

(Watson 1989). On 16 Jan 1989 an oiled and weakened bird was found on Rockaway Beach, Tillamook Co., and was taken to a rehabilitation center where it later died (OBRC). Monotypic (AOU 1957).—*Harry B. Nehls*

Ross's Gull *Rhodostethia rosea*

This Arctic gull breeds in n. Siberia and n. Canada and winters over the Arctic oceans. It is casual southward in N. America but reports are increasing. From 18 Feb to 2 Mar 1987 a rather unwary basic-plumaged adult was photographed at Yaquina Bay, Lincoln Co. (Nehls 1987c, Watson 1988). A bright adult was at McNary Dam on the Columbia R., Umatilla Co., 27 Nov to 1 Dec 1994 (Sullivan T 1995, Sullivan, PT 1995b).—*Harry B. Nehls*

Subfamily Sterninae

Caspian Tern *Sterna caspia*

The largest species of tern in the world, the Caspian Tern is easily recognizable by its black cap, pale gray upperparts, scarlet bill, and gull-like size. Although scarce or declining throughout much of its range, most populations in N. America have recently grown, including the Pacific coast/Western states population. Oregon currently hosts the largest known Caspian Tern nesting colony in the world (on East Sand I. in the Columbia R. estuary), but the future of this colony is uncertain. The species has recently gained notoriety in the Pacific Northwest as a predator on young salmon and its management has become highly controversial.

General Distribution: Breeds at scattered sites in N. America, Eurasia, Africa, Australia, and New Zealand (Cramp 1985, Cuthbert and Wires 1999). Widespread but disjunct breeding distribution in N. America: Atlantic coast from Newfoundland to N. Carolina; Gulf coast from Florida to Texas; Great Lakes region; c.

Canada; Pacific coast from Alaska to Baja California; Great Basin region. Wintering range in N. America mostly coastal: N. Carolina to Florida, Gulf coast, Caribbean islands (rarely), and south to Honduras. On the Pacific coast, it winters along the coast of s. California, Mexico, M. America, and extreme n. S. America. Monotypic (AOU 1945); includes *imperator*, a subspecies in Gabrielson and Jewett (1940).

Oregon Distribution: Breeding colonies in recent years have been on islands in the Columbia R. estuary in extreme nw. Oregon; on the mid-Columbia R. east of the Cascades in nc. Oregon; Malheur and Harney lakes in se. Oregon; Summer L. and lakes in the Warner Valley in sc. Oregon. Most colony sites have a history of intermittent use. It is a locally common summer resident during breeding season within foraging distance of nesting colonies (30-40 mi [50-65 km]); rare elsewhere. Later in the breeding season, failed breeders wander widely and occur farther from active colonies (Anderson SK in prep.). It is fairly common in bays and estuaries along the coast during spring and fall migration. Smaller numbers are found on inland waters during migration, including mid-Columbia, Willamette, and Snake rivers, large lakes in the western interior valleys, and lakes and reservoirs east of the Cascades and in sc. Oregon. Occasional along the coast and inland in late fall and early spring (Gilligan et al. 1994).

Habitat and Diet: Found in a variety of marine, brackish, and freshwater habitats, usually on or near large water bodies, where forage fishes 4-10 in (10-25 cm) in length are readily available at surface. Most numerous along the coast, especially in bays and estuaries; rarely beyond sight of land. Breeds in colonies, often in association with other colonial waterbirds, especially gulls. For nesting prefers unvegetated sites on islands that are isolated, free of mammalian predators, and in large bodies of water.



On coast, nests on sandy islands, including dredge spoil sites. The nest is usually a shallow scrape in sand or gravel with little or no nest material; frequently adjacent to driftwood or other debris. Occasionally nests amidst vegetation or on mats of floating vegetation (e.g., at Malheur L., Upper Klamath Basin) (Finley 1907a, *KC*).

Caspian Terns are almost entirely piscivorous and forage opportunistically on fish at or near the surface. Normally forages alone or, if prey aggregated, in loose foraging flocks, often with other piscivorous birds (e.g., Double-crested Cormorants). Dives from heights up to 100 ft (30 m) into water to capture prey (Cuthbert and Wires 1999). Diet on Rice I. in Columbia R. estuary was mostly juvenile salmonids (73-90% of prey items), including coho salmon, chinook salmon, and steelhead (Collis et al. 2001, Collis et al. 2002, Roby et al. 2002). Diet on Threemile Canyon I. in mid-Columbia R. was also mostly salmonids (81% of prey items), with smaller amounts of bass, yellow perch, and suckers (Collis et al. 2002, Antolos in prep.). Diet on East Sand I. in Columbia R. estuary mostly non-salmonids: anchovy, herring, sardines, surfperch, sand lance, sculpins, smelt, and flatfish (Roby et al. 2002). East Sand I. and Rice I. are only 13 mi (21 km) apart; diet largely reflects local forage fish availability. Only limited diet data are available from Malheur L. or sc. Oregon, but food is assumed to consist mostly of small carp, minnows, suckers, centrarchids, and perch. During 1994-95, they fed chiefly on tui chub (*G. L. Ivey p.c.*).

Seasonal Activity and Behavior: Reaches Oregon in early Mar; 3 Mar 2002 at Brookings the earliest recent arrival (*D. Munson p.c.*). Arrival of breeding adults at colonies begins in late Mar/early Apr; continues to mid-May. Courtship displays, courtship meal exchange, and copulation commence soon after arrival at a colony, indicating some pairing prior to arrival. Age at first reproduction is 3-4 yr (Cuthbert and Wires 1999); maximum longevity is 25 yr based on a banded adult recovered on Rice I. (*Suryan et al. unpubl. ms.*). Frequently nests alongside California and Ring-billed Gulls in interior Oregon; nests near Glaucous-winged/Western Gulls in Columbia R. estuary (Roby et al. 2002). Egg laying commences during the third or fourth week in Apr; earliest egg dates are 18 Apr in Columbia R. estuary and 22 Apr at Threemile Canyon I. (Columbia Bird Research [CBR] unpubl. data, Antolos in prep.). Laying peak is variable, but usually early May. If nesting habitat available and/or if earlier nesting attempts fail, egg laying (presumably by renesters) can occur in Jun and (rarely) early Jul (CBR unpubl. data). Clutch size 1-3 eggs; supernormal clutches of 4-6 eggs uncommon and may reflect female-female pairs (Thompson and Tabor 1981, Cuthbert and Wires 1999). Average clutch size 2.0 eggs at Rice

I. in Columbia R. estuary (Roby et al. 1998) and 2.1 eggs at Threemile Canyon I. (Antolos in prep.).

Incubation period 26-27 days (Penland 1981, *DDR*). Earliest hatching date 15 May in Columbia R. estuary (CBR unpubl. data). Hatching peak variable, but usually about 1 Jun. Young semi-precocial, down-covered at hatch, semi-nidifugous, able to leave nest scrape within 2 days of hatching (Cuthbert and Wires 1999). Eggs and hatchlings are especially vulnerable to gull predation; older chicks may succumb to starvation, abandonment, and aggression from adults. Young tend to form crèches when predators (e.g., Bald Eagles) flush adults from colony, leaving chicks vulnerable. Nesting success varied from 0.06 to 0.55 young raised per pair at Rice I. during 1997-2000, and from 0.57 to 1.40 young raised per pair at East Sand I. during 1999-2001 (Roby et al. 1998, Roby et al. 2002).

Young-of-year first fly late in Jun at 6-7 wk post-hatch; most young fledge and leave natal colony by late Jul when 7-8 wk post-hatch (CBR unpubl. data, Antolos in prep.). Renesting is common following loss of clutch to predators or disturbance (Cuthbert 1988); thus some fledging occurs through Aug and (rarely) into Sep for renesting pairs (CBR unpubl. data). Breeding adults may depart colonies in Jun if nesting attempt fails, or from mid-Jul through Aug if accompanied by fledglings.

Extended post-fledging parental care; parents may continue to feed young several months after fledging (Cuthbert and Wires 1999). Thus adults feeding young can be seen hundreds of miles from the nearest active colony. Adults and fledglings disperse widely across the Pacific Northwest, coastal British Columbia, California, and Alaska before southward migration to wintering grounds (CBR unpubl. data). Most birds drift south along Oregon coast during late Jul to mid-Sep; sightings trail off in late Sep and Oct; few records of stragglers in early Nov (Gilligan et al. 1994).

Detection: Readily observed during breeding season in the Columbia R. estuary; along The Dalles, John Day, and McNary dam impoundments on mid-Columbia R.; at Malheur NWR, Summer L., and Warner Valley lakes in sc. Oregon (*DDR, KC*). Readily observed during spring and fall migration in bays and estuaries along the coast of Oregon; frequently rests on sandy spits with gulls. Caspian Terns are often detected first by their characteristic harsh, raucous calls, given in flight and audible for considerable distances day and night. These calls have become a characteristic sound at most Oregon estuaries in late summer when adults accompanied by squealing juveniles can be found all along the coast.

Population Status and Conservation: Five breeding populations in N. America: (1) Pacific coast/Western

states, (2) Central Canada, (3) Great Lakes, (4) Atlantic coast, (5) Gulf coast (Wires and Cuthbert 2000). Pairs breeding in Oregon belong to Pacific coast/Western states population (Wires and Cuthbert 2000). Band recoveries indicate widespread movement of individuals among colonies along Pacific coast (Gill and Mewaldt 1983, Suryan et al. unpubl. ms.). Pacific coast/Western states population increased from about 4,500 pairs in 1960 to about 15,000 pairs in 2000 (Gill and Mewaldt 1983, Suryan et al. unpubl. ms.).

Recent trends in Oregon reflect general trends in Pacific coast/western States. In 1940, fewer than 1,000 pairs nested throughout Oregon and colonies were restricted to Malheur L. and a few shallow lakes in sc. Oregon. These small, declining colonies were of conservation concern (Gabrielson and Jewett 1940, Bent 1921). During the latter half of the 20th century, breeding habitat/distribution shifted dramatically from inland lakes and reservoirs in se. and sc. Oregon to the lower Columbia R. in nw. Oregon. The statewide breeding population currently approaches 10,000 pairs. Factors responsible for increase include creation of nesting habitat on dredge spoil islands and other anthropogenic sites; changes in availability of forage fishes, especially hatchery production of salmonid smolts; displacement from former breeding colonies, especially along the Washington coast (DDR, CBR unpubl. data).

Nesting in Oregon has occurred at only a few sites in recent years. Most nesting now occurs in the Columbia R. estuary, the only coastal colonies in Oregon (Collis et al. 1999, Roby et al. 2002). The first record of a breeding colony along the Oregon coast was in 1984 on East Sand I.; nesting by up to 1,000 pairs continued there through 1986. First recorded nesting on Rice I. in Columbia R. estuary in 1986 (A. Clark p.c.); by 1998 the Rice I. colony had increased to 8,700 breeding pairs. Nesting on Miller Sands Spit occurred in 1998; no young were raised.

In 1977 a colony of about 200 pairs was discovered on Threemile Canyon I. on the Oregon side of the John Day pool in the mid-Columbia R. near Boardman (Thompson and Tabor 1981). This colony was adjacent to a large California and Ring-billed Gull colony and consisted of 200-400 pairs during 1997-99 (Collis et al. 2002, CBR unpubl. data). The colony was abandoned in 2000 due to mink activity and not reoccupied in 2001 or 2002 (Antolos in prep.).

There is a long but sporadic history of nesting at Malheur NWR/Harney L. in se. Oregon (Willett 1919). Colony sizes and locations have been variable; breeding ceased in 1961 due to drought; resumed in 1983 (Littlefield 1990a) and continued until drought in early 1990s; 600 pairs returned in 1994 following flood (Suryan et al. unpubl. ms.); 200-300 pairs nested on two separate islands at the north end of the lake in 2000 (KC); less than 100 pairs at only one site in 2001, a drought year (R. Roy p.c., M. Laws p.c.).

A few small colonies are still present in sc. Oregon, but nesting is sporadic due to fluctuating water levels (KC, M. Laws p.c., M. St. Louis p.c.). Has nested on islands in several lakes in the Warner Valley, including Pelican, Crump, and Bluejoint lakes (Stern 1988). In 2000, about 150 pairs nested on Crump L. and no nesting colonies were found elsewhere in the Warner Valley (KC). Summer L. in recent years has supported less than 50 nesting pairs (M. St. Louis p.c.). Formerly as many as 500 pairs nested on Upper Klamath L. (Finley 1907a), but no recent breeding records in the Upper Klamath Basin.

Small numbers previously reported nesting on islands on the Oregon side of Snake R. near Ontario and Nyssa in e. Oregon, but no confirmed nesting records in recent years (Contreras and Kindschy 1996).

Beginning in 1999, federal, state, and tribal resource management agencies attempted relocating the Rice I. colony (river mile 21) to East Sand I. (river mile 5) to reduce predation on juvenile salmonids in Columbia R. estuary (USACE 2001). By 2001, all nesting in Columbia R. estuary had shifted to East Sand I., where the proportion of salmonids in diet was less than half that on Rice I., and where nesting success was more than twice as high (Roby et al. 2002). At 8,900 pairs in 2001, the East Sand I. colony is currently home to about two-thirds of the Pacific coast/Western states population, one-quarter of the N. American metapopulation, and one-tenth of the worldwide population (Roby et al. 2002).

The unprecedented breeding aggregation in the Columbia R. estuary has an uncertain future. Large breeding aggregations are vulnerable to oil spills, severe storms, disease outbreaks, and disruption by predators. But prospects for restoring or creating suitable nesting habitat elsewhere are not good, and nearby colony sites appear to be at capacity. Additionally, there is no long-term assurance that habitat on East Sand I. will be maintained for terns or that terns would be allowed to recolonize Rice I. if East Sand I. habitat is lost. Caspian Terns are in need of a region-wide management plan; assurance of sufficient suitable nesting habitat through ongoing management efforts is essential if current population size is to be maintained.—*Daniel D. Roby, Ken Collis, Donald E. Lyons, David P. Craig, and Michelle Antolos*

Elegant Tern *Sterna elegans*

A slender, orange bill, pearl gray upperparts, and fringed black crest adjoining a white face and neck indeed render this graceful hunter from the south elegant. Adults' foreheads turn white in postbreeding plumage, their usual state in Oregon. Elegant Terns were observed in Oregon for the first time in 1983, a strong El Niño/Southern Oscillation (ENSO) year. Mostly adults with a few immatures have been observed