

TUNDRA SWAN (*Cygnus columbianus*)

Associated Species: Other bird species that may respond similarly to habitat components used by the Tundra Swan are: American White Pelican, Trumpeter Swan, Mallard, Gadwall, Wigeon, Redhead, Canvasback, Scaup spp., and Canada Geese.

Distribution: Breeding occurs on arctic wetlands while wintering occurs on estuaries along the east and west coasts. The Tundra Swans utilize traditional migratory routes inland across the continent. Interior stopovers areas are primarily in the Great Basin, upper Mississippi River Valley, southern Ontario, and Susquehanna River Valley in southeast Pennsylvania. Breeding range in the Arctic is from the Aleutian Islands across the northern tundra regions of Alaska, Yukon, Northwest Territories, northeast Manitoba, northern Ontario, and northwest Quebec. The birds that stop at the Refuge are considered part of the Western Population of Tundra Swans, while birds traveling to the east coast of the U.S. are considered part of the Eastern Population.

The average fall peak Tundra Swan population in Utah is 24,746 (1990-01) and occurs between November 26 and December 2. The Refuge average peak is 13,111 (1990-01) and occurs between November 8 and December 2 (Refuge records). More than 99 percent of Utah's migrant Tundra Swans utilize the freshwater wetland habitats in the Bear River Bay of the Great Salt Lake, which includes the Refuge. Based on mid-winter indices, northern Utah may host up to 30 percent of the Western Population of Tundra Swans at any one time, with the Refuge accounting for about one-half of that population (15 percent). Sporadic counts for the spring (1992-2002) show an average peak for the Refuge of 3,318 between February 15 and March 22.

Ecology (Limpert and Earnst 1994): Comments are restricted to migrating and staging birds as that is the role the Refuge supports. Tundra Swans form permanent, monogamous pair bonds. This swan migrates in flocks composed of family groups. Cygnets stay with parents throughout autumn and winter of first year. Parents continue to provide parental care by protecting cygnets from foraging competition and allowing cygnets to exploit foraging behavior (paddling to bring tubers to water surface).

Individuals preen extensively at all times of year. Swans molt body feathers over an extended period (June-December). Initiation and completion of body molt depends on several factors such as age, breeding status, and sex. Wing molt takes place on the breeding grounds. This species sleeps while sitting or standing on one or both feet, usually with head resting on back and sometimes with head partially under wing. This bird roosts more often on water than land during nonbreeding seasons. On a migratory stopover, most swans (81 percent) are roosting at any given time, only 19 percent are foraging, traveling, or interacting.

Habitat Requirements: In spring and fall, migrating swans prefer shallow ponds, lakes, and riverine marshes. Major food items for the Tundra Swan include plants, primarily seeds, stems, roots, and tubers of submerged and emergent aquatic vegetation. On migration and in winter, diet may include agricultural crops; waste grains and growing winter cereal grain crops (Limpert and Earnst 1994). Forages throughout the day, although some feeding will occur at night during a full moon. On migration and in winter, feeds as a flock by dabbling, submerging head and

neck, upending and grazing in and along margins of lakes and old channels. Feet used to excavate plant parts and mollusks from substrate. On migration, the seeds and tubers of Pondweed, *Potamogeton pectinatus*, are a major food item in Utah and in North Dakota, while tubers of cattail, *Sagittaria latifolia*, are consumed in western Minnesota. The long neck of the Tundra Swan permits feeding in water up to 3 feet deep.

Seasonal Use/Refuge Habitats: Tundra Swans use the Refuge as a staging area and migratory stopover before continuing their journey across the Great Basin to the central valley of California, where they normally over-winter; and on their return trip to Arctic breeding grounds. On the Refuge, Tundra Swans use wet mudflats and wet meadows for loafing (October - January, and March - April). Tundra swans use shallow submergent and deep submergent marshes for feeding (Table 5). In mild winters tundra swans may be present October through March (Table 6).

Habitat and/or Population Objectives: The ten-year average wintering population index for the Western Population of Tundra Swans is 84,605 (1992-2001). The long term mid-winter index is 59,706 (1955-2002). The target population size for the Western Population is 60,000 (Pacific Flyway Council 2001).

Population Objective: Support migratory population at 15 percent of total Western Population of Tundra Swan based on a five-year average mid-winter indices.

Habitat Objectives: 1) Provide 31,200 acres of vegetated mudflat, 6,800 acres of unvegetated mudflat, and 3,200 acres of wet and salt meadow for loafing swans (October-December); 2) Provide 8,700 acres of shallow submergent and 2,500 acres of deep submergent marsh for feeding swans (October-December, March-April).

Habitat Management Strategy: See Section V. Habitat Management Strategies: Wetlands, Saltair Mudflats, Wet Meadow, and Salt Meadow.

Refuge Specific Monitoring Needs:

1. Determine number of swans harvested from the Refuge each year.
2. Determine number of swans utilizing Refuge habitats by method of weekly ground counts.