

REVISITING THE PAST: HISTORICAL STATUS OF BREEDING RING-BILLED AND CALIFORNIA GULLS IN THE KLAMATH BASIN, OREGON

W. DAVID SHUFORD, Point Blue Conservation Science, 3820 Cypress Dr., #11, Petaluma, California 94954; dshuford-ra@pointblue.org (current address: 1040 Helen Ct., Petaluma, California 94954)

ABSTRACT: Three summaries of the historical and recent status of breeding Ring-billed (*Larus delawarensis*) and California (*L. californicus*) gulls in Oregon mention just two colony sites in the Klamath Basin—Upper Klamath Lake and Spring Lake—and lack numerical data for individual colonies. Nevertheless, nesting of gulls at Lower Klamath Lake before its water source was cut off in 1917 is well documented. Egg-set records, published literature, and archived field notes attest to nesting of both species before 1954 at two additional sites in the Klamath Basin, the Link and Klamath rivers. The largest known colonies up to that time were at Lower Klamath Lake (~2000 pairs, perhaps many more) and along the Klamath River below the town of Klamath Falls (~2000 pairs). Gulls no longer nest at these five sites, but, since at least 2000, they have nested intermittently at Swan Lake and Gerber Reservoir. Though Gabrielson and Jewett (1940) considered the California Gull more abundant in southeastern Oregon than the Ring-billed, egg-collectors' data from 1926 to 1953 suggest the opposite, as in northeastern California. The California Gull may have been the more numerous of the two in the Klamath Basin when nesting and foraging habitat was dominated by wetlands, but the drying of Lower Klamath Lake and the great expansion of irrigated agriculture starting in the 1920s may have favored the Ring-billed. Trends in the Klamath Basin's gull populations are unclear, but much nesting habitat has been lost. Documentation of the historical record of nesting gulls and other waterbirds is critical, as conservation efforts typically aim at restoring populations to some historical baseline, which can gradually shift lower with further declines and successive generations accepting a new status quo.

Both the Ring-billed Gull (*Larus delawarensis*) and California Gull (*L. californicus*) have long bred in the Klamath Basin of California and Oregon. The recent and historical breeding status of these species has been fairly well documented for the California portion of the Klamath Basin (Shuford and Ryan 2000, Shuford et al. 2006, Shuford 2010, 2014, Doster and Shuford 2018). Documentation for the Oregon portion, however, is less thorough, and the summaries of historical nesting are brief and lack important details. Notably, various authors have reported breeding of the two species at Upper Klamath Lake, Oregon's largest lake, but none have identified specific nesting locations or provided estimates of the size of any colonies.

The first well-documented account of gulls breeding in the Oregon portion of the Klamath Basin is Finley's (1907) detailed description of a mixed colony of Ring-billed and California gulls of "at least five hundred pairs" nesting on tule-mat islands in Lower Klamath Lake in 1905, before its inflow was diverted. Gabrielson and Jewett (1940) reported "one or more" colonies of the California Gull at Upper Klamath Lake and another recently established colony at Spring Lake, "a small pond a few miles out of Klamath Falls." They noted that the Ring-billed Gull occurred in "each of the great colonies of California Gulls in ... the Klamath Basin" but in smaller numbers than the California. Yet they identified only Spring Lake as a specific colony site of the

Ring-billed. F. Newton (*in* Conover 1983) reported both gull species “breeding” at Upper Klamath Lake in 1979 but provided no estimate of the colony size or its location at the large lake. Gilligan et al. (1994) reported that “in recent years over 2000 pairs” of California Gulls had nested in the Klamath Basin, Klamath County, but they provided no actual colony location(s). Similarly, these authors indicated that the California is joined by the Ring-billed at Klamath County colonies but provided no estimate of the size of the latter species’ population in this region. Butler (2003a) cited Conover (1983) and Gilligan et al. (1994) together for various estimates of nesting pairs of California Gulls in Oregon during the early 1990s, including “2000 pairs in Lake (Pelican L., Warner Valley, and Summer L.) and Klamath counties (Upper Klamath L.)” It is unclear where Butler’s numbers came from, as Conover reported about 1000 breeding *individuals* (not pairs) for the two Lake County sites combined and no numbers for Upper Klamath Lake. The estimate of “over 2,000 pairs” by Gilligan et al. was for all of Klamath County. Butler (2003b) also cited Conover as evidence of Ring-billed Gulls nesting at Upper Klamath Lake. Except for Finley (1907), none of these sources cited any specific documentation, such as egg-set records, observers’ names, archived field notes, or pictures of colonies; Gabrielson and Jewett (1940) did not specify the locations of photos of a colony of each of the gull species they published.

This paper summarizes previously unpublished data on the locations and sizes of colonies of the Ring-billed and California gulls in the Klamath Basin of Oregon, attempts to reconcile this information with that provided in prior publications, and suggests how current avifaunal works can better represent the historical record by making use of online resources that have proliferated in recent years. With these data, I evaluate colonies’ longevity, how the historical baseline has changed over time, and what effect this might have on conservation measures for these or other species of waterbirds.

Study Area and Methods

The study area encompassed the key wetlands, water bodies, and surrounding irrigated agricultural fields of the Upper Klamath Basin of Oregon (Klamath County and a small part of Lake County). I excluded the California portion of the basin (Siskiyou and Modoc counties) because the historical record of gull nesting there has already been well described. The Upper Klamath Basin (or just “Klamath Basin”) is defined as the combined watersheds of the Klamath (above Iron Gate Dam) and Lost rivers (USBR 1998; USGS map at www.usgs.gov/media/images/map-upper-klamath-basin).

For data on historical gull nesting, I searched for records of egg sets in the extensive collection of the Western Foundation of Vertebrate Zoology (<https://wfvz.org/databases/>) and the records of various other museums aggregated by the search portals VertNet (<http://portal.vertnet.org/search>), the Global Biodiversity Information Facility (www.gbif.org/), and Integrated Digitized Biocollections (www.idigbio.org). I also contacted curators, or searched online databases, for details on any egg sets in various museums, particularly in Oregon, including those at the University of Oregon, Oregon State University, Willamette University, Portland State University, the University of Oregon’s Charleston Marine Life Center and Oregon Institute of Marine Biology, and at the Clark R. Bavin National Fish and Wildlife Foren-

sics Lab in Ashland. Furthermore, I examined, where available, the diaries/field notes, correspondence, and articles of key field workers, including Ira N. Gabrielson (1918–1987), Stanley G. Jewett (1912–1939), and William L. Finley (1899–1955).

I also searched for any additional information on gull nesting in the Klamath Basin in the relevant seasonal reports published in *Bird-Lore* and its successors through *North American Birds*, the seasonal reports for various subregions of Oregon, especially the south-central region, published in *Oregon Birds*, other published literature and unpublished reports, and observations from Klamath and Lake counties posted to <https://ebird.org>. Finally, I contacted various field ornithologists in Oregon for further information or leads on gull nesting in the Klamath Basin.

RESULTS

Colony Locations

I located records of 102 egg sets of the Ring-billed Gull and 84 egg sets (plus a downy chick) of the California Gull that had been collected in Klamath County between 1926 and 1953 (Tables 1, 2). Many were collected from mixed-species colonies at the same location on the same or multiple dates. Gabrielson and Jewett (1940), Gilligan et al. (1994), and Butler (2003a,b) reported these gulls breeding in Klamath County at just two locations—Upper Klamath Lake and Spring Lake—but in none of the many cases where unpublished egg-set data specified a colony’s location did it correspond with either of these lakes (Tables 1, 2). Likewise, some brief published accounts used colloquial names for colony locations that matched those from egg-set records. Here I summarize knowledge of gull nesting at five sites historically occupied in the Klamath Basin, clarify ambiguous locations, and supply additional detail on colony sizes. Two other colonies have been occupied since at least 2000, but earlier field workers may not have known about these sites.

Upper Klamath Lake. W. Wittich (*in* Mearns 1879) was based in Fort Klamath and collected birds for four years (1875–1878) near the fort and the north end of Upper Klamath Lake. He described a bare island that during the breeding season was “covered with the eggs of Water-birds of many species.” Also based out of Fort Klamath (September 1886 to August 1887), Merrill (1888) reported that “gulls of at least two species [probably Ring-billed and California] ... remained to breed on the islands in the lake.” Presumably both accounts refer to Bare Island, situated at the north end of Upper Klamath Lake; the lake’s other island, Buck Island, is about 14.5 km away at the south end. The Klamath Indians had villages and gathered food on both islands (KCHS 1997). Although Gabrielson and Jewett (1940) included Mearns (1879) and Merrill (1888) in their bibliography, they did not cite them, or any other sources, as documentation of gull nesting at Upper Klamath Lake. My searches of various other published sources, egg sets, and field notes did not uncover any additional convincing evidence of gull nesting at that lake. Bare Island was homesteaded by Euro-American settlers by at least the 1890s and occupied intermittently thereafter (Deller 1992). Their activities, including the raising of pigs and sheep, may have forced nesting gulls to abandon the

TABLE 1 Data for 102 Egg Sets of the Ring-billed Gull Collected in Klamath County, Oregon, 1927–1953

Catalog number ^a	Date	Location	Collector	Comments ^b
WFVZ: EN-44501, -44502	18 May 1927	10 mi. south of Klamath Falls	Braly, J. C.	About 250 pair, and about the same number of California Gulls nesting.
WFVZ: EN-28430	27 May 1927	[No location reported]	Currier, E. S.	A colony of about 200 pairs nesting in alkali sumps.
UF: 93318	16 May 1928	Klamath Falls, island	Egg set donated by J. H. Connelly; collector unknown	
MSB Bird: 41280	18 June 1928	"Sump"	Kalmbach, E. R.	
WFVZ: EN-38978	18 June 1929	"The Sump," 10 mi. south of Klamath Falls	Jewett, S. G.	Nest on mud island.
WFVZ: EN-39052, -201598 to -201604 [7], -201642, -201649 to -201651 [3], -43449 to -43453 [5], -44493 to -44500 [8], -201605, -201607, -201608, -201627, -201640, -201643, -201644, -201647, -201648, -44538, -44539, ROM: 503330, 503331.	18 May 1930	10 mi. south of Klamath Falls	Braly, J. C.	About 250 pair, and about the same number of California Gulls nesting.
YPM: ORN 129092, ORN 129093.				
WFVZ: EN-43445, -43446 to -43448 [3], -44491, -44492	18 May 1930	Sumps	Wells, G.	Nests placed in the mud on a small, low isle in the marsh.

(continued)

Catalog number ^a	Date	Location	Collector	Comments ^b
WFVZ: EN-43444, -44488, -44489	12 May 1931	Sumps	Currier, E. S.	
WFVZ: EN-63974, -65575 to -65580 [6], -65582, -54095, -63975 to -63982 [8], -65574, -65581, -65584	19 May 1938	Klamath River, 7 mi. below Klamath Falls	Griffie, W. E.	About 1200 to 1500 pairs of this species and 300 to 400 pairs of California Gulls nesting on a narrow strip of dry ground between the river and a marsh.
WFVZ: -185725 to -185740 [16], -33638	18 May 1939	Near Klamath Falls	Carriger, H. W.	On a levee along river; large colony with California Gulls.
WFVZ: EN-63983, -65583, -27328 to -27331 [4], -54094, -28431	18 May 1939	Klamath River, 7 mi. below Klamath Falls	Griffie, W. E.	Perhaps 2000 pairs of this species and California Gull nesting on a narrow strip of dry ground between the river and a large marsh.
MVZ Egg: 14231	18 May 1939	Klamath River	Burtis, P. T., Jr.	About 2000 birds in mixed colony with California Gulls. Nest on bank of the Klamath River.
WFVZ: EN-68339	18 May 1953	Klamath River, 10 mi. below Klamath Falls	Andresen, C.	Thousands nesting on the banks of the Klamath River 10 mi. below Klamath Falls.

^aCAS, California Academy of Sciences, San Francisco; MSB, Museum of Southwestern Biology, University of New Mexico, Albuquerque; MVZ, Museum of Vertebrate Zoology, University of California, Berkeley; OSU, Oregon State University, Corvallis; ROM, Royal Ontario Museum, Toronto; UF, Florida Museum of Natural History, Gainesville; WFFVZ, Western Foundation of Vertebrate Zoology, Camarillo, CA; YMP, Yale University Peabody Museum, New Haven, CT.

^bRelevant comments on egg-set card or in online catalog.

TABLE 2 Data for 85 Egg Sets and One Downy Chick of the California Gull Collected in Klamath County, Oregon, 1926–1953

Catalog number ^a	Date	Location	Collector	Comments ^b
SDNHM: 21504	13 June 1926	The Sump	Jewett, S. G. [likely in company with Gabrielson, I. R. (Bird-Lore 28:352–353)]	Downy chick.
WFVZ: EN-201588, -39066, -43454, -44459 to -44462 [4], -44487, -201586, -201587 UOMNCH: 1009 UF: 93313, 93315, 93316	16 May 1928	Klamath Falls	Braly, J. C.	On a small island in the center of a small lake. About 300 pairs nesting.
USNM: B38824	16 May 1928	Klamath Falls	Egg sets donated by J. H. Connelly; collector unknown	
	8 June 1929	10 mi. south of Klamath Falls	Kalmbach, E.	Presumably the colony at "The Sump" that Jewett (1912–1939) visited on 13 May 1929, when gulls were building nests and initiating egg laying. About 250 pair and about the same number of Ring-billed nesting [EN-139128 only: about 300 pair nesting].
WFVZ: EN-139128, -201577, -201578, -201580 to -201583 [4], -201591, -44463 to -44469 [7], -44485, -44486, -201584 UOMNCH: 1004, 1006 to 1008 [3], 1010, 1011 ^c , 1012, 1260, 1348 WFVZ: EN-44483, -44484	18 May 1930	10 mi. south of Klamath Falls	Braly, J. C.	
	18 May 1930	Sump (or Sumps, or Sump)	Wells, G.	A colony on small isle on a marsh.
WFVZ: EN-44533, UWBM: 67284	12 May 1931	"Sump," Klamath Falls	Currier, E. S.	
UOMNCH: 1011 ^c , 1011 ^c	15 May 1932	Klamath Falls	Braly, J. C.	Nest on the ground near the water.

(continued)

Catalog number ^a	Date	Location	Collector	Comments ^b
WFVZ: EN-201593	18 May 1932	Klamath Valley ("The Sump")	Jewett, S. G.	In colony of about 80 pairs; may be an estimate of a subcolony on one island where eggs taken, as in his field notes and Bird-Lore (34:280) estimated 300–350 pairs in May 1932.
NYSM: 12904	24 May 1932	The Sump	Jewett, S. G.	3 eggs from 3 nests.
WFVZ: EN-39120	29 May 1934	Merrill	Jewett, S. G.	
WFVZ: EN-201533, -28427, -37111, -63964 to -63973 [10], -65585 to -65591 [7], -99789. USNM: B46607 (lacks information on population size, but all else matches).	19 May 1938	On Klamath River, 7 mi below Klamath Falls	Griffie, W. E.	From a colony on a narrow strip of dry ground between the river and a marsh. About 300 to 400 pairs of this species and 1200 to 1500 pairs of Ring-billed Gull nesting in scattered dense groups along a half mile of the river.
WFVZ: EN-177260 to -177268 [9]	18 May 1939	Near Klamath Falls	Carriger, H. W.	On levee along river. Large colony of this species and Ring-billed nesting close together.
MVZ Egg: 14229	18 May 1939	Klamath River	Burtis, P. T., Jr.	About 2000 birds in mixed colony with Ring-billed Gulls. Nest placed on the bank of the Klamath River.
WFVZ: EN-68338	18 May 1953	Klamath River	Andresen, C.	Birds mixed, usually outside of edge of Ring-billed Gull colony.

^aCAS, California Academy of Sciences, San Francisco; CSUSC, California State University, San Jose; MM, Maturango Museum, Ridgecrest, CA; MVZ, Museum of Vertebrate Zoology, University of California, Berkeley; NYSM, New York State Museum, Albany; OSU, Oregon State University, Corvallis; UF, Florida Museum of Natural History, Gainesville; UOMNCH, University of Oregon, Museum of Natural and Cultural History, Eugene; USNM, National Museum of Natural History, Smithsonian Institution, Washington, DC; UWBM, University of Washington Burke Museum, Seattle; WFVZ: Western Foundation of Vertebrate Zoology, Camarillo, CA.

^bRelevant comments on egg-set cards or in online catalog.

^cThree unique nest record cards in the UOMNCH collection bear the identical (1011) catalog number.

island. It is possible that documentation of gull nesting exists in some field worker's unpublished notes, but, if so, that remains to be seen. Notably, Finley and Finley (1924) wrote, "The Upper [Klamath] Lake is a great feeding and resting lake, but for some reason it has not been a breeding place for the colonies of birds such as the Lower Klamath [Lake] before it was dried up."

More recent suggestions of breeding at Upper Klamath Lake are not convincing. F. Newton's report (*in* Conover 1983) of both gull species "breeding" at Upper Klamath Lake in 1979 lacks support and may be based just on observations of gulls at that lake during the breeding season. Notably, Conover (1983) erred in reporting gulls' status as breeding or their abundance for at least two sites, including Tule Lake, said to have large numbers breeding in 1976 when in fact no gulls bred there that year (Shuford and Ryan 2000:147). Butler (2003a) cited Conover (1983) and Gilligan et al. (1994) in support of an estimate of 2000 pairs of California Gulls in Lake (Pelican L., Warner Valley, and Summer L.) and Klamath counties (Upper Klamath L.) combined during the early 1990s, though neither of the cited authors provided any numerical estimates of nesting gulls at Upper Klamath. Most telling, biologists at the Klamath Basin National Wildlife Refuge Complex flew aerial surveys to count colonial waterbirds nesting at Upper Klamath Marsh at Upper Klamath Lake from the early 1970s through 2015 and never saw any evidence of breeding gulls there (J. Hainline, J. Beckstrand pers. comm.). They likely would have seen any gull nesting on the lake's two large islands—Bare and Buck—as their aircraft flew up the lake, and many people visit these islands, probably precluding nesting (J. Hainline pers. comm.).

Link River. At its south end, Upper Klamath Lake's waters flow into the Link River and after 2.4 km enter Lake Ewauna, the outflow of which spawns the Klamath River. According to his field notes, on 22 June 1934, I. N. Gabrielson visited the Link River in company with W. L. Finley and H. M. Worcester, finding a "huge colony" of Ring-billed and California gulls (Gabrielson 1931–1935). But for unknown reasons Gabrielson and Jewett (1940) did not note this river as a location for breeding gulls.

Klamath River. None of the books on the birds of Oregon reported gulls nesting along this river (Gabrielson and Jewett 1940, Gilligan et al. 1994, Butler 2003a,b), yet the vast majority of the egg sets available from Klamath County were ascribed to locations 7 or 10 miles (11 or 16 km) south of Klamath Falls. Many data cards specify the location as along the Klamath River (Tables 1, 2). In fact, from 1938 to 1953 (the last year for which egg sets are available), the Klamath River was the only location in Klamath County from which egg sets were recorded. At the most thoroughly described site, 7 miles (11 km) below Klamath Falls, W. E. Griffiee noted a large mixed gull colony "on a narrow strip of dry ground between the river and a marsh" with birds "nesting in scattered dense groups along a half mile of the river" (WFWZ EN-63964). It is unclear how much marshland remained in this area in 1938 when Griffiee wrote this summary, but a 1906 map showed extensive marshes on both sides of this stretch of the river from Keno upstream to beyond Miller Island (Weddell 2002, Figure 1). Currently, Furber Marsh is 11 or 16 km south of Klamath Falls, east of the Klamath River and west of the railroad grade that was constructed across the marshes in the early 20th century. At Furber Marsh's south end, that river formerly overflowed through the marshy

RING-BILLED AND CALIFORNIA GULLS IN THE KLAMATH BASIN, OREGON

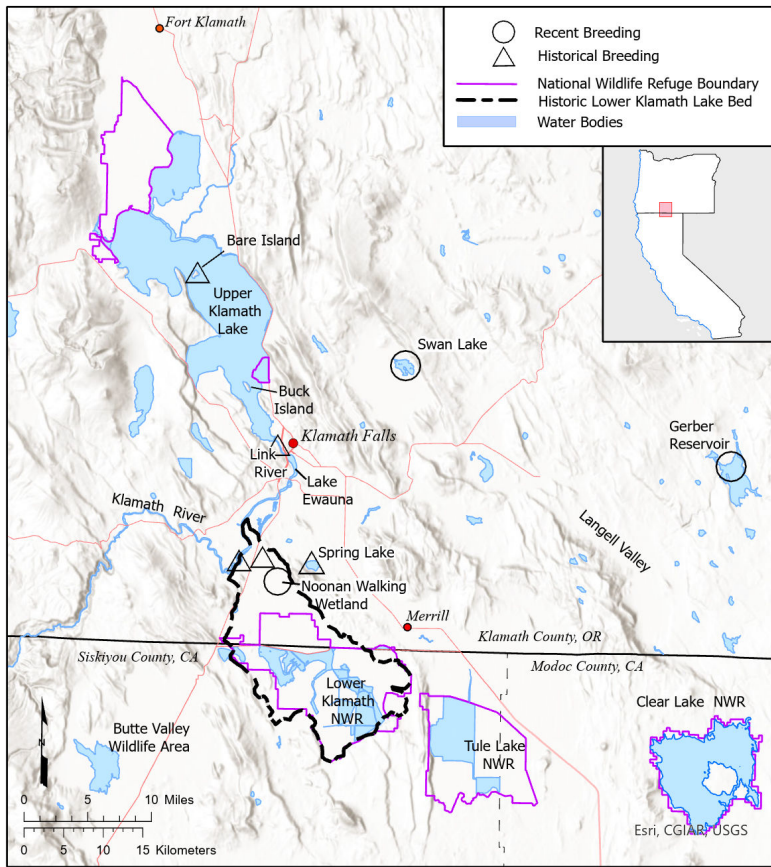


FIGURE 1. Locations of historical and recent nesting sites for the Ring-billed and California gulls in the Oregon portion of the Klamath Basin. Nesting has been irregular at all recent breeding sites. Historical and recent breeding sites in the California portion of the Klamath Basin are not depicted.

Klamath Straits into Lower Klamath Lake (Foster 2002). From the descriptions collectors gave, the vicinity of today's Furber Marsh and the Klamath Straits is likely where many of the egg sets were collected from 1938 to 1953, though apparently the habitat there is no longer suitable for gull nesting.

The largest colonies attested from egg-set records for any location in Klamath County were along the Klamath River. At the mixed colony 11 km below Klamath Falls, W. E. Griffiee collected 20 egg sets of the Ring-billed and 20 of the California on 19 May 1938 and estimated there were about 1200 to 1500 pairs of the former species and 300 to 400 pairs of the latter (Tables 1–2). The following year, he returned on 18 May 1939 and estimated that perhaps 2000 pairs of gulls were nesting (e.g., MVZ EN-63983). This was echoed by P. T. Burtis, Jr., also collecting that day, who noted there were about 2000

birds of each species (MVZ Egg: 14229 and 14231). On the data card for a set of Ring-billed Gull eggs collected 10 miles (16 km) below Klamath Falls on 18 May 1953, C. Andresen noted "thousands nesting on banks of Klamath River" (WFVZ EN-68339), and that California Gull nests were usually outside the edge of the Ring-billed colony, suggesting that the latter was the more numerous species.

Lower Klamath Lake. In 1905, W. L. Finley and his field companion and photographer H. T. Bohlman were appointed deputy game wardens by the Oregon authorities and tasked with guarding the extensive waterbird rookeries in the Klamath Lake region against the ravages of plume hunters (Bird-Lore 7:336–342). While cruising Lower Klamath Lake in 1905, they reported finding large rookeries of the Double-crested Cormorant (*Nannopterum auritum*), grebes, American White Pelican (*Pelecanus erythrorhynchos*), Great Blue Heron (*Ardea herodias*), California Gull, and Caspian Tern (*Hydroprogne caspia*), forming the most extensive bird colonies they had ever seen. These colonies were miles out from the main shore of the lake, where the birds were nesting on flat, floating tule islands. Among the throngs, there were three large colonies of the California Gull, the largest containing about 1000 pairs, the next about 600 (ibid., p. 338). Finley (1907), reporting on a (same?) trip to Lower Klamath Lake in 1905, described a mixed Ring-billed and California gull colony of "at least five hundred pairs" nesting on tule-mat islands. Chapman (1908) also visited the vast bird colonies on the lake in early July 1906 and found pelicans nesting on 15 islands and gulls and other species on at least a dozen more. Gulls were the most abundant birds in the rookery and were nesting on nearly every island; they appeared to be equally divided between the California and Ring-billed. On another visit in 1915, Finley (1915) noted that the main bird colonies were in the northwestern part of the lake, and the California Gulls that formerly nested with the pelicans and herons had moved to shallower water to the west. Things were soon to change drastically.

Following initial water diversions for small private irrigation ventures by white settlers beginning in the latter half of the 19th century, in 1906 the Reclamation Service began work on a massive reclamation project designed to drain Lower Klamath Lake and convert the lakebed and marshes to farmland (Weddell 2002). Ultimately an embankment was constructed across the marshes with a gate at the Klamath Straits. When closed permanently in the fall of 1917, the gate cut off all water from the Klamath River to Lower Klamath Lake. In the first year after closure, the flooded area of the lake decreased by about 53%, and it took about 5 years for most of the lake's waters to evaporate. W. L. Finley further described the effects, noting that by the summer of 1921 "the whole country had been changed into an alkali desert in places and in other parts to a wide, dry peat-bed, which took fire and burned to a depth of several feet leaving a vast area of ashes" (Bird-Lore 26:474). Still, in May 1922, I. N. Gabrielson visited the lake, and, despite its drying, reported that a "great colony" of California Gulls had re-established itself in an area of spring floodwater that was small compared to the original lake (Bird-Lore 24:226). By 1926, Lower Klamath Lake had been reduced from 344 km² of marsh and open water to 8 km² of open water (Akins 1970). As far as I can determine, the only subsequent record of gull nesting on the bed of the former Lower Klamath Lake is the observation of 96 and 3 nests

of the Ring-billed and California, respectively, on a low-lying island at the Noonan South Walking Wetland on 10 June 2009 (Doster and Shuford 2018, in which the 96 “breeding individuals” in table 1 should be 96 nests, pers. obs.). This site, located about 3.9 km east of the junction of Hwy. 97 and the Klamath Straits canal (42.0755° N, 121.7994° W), was a temporary seasonal wetland of 0.3 km² created to benefit wildlife while increasing the productivity of agricultural land.

Spring Lake. Gabrielson and Jewett (1940) reported that both California and Ring-billed gulls bred at Spring Lake—14 km south of Klamath Falls—but provided no details or estimates of colony size. None of the egg sets collected or reports in *Bird-Lore* of gulls nesting in Klamath County are attributed to Spring Lake, but I deduce that colonies ascribed to “The Sump” in both sources pertain to Spring Lake. On 13 June 1926, I. N. Gabrielson located a “large colony” of California Gulls and one of about 20 pairs of Caspian Terns nesting on little islands on the west end of a small lake south of Klamath Falls known locally as “The Sump,” where no colony of this kind had been noted previously (Gabrielson 1922–1931, *Bird-Lore* 28:352–353). He suggested that these colonies had probably moved from Lower Klamath Lake. Gabrielson and Jewett (1940) noted that with the demise of the great colonies of Caspian Terns at Lower Klamath Lake after it dried that “in late years” the only colony in Klamath County was usually at Spring Lake. Hence if Gabrielson found Caspian Terns breeding at “The Sump” in 1926 that site must be synonymous with Spring Lake; otherwise, in 1940 he would have noted that there was a second nesting site for that species.

Evidently all gull eggs (and a downy chick) collected in Klamath County from 1926 to 1934 were from Spring Lake (i.e., “The Sump”), with the colony sometimes including one, other times two, gull species (Tables 1, 2). During this period, estimates of the colony’s size ranged up to 350 pairs for the California and 250 pairs for the Ring-billed (Tables 1, 2, *Bird-Lore* 34:280, Jewett 1912–1939). Occasional accounts noted short-term trends in gull numbers at “The Sump.” In June 1929, I. N. Gabrielson noted the mixed gull colony was “about the same size as two years ago” (*Bird-Lore* 31:349). In late May 1930, he reported that the colony was increasing, with several times as many of the Ring-billed and many more of the California than the previous year (*Bird-Lore* 32:291).

Currently any gull colony would likely be seen from paved Spring Lake Road, which passes right along the east side of Spring Lake. Shuford et al. (2006) did not detect any gull nesting on surveys of Spring Lake on 19 June 2003 and 15 June 2004. Neither did observers with the Klamath Bird Observatory (unpubl. data) on 6 June 2010 and 24 May 2011.

Swan Lake. On private land, this lake is about 2 km from the nearest public road, which may explain a lack of early records of gull nesting there. From aerial photos, Shuford et al. (2006) estimated that 5673 and 6604 pairs of the Ring-billed and 1832 and 1160 pairs of the California were nesting at Swan Lake on 12 May 2003 and 13 May 2004, respectively. G. Ivey (in litt.) estimated about 150 Ring-billed Gull nests at Swan Lake during an aerial survey for cranes in 2000. Doster and Shuford (2018) reported an estimated 144 Ring-billed and 680 California gulls at Swan Lake on 20 May 2009, but on a return visit to the island for a total nest count on 25 May observers with the

Klamath Bird Observatory found no gulls but old empty nests, some broken eggshells, and canid tracks and scat (unpubl. data). It is unclear whether the colony was disrupted by predators or if nesting was not fully initiated. Surveys of Swan Lake on 8 and 20 June 2010, when it was dry, found no nesting gulls, but on 9 June 2011 biologists with the Klamath Bird Observatory estimated 256 pairs of the Ring-billed there (unpubl. data). The limited data suggest gull abundance at Swan Lake is highly variable; numbers may be greatest when birds shift from other nearby colonies that are abandoned or reduced during drought. For example, the numbers at Swan Lake were highest in 2003 and 2004, when intermittently large colonies at Meiss Lake in the California portion of the Klamath Basin were abandoned and those at Clear Lake were reduced (Shuford et al. 2006). In more extreme cases (e.g., 2009 and 2010), Swan Lake can be abandoned too.

Gerber Reservoir. Although Gerber Reservoir began filling in June 1925 when the Bureau of Reclamation dammed Miller Creek, it is unclear when gulls first colonized it. From aerial photos, Shuford et al. (2006) estimated 1024 and 1323 pairs of the Ring-billed and 0 and 63 pairs of the California, were nesting on islands in Gerber Reservoir on 12 May 2003 and 13 May 2004, respectively. A survey at Gerber on 22 May 2009 found no active gull colony but about eight old cup nests, three broken eggshells, and one intact, bleached California Gull egg on a rock; surveys on 29 May 2010 and 15 June 2011 did not detect any signs of nesting gulls (Klamath Bird Observatory unpubl. data). As at Swan Lake, gull numbers at Gerber Reservoir may be higher in some drought years when other traditional colonies are abandoned or reduced in size (Shuford et al. 2006). Gull nesting at Gerber is intermittent, as islands are not available in all years and sometime may emerge too late in the season for nesting (W. Watkins pers. comm.).

DISCUSSION

There are several reasons why locations of gull colonies in the Klamath Basin described in the published literature through 2003 (Lower Klamath Lake, Upper Klamath Lake, Spring Lake) may have differed from those attested by egg sets and a downy chick collected from 1926 to 1953. These include (1) loss of habitat at former colony locations, (2) the author's lack of knowledge of egg sets or other material documenting colony sites, (3) assumptions of breeding at a specific location without documentation, and (4) authors calling colony locations by names that differ from those in primary sources. In the present case, identifying the factors responsible is made difficult because many prior publications do not cite any documentation for breeding locations, such as egg sets, specimens, archived field notes, pictures of colonies, attributions to specific observers, or personal observations.

Loss of habitat explains why egg sets taken from 1927 on were not from Lower Klamath Lake, which had disappeared by that time. But it is curious why Gabrielson and Jewett (1940) did not discuss gull nesting at Lower Klamath Lake earlier in 20th century during the lake's prime (or Gabrielson's observation of a colony of the California there in 1922 when the lake's waters had largely dried). This despite reporting the former nesting of the Caspian Tern at Lower Klamath Lake, listing Finley's (1907) paper on gull nesting at

Lower Klamath in their bibliography, and discussing the former nesting of the California Gull at Silver Lake, Lake County, Oregon.

Some authors may have been unaware of egg sets collected prior to their publications, but this seems not to have been the case for Gabrielson and Jewett (1940) at least. The preface for that book indicates that the manuscript was finished in June 1935 and only a few important records were added thereafter. Of those I have located, 55 of 102 egg sets of the Ring-billed and 52 of 84 of the California were collected prior to 1935 (Tables 1, 2). Additionally, during this period egg sets were collected over nine years by at least six individuals, including Jewett himself and two others (J. C. Braly and E. S. Currier) who were among the persons Gabrielson and Jewett (1940, preface) thanked for providing valuable records and notes. Thus they were clearly aware of the egg sets collected, and other observations, including their own, reported in *Bird-Lore*, documenting gull nesting at "The Sump." What is unclear, however, is why they used Spring Lake as the name of record in their book without explaining this was synonymous with the colloquial name "The Sump," which those authors and others had used exclusively when reporting in *Bird-Lore* and on egg-set record cards. That Gabrielson and Jewett (1940) omitted mentioning gull nesting on the Klamath River below Klamath Falls is due to collection of gull eggs there beginning in 1938, after the cutoff date of 1935 for inclusion of records in that book.

In the category of questionable attribution of breeding to a location without documentation, I include F. Newton's (*in* Conover 1983) report of both gull species "breeding" at Upper Klamath Lake in 1979. Similarly, Butler (2003a) cited two sources for an estimate of 2000 pairs of the California nesting in Lake (two colonies) and Klamath (one colony, Upper Klamath Lake) counties during the early 1990s, though neither source provided any numerical estimate of nesting gulls at Upper Klamath Lake. Further reasons to discount these reports are outlined above.

Some confusion on gull nesting sites may stem from authors using local-ity names that differ from common usage. Gabrielson and Jewett (1940) described gulls nesting in the Klamath Basin only at Upper Klamath Lake and Spring Lake, raising the question of why the egg sets collected by Jewett and associates, and reports of nesting in *Bird-Lore* prior to that publication, did not mention either of those lakes. As described above, Spring Lake is synonymous with "The Sump," which was named as a colony location for egg sets and observations of nesting. Given that Gabrielson and Jewett (1940) did not discuss former nesting at Lower Klamath Lake prior to its being drained, it is unclear why they mentioned Upper Klamath Lake, as I can find no solid evidence of nesting there during the 20th (or 21st) century. One possible explanation is that they considered "Upper Klamath Lake" the entire system above Lower Klamath Lake, including that short stretch of the Klamath River, Lake Ewauna, and the even shorter Link River. Thus Gabrielson and Jewett (1940) may not have reported the Link River as one of the gull-nesting sites in Klamath County, despite Gabrielson's observation of a colony there in 1934, because they may have considered it among the "usually one or more" colonies of gulls at Upper Klamath Lake (*ibid.*, p. 290).

Relative Abundance of Ring-billed and California Gulls

There appear to be no published historical accounts of the relative abundance of the Ring-billed and California gulls in the Klamath Basin. But for the colonies of southeastern Oregon overall, which include Klamath colonies, Gabrielson and Jewett (1940) considered the California a much more abundant breeder than the Ring-billed, and Gilligan et al. (1994) stated that the latter species accounted for less than 40% of nesters. Early accounts of the large gull colonies at Lower Klamath Lake are equivocal, with Finley emphasizing the California and Chapman reporting about equal numbers of the two species. The summary of colony counts from egg-set records from the mid-1920s to mid-1950s, however, suggests that the Ring-billed far outnumbered the California, at least in the largest colonies along the Klamath River. This is consistent with the pattern found from counts of colonies in the Klamath Basin of Oregon and California in 2003 and 2004, particularly at the largest colonies, which were in Oregon (Swan Lake, Gerber Reservoir) in those years (Shuford et al. 2006). A much higher ratio of Ring-billed to California gulls has also been a consistent pattern where those species overlap in northeastern California (Siskiyou, Modoc, Lassen, and Plumas counties), including that state's portion of the Klamath Basin, since at least the late 1970s (Winkler 1982, Shuford and Ryan 2000, Shuford et al. 2006, Doster and Shuford 2018). Also, away from breeding colonies, as in agricultural fields or at water bodies such as Lake Ewauna, the Ring-billed has greatly outnumbered the California since at least the late 1980s (D. Haupt and K. Spencer pers. comm.). It is possible that the California was the more numerous of the two in the Klamath Basin of Oregon when nesting and foraging habitat was dominated by wetlands, but with the drying of Lower Klamath Lake and the great expansion of irrigated agriculture starting in the 1920s, this pattern may have shifted in favor of the Ring-billed.

Importance of the Historical Record

It is extremely important to document the historical record of nesting gulls and other waterbirds given that current conservation efforts are typically predicated on reversing declines from some historical baseline. When discussing population trends, Shuford et al. (2018) stressed the need to be mindful of the trap of "shifting baseline syndrome," which could hinder the establishment of suitable (i.e., more ambitious) conservation targets (Pauly 1995, Soga and Gaston 2018). This happens when successive generations of scientists accept as baseline the population sizes that existed at the beginning of their careers and use this as the benchmark for evaluating changes (Pauly 1995). With further declines and new generations of researchers accepting a new and lower baseline, this can result in a gradual shift of the baseline and thus an inappropriate reference point for evaluating losses or identifying conservation targets.

The perceived causes of this syndrome are many (Soga and Gaston 2018), but ones particularly pertinent to the present case are lack of familiarity with the historical literature and with the data available in scientific collections. These issues are compounded when avifaunal works covering all species in a large region are written, as finding obscure historical references and relevant

egg-set and specimen records can be laborious for just one or a few species, let alone for hundreds. Currently, however, this process can be streamlined by the use of online databases, which will improve in the future with increased digitization of records and integration of collections (Johnson et al. 2023). It should be recognized that for colonial nesters, the data cards accompanying the egg sets or the collector's field notes are more likely to provide numerical estimates of abundance than they are for species widely distributed over the landscape. There are varying views on how field ornithology has changed over the years (Contreras 2000, Hochachka et al. 2001), but, regardless, egg collections are currently a greatly underused resource (Marini et al. 2020).

Although populations of the Ring-billed and California gulls appear to have been increasing across their ranges in the western United States (Conover 1983, Shuford and Doster 2018), it is unclear if this is the case in the Klamath Basin because of the imperfect historical record of breeding sites and abundance. At least five former colony sites—Upper Klamath Lake, Link River, Klamath River, Lower Klamath Lake, and Spring Lake—are no longer occupied, and two recent sites—Swan Lake and Gerber Reservoir—are occupied irregularly. Regardless, it is very clear that the loss of wetlands that has affected gulls in the Klamath Basin has greatly reduced the regional populations of some other colonial nesters (e.g., American White Pelican) and likely others for which there are no adequate estimates of historical abundance (e.g., Eared, Western, and Clark's grebes; Shuford et al. 2006).

ACKNOWLEDGMENTS

The egg sets, specimens, and field notes preserved by the institutions cited, and curated with limited budgets and staff, were invaluable for reviewing and revising the history of gull nesting in the Klamath Basin of Oregon. Many thanks to the following individuals for answering queries about gull nesting in this region: John Beckstrand, Alan Contreras, René Corado, David Craig, Pamela Endzweig, Steve Floray, Kimball Garrett, Jim Hainline, Andy Johnson, Trish Mace, Mark Madison, Christopher Milensky, Doug Robinson, Trisha Roninger, Deborah Shapiro, Kevin Spencer, Jaime Stephens, Jessica Oswald Terrill, Ryan Terrill, Philip Unitt, Wedge Watkins, and Peter Wimberger. Rusty Scalf graciously produced the map of the study area. Funding for surveys of waterbirds in the Klamath Basin, which stimulated this evaluation of the history of breeding gulls in that region, was provided by the U.S. Fish and Wildlife Service's Klamath Basin National Wildlife Refuge Complex and by the National Fish and Wildlife Foundation. Dave Haupt, Dan Ruthrauff, Kevin Spencer, and Philip Unitt provided helpful comments on the manuscript. This is Point Blue contribution 2503.

LITERATURE CITED

- Akins, G. J. 1970. The effects of land use and land management on the wetlands of the Upper Klamath Basin. M.S. thesis, W. Wash. State Univ., Bellingham.
- Butler, C. 2003a. California Gull, *in* *Birds of Oregon: A General Reference* (D. B. Marshall, M. G. Hunter, and A. L. Contreras, eds.), pp. 265–267. Ore. State Univ. Press, Corvallis.
- Butler, C. 2003b. Ring-billed Gull, *in* *Birds of Oregon: A General Reference* (D. B. Marshall, M. G. Hunter, and A. L. Contreras, eds.), pp. 264–265. Ore. State Univ. Press, Corvallis.

RING-BILLED AND CALIFORNIA GULLS IN THE KLAMATH BASIN, OREGON

- Chapman, F. M. 1908. *Camps and Cruises of an Ornithologist*. Appleton, New York; doi.org/10.5962/bhl.title.161338.
- Conover, M. R. 1983. Recent changes in Ring-billed and California gull populations in the western United States. *Wilson Bull.* 95:362–383.
- Contreras, A. L. 2000. The past, present, and future of field ornithology. *N. Am. Birds* 54:345–347.
- Deller, P. 1992. Buck, Bare islands have colorful histories. *Herald and News (Klamath Falls)*, 24 February, “Klamath Roots.” Reprinted in the *Trumpeter* 48: Apr–June 1997, newsletter of the Klamath County Historical Society; https://klamath-countyhistoricalsociety.org/images/Trumpeters/1997JuneTrumpeter_48.pdf.
- Doster, R. H., and Shuford, W. D. 2018. Recent trends in population size and distribution of Ring-billed and California gulls in the western United States, *in* *Trends and traditions: Avifaunal change in western North America* (W. D. Shuford, R. E. Gill Jr., and C. M. Handel, eds.), pp. 161–179. *Studies of Western Birds* 3. W. Field Ornithol., Camarillo, CA; doi.org/10.21199/SWB3.8.
- Finley, W. L. 1899–1955. William L. Finley papers. Special Collections and Archives Research Center, Corvallis, OR; <https://scarc.library.oregonstate.edu/findingaids/index.php?p=collections/findingaid&id=1851#id97215>.
- Finley, W. L. 1907. Among the gulls on Klamath Lake. *Condor* 9:12–16; doi.org/10.2307/1361523.
- Finley, W. L. 1915. Cruising the Klamath. *Bird-Lore* 17:485–491.
- Finley, W. L., and Finley, I. 1924. Bird life in Klamath County. *Volt* (12):1–6; *in* William L. Finley papers, 1899–1955, series 6: organizations and issues, 1909–1946, box-folder 6.11: Lower Klamath Lake, Tule Lake, and Clear Lake refuges, 1917–1935, pp. 24–29. Oregon State Univ. Special Collections and Archives Research Center, Corvallis, OR; <https://oregondigital.org/concern/documents/df719c132?locale=en#page/1/mode/1up>.
- Foster, D. 2002. Refuges and reclamation: Conflicts in the Klamath Basin, 1904–1964. *Ore. Hist. Quart.* 103:150–187; www.jstor.org/stable/20615228.
- Gabrielson, I. N. 1918–1987. Record unit 7319, Ira Noel Gabrielson papers, 1918–1987. Smithsonian Institution Archives, Washington, DC; https://siarchives.si.edu/collections/siris_arc_217475.
- Gabrielson, I. N. 1922–1931. Series 3, diaries of Ira. N. Gabrielson, 1918–1977, box 6, folder 2 diary, 1922–1931, *in* record unit 7319, Ira Noel Gabrielson papers, 1918–1987. Smithsonian Institution Archives, Washington, DC.
- Gabrielson, I. N. 1931–1935. Series 3, diaries of Ira. N. Gabrielson, 1918–1977, box 6, folder 3 diary, 1931–1935, *in* record unit 7319, Ira Noel Gabrielson papers, 1918–1987. Smithsonian Institution Archives, Washington, DC; https://siarchives.si.edu/collections/fbr_item_modsi2309.
- Gabrielson, I. N., and Jewett, S. G. 1940. *Birds of Oregon*. Ore. State College, Corvallis.
- Gilligan, J., Smith, M., Rogers, D., and Contreras, A. (eds.). 1994. *Birds of Oregon: Status and Distribution*. Cinculus Publ., McMinnville, OR.
- Hochachka, W., Fitzpatrick, J. W., and Rosenberg, K. V. 2001. Whither field ornithology? Perspectives from the “inside.” *N. Am. Birds* 55:373–374.
- Jewett, S. G. 1912–1939. Bird species cards for Ring-billed and California gulls. Archives, Puget Sound Mus. Nat. Hist., Tacoma.
- Johnson, K. R., Owens, I. F. P., and The Global Collection Group. 2023. A global approach for natural history museum collections: Integration of the world’s natural history collections can provide a resource for decision-makers. *Science* 379:1192–1194; doi.org/10.1126/science.adf6434.
- Klamath County Historical Society (KCHS). 1997. The islands in Klamath Lake: Buck and Bare. *Trumpeter* 48: Apr–June; https://klamathcountyhistoricalsociety.org/images/Trumpeters/1997JuneTrumpeter_48.pdf.

RING-BILLED AND CALIFORNIA GULLS IN THE KLAMATH BASIN, OREGON

- Marini, M. A., Hall, L., Bates, J., Steinheimer, F. D., McGowan, R., Silveira, L. F., Lijtmaer, D. A., et 14 al. 2020. The five million bird eggs in the world's museum collections are an invaluable and underused resource. *Auk: Ornithol. Advances* 137:1–7; doi.org/10.1093/auk/ukaa036.
- Mearns, E. A. 1879. A partial list of the birds of Fort Klamath, Oregon, collected by Lieutenant Willis Wittich, U.S.A., with annotations and additions by the collector. *Bull. Nuttall Ornithol. Club* 4:161–166.
- Merrill, J. C. 1888. Notes on the birds of Fort Klamath, Oregon. *Auk* 5:139–146; doi.org/10.2307/4067148.
- Pauly, D. 1995. Anecdotes and the shifting baseline syndrome of fisheries. *Trends Ecol. Evol.* 10:430; doi.org/10.1016/S0169-5347(00)89171-5.
- Shuford, W. D. 2010. Inland-breeding pelicans, cormorants, gulls, and terns in California: A catalogue, digital atlas, and conservation tool. Wildlife Branch, Nongame Wildlife Program Rep. 2010-01. Calif. Dept. Fish and Game, Sacramento; nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=24095.
- Shuford, W. D. 2014. Patterns of distribution and abundance of breeding colonial waterbirds in the interior of California, 2009–2012. A report of Point Blue Conservation Science to Calif. Dept. Fish and Wildlife and U.S. Fish and Wildlife Serv. (Region 8); www.fws.gov/mountain-prairie/migbirds/species/birds/western_colonial/.
- Shuford, W. D., and Ryan, T. P. 2000. Nesting populations of California and Ring-billed gulls in California: Recent surveys and historical status. *W. Birds* 31:133–164.
- Shuford, W. D., Thomson, D. L., Mauser, D. W., and Beckstrand, J. 2006. Abundance and distribution of nongame waterbirds in the Klamath Basin of Oregon and California from comprehensive surveys in 2003 and 2004. Final report to U.S. Fish and Wildlife Serv., Klamath Basin NWR Complex, 4009 Hill Rd., Tulelake, CA 96134. Contribution 1284 of PRBO Conservation Science, 3820 Cypress Dr., #11, Petaluma, CA 94954.
- Shuford, W. D., Gill, R. E. Jr., and Handel, C. M. 2018. Trends and traditions: Overview and synthesis, *in* Trends and traditions: Avifaunal change in western North America (W. D. Shuford, R. E. Gill Jr., and C. M. Handel, eds.), pp. 2–10. *Studies of Western Birds* 3. W. Field Ornithol., Camarillo, CA; doi.org/10.21199/SWB3.Intro.
- Soga, M., and Gaston, K. J. 2018. Shifting baseline syndrome: Causes, consequences, and implications. *Front. Ecol. Environ.* 16:222–230; doi.org/10.1002/fee.1794.
- U.S. Bureau of Reclamation (USBR). 1998. 1998 Klamath Operations Plan Environmental Assessment. U.S. Bur. Reclam., Klamath Basin Area Office, 6600 Washburn Way, Klamath Falls, OR 97603.
- Weddell, B. J. 2002. Relationship between flows in the Klamath River and Lower Klamath Lake prior to 1910, *in* Proceedings of the 2001 Klamath Basin Fish and Water Management Symposium (Y. Everett, M. George, and A. King, eds.), pp. 1-43–1-54. Klamath River Inter-Tribal Fish and Water Commission and Humboldt State Univ. Colleges of Natural Resources and Science and Arts, Humanities and Social Sciences; www.krisweb.com/biblio/klamath_hsu_everettetal_2002_symprocs.pdf.
- Winkler, D. W. 1982. Importance of Great Basin lakes in northern California to nongame aquatic birds, 1977. Wildlife Mgmt. Branch Admin. Rep. 82-4. Calif. Dept. Fish and Game, 1416 Ninth St., Sacramento.

Accepted 19 April 2024
Associate editor: Daniel R. Ruthrauff