Trumpeter Swan

Cygnus buccinator

REGULATORY STATUS

USFWS: Listing Denied; Migratory Game Bird
USFS R2: Sensitive
USFS R4: Sensitive
Wyoming BLM: Sensitive
State of Wyoming: Game Bird (see regulations); Protected Bird

CONSERVATION RANKS

USFWS: No special status
WGFD: NSS2 (Ba), Tier II
WYNDD: G4, S3
Wyoming Contribution: HIGH
IUCN: Least Concern
PIF Continental Concern Score: Not ranked

STATUS AND RANK COMMENTS

In 1989, the Tri-State Area flock (see Distribution & Range, below) of Trumpeter Swan (*Cygnus buccinator*) was petitioned for listing as a Distinct Population Segment (DPS) under the Endangered Species Act. In 2003, the United States Fish and Wildlife Service determined that listing was not warranted because the Tri-State Area flock did not represent a DPS [1]. Resident Trumpeter Swans in Wyoming are managed through the Pacific Flyway which designates these birds are part of the U.S. segment of the Rocky Mountain Population (RMP) [2].

NATURAL HISTORY

Taxonomy:

There are no recognized subspecies of Trumpeter Swan [3], but swans in the Pacific Coast region show greater genetic diversity than those in the RMP [4].

Description:

Identification of Trumpeter Swan is possible but it can be difficult in the field to distinguish it from its close relative the Tundra Swan (*C. columbianus*), which is an uncommon seasonal migrant in Wyoming [5, 6]. Trumpeter Swan is the largest waterfowl in the world, with a wingspan of 2 to 2.4 m, and a body length of 1.4 to 1.6 m when fully grown [7]. Males and females are similar in appearance but males are larger. It is an all-white bird, except for the feet, legs, and bill, which are all black in most adult birds [8]. It has a long neck, which is held outstretched in flight and vertically when swimming [8]. Young birds have grayish plumage, retaining some gray feathers into their second year, and becoming all-white by their third year.

Distribution & Range:

Trumpeter Swan was formerly widely distributed across North America, with a breeding range extending from Alaska and the Pacific Northwest across to Ontario, Canada, and south into the northern Rockies including Wyoming, across the plains states, and into portions of the northeast

United States [3]. The species was nearly eliminated by market and subsistence hunting by the turn of the 20th century and the current range is much reduced, with three distinct breeding populations. The Pacific Coast Population is the largest and extends from central Alaska south and east into western portions of the Yukon Territory and British Columbia [9]. The restored Interior Population includes birds in the central Canadian provinces, north-central United States, and western Great Plains, including rare stragglers into eastern and possibly central Wyoming [7]. The RMP is composed of two distinct segments. The U.S. resident flock is composed of relatively sedentary individuals that reside year round in western Wyoming, eastern Idaho and southwestern Montana (referred to as the Greater Yellowstone Area flocks) plus other isolated flocks in Nevada, Oregon, and Montana [2, 10]. Current distribution in Wyoming includes Yellowstone National Park (YNP), and the Snake, Salt, and Green River drainages with a small number also in the Wind River drainage [11]. The RMP also includes a large Canadian migratory segment, which winters in the Greater Yellowstone and surrounding areas with a summer range that extends from eastern Yukon and Northwest Territories to Alberta and western Saskatchewan in Canada.

Habitat:

Trumpeter Swan requires freshwater wetlands year round. These include marshes, ponds, lakes, and slow moving areas in streams, and rivers [3]. For breeding, the species requires at least 4 ha of wetland habitat with at least 100 m of open water for takeoff. Breeding habitat must also have abundant accessible aquatic vegetation and aquatic insects. Suitable wetlands are shallow, generally below 1.2 m in depth, with dense emergent vegetation, fairly stable water levels, and minimum human disturbance [12]. Nests are placed on small islands, floating sedge mats, muskrat lodges or on shorelines [3, 13]. Trumpeter swan pairs are highly territorial and aggressively defend nest sites from other swans [3]. Accessibility to adequate foraging habitat in the pre-laying period appears to be related to Trumpeter Swan nest success and productivity [14]. During migration, the species will use a variety of marshes, lakes, inlets, outlets, rivers, and brackish estuaries, often dictated by ice levels [3]. Overwinter habitat includes freshwater springs, streams, rivers, ponds, lakes, and reservoirs that remain unfrozen [3]. Areas used in Wyoming in the winter are dictated by available open water, forage, and ice conditions [3].

Phenology:

The breeding season typically begins in late April although can vary widely depending on annual weather patterns. Often pairs occupy nest sites before the ice has melted from the breeding site and begin nest building. Nest construction takes 11–35 days. Incubation ranges from 32–37 days, and young develop the ability to fly at about 100 days of age [7]. For migratory populations, fall migration may begin in September, but typically occurs from mid-October to late November as waters freeze [3]. Birds of the RMP migratory flock overwinter in the Greater Yellowstone area, arriving in late October through November and departing in March to return north [3].

Diet:

Trumpeter Swan feeds primarily on the leaves, stems, roots, and tubers of submerged, floating, and emergent aquatic plants. Occasionally it will eat fish (*Oncorhynchus* spp.) and fish eggs. Cygnets feed upon aquatic invertebrates until they are about 5 weeks old [3, 7]. In winter, swans in some areas have learned to field feed in grain and potato fields [3]. Most important aquatic plant species in western Wyoming include *Potamogeton pectinatus*, *Elodea canadensis*, *Myriophyllus exalbescens*, and *Chara*, spp. [14].

CONSERVATION CONCERNS

Abundance:
Continental: WIDESPREAD BUT PATCHY
Wyoming: VERY RARE
Trumpeter Swan abundance in Wyoming differs between the breeding and non-breeding seasons. Trumpeter Swan numbers increase in late fall through mid-March with an influx of Canadian migrants. In February of 2015, a total of 931 Trumpeter Swans (776 adults and 155 cygnets) were documented in Wyoming compared to a September count, prior to the arrival of migrants, of 303 swans (212 adults and 65cygnets outside of YNP, and 20 adults and 6 cygnets in the park) [15, 16]. This represents a 3-fold increase of swans in winter.

Population Trends:
Historic: LARGE DECLINE
Recent: INCREASE
Trumpeter Swan was eliminated from most of its historic range by the early 1990s, decimated by market and subsistence hunting over the previous century [2]. A remnant flock of fewer than 100 resident birds remained in the vicinity of YNP and a similar number migrated to the Yellowstone area from interior Canada [2]. There were also scattered flocks, of unknown numbers, in areas of Canada and Alaska [2]. Conservation efforts, first started in the 1930s and increasing from the 1980s to the current period have led to increases in Trumpeter Swan numbers range-wide [3]. Management actions have included translocations of both wild and captive-raised swans, reintroductions, wetland habitat conservation and management, and protection from shooting [2, 3]. The RMP Canadian migratory flock has steadily increased since 1972 [16]. The RMP Greater Yellowstone Area flock has fluctuated sporadically with a peak of 601 swans in 1988 and a low of 277 in 1993 [2]. From 2000 to 2014 total numbers have ranged between 326 and 589 birds [17]. Since 2012, the number of adult and subadult birds increased to over 400 for the first time since 1991 [17].

Intrinsic Vulnerability:
HIGH VULNERABILITY
The resident breeding population of Trumpeter Swans remains very small in Wyoming so is vulnerable to stochastic events that could result in catastrophic declines. Trumpeter Swan has very specific habitat requirements during the breeding season and is highly territorial [3]. Also annual productivity is highly variable, and only a small percentage of occupied nest sites consistently produce young year to year [11]. Individuals have strong fidelity to nest sites (even unproductive sites) and to wintering sites [11] which can result in overcrowding in some areas, potentially increasing the risks of disease transmission, food shortage, and mass mortality events [2, 3]. Given its size and weight, Trumpeter Swan is subject to death and injury by collisions especially when taking off or landing.

Extrinsic Stressors:
MODERATELY STRESSED
Principle threats to breeding Trumpeter Swans in Wyoming includes limited high quality shallow water wetland habitat year-round and continued wetland habitat loss as a result of climate change, drought and increasing human development [2, 3, 11]. Increasing number of over-wintering migrants may be depleting forage especially in late winter and early spring for the Wyoming resident, breeding population [11]. The species is sensitive to human disturbance, and increasing recreational activities, especially fishing and boating, can cause appropriate habitat to

be abandoned or unused [7]. All swan species are vulnerable to diseases such as avian influenza, West Nile, avian cholera, and botulism [3]. Collisions with power lines, fences, or bridges are an important mortality factor and resulted in the death of 47 birds in Wyoming between 1991 and 2015 [3, 11]. Though Trumpeter Swan is protected from hunting, accidental shooting by waterfowl hunters and recreational shooters has been documented across the species' range [2, 3]. Lead poisoning through the ingestion of lead shot and fishing tackle, can cause significant mortality [3]. Attempts to establish more migratory behaviors and additional pathways are limited by the lack of available winter and stopover habitat [2]. Although the number of nesting pairs has increased since 2004 in the Green River basin, challenges remain for swans nesting in the Greater Yellowstone area [11, 18]. Winter distribution of swans in Wyoming has increased over the last 30 years as a result of the range expansion efforts but over 50% continue to concentrate in the Jackson area where open water habitat is limited especially in severe winters [11].

KEY ACTIVITIES IN WYOMING

Active monitoring and management of Trumpeter Swan has been performed by the Wyoming Game and Fish Department (WGFD) since the 1980s (WGFD annual reports). Range expansion efforts have resulted in development of new wintering areas in the Salt and Green River drainages, and a new, growing nesting population in the Green River basin [19]. Monitoring efforts have included aerial and ground surveys to track number of resident and migrant swans and number of nesting pairs and annual productivity [11]. An annual fall survey in September in coordination with other state and federal agencies provides a total count of the Greater Yellowstone Area breeding population. Annual, coordinated winter surveys were discontinued after 2015 due to budget constraints [11]. Since 2005, WGFD has focused working with a number of partners to develop additional shallow water wetland habitat in the Green River basin to provide additional summer habitat [12, 20]. WGFD is a member of the Greater Yellowstone Trumpeter Swan Working Group which meets yearly to compile data, and make recommendations to the Pacific Flyway on Trumpeter Swan management issues and allocations of captive-raised swans.

ECOLOGICAL INFORMATION NEEDS

Landscape level wetland habitat inventories and assessments are needed to determine the amount of unoccupied, yet suitable habitat throughout the state [7]. As assessment of site-specific habitat selection by swans in Wyoming would also provide valuable information for modeling habitat availability and for guiding future habitat restoration range expansion work [11]. Data are lacking on dispersal and survivorship of sub-adults.

MANAGEMENT IN WYOMING

This section authored solely by WGFD; Susan M. Patla. Trumpeter Swan management efforts by the WGFD since 1994 has resulted in establishment of an expanded nesting and wintering population in the Green River basin in Wyoming. This has more than doubled the distribution and number of nesting pairs in the state and greatly increased cygnet production [20]. In addition, working with willing landowners and other agencies in the Green River basin, the WGFD has helped to fund and create over 60 acres of new shallow water summer wetland habitat for swans on private lands since 2004. While the number of nesting pairs in the Green River area has increased, few nest sites in the Snake River core area of Wyoming show consistent productivity, and loss of historic sites has occurred including in YNP [11, 18]. YNP is currently implementing a

10 year plan to sustain their declining nesting population (D. Smith, pers. comm.). Monitoring and management efforts for swans are coordinated through the Greater Yellowstone Trumpeter Swan Working Group and the Trumpeter Swan sub-committee of the Pacific Flyway. Future priority management actions should include: 1) continue to coordinate with the Greater Yellowstone Trumpeter Swan Working Group and the Pacific Flyway on monitoring efforts, and developing region-wide management strategies; 2) monitor and conserve all productive nest sites in Wyoming; 3) identify potential problems at low productivity nest sites that swans continue to occupy and implement actions such as installing nest platforms or enhancing aquatic vegetation growth; 4) continue to work with partners to identify, fund, and create additional summer wetland habitat capable of supporting nesting swans in Wyoming; 5) complete a habitat selection study of nesting pairs and develop GIS habitat models to identify and quantify potential swan nesting habitat throughout Wyoming; 6) work with land trusts, county conservation districts, and other partners to prioritize and implement wetland conservation strategies identified in the state and regional Wetland Conservation Plans; 7) continue to monitor mortality and work with the state veterinary lab to complete necropsies; and 8) conduct educational programs, wetland seminars, and field trips to involve the public in swan and wetland conservation.

CONTRIBUTORS

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Figure 1: Trumpeter Swan in Seedskadee National Wildlife Refuge, Sweetwater County, Wyoming. (Photo courtesy of Tom Koerner, USFWS)

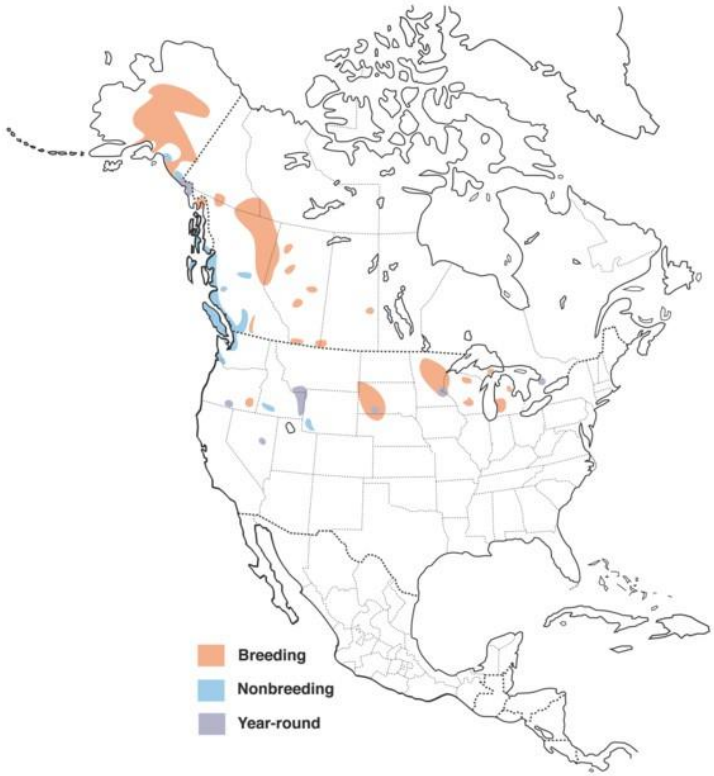

Figure 2: North American range of *Cygnus buccinator*. (Map courtesy of Birds of North America, http://bna.birds.cornell.edu/bna, maintained by the Cornell Lab of Ornithology)

Figure 3: Trumpeter Swan habitat in the upper Green River Basin, Wyoming. (Photo courtesy of Mark Gocke, WGFD)

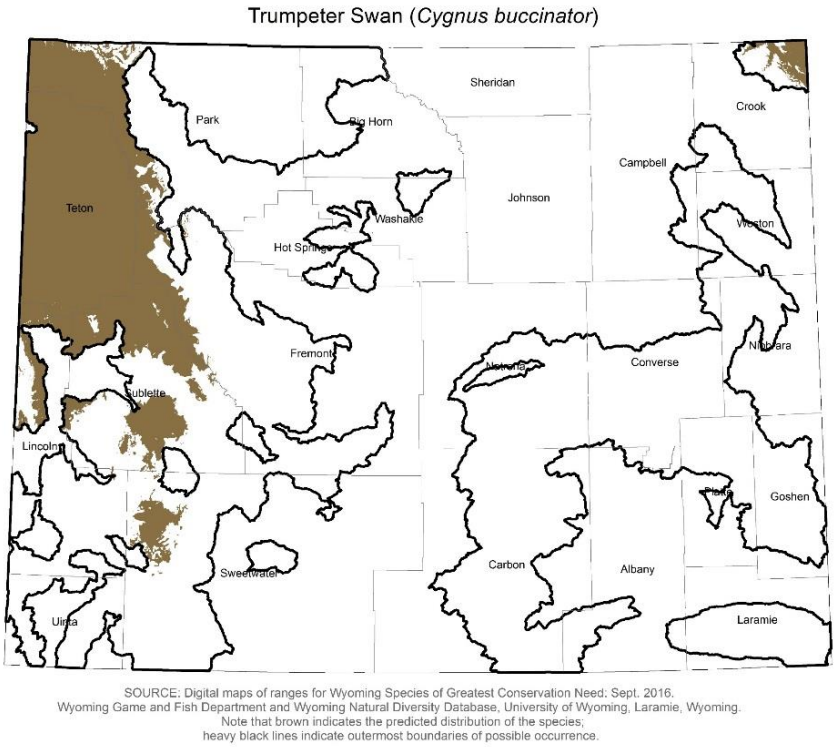

Figure 4: Range and predicted distribution of *Cygnus buccinator* in Wyoming.