and Western (*L. occidentalis*) gulls nested on Island 18 in the Columbia River at Richland, Washington, in 1981 (Weber and Fitzner 1986). Even the extralimital nesting of a Glaucous-winged Gull mated to a Western Gull on the coast at Pt. Reyes, California, in summer 1994 (NASFN 48:985) could be related to the same factors causing inland expansion.

Age Composition

Of the 77 individuals from interior states and provinces for which we have detailed age data, 54 (70.1%) were first-year (first-winter or first-summer) birds, 13 (16.9%) second-year, two (2.6%) third-year, and eight (10.4%) adult. An additional six were stated to be "immatures." The high percentage of first-year birds may reflect a combination of normal age distribution plus a possible propensity for this age to disperse farther. The lower number of second-year birds and near absence of third-year individuals represent a typical age composition in four-year gulls. What is unusual is the low count of adults, which on the coast in winter normally far outnum-

ber second-year birds and slightly exceed or approximate the number of first-year birds (Verbeek 1993). Thus the interior sample does not have a normal age structure and therefore cannot represent a stable self-perpetuating population. The presence of adults, on the other hand, implies that the inland environment is not a total population sink that eliminates the birds before they have a chance to breed.

ROUTE OF DISPERSAL

Weber (1981) suggested that Glaucous-winged Gulls reaching northern Idaho came through eastern Washington and Oregon via the Columbia and Spokane rivers, and as the species' pattern of initial occurrence and subsequent expansion in all three states is similar, we agree.

How this gull reached other regions of the interior, however, is much more problematical. Possibly, birds in southern Idaho and perhaps farther south in Utah and Nevada, even Arizona, originated in eastern Washington and Oregon and northern Idaho. Once they passed the Cascades, via the Columbia River, birds might have a clear passage southward through the Great Basin. Although we cannot refute this hypothesis, we note that there are no records for the area of Lewiston, Idaho, situated at the confluence of the Snake and Clearwater rivers (Weber 1981), while there are records farther south in the Boise–Nampa region. Furthermore, the Great Basin is fraught with 8–10,000-foot mountain ranges that seem hardly less daunting than the Cascades and Sierra Nevada.

Instead, we suggest that birds pass inland directly over (or through a number of passes in) the Cascades and Sierra. As evidence for this idea stand the four California records (mentioned above) and one Nevada record for Lake Tahoe, at 6229 feet elevation on the California–Nevada border. That the Glaucous-winged Gull is capable of such over-mountain flights is evidenced by the 26 records east of the Rocky Mountains in Alberta, Saskatchewan, Montana, Colorado, Oklahoma, and Illinois.

Glaucous-winged Gulls could enter the Central Valley of California via San Francisco Bay and the Sacramento delta. However, to reach such localities as Redding (AB 39:98) in the northern Sacramento Valley, or Yreka farther to the north, they would have to retreat a considerable distance northward. We think it more likely that they simply fly over the low Coast Ranges.

All 19 Alberta and Colorado records are from east of the Rocky Mountains, and all but one (Colorado, summer) are of spring or fall transients. Geography suggests that birds may use the leading line of the range to fly southeastward from Alberta through Montana, Colorado, and Oklahoma to an unknown wintering destination, perhaps the Gulf coast, where we predict the species will eventually be discovered; this path would also take birds through Wyoming, which has no records yet.

The Glaucous-winged Gull probably uses the Salton Sea as a stepping stone between the Pacific and the Gulf of California, as suspected for other aquatic birds (Garrett and Dunn 1981:30). The recent concentrations at this sea may consist of birds that were heading to or from the Gulf but were

attracted to ephemeral food resources like the fish die-off in 1982–83 (AB 37:338). Thus the species' abundance at the Salton Sea may be intimately related to the number of birds wintering or intending to winter on the Gulf.

CURRENT STATUS

Here we summarize the current inland status of the Glaucous-winged Gull, first geographically for all inland regions, and second temporally for only interior states and provinces. See the Appendix for details. We use the following scale of abundance and regularity: for annual occurrence, *common* (an average of 1–10 per day may be found), *uncommon* (3 per month–1 per day), or *rare* (1 per season–3 per month); for nonannual occurrence, *occasional* (1 individual every 1–3 years), *casual* (1 per 3–11 years), or *accidental* (1 per 11+ years). For mode of occurrence, we use *visitant* for birds seemingly remaining only short periods within winter or summer; *resident* for birds remaining most or all of one winter or summer; and *transient* for what appear to be spring or fall migrants passing through a region. We have avoided the term vagrant because we contend that today many interior birds are within their newly established "normal" range. The number of individual birds recorded is given in parentheses after the name of the area. Extreme dates given for various periods are based on our data and undoubtedly will be expanded by future records.

Geographical

Alberta (14); occasional spring (21 March–9 May) and casual fall (mid September–14 November) transient; we treat two records, 11 and 6–21 August, as representing casual summer visitants, as they are earlier than the species is supposed to migrate (Verbeek 1993) and earlier than any coastal California arrival dates we can find. **Arizona** (5): casual winter resident (12 December–24 February) and accidental late-fall transient (two, 30 October and 17 November). **British Columbia**, eastern (many): spring and fall transient, casual in north, occasional or rare in south. **California** interior (many): as a winter visitant and resident, rare at the Salton Sea and in the Central Valley, casual to accidental elsewhere in the far interior, and commoner near the coast; as a summer resident and visitant, casual at the Salton Sea and casual to accidental elsewhere (but no Central Valley record). **Colorado** (5): casual spring transient (1 March–1 May) and accidental summer visitant (one, 24–25 July). **Idaho** (23): in north, occasional (probably rare) during fall and winter (30 October–8 March), most individuals being late-fall transients or seemingly winter visitants, with only two known to be winter residents (18 November–8 February); in south, accidental fall transient (one, 26 October) and midwinter visitant (two, 4 January, 17 February). **Illinois** (1): accidental late-fall transient (27 November–12 December). **Manitoba** (1): accidental summer visitant or resident (collected 1 June). **Montana** (4): accidental spring transient (one, 21 March–6 April), late-fall transient (one, early November), winter visitant (one, 26 January), and winter resident (one, 7 December–18 April). **Nevada** (28): rare during fall and winter (21 October–27 February), with individuals classed as

occasional late-fall transients (21 October–early January, main migration period from mid November to mid December), casual midwinter visitants, and occasional winter residents (7 December–21 February); accidental spring transient (two, 27 March and 3 May). "One or two individuals almost every winter" (C. C. Lawson in Alcorn 1988); "regular in small numbers from November through February" (L. A. Neel in litt. 1994). **New Mexico** (2): accidental winter resident (21 January–7 March) and nonbreeding summer resident (bird discovered 12 February remained through next summer into October, when collected). **Oklahoma** (1): accidental winter visitant or resident (collected 15 February). **Oregon**, eastern (many): winter resident, uncommon [Gilligan et al. (1994) say "common"] along Columbia River at least as far inland as Umatilla and casual elsewhere; occasional or casual breeding permanent or summer resident along this river as far inland as Miller Rocks, Sherman Co. **Saskatchewan** (1): accidental late-fall transient (9–16 November). **Sonora** (14 reports, some of several individuals): winter resident, occasional (probably rare) at Puerto Peñasco, casual south to the Guaymas area (S.M. Russell in litt.). **Utah** (14): occasional (probably rare) during fall and winter (10 November–26 February), with individuals classed as casual late-fall transients (10 November–28 December) and midwinter visitants and accidental winter residents (one, 7 December–26 February); accidental spring transient (two, 26 Febraury–13 March, and 30–31 March). "It appears now to be a regular migrant and winter visitant" (Fischer 1988). The paucity of records in recent years is because: "no one has looked; I suspect the Glaucous-winged is a regular but rare winter visitor" (E. Sorensen in litt. 1994). **Washington**, eastern (many): winter resident along the Columbia and Spokane rivers, uncommon as far as Richland and occasional from there to Spokane; breeding permanent or summer resident, at least casual, along the Columbia River east to the Richland area.

Temporal

Here we discuss seasonal distribution in interior states and provinces, as shown in part (excluding summer) in Figure 2.

Fall. Fall migration begins as early as mid September (not shown in Figure 2) in Alberta, and elsewhere accelerates sharply in the last few days of October. The earliest arrivals in Saskatchewan, Montana, Idaho, Nevada, Utah, and Arizona all fall between 21 October and 10 November. Of the nine known winter residents, seven arrived between 30 October and 12 December, with five of these on either 7 or 12 December. Migration increases steadily to a peak in mid December, although some individuals continue to arrive through late December and apparently even early January (Nevada).

Winter. Taken as a whole, the population remains rather stable from mid December through mid February, although in at least Idaho, Montana, Utah, and Nevada a few birds continue to wander, i.e., appear, stay briefly, and leave, even in midwinter (about 10 January–10 February). Most winter residents and visitants disappear during the last two weeks of February, when a fairly steady decline in numbers begins and continues through mid

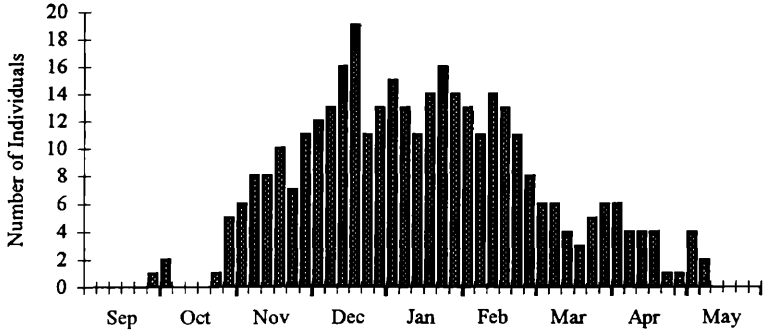

Figure 2. Seasonal distribution of individual Glaucous-winged Gulls (n = 86) in interior states and provinces during approximately 5-day periods, September–May, 1912–1994. Each individual is shown for every period it was present.

March. Overwintering has been recorded for Montana, northern Idaho, Nevada (both northern and southern), Utah, Arizona, and New Mexico. Montana has the Missouri River, and the other five states have large reservoirs, lakes, or rivers that remain open through the winter and are capable of supporting gulls. In Alberta and Saskatchewan the species is only a spring and/or fall transient; the absence of large rivers and the freezing of still waters preclude winter occurrence. Overwintering in northern Idaho is probably more common than the two records suggest; observers there as elsewhere should record inclusive dates of individual birds to determine the extent of overwintering.

Spring. The slight peak in late March and early April reflects spring transients in Alberta and Colorado and, to a lesser degree, Nevada, Utah, and Montana. Dates for spring stragglers extend to 18 April in Montana, 1 May in Colorado, 3 May in Nevada, and 9 May in Alberta.

The entire pattern detailed above is very similar to that on the South Farallon Islands off central California (DeSante and Ainley 1980). Thus the interior population, although consisting of "vagrants" in the sense that individuals are outside the species' normal coastal range, exhibits a pattern typical of a winter resident; there are no temporal anomalies that might indicate a vagrant status.

Summer. Six individuals have been found in interior states and provinces during summer, single birds in Manitoba, Colorado, Nevada, and New Mexico, and two in Alberta. However, the bird found in Nevada in July was discovered as a disarticulated skeleton and hence arrived much earlier. Only the one in New Mexico is known to have oversummered, although the one in Manitoba might have if it had not been collected on 1 June. Hence, some individuals occur in summer in the interior, but most, even immatures, apparently return to the coast or expire.

CAUSES OF INLAND EXPANSION

Coverage

When a species undergoes a very rapid expansion, as in the cases of the House Finch (*Carpodacus mexicanus*; Mundinger and Hope 1982) and Cattle Egret (*Bubulcus ibis*; Crosby 1972), the change is quickly detected and confidently attributed to natural causes. A slow dispersal, however, like that of the Glaucous-winged Gull, even when documented, is often passed off as an artifact of improved coverage by observers. We do not deny the importance of better coverage. The proliferation of birders, better communication among them, improved optics, identification guides, and techniques, and the greater emphasis on finding rarities clearly have contributed to an increase in records of vagrants of many species, including the Glaucous-winged Gull. Nevertheless, for several reasons we believe that increased coverage alone cannot account for the apparent inland expansion of this species.

The possibility that past observers overlooked the Glaucous-winged is unlikely. The only similar species then seen regularly with which it might have been confused was the Herring Gull (*L. argentatus*), which was uncommon enough throughout much of the western interior that all were scrutinized.

During the 1950s and 1960s, inland records of the then common California (*L. californicus*), Ring-billed (*L. delawarensis*), and Franklin's (*L. pipixcan*) gulls, the scarce Herring Gull, and the rare Bonaparte's Gull (*L. philadelphia*) were studiously reported and published in *Audubon Field Notes*. Reports came from some of the same localities where Glaucous-winged Gulls have been found more recently, such as Spokane, Washington (birded in the early 1960s), Farmington Bay, Utah (1963), Ft. Peck, Montana (1964), Coeur d'Alene, Idaho (1966), and Calgary, Alberta (early 1970s). Clearly then, birders were paying attention to gulls and at the proper localities. Yet they identified no Glaucous-winged Gulls.

Neither did they find several other species, most of them easily identified, such as Sabine's (*Xema sabini*), Glaucous (*L. hyperboreus*), and Western gulls, the Black-legged Kittiwake (*Rissa tridactyla*), and jaegers (*Stercorarius* spp.). Today, however, most of these occur somewhere in the western interior virtually every year, often with multiple sightings. For example, for Nebraska, Kansas, Oklahoma, and northern Texas, F. Williams (AB 33:192, 1979) wrote, "In the past ten years the status of Bonaparte's Gull has changed from 'rare transient' to 'common migrant and winter resident'" and "It appears that Sabine's Gulls may be following the same pattern, as they are now reported somewhere in the Region each fall or winter season." The last statement has also been applied to the Black-legged Kittiwake (AB 31:195, 1977). In fall 1981, birders found 13 Sabine's Gulls in Utah, Nevada, Wyoming, and Colorado (AB 36:202). In fall 1990 the same states hosted all three jaeger species, Heermann's (*L. heermanni*), Mew (*L. canus*), Lesser Black-backed (*L. fuscus*), Western, and Glaucous-winged gulls, Black-legged Kittiwake, and "only" eight Sabine's Gulls (AB 45:133), while North Dakota had 11 species of gulls (AB

45:121). Many other examples from throughout the western interior could be cited.

Clearly, then, the *number of records* for many gulls, in addition to the Glaucous-winged, has greatly increased in recent years. We contend that the magnitude of this increase is too great to be accounted for by coverage alone and that several new factors have recently combined to increase the *actual number of birds* and improve their detectability.

Mechanism of Dispersal

Before discussing these new factors, we present a summary of the mechanisms of dispersal, as we believe they might apply to the Glaucous-winged Gull, based largely on Udvardy (1969, especially pp. 71–75).

Vagrancy (nomadism), enhanced by the innate urge and ability to migrate, may be of two major types, slow penetration into areas adjacent to the normal range and jump-dispersal, over inhospitable terrain, into more distant, sometimes far-flung regions. In either case the pioneers encounter newly available suitable habitat. Both types of movement are repeated, in varying degrees of regularity and abundance, but potentially annually in small numbers, resulting in recruitment, fostered by philopatry and longevity. The founders establish local nuclear populations, first in winter and then in summer; breeding may ensue. The nearer an area to the core population, the more often vagrants reach it and the more rapidly a new population is established there.

Breeding Population

One important change leading to inland expansion is the population explosion in large North American gulls (e.g., Conover 1983), including the Glaucous-winged. According to Verbeek (1993), a population on four islands in the western Aleutians nearly doubled from 1970 to 1979; one in the Strait of Georgia, British Columbia, expanded from 6150 pairs in 1959 and 1960 to 13,002 in 1986; in British Columbia as a whole, populations have increased 350% in the last 50 years. The large colony on Protection Island, Washington, grew from 4300 pairs in 1976 to 6785 in 1984, a mean annual increase of 5.9% (Reid 1988, Verbeek 1993).

Such increases have been attributed to protection from human persecution (taking of eggs, adults, and young for food, sport, and the millinery trade), better food resources (garbage dumps, farms, domestic sewage, fish waste), and more breeding sites afforded by islands in new reservoirs (Conover 1983, Reid 1988). Most of these factors also favor gulls in winter.

An increase in the core breeding population of a species may cause intraspecific population pressures, such as overcrowding, that trigger an intrinsic restlessness, leading to nomadism in some individuals (Udvardy 1969). In addition, most if not all migrant species generate vagrants to a greater or lesser degree. If at least some vagrants are misoriented migrants (DeSante 1973), a growing breeding population should cast off increasing numbers of vagrants. A third possibility is the evolution of a new genotype favoring vagrancy; this is more likely "in marginal, vulnerable areas and bridgeheads of expansion" (Udvardy 1969). The new breeding population

in eastern Washington and Oregon, although still very small, seems to qualify, having colonized an environment dissimilar to that on the coast in its moving fresh water, freshwater prey, and inland climate.

Habitat

The inland environment encountered by recent vagrants has changed gradually but significantly. It now includes many large garbage dumps, reservoirs, and hydroelectric dams, habitats that at least in combination can support large gulls.

Of the 86 individual Glaucous-winged Gulls for which we have habitat data from interior states and provinces, 32 (37.2%) were found on reservoirs, 27 (31.4%) at dumps, 14 (16.3%) on rivers, 8 (9.3%) on natural lakes, two (2.3%) on dumps and adjacent rivers, one (1.2%) on a river and a lake, one (1.2%) at sewage ponds, and one (1.2%) inland.

With the proliferation and rising affluence of humanity, edible waste has increased dramatically, and garbage dumps have become larger and more numerous. These are very attractive to the Glaucous-winged Gull, as the 29 (33.7%) birds found in this habitat demonstrate. However, the importance of this habitat should not be overestimated, as 57 (66.3%) birds were seen only in other habitats. Even along the Pacific coast, many Glaucous-winged Gulls feed in natural environments (pers. obs.), and in the interior, use of dumps is confined largely to Utah and Idaho. On the other hand, our data probably do not treat the subject fairly, because other birds, especially in Idaho, although recorded on rivers or lakes, very likely fed at nearby dumps.

Because such birds as Bonaparte's and Sabine's gulls, the Black-legged Kittiwake, and jaegers are not dump-visiting species, we must seek a different explanation for their increased numbers in the interior, one that also fits dump-seekers like the Glaucous-winged Gull. The importance of reservoirs and associated dam effluents may have been underestimated in comparison to that of dumps. As early as 1960 LaFave (1965 and in AFN 14:327) opined that the reservoirs behind Columbia River dams were responsible for bringing more and more rare gulls into eastern Washington, changing the status of the Herring Gull from quite rare to regular in winter. The winter gulls at Ft. Peck, Montana, frequent the Missouri River just below Ft. Peck Dam, where they feed on dead fish that have passed through the turbines of the hydroelectric plant; the nearest garbage dump is over 15 miles away at Glasgow (C. M. Carlson in litt.). G. Berkey (AB 45:121) summarized this effect: "The Missouri mainstream reservoir outlets are great gull feeders, offering ideal conditions for the sparse numbers of rarities that must have overflown the Region before their construction. The collection observed at Garrison Dam this fall [1990] was particularly striking...; 11 of the 12 gull species for North Dakota this season were seen there." Dams without hydroelectric plants may be less attractive to gulls, but we presume that all reservoirs have been stocked with sport fish, a potential food supply.

At many localities, especially near cities, dumps are close to reservoirs, natural lakes, and/or large rivers, and this we believe is an ideal situation for wintering Glaucous-winged Gulls — dumps for feeding, adjacent water for

drinking and bathing, and nearby islands or deep safe waters for night roosting. The absence of one or another habitat may significantly reduce the probability of occurrence and, especially, overwintering of Glaucous-winged Gulls. However, some dam effluents and reservoirs are equally attractive food sources.

Philopatry and Longevity

The Glaucous-winged Gull is partially philopatric in winter, as evidenced by a bird banded 11 miles north of Merville, British Columbia, on 29 July 1968 that visited the same rooftop in San Francisco, California, for seven consecutive winters, 26 January 1970 to 15 January 1978 (Binford pers. obs.). Also, this species has lived to the age of 32 and has an average life expectancy of 13.5 years (Verbeek 1993). The effect of these two attributes may have changed in recent years. As the number of inland vagrants increases, so does the likelihood that some will be philopatric, and the longer a philopatric individual lives, the greater its chances of being joined by other birds to form a population. We do not know if philopatry is occurring inland, but the presence of a few adults there suggests it is. Also, Glaucous-winged Gulls presumably are more likely to succeed in returning to localities closer to the coast, and in fact six of the eight adults, as well as both third-year birds, were in Alberta and Idaho.

How then did population growth, habitat alteration, philopatry, and longevity affect the Glaucous-winged Gull? Although inland vagrancy has always occurred, prior to about 1971 fewer vagrants originated from the then smaller coastal breeding colonies; those individuals that ventured inland found little suitable habitat to sustain them and either retreated quickly or perished before they could be detected by the scant force of capable observers. More recently, however, growth in the coastal breeding populations, and perhaps the establishment of new breeding colonies along the Columbia River, resulted in more individuals with nomadic tendencies, and population pressures stimulated a greater percentage of these to disperse inland. These pioneers found new and improved inland habitats provided by dumps, reservoirs, and hydroelectric dam effluents, which allowed them to remain and, with recruitment fostered by philopatry and longevity, form small winter populations more easily discovered by the larger army of observers. Improved coverage has produced more records but has also masked the effects of a "natural" process that has resulted in an increase in the actual number of birds.

SUMMARY

The Glaucous-winged Gull is expanding its winter range east into interior states and provinces (97 acceptable records) as well as to inland localities in coastal states and provinces (many records). This expansion seems due to both slow diffusion along the Columbia River system into areas (eastern Washington, adjacent Oregon, and northern Idaho) nearest the coastal breeding population, as well as areas (Central Valley and Salton Sea of California) close to the coastal wintering population, and jump-dispersal

directly over inhospitable mountain ranges to more distant regions (eastern British Columbia and Alberta, Saskatchewan, Manitoba, southern Idaho, Montana, Colorado, Oklahoma, Illinois, Utah, Nevada, Arizona, and New Mexico). Both types of movement occurred in the past (1912, 1950s, 1960s), but because of the scarcity of adequate inland habitat, birds did not remain and hence were less detectable. Newly available suitable habitat in the form of reservoirs, hydroelectric dams, and large garbage dumps has been encountered by recent birds, allowing them to remain and thus be more detectable. A burgeoning breeding population on the coast has resulted in more repeated inland occurrence starting about 1971 and especially during winter 1988–89. Improved coverage by observers can account for only some of this increase and has masked the effects of "natural" factors. Repeated vagrancy has resulted in recruitment, probably fostered by philopatry and longevity, producing local winter populations that are small but more or less regular in northwestern Sonora, the Central Valley and Salton Sea of California, eastern Washington, north-central Oregon, northern Idaho, Utah, and Nevada. Winter temporal distribution inland is similar to that along the California coast, with some birds arriving as early as mid September but most from late October through mid December, leaving from late February through early March, and straggling into May; some continue to wander in midwinter. There are nonbreeding summer records for Alberta, Manitoba, interior California, Colorado, and New Mexico, although most winter visitors inland apparently summer on the coast. Starting about 1977 a small breeding population established itself along the Columbia River in eastern Washington and Oregon. These last two states, which are nearest the core breeding population on the Pacific coast, have received the most birds and thus were the first to support new inland wintering and breeding centers.

To monitor further expansion or contraction of the Glaucous-winged Gull's range, observers are urged to document and publish all far-inland sightings.

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We thank the following persons who kindly provided information on Glaucous-winged Gull records from particular states and provinces: *Alberta*, M. Harrison, P. Sherrington; *Arizona*, T. R. Huels, J. Witzeman, R. L. Zusi; *Arkansas*, M. Parker; *Colorado*, H. E. Kingery, B. Prather; *Idaho*, T. H. Rogers, D. A. Stephens, S. H. Sturts, C. H. Trost; *Illinois*, R. E. Goetz; *Iowa*, C. J. Bendorf, T. H. Kent; *Kansas*, S. Patti; *Louisiana*, D. L. Dittmann; *Manitoba*, P. C. Chu; *Minnesota*, K. Eckert; *Missouri*, R. E. Goetz; *Montana*, C. M. Carlson, P. L. Wright; *Nebraska*, A. G. Grenon; *Nevada*, M. Cressman, J. L. Dunn, A. A. Gubanich, H. E. Kingery, M. V. Mowbray, L. A. Neel, C. S. Robbins; *New Mexico*, R. W. Dickerman, J. P. Hubbard, J. E. Parmeter; *New York*, R. F. Andrle; *North Dakota*, D. Buitron, G. Nielsen; *Oklahoma*, G. D. Schnell; *Ontario*, B. Curry; *Saskatchewan*, C. S. Houston; *Sonora*, S. M. Russell; *South Dakota*, D. Swanson; *Texas*, G. Lasley; *Utah*, D. L. Fischer, L. A. Ryel, E. Sorensen, M. Tove; *Wyoming*, L. Hunter. We also extend our appreciation to D. E. Willard for access to libraries of the Field Museum of Natural History, Chicago, R. B. Payne for providing pertinent literature, and N. A. M. Verbeek, who reviewed a draft of the manuscript.

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APPENDIX. Records of the Glaucous-winged Gull from interior states and provinces of North America through 1993.

Because most records have not received formal committee review and many lack detailed documentation, we cannot vouch for their validity. Some, especially from earlier years, might have been of other species or hybrids. All, however, have received screening by at least one authority, usually the appropriate *American Birds* regional editor. Possibly, some records we treat as separate pertain to the same individual bird seen the same season (possibly at different localities) or returning in subsequent years. On the other hand, we or others have questioned certain records that may in fact be valid; for completeness, we list these in brackets, but have not used them to formulate statements in the text.

Records are listed and numbered chronologically within each state or province. Each individual bird is considered one "record." Information, if known, includes, in order of presentation, inclusive dates of occurrence (all years are in the 20th century), locality, number of individuals and their ages, photographic (published photos are in the cited publications), specimen, or banding documentation (all records are sight records unless otherwise noted), habitat, comments, and citations. Some "in litt." citations follow the name of the region.

Abbreviations. [ ], record invalid, or possibly valid but not used by us in text; *, record accepted by the appropriate state records committee, an extant specimen identified by an ornithologist, or a banding record; AB, *American Birds*; ad, adult; AFN, *Audubon Field Notes*; im, immature; mi., miles; MSB, Museum of Southwestern Biology, University of New Mexico, Albuquerque, NM; NASFN, *National*

Audubon Society Field Notes; res, reservoir; UMMZ, University of Michigan Museum of Zoology, Ann Arbor, MI; USNM, United States National Museum of Natural History, Washington, DC.

ALBERTA (all M. Harrison and P. Sherrington in litt.): [before 1936; near Calgary; 1 im; specimen, since lost (Weseloh and Lang 1973)]. (*1) mid Sep 58; Bear Lake, northwest of Grande Prairie; 1 2nd-yr; lake; mounted specimen (Salt 1966). (*2) 11 Aug 59; Bear Lake, northwest of Grand Prairie; 1 3rd-yr; lake; mounted specimen; the statement that this was one of 10–12 present here in fall 1959 is not well supported (Salt 1966). (*3) 15 Apr 60; Therien Lake southwest of St. Paul; 1 1st-yr; lake; banded (597-56837) on Christie Islet, south of Anvil Island, Howe Sound, British Columbia 19 Jul 59 and found alive and released at Therien Lake; date of recovery sometimes given incorrectly as 2 Jun 60 (Merilees 1961). (4) 28 Sep 66; Valleyview garbage dump; 1 ad; dump (Stirling 1967). (5) 3–4 May 72; Forest Lawn Sanitary Landfill, Calgary; 1 ad; dump; unpublished photographs (AB 26:776; Weseloh and Lang 1973). (6) 2 Oct 76; Legal; 1 im (Pinel et al. 1991). (7) 5 Apr 80; along Bow River, Calgary; 1 2nd-yr; river (AB 34:788; Pinel et al. 1991). (8) 6–21 Aug 83; Namaka Lake, about 10 mi. SE of Strathmore; 1 im (AB 38:215). (9) 9 May 84; along Bow River, Calgary; 1 1st-yr; river (AB 38:926). (10) 3–10 Nov 84; along Bow River, Calgary; 1 1st-yr; river (AB 39:68). (11) 17 Apr 85; along Bow River, Calgary; 1 im; river (AB 39:316). (12) 6–14 Nov 88; along Bow River, Calgary; 1 im; river; unpublished photos (Dickson 1989). (13) 3 Apr 90; along Bow River, Calgary; 1; river (AB 44:446). (14) 21 Mar 92; along Bow River Calgary; 1 1st-yr; river; unpublished photos (AB 46:438–439).

ARIZONA (all J. Witzeman in litt.): (*1) 4–24 Feb 54; Lake National Wildlife Refuge, Bill Williams Arm, lower Lake Havasu; 1 1st-yr; res; female specimen (USNM 481196) (AFN 8:263; Monson and Phillips 1981; R. L. Zusi in litt.). (*2) 17 Nov 56; 8 mi. above Imperial Dam and 1 mi. below Yuma Wash on Imperial National Wildlife Refuge; 1 1st-yr; river; unsexed specimen (University of Arizona, Tucson, 4913) (AFN 11:48; Monson and Phillips 1981; T. R. Huels in litt.). (*3) 12 Dec 74–18 Feb 75; below Davis Dam; 1 1st-yr; river; also recorded in Nevada (AB 29:725). (*4) all winter 75–76; below Davis Dam; 1 2nd-yr; river; also recorded in Nevada (AB 30:750). (*5) 30 Oct 81; Lake Havasu City; 1 1st-yr; res (AB 36:204).

COLORADO (all B. Prather in litt.): [21 Oct 56; Marston Lake; 1 im; lake; said to be a new species for Colorado; not reviewed by state records committee, as no documentation available (AFN 11:36)]. [24 Nov 56; South Platte River in Denver; 1; river; not reviewed by state records committee, as no documentation available (AFN 11:36)]. (*1) 24–25 Jul 81; Antero Reservoir near Hartsell; 1 1st-yr; res. (*2) 31 Mar–6 Apr 89; Julesburg Reservoir west of Julesburg; 1 1st-yr; res (AB 43:515). (*3) 11–19 Apr 89; Cherry Creek Reservoir, Denver area; 1 2nd-yr; res; published photo (AB 43:515, 516). (*4) 1 May 90; Cherry Creek Reservoir, Denver area; 1 2nd-yr, molting; res. (*5) 1 Mar–1 Apr 92; Cherry Creek Reservoir, Denver area; 1 1st-yr; res (AB 46:455).

IDAHO: (1) 17–23 Feb 63; Spokane River, Coeur d'Alene; 1 im; river; unpublished photo (J. Acton) (AFN 17:344; Burleigh 1971; LaFave 1965; Weber 1981; S. H. Sturts in litt.). (2) 1 Jan 65; Coeur d'Alene Landfill (Ramsey Rd.); 1; dump (AFN 19:403; S. H. Sturts in litt.). (3) 16 Feb–8 Mar 75; Spokane River and Cougar Bay, Coeur d'Alene; 1 im; river and lake; possibly two different individuals (AB 29:718; S. H. Sturts in litt.). (4) 4 Dec 76; Spokane River, Coeur d'Alene; 1 1st -yr; river (S. H. Sturts in litt.). (5) 29 Jan–5 Feb 77; Spokane River and Coeur d'Alene Landfill (Ramsey Rd.); 1; river and dump (S. H. Sturts in litt.). (6) 28 Dec 77; Coeur d'Alene area; 1 ad (AB 32:378; Weber 1981; S. H. Sturts in litt.). (7) 17 Feb 78; Nampa; 1 (AB 32:378; Taylor and Trost 1987; Weber 1981). (8–10) 14 Feb 87; Cougar Bay,

Coeur d'Alene Lake; 1 ad, 1 1st-yr, 1 3rd-yr; lake (AB 41:306; C. H. Trost and S. H. Sturts in litt.). (11) 2–7 Jan 89; Coeur d'Alene Landfill (Ramsey Rd.); 1 1st-yr; dump (AB 43-343; C. H. Trost and S. H. Sturts in litt.). (12) 4 Nov 89; Wolf Lodge Bay, Coeur d'Alene Lake; 1 ad; lake (AB 44:129; S. H. Sturts in litt.). (13) 1 Jan 90; Coeur d'Alene Landfill (Ramsey Rd.); 1 1st-yr; dump (S. H. Sturts in litt.). (14) 13 Dec 90; Coeur d'Alene area; 1 (AB 45:295; C. H. Trost and S. H. Sturts in litt.). (15) 1 Dec 91: Coeur d'Alene Landfill (Ramsey Rd.); 1 1st-yr; dump (AB 46:291; C. H. Trost and S. H. Sturts in litt.). (16) 4 Jan 92; Boise; 1 1st-yr (AB 46:291; C. H. Trost in litt.). (17) 18 Nov 92–8 Feb 93; Coeur d'Alene Landfill (Ramsey Rd.); 1 1st-yr; dump (AB 47:122, 279; S. H. Sturts in litt.). (18) 26 Oct 93; near dam in Willow Bay on American Falls Reservoir; 1 ad; res (NASFN 48:131; C. H. Trost in litt.). (19) 30 Oct–11 Nov 93; Coeur d'Alene Landfill (Fighting Creek); 1 1st-yr; dump; unpublished photos; possibly two different individuals (NASFN 48:131, 229; C. H. Trost and S. H. Sturts in litt.). (20) 17 Dec 93; Coeur d'Alene Landfill (Fighting Creek); 1 2nd-yr; dump (NASFN 48:229; S. H. Sturts in litt.). (21) 17 Dec 93–16 Jan 94; Coeur d'Alene Landfill (Fighting Creek); 1 2nd-yr; dump (NASFN 48:229; S. H. Sturts in litt.). (22–23) 25 Jan 94; Colburn (Bonner Co.) Landfill; 1 1st-yr and 1 unknown; dump (NASFN 48:229; S. H. Sturts in litt.).

ILLINOIS: [18–25 Feb 89; Peoria area; 1 ad; river; under review by state records committee]. (*1) 27 Nov–12 Dec 92; Chicago; 1 2nd-yr; two rivers and two dumps; video and published photos (AB 47:101–102, 169; Johnson et al. 1995). [27–28 Feb 93; Peoria Lock and Dam; 1 3rd-yr; river; under review by state records committee (AB 47:263–264)]. [19–20 Feb 93; Lake Decatur; 1 3rd-yr; lake at warm-water outlet; under review by state records committee (AB 47:263–264)].

MANITOBA: (*1) 1 Jun 64; Churchill; 1 2nd-yr; female specimen (UMMZ 211531) (Jehl 1974: P. Chu in litt.).

MICHIGAN: [19 Dec 70; St. Joseph; 1; listed as hypothetical by Payne (1983) and rejected by state records committee (Chu 1992)].

MONTANA (all C.M. Carlson in litt.): [1 Jan 55; Great Falls; 1; no description available to state records committee and not included in recent Montana publications (AFN 9:272)]. (*1) 21 Mar–6 Apr 85; Missouri River just below Ft. Peck Dam; 1 1st-yr; river at dam; published photo (AB 44:450). (2) 26 Jan 91; Polson dump near Flathead Lake; 1 1st-yr; dump (AB 45:295). (3) early Nov 91; Polson dump near Flathead Lake; 1 1st-yr; dump (AB 46:125). (*4) 7 Dec 91–18 Apr 92; Missouri River just below Ft. Peck Dam; 1 1st-yr; river at dam; published photo (AB 46:282, 441).

NEVADA: (1–3) 30 Oct 71–27 Feb 72; Las Vegas Bay, Lake Mead; up to 3 1st-yr present during period; res; a fourth bird, collected 11 Feb 72, was a Thayer's Gull (AB 26:101, 639, 888; Alcorn 1988; Lawson 1973; M. V. Mowbray in litt.). (*4) late Jul 72; 1 mi. from east shore of Lake Tahoe near Glenbrook; 1 1st-yr; inland; banded (967-19765) 8 mi. NW of Tofino, Vancouver Island, British Columbia 11 July 1971 (not 1972 as in Alcorn 1988); because bird found as a disarticulated skeleton, recovery date means nothing (Alcorn 1988; Lawson 1973; C.S. Robbins in litt.). (5) Nov, 16–28 Dec 72; Las Vegas Bay, Lake Mead; 1 1st-yr; res (AB 27:648; Alcorn 1988; Lawson 1973; M. V. Mowbray in litt.). (6) 15 Dec 73; Las Vegas Bay, Lake Mead; 1st-yr; res (M. V. Mowbray in litt.). (7–8) 30 Nov 74; Boulder Beach, Lake Mead; 2 1st-yr; res (AB 29:94; Alcorn 1988; Lawson 1977; M. V. Mowbray in litt.). (9) 12–18 Dec 74, 18 Feb 75; below Davis Dam; 1 1st-yr; river; seen also in Arizona (Alcorn 1988; Lawson 1977). (10) 4 Dec 75; Cottonwood Basin, Lake Mojave; 1; res (Alcorn 1988; Lawson 1977). (11) 9–29 Jan 76; below Davis Dam; 1 2nd-yr; published photo; river; seen also in Arizona (Alcorn 1988; Lawson 1977; M. V. Mowbray in litt.). (12) 14 Nov 76; Las Vegas Bay, Lake Mead; 1 1st-yr; res (AB

31:205; Alcorn 1988; Lawson 1977; M. V. Mowbray in litt.). (13–14) 17–22 Jan 78; Las Vegas Bay, Lake Mead; 2 1st-yr; res (AB 32:381; Alcorn 1988; M. V. Mowbray in litt.). [summer 79; Lahontan Reservoir; 7; res; the number of individuals and summer date make us suspect these were worn faded individuals of another species (Alcorn 1988)]. (15) 7 Dec 80–21 Feb 81; Las Vegas Bay, Lake Mead; 1 1st-yr; res (AB 35:322; Alcorn 1988; M. V. Mowbray in litt.). (16) 19 Nov–19 Dec 81; Las Vegas Bay, Lake Mead; 1 1st-yr; res; with #17 on 19 Dec (AB 36:202; Alcorn 1988). (17) 19 Dec 81; Las Vegas Bay, Lake Mead; 1 1st-yr; res; with #16 on 19 Dec (M. V. Mowbray in litt.). (18) 27 Mar 88; Walker Lake; 1; lake (AB 42:468). (19) 19 Dec 88; Las Vegas Bay, Lake Mead; 1 1st-yr; res (M. V. Mowbray in litt.). (20) 24 Nov 90; Lake Mead marina; 1 1st-yr; res (AB 45:133; M. V. Mowbray in litt.). [10 Jan 91; Lake Mead; 1; res; no description and not published in AB (H. E. Kingery in litt.)]. (21) 21 Oct 91; Mud Lake; 1 (AB 46:128). (22) 26 Nov 91–4 Jan 92; Pyramid Lake; 1; res; three other birds at Pyramid Lake during winter 91–92 considered of questionable identity in AB (AB 46:128, 293, 295). (23) 3 May 92; Reno; 1 (AB 46:455). (24) 1 Jan–22 Feb 93; Reno; 1 (H. E. Kingery in litt.). (25) 18 Dec 93–9 Jan 94; Virginia Lake in Reno; 1 2nd-yr; res (L. A. Neel in litt.). (26) 10 Feb 94; Virginia Lake in Reno; 1 1st-yr; res (L. A. Neel in litt.). (27) 11–15 Nov 94; Las Vegas Bay, Lake Mead; 1 1st-yr; res; unpublished photos seen by us (M. Cressman and M. V. Mowbray in litt.). (28) 19 Nov 94; Virginia Lake in Reno; 1st-yr; res (L. A. Neel in litt.).

NEW MEXICO: [10 Jan 54 (not 1 Jan); Lee Ranch, 30 mi. N of Grants; 1 im; flying over land; description too incomplete to eliminate other forms (AFN 8:263; J. P. Hubbard in litt.)]. [31 Dec 55; Roswell; 7; Christmas Bird Count; no details (AFN 10:206; J. P. Hubbard in litt.)]. (*1) 21–24 Jan 90, Caballo Lake, and 7 Feb, 7 Mar 90, Elephant Butte Lake; 1 2nd-yr; both res; two photos (New Mexico Ornithological Society #1990-11A-B) from Caballo Lake, one published; female specimen (MSB 8650); here presumed to be the same bird on all dates (AB 44:306; J. P. Hubbard and R. W. Dickerman in litt.). (*2) 12 Feb–3 Oct 94; Elephant Butte Lake; 1 1st-yr (2nd-yr when collected); res; unpublished photos; male specimen (MSB 18929); a possible Glaucous-winged at Caballo Lake 16 Jan and 6 Feb 94 might have been same bird (NASFN 48:236, 328; J. E. Parmeter and R. W. Dickerman in litt.).

NORTH DAKOTA: [30 Oct 90; below Garrison Dam near Riverdale; 1 3rd-yr or ad; river; 10 unpublished photos; state records committee has made no final disposition but tends toward rejection (D. Buitron and G. Nielsen in litt.)]. [30 Sep–4 Nov 90; Garrison Dam; 1 2nd-yr; not yet reviewed by state records committee (AB 45:121)].

OKLAHOMA: (*1) 15 Feb 12; Capron; 1 ad; unsexed mounted specimen (Northwest State College, Alva, Oklahoma, 0112) (Sutton 1938; G. D. Schnell in litt.).

SASKATCHEWAN: [19 Dec 87; 3 km west of Naicam; 1 ad; described as having yellow eyes and white head, so we consider identity questionable (Jensen 1988, C. S. Houston in litt.)]. (1) 9–16 Nov 91; Gardiner Dam; 1 2nd-yr; res (AB 46:109; C. S. Houston in litt.).

UTAH: (1) 19 Dec 83; Salt Lake City Landfill; 1 1st-yr; dump; unpublished photos used after original identification as Thayer's Gull (M. Tove in litt.). (*2) 20 Nov–19 Dec 84; near Provo Dump and Salt Lake City Landfill; 1 1st-yr; dumps; published photo (AB 39:84; Fischer 1988; M. Tove and D. L. Fischer in litt.). (*3) 7 Dec 84–26 Feb 85; Orem Dump and Salt Lake City Landfill; 1 1st-yr; dumps, unpublished photo (Fischer 1988; M. Tove and D. L. Fischer in litt.). (*4) 19 Jan–4 Feb 85; Salt Lake City Landfill; 1 1st-yr; dump, unpublished photo (Fischer 1988; M. Tove and D. L. Fischer in litt.). (*5) 26 Feb–13 Mar 85; Bountiful Area Refuse Dump, south shore of

Farmington Bay; 1 1st-yr; dump (Fischer 1988; M. Tove and D. L. Fischer in litt.). (*6) 30–31 Mar 85; near Provo Dump; 1 1st-yr; near dump, unpublished photo (AB 39:331; Tove and Fischer 1988; Fischer 1988: M. Tove and D. L. Fischer in litt.). (7) 20 Nov 85; Provo Dump and Salt Lake City Landfill; 1 2nd-yr; dumps (AB 40:147; Fischer 1988; Tove and Fischer 1988). (8) 7–18 Dec 85; Bountiful Area Refuse Dump, south shore of Farmington Bay; 1 1st-yr; dump (AB 40:308; Fischer 1988; M. Tove in litt.). (9) winter 85–86; region of Salt Lake City; 1 1st-yr; dump (AB 40:308; Fischer 1988; Tove and Fischer 1988). (10) winter 85–86; region of Salt Lake City; 1 1st-yr; dump (AB 40:308; Fischer 1988; Tove and Fischer 1988). (11) 10 Nov 89; Logan; 1 1st-yr; sewage ponds; unpublished photos (AB 44:131; L. A. Ryel in litt.). (12) 28 Dec 90; Salt Lake City Landill; 1 ad; dump; unpublished photo (E. Sorensen in litt.). (13–14) winter 1993–94; Salt Lake City Landfill; 2; dump; unpublished videotape (NASFN 48:231).

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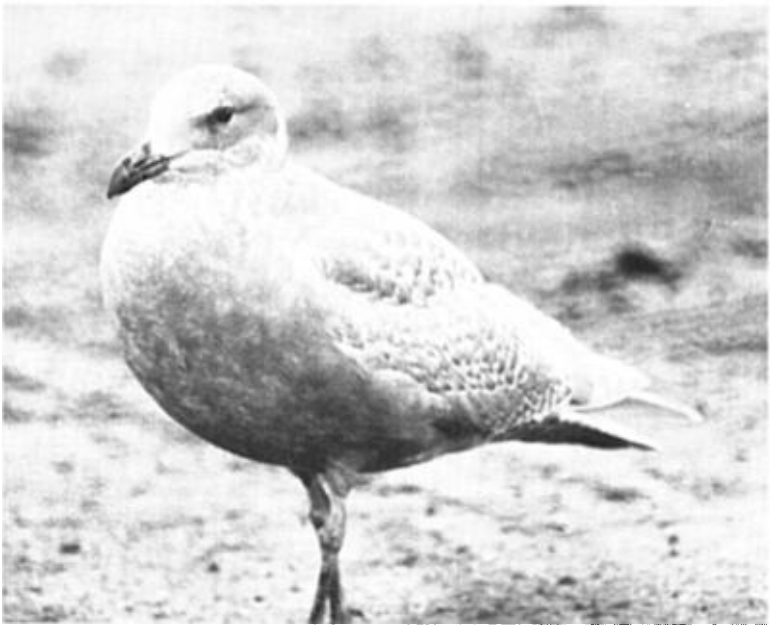

Glaucous-winged Gull, 11–15 November 1994, Lake Mead Marina, Las Vegas Bay, Lake Mead, Nevada.

Photo by Marian Cressman