PRIBILOF ROCK SANDPIPER

TAXONOMY

Scientific name: *Calidris ptilocnemis ptilocnemis*
Common name: Pribilof Rock Sandpiper
Family: Scolopacidae

Taxonomic comments:
Previously placed in genera *Arquatella*, *Eriola*, and *Tringa*. At times has been classified as conspecific with Purple Sandpiper (*Calidris maritima*); Rock and Purple Sandpipers now generally considered as allospecies within a superspecies group (Gill et al. 2002). There are four recognized races of Rock Sandpiper: *C. p. ptilocnemis*, the nominate form, which breeds on Bering Sea islands, *C. p.tschuktschorum*, which breeds in east Siberia and west Alaska, *C. p. couesi*, which breeds on the Aleutian Islands and in south Alaska, and *C. p. quarta*, which breeds on the Commander and Kuril Islands (Hayman et al. 1986, Gill et al. 2002).

DESCRIPTION

Basic description: A medium-sized shorebird.

General description:
Largest and stockiest of the "small" sandpipers, with short legs and a slightly drooping, medium-length bill. In breeding plumage, streaked on head and neck, gray, rufous, and black above, smudged heavily with black marks on the belly. In winter, looks identical to Purple Sandpiper with an overall grayish appearance and yellowish legs. Adults of *C. p. ptilocnemis* stand out as being the largest of the species, have the palest breeding plumage, and are the only subspecies with a distinct basic plumage. In basic plumage, under wing palest, wing stripe broadest, and primaries with more white than all other subspecies (Murie 1959, Gill et al. 2002).

Length (cm): 13
Weight (g): 100

Reproduction:
Breeding begins in early June (Harrison 1978). Clutch size usually four. Incubation about 20 days, by both sexes. Nestlings precocial and downy. Young tended by both sexes. Eggs found on Pribilof Islands from May 6 to July 24, suggesting a surprisingly long nesting season (Johnsgard 1981). Re-nesting may occur (Hanna 1921).

Ecology:
A Beringian shorebird having four recognized subspecies, all with breeding and non-breeding populations confined to Alaska and northeast Asia (Gill and Tibbitts 1999). Often seen in

association with Black Turnstones (*Arenaria melanocephala*) and Surfbirds (*Aphriza virgata*). This species winters farther north than any North American shorebird.

Migration:
Short to intermediate distance migrant between breeding sites on Bering Sea islands and wintering range in Cook Inlet and Southeast Alaska. Migration is both earliest in spring (mid- to late Apr) and latest in fall (Oct-Nov) among northern-breeding shorebirds. Large portions of the population leave breeding grounds to molt at sites 250-300 km away on Alaska mainland before moving to wintering areas (Gill et al. 2002). Most leave breeding grounds by mid-September (Preble and McAtee 1923). Arrival in Cook Inlet not until mid-October (Gill and Tibbitts 1999, Gill et al. 2002). Movements to wintering area likely funneled through Bristol Bay (Gill et al. 2002).

Scale and extent of movements during winter are largely unknown. *C. p. ptilocnemis* wintering in Cook Inlet regularly move 50-150 km south during periods of severe cold, then return when conditions improve. Southward movements during winter usually occur over one or two weeks (Gill and Tibbitts 1999).

Food:
Forages along rocky shores feeding on crustaceans, small mollusks, insects, and worms. Also eats algae, seeds, and berries.

In Cook Inlet, winter diet consists entirely of the mollusk *Macoma balthica*. In spring, may feed on herring roe attached to marine vegetation and rocks, and in summer on gonads of beached jellyfish (Gill et al. 2002).

Habitat:
Breeding: Occurs on a variety of coastal lowland tundra or montane subarctic tundra; vegetation is ankle high; seldom found at elevations greater than a few hundred meters above sea level or far inland (Gill et al. 2002); will also nest on disturbed habitats (around airports and on reclaimed/ revegetated land), mostly on Bering Sea Islands (Gill et al. 2002). On Pribilof Islands, breeds on high upland tundra (Nelson 1887, Hanna 1921, Preble and McAtee 1923) while on St. Matthew Island utilizes lowlands often just back from the driftwood lines (Hanna 1921). Associated with forb and forb-sedge tundra, rocky shrub tundra/ uplands, crowberry meadows, sedge meadows, beach ridges and dunes (Gill et al. 2002). Nest site generally in upland heath meadows; most nests placed directly on substrate underlain by moss. Nest sites on the Pribilof Islands had little cover when nests were initiated, but those positioned in forb-sedge tundra were probably well-concealed by the time of hatch (Gill et al. 2002).

Non-breeding: Species is confined to intertidal habitats during all phases of non-breeding period. Postbreeding and molting birds found on rocky and soft substrates. Forms roosts at high-tide adjacent to intertidal areas on exposed rocky, cut bank, and sandspit shorelines, and occasionally on man-made structures (Gill et al. 2002). At northern end of wintering range, generally found on hard substrates. In Cook Inlet, birds are restricted to mud and mixed mud and sand flats (Gill et al. 2002).

Foraging: During breeding season forages mostly on tundra. On Bering Sea islands, may also forage on rocky inter-tidal habitats and on gravel and sandy beaches in surf zone. On Pribilof Islands, birds frequently make foraging flights between inter-tidal areas and snow-free inland habitats. Once birds move to nesting areas and establish territories, forage in pooling water at ice edge of melting lakes, in low wet meadows, on islands of open ground around emerging overwintered standing dead sedge, and over snow-rich wetlands embedded in uplands. During non-breeding period forages in various intertidal habitats (Gill et al. 2002)

STATUS

Global rank: G5T3T4 (2004-09-28)
Global rank reasons:
Subspecies *C. p. ptilocnemis* is an Alaskan endemic; breeds and winters exclusively in Alaska. Restricted breeding and wintering distribution, small population size (< 20,000 individuals), and potential adverse impacts in non-breeding areas are of concern. Habitat within breeding range on Bering Sea islands has been markedly altered by reindeer grazing. Vulnerable to oil contamination, especially on restricted wintering grounds in Upper Cook Inlet.

State rank: S3S4B, S3N (2004-08-10)
State rank reasons:
Subspecies *C. p. ptilocnemis* is an Alaskan endemic; breeds and winters exclusively in Alaska. Restricted breeding and wintering distribution, small population size (< 20,000 individuals), and potential adverse impacts in non-breeding areas are of concern. Habitat within breeding range on Bering Sea islands has been markedly altered by reindeer grazing. Vulnerable to oil contamination, especially on restricted wintering grounds in Upper Cook Inlet.

DISTRIBUTION AND ABUNDANCE

Range:
Global range:
Alaskan endemic. See State range comments.

State range:
Breeding: Breeds only on Bering Sea islands (St. Paul, St. George, St. Matthew, and Hall).

Non-breeding: Does not occur on breeding grounds during winter, but has been seen for brief periods in relatively small numbers along the west coast of Alaska and the Alaska Peninsula in autumn among flocks of predominantly *C. p. couesi* (Gill and Tibbitts 1999). Winters mainly in Cook Inlet near the mouth of Beluga River of the Susitna Flats; in lesser numbers along Alaska Peninsula (Izembek Lagoon); and from the northern Gulf of Alaska to southern Alexander Archipelago (Gill and Tibbitts 1999). A single bird photographed at Ocean Shores, WA, is the only record south of Alaska (Aversa 2001, Gill et al. 2002).

Abundance:
Global abundance:
Alaskan endemic. See State abundance comments.

State abundance:
Subspecies *C. p. ptilocnemis* population estimated at < 20,000 (Gill et al. 2002, Alaska Shorebird Group 2004).

Total Alaska Rock Sandpiper population less than 150,000 as of 2003: *C.p couesi* estimated at 75,000; *C. p. tschuktschonum* estimated at 50,000 (Gill et al. 2002, Alaska Shorebird Group 2004).

Trends:
Global trend:
Alaskan endemic. See State trend comments.

State trend:
Unknown. On Pribilof Islands, numbers of *C. p. ptilocnemis* may have increased over the past 80 years according to observations gathered throughout an entire nesting season in the early 1920s, when "not more than a dozen" were reported. Currently a common nesting species . Interim populations may have been higher (Gill et al. 2002).

EXISTING PROTECTION

Global protection:
See State protection comments below.

State protection:
Protected under the Migratory Bird Treaty Act (1918). In Alaska, habitat in several major use areas protected as State of Alaska Game Refuges or Critical Habitat Areas (Mendenhall Wetlands, Susitna Flats, Trading Bay, Redoubt Bay, Tuxedni Bay, Ugashik Bay, Egegik Bay, Cinder Lagoon, Port Heiden) and/or as U.S. National Wildlife Refuges (Alaska Maritime Refuge, Yukon Delta, Becharof, Alaska Peninsula, Kodiak, Izembek, Togiak; Gill et al. 2002).

CHALLENGES

Global challenges:
See State challenges.

State challenges:
Introduced species: Birds breed only on Bering Sea islands where habitat has been markedly altered by reindeer (*Rangifer tarandus*) grazing (especially on the Pribilof Islands; Andres and Gill 2000, Alaska Shorebird Working Group 2004). Although effects on sandpiper populations are unknown, introduced reindeer on other islands in the Bering Sea have caused severe damage to native forbs and lichens that may take 20 years or more to recover; furthermore, overgrazing on hilly areas has caused soil erosion and permanent loss of natural plant communities, reducing natural biological diversity and, in some cases, causing desert conditions (Ebbert and Byrd 2002).

Islands used by Rock Sandpipers for breeding are currently rat (*Rattus norvegicus*) free, but species is at high risk for accidental introduction from grounded vessels (Andres and Gill 2000). Introduced rats on nearby islands are likely predators of eggs (Gill et al. 2002) and probably reduce

populations of other ground nesting species (Ebbert and Byrd 2002). Rat populations are very difficult to eradicate (Pribilof Islands Wildlife Protection Subgroup 2001). Expanding onshore fish processing development in the Bering Sea has resulted in new fish plants on two rat-free islands in the Pribilof Islands (Ebbert and Byrd 2002). Introduced foxes on Aleutian Archipelago are also potential predators.

Oil and gas development on wintering grounds: Species is vulnerable to contamination by oil especially in winter in Upper Cook Inlet, both from direct oiling and indirectly through loss or reduction in their food supply (Gill and Tibbitts 1999). Oil-vulnerability index of King and Sanger (1979) placed Rock Sandpiper as second highest among all North American shorebirds (Gill et al. 2002).

Cook Inlet is the primary wintering site of *C. p. ptilocnemis* and is one of the most active gas and oil exploration and development areas in the state (Andres and Gill 2000). Oil-Spill-Risk-Analysis (ORSA) for Cook Inlet (1996) indicates a high (27-72%) probability for a major spill associated with gas and oil exploration and development in this region (Gill and Tibbitts 1999). Offshore production has occurred in this region since the late 1960's so aging production and transportation infrastructure pose increased risks for spills. Additionally, facilities must withstand relatively frequent seismic events (Alaska Shorebird Group 2004). In 2000, 17 gas- and 7 oil- producing fields occurred within Cook Inlet along with large storage and transfer facilities, a refinery, and a urea production plant. Nearly all of Cook Inlet has been opened to lease sales by either state or federal agencies. Thirteen million barrels of jet fuel are transported each year beneath the intertidal zone between the Port of Anchorage and the Anchorage International Airport via a subsurface pipeline. A spill or persistent discharge from drilling platforms, transfer facilities, or pipelines would be harmful to the inter-tidal environment important to wintering sandpipers. Cleanup efforts could be hampered by extreme currents and by ice floes that choke the inlet in winter (Andres and Gill 2000, Alaska Shorebird Working Group 2004).

In Upper Cook Inlet, species feeds almost exclusively on the small bivalve *Macoma balthica* (Gill et al. 2002). Intertidal invertebrates are particularly vulnerable to oiling and have some of the longest recovery times of organisms affected by oil spills. Loss of or sub-lethal effects to food sources could have major consequences on the viability of the Cook Inlet Rock Sandpiper population at a time when birds are faced with high metabolic demands (Gill and Tibbitts 1999).

Littoral zone disturbance: Ranked as highly susceptible to littoral zone disturbances on Bering Sea islands (Gill and Handel 1981). In 1987, a breakwater project on St. Paul Island blocked Salt Lagoon, the islands only large inter-tidal area regularly used each summer-autumn by a few thousand Rock Sandpipers. As a result, this large mudflat was no longer exposed to the birds at low tide. A decline in the Rock Sandpiper population (potentially as high as 75%) coincided with human-caused alteration of this inter-tidal area (Gill et al. 2002).

Predation: Adults are vulnerable to predation by raptors (primarily falcons and harriers [*Circus spp.*]), and jaegers (*Stercorarius* spp.). Eggs, chicks and recently fledged juveniles also vulnerable to corvids and gulls. Peregrine Falcon (*Falco perigrinus*) is the only predator seen pursuing Rock Sandpipers during winter (Gill et al. 2002).

RESEARCH AND INVENTORY NEEDS

Global research needs:
See State research needs below.

State research needs:
Research needs include an understanding of the distribution, movements/mixing, and taxonomy of the various subspecies of Rock Sandpipers so that the breeding origin of all individuals in future studies may be assigned with confidence (Gill et al. 2002). Research needed to determine whether Cook Inlet is the principle wintering area for *C. p. ptilocnemis* and what role Alaska Peninsula estuaries play in supporting populations of this subspecies when en route to and from insular Bering Sea nesting areas (Gill et al. 2002). Winter ecology needs study, given the fact that this species winters farther north than any North American shorebird. Effects of habitat change caused by introduced reindeer to Bering Sea Islands on the distribution, habitat selection/ availability, and population structure needs study (Gill et al. 2002).

Global inventory needs:
See State inventory needs below.

State inventory needs:
Study needed on long-term population demographics and status and trends of population (Gill et al. 2002). Determine specific staging areas used by St. Matthew and Pribilof Island populations (Gill et al. 2002). Movements of population during the nonbreeding season need study, including the timing of molt-migration.

CONSERVATION AND MANAGEMENT NEEDS

Global conservation and management needs:
See State conservation and management needs

State conservation and management needs:
Habitat requirements need to be reviewed, particularly on the Cook Inlet wintering grounds, when the majority of the population is concentrated in a small area (sometimes as restricted as 2-5 km of shoreline) and highly susceptible to perturbation. This is one of the most active gas and oil development areas in the state (Gill and Tibbitts 1999). Consideration should be given recognizing several areas in Cook Inlet as being of hemispheric and international importance to shorebirds. This should include portions of west side of Cook Inlet from Pt. McKenzie to southern Tuxedni Bay (Gill and Tibbitts 1999). Additionally, Bering Sea island breeding grounds, Saint Lawrence Island, St. Matthew Island, and Pribilof Islands potentially qualify for inclusion within the Western Hemisphere Shorebird Reserve Network (WHSRN; Andres and Gill 2000).

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