Clark's Grebe

Aechmophorus clarkii

REGULATORY STATUS

USFWS: Migratory Bird
USFS R2: No special status
USFS R4: No special status
Wyoming BLM: No special status
State of Wyoming: Protected Bird

CONSERVATION RANKS

USFWS: No special status
WGFD: NSSU (U), Tier II
WYNDD: G5, S2S3
Wyoming Contribution: LOW
IUCN: Least Concern
PIF Continental Concern Score: Not ranked

STATUS AND RANK COMMENTS

The Wyoming Natural Diversity Database has assigned Clark's Grebe (*Aechmophorus clarkii*) a state conservation rank ranging from S2 (Imperiled) to S3 (Vulnerable) because of uncertainty about historic and recent population trends for this species in Wyoming.

NATURAL HISTORY

Taxonomy:

Clark's Grebe was believed to be a light color morph of Western Grebe (*A. occidentalis*) until it was officially recognized as a separate species in 1985 based on genetic evidence and differences in advertising calls [1]. Due to the relatively recent separation of these two closely related species, a majority of the basic life history information for Clark's Grebe remains combined within the Western Grebe literature [2, 3]. Therefore, Western Grebe literature (especially the species account within the Birds of North America series) is frequently referenced throughout this document. The 2 species are known to occasionally hybridize [3-6]. There are two recognized subspecies of Clark's Grebe, but only *A. c. transitionalis* is found in Wyoming and surrounding states [2, 7].

Description:

Identification of Clark's Grebe is possible in the field. It is a large aquatic diving bird; adults weight between 800–1,800 g, range in length from 55–75 cm, and have a wingspan of approximately 61 cm [3, 8]. The sexes are similar in appearance [2], but females are smaller-bodied with shorter narrower bills that appear slightly upturned [3, 9]. Both sexes have bright red eyes, a bright orange-yellow bill with a defined black culmen, yellowish-green legs attached to the rear of the body, and flat lobed toes [2, 3, 8]. In the breeding season, the cheeks, throat, front of the neck, and breast are all white, while the forehead, crown, and back of the neck are black [2, 8]. The back is dark gray, and sides are paler and streaked with varying amounts of white [8]. Non-breeding plumage is almost identical, but the face may darken slightly around the eyes [8]. Three other

species of grebe are classified as summer residents in Wyoming and are known to breed in the state: Western Grebe, Pied-billed Grebe (*Podilymbus podiceps*), and Eared Grebe (*Podiceps nigricollis*) [10]. Clark's Grebe is very similar in appearance to Western Grebe, but Western Grebe has a greenish-yellow bill, a black crown that extends below the eyes, and typically darker sides [2, 3].

Distribution & Range:
The distribution of Clark's Grebe overlaps substantially with that of Western Grebe [2, 3]. Clark's Grebe is found year-round in inland Mexico and also breeds in southwestern Canada and the western and mid-western United States [3]. Wyoming is centrally located within Clark's Grebe's breeding distribution. The species migrates through the state in the spring and fall and is a summer resident [10, 11]. Clark's Grebe has been observed at waterbodies across much of Wyoming [10, 11]; however, confirmed or suspected breeding has been documented in just 5 of the 28 latitude/longitude degree blocks, primarily in the western half of the state [11]. The species winters along the western coast of North America, in New Mexico and far western Texas, and along the Gulf Coast of Texas [2].

Habitat:
Clark's Grebe breeds primarily on large, freshwater lakes and marshes with several square kilometers of open water and areas of flooded emergent vegetation [3]. In Wyoming, Clark's Grebe colonies are found on large, deep, open-water lakes and reservoirs with emergent vegetation for nesting [10, 12]. Nests are constructed by both sexes as mounds or floating platforms of aquatic vegetation, usually anchored to emergent or dense submerged vegetation in > 25 cm of water [3, 12]. Migrating individual may be observed at open, freshwater sites of various sizes, but are most common on large waterbodies [3]. Clark's Grebe typically winters in coastal bays, estuaries, and sheltered marine shorelines, but may occasionally be found in freshwater lakes and rivers [3].

Phenology:
In Wyoming, spring arrival of migrating and breeding Clark's Grebes begins in mid-April [10], but very little is known about the nesting and breeding habits of this colonial nesting species in the state. *Aechmophorus* grebes have extremely complex and ritualized courtship ceremonies, including one that involves "rushing", where a pair run side-by-side along the surface of the water [3, 13]. The courtship ceremonies of Clark's Grebe and Western Grebe are identical except for the number of notes in the advertising call [3, 4], and the two species are known to occasionally interbreed and produce fertile hybrid offspring [3-6]. Mean clutch size may decrease over the course of a breeding season [3], but averaged 2.4 (n = 105 clutches) across a season for a population of Clark's Grebe in Utah [2]. Eggs begin to hatch after an incubation period of 22–24 days, and both parents take turns back-brooding the chicks for the first 2–4 weeks [3]. Young are dependent on parents for 6–7 weeks [3]. Clark's Grebe is a single brood species, but will renest if the first nest is lost [3]. In Wyoming, fall migration of Clark's Grebe likely coincides with that of Western Grebe, which peaks in October [10].

Diet:
Clark's Grebe is primarily piscivorous, but will also consume frogs, salamanders, crustaceans, and aquatic worms [3, 12]. Grebes are specialized divers and capture a majority of their prey underwater [3].

CONSERVATION CONCERNS

Abundance:
Continental: WIDESPREAD
Wyoming: VERY RARE
There are no robust estimates of abundance available for Clark's Grebe in Wyoming. The species has a statewide abundance rank of VERY RARE and appears to be uncommon within suitable environments in its range [11]. Colonial nesting waterbird surveys conducted from 2002–2006 by the Wyoming Game and Fish Department (WGFD) recorded a range of 0 to 80 individuals annually across all surveyed sites [14-18]. From 1987–2015, following Clark Grebe's split from Western Grebe, annual Wyoming Breeding Bird Survey (BBS) detections of Clark's Grebe ranged from 0 to 6 with none recorded in most years [19]. Clark's Grebe was not detected during surveys for the Integrated Monitoring in Bird Conservation Regions (IMBCR) program between 2009–2015 [20]. While surveys conducted as part of the BBS and IMBCR programs may occasional detect this species, neither is specifically designed to capture grebe observations.

Population Trends:
Historic: UNKNOWN
Recent: UNKNOWN
Robust population trends are not available for Clark's Grebe in Wyoming because the species is infrequently detected during monitoring efforts. North American BBS survey-wide trend data have deficiencies, and should be viewed with caution, but suggest that Clark's Grebe numbers declined annually by 1.61% from 1966–2013 and increased annually by 2.70% from 2003–2013 [21]. Neither trend estimate was statistically significant.

Intrinsic Vulnerability:
MODERATE VULNERABILITY
Clark's Grebe has moderate intrinsic vulnerability in Wyoming due to a narrow range of habitat requirements for breeding (e.g., expansive open water, sufficient water depth, rooted emergent or submerged vegetation), and colonial nesting and nest-building behaviors that can leave the species susceptible to disturbance. Natural or anthropogenic disturbance to breeding colonies can potentially affect large numbers of nesting individuals and negatively impact local populations of Clark's Grebe. The floating nests of this species are vulnerable to damage or loss from surface disturbance and fluctuating water levels [3, 22], which commonly occur on water bodies in Wyoming. However, Clark's Grebe has demonstrated some ability to adjust breeding phenology to changing habitat conditions in other parts of its range [23], and has been known to use man-made floating nest platforms [22].

Extrinsic Stressors:
MODERATELY STRESSED
Clark's Grebe is moderately stressed by extrinsic stressors in Wyoming, where already limited aquatic and wetland habitat is potentially vulnerable to climate change and drought, invasive plant species, and development for infrastructure, energy, and agriculture [12, 24, 25]. Annual colony size is often dependent on water levels, and recent drought conditions in Wyoming have already led to the desertion of existing *Aechmophorus* colonies [10]. Clark's Grebe colonies are also vulnerable to abandonment or increased predation risk from repeated anthropogenic disturbance [12]. This species may experience bioaccumulation of environmental contaminants from feeding in polluted aquatic habitats [12, 26-28].

KEY ACTIVITIES IN WYOMING

Clark's Grebe is classified as a Species of Greatest Conservation Need (SGCN) by the WGFD, and as a Level III Priority Bird Species requiring local interest in the Wyoming Bird Conservation Plan [12]. Some current statewide bird monitoring programs are designed for monitoring breeding songbird populations and are unlikely to provide useful information on Clark's Grebe. These monitoring programs include the BBS program conducted on 108 established routes since 1968 [21], and the multi-agency IMBCR program initiated in 2009 [20]. Since 1984, WGFD has conducted annual or periodic monitoring at the most important and productive sites for colonial waterbird SGCN to determine species presence and distribution, and to estimate number of nesting pairs. The most recent effort was the culmination of a multi-year cooperative agreement between the WGFD and the United States Fish and Wildlife Service to conduct an intensive survey of all historic, known, potential, and new colonial waterbird breeding sites statewide as part of a western range-wide effort to track population size, trends, and locations of breeding colonial waterbirds in the western United States [29, 30]. In 2014, an online Atlas of western colonial waterbird nesting sites was produced with data collected and submitted by participating states [31]. Every three to five years, WGFD personnel visit known colonial waterbird nesting sites outside of Yellowstone National Park to evaluate water level conditions, determine species present at each site, and estimate the number of nesting pairs of colonial waterbirds. There are currently no research projects designed specifically for Clark's Grebe in Wyoming.

ECOLOGICAL INFORMATION NEEDS

Clark's Grebe would benefit from research to determine its detailed distribution, the location and habitat characteristics of current breeding colonies, and the annual abundance of migrating and breeding adults in Wyoming. Beyond approximate arrival and departure dates, very little is known about migratory pathways, or the specific breeding habits of this species in the state. Nothing is known about nest success or fledgling survival at the few known breeding locations. Due to the scarcity and inherent vulnerability of Wyoming's aquatic habitats, it would be valuable to identify current and future anthropogenic and natural stressors to ensure the persistence of breeding habitat for Clark's Grebe.

MANAGEMENT IN WYOMING

This section authored solely by WGFD; Andrea C. Orabona and Zachary J. Walker. The colonial nature of Clark's Grebe and other waterbirds makes these species particularly vulnerable across their range to loss or degradation of nesting sites, stochastic weather events such as drought and flooding, changing land use practices, pollution, and climate change. In Wyoming, Clark's Grebe is classified as a SGCN due to limited suitable aquatic or wetland breeding habitat, sensitivity to human disturbance during the breeding season, and susceptibility of nests to fluctuating water levels [12]. Two separate but compatible survey programs are in place to monitor populations of many avian species that breed in Wyoming; the BBS [21] and IMBCR [20] programs. While these monitoring programs provide robust estimates of occupancy, density, or population trend for many species in Wyoming, colonial waterbirds are one of the species groups that warrant a targeted, species-specific survey method approach to obtain these data. Because of this need, targeted colonial waterbird surveys are conducted every three years to determine Clark's Grebe presence. Surveys should be continued to determine nesting sites for this species in the state. Best management practices to benefit Clark's Grebe include maintaining large, high

quality wetland complexes, including buffer zones to block siltation, pesticides, and fertilizer runoff into wetlands; keeping water levels stable during the nesting season; installing artificial nest platforms where needed; protecting any colony site used by Clark's Grebe; keeping human disturbance to a minimum during the breeding season; and monitoring colony sites.

CONTRIBUTORS

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Figure 1: Adult Clark's Grebe in Laramie County, Wyoming. (Photo courtesy of Pete Arnold)

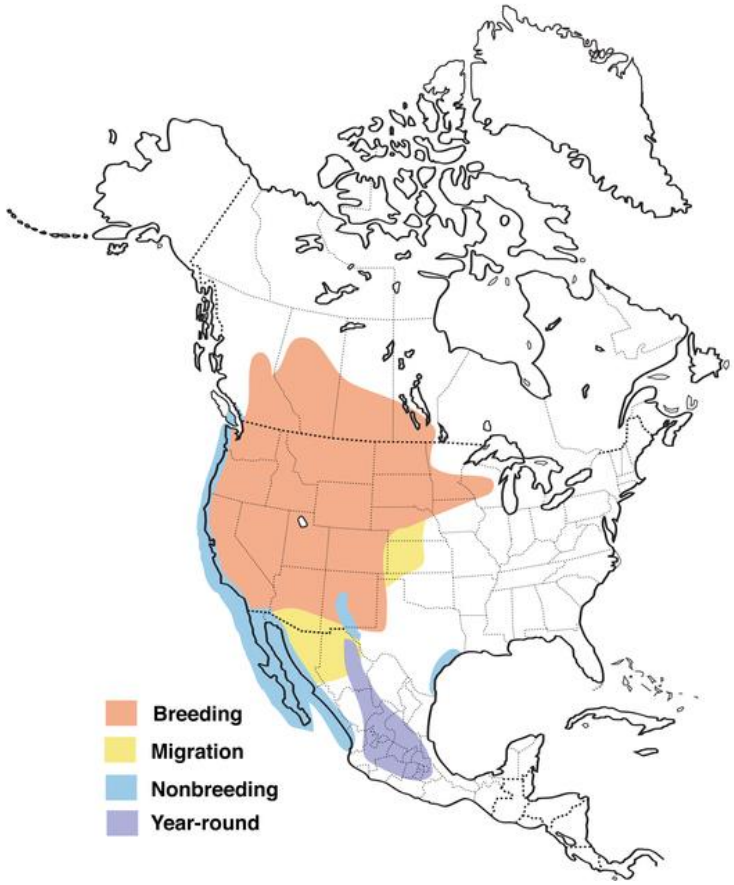

Figure 2: North American range of *Aechmophorus clarkii*. (Map courtesy of Birds of North America, http://bna.birds.cornell.edu/bna, maintained by the Cornell Lab of Ornithology)

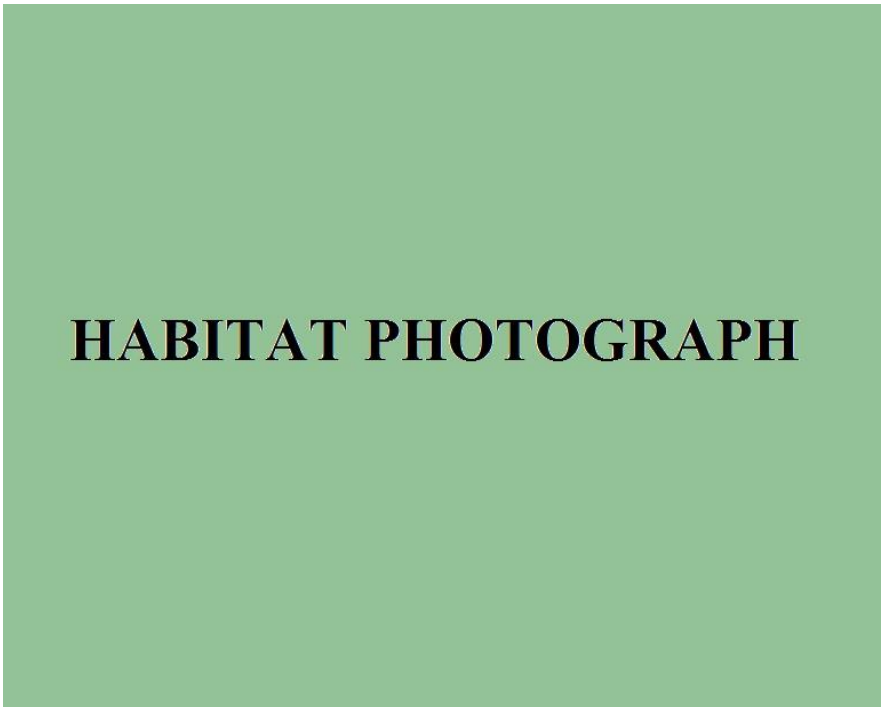

Figure 3: Photo not available.

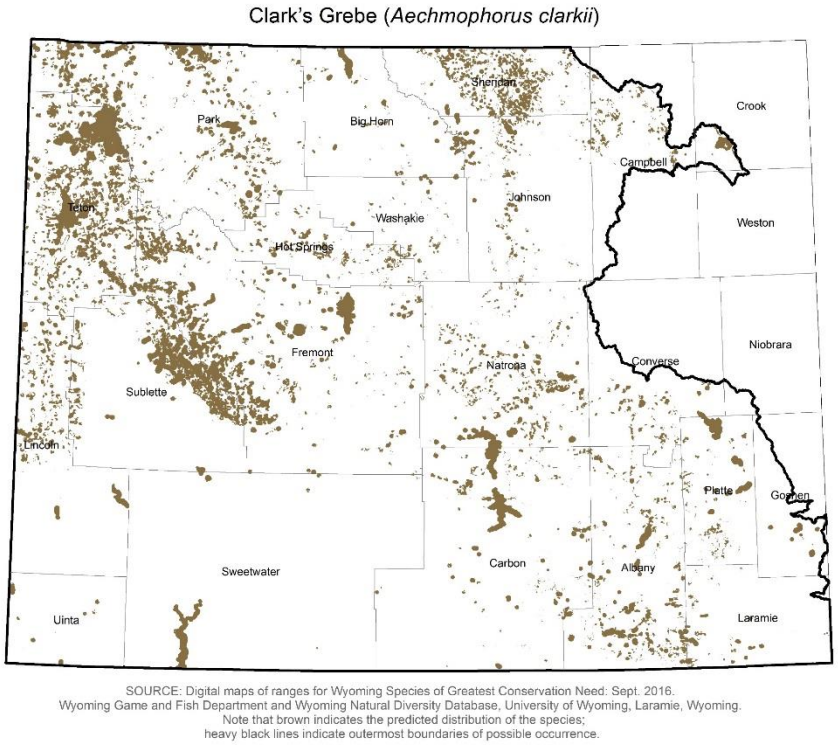

Figure 4: Range and predicted distribution of *Aechmophorus clarkii* in Wyoming.