

Western Grebe

Aechmophorus occidentalis

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, S3S4
Wyoming Contribution: LOW
IUCN: Least Concern
PIF Continental Concern Score: Not ranked

STATUS AND RANK COMMENTS

The Wyoming Natural Diversity Database has assigned Western Grebe (*Aechmophorus occidentalis*) a state conservation rank ranging from S3 (Vulnerable) to S4 (Apparently Secure) because of uncertainty about historic and recent population trends for this species in Wyoming.

NATURAL HISTORY

Taxonomy:

Two subspecies of Western Grebe are recognized based on size and wing length ¹. *A. o. occidentalis* is larger (male wing chord > 192 mm, female > 178 mm); it occurs in the northern range from southwestern Canada south through the western United States to northern Baja, California, and winters mainly from Puget Sound to west-central Mexico and in the desert southwest ². *A. o. ephemeralis* is smaller (male wing chord < 193 mm, female < 178 mm); it occurs in the southern range in Mexico from Chihuahua south to the Valley of Mexico ². *A. o. occidentalis* occurs in Wyoming ³. Clark's Grebe (*A. clarkii*) was believed to be a color morph of Western Grebe until it was recognized as a separate species in 1985 ⁴.

Description:

Identification of Western Grebe is possible in the field. It is a relatively large, slender waterbird (length 55–75 cm, wingspan 21 cm, weight 800–1,800 g) ⁵. Adults have a black crown; a long, sharply pointed bill; a long neck that is black on the upperparts and white on the underparts; a narrow, sooty-black body; and red eyes ². Males and females are similar in appearance; however, the female has a smaller body overall and a shorter, thinner, straighter bill that may appear slightly upturned ². The species is similar in appearance to Clark's Grebe (*A. clarkii*); however, Western Grebe has a yellowish-green bill, dark coloration on the face that extends below the eyes, and a wider black stripe on the back of the neck. Juveniles are similar to adults, except the dark areas of the face and back are washed with gray or brown, and the lores are pale to dark

gray². The appearance of Western Grebe is distinctly different from the other species of grebe that occur in Wyoming—Pied-billed Grebe (*Podilymbus podiceps*), Horned Grebe (*Podiceps auritus*), Red-necked Grebe (*Podiceps grisegena*), and Eared Grebe (*Podiceps nigricollis*).

Distribution & Range:

Western Grebe is restricted to the western half of North America for both the breeding and non-breeding seasons². The species is found year-round along the western coast of North America, southwestern United States, and inland Mexico; however, some individuals are migratory and breed in the western and mid-western United States and southwestern Canada². Wyoming is centrally located within this migratory breeding distribution. Western Grebe migrates through the state in the spring and fall and is classified as a summer resident, with observations occurring in 27 of the state's 28 latitude/longitude degree blocks, and confirmed or circumstantial evidence of breeding documented in 17 of those 27 degree blocks, primarily in the western and southeast portions of the state⁶.

Habitat:

Western Grebe prefers fresh water marshes and lakes that have large areas of open water and emergent vegetation along the borders². In Wyoming, Western Grebe breeds on lakes below 2,438 m in elevation, particularly large lakes with shallow areas and extensive stands of emergent vegetation³. Nesting colony sites are somewhat traditional, but can shift from year-to-year depending on habitat conditions such as water level, water quality, and availability of prey^{2,7}. Western Grebe nests are compact, floating platforms of fresh and decayed vegetation constructed near or within stands of emergent plants, where they can be anchored in place and often concealed^{2,8}.

Phenology:

In Wyoming, spring arrival of Western Grebe occurs in mid-April, with peak migration occurring in early May³. Clutch size is typically 3–4 eggs but can range from 2–7 eggs⁸. Average clutch size in Wyoming is unknown; in Utah average clutch size is 2.5 eggs and in Colorado it is 3.4 eggs⁹. The species usually has 1 brood per year, but renesting can occur if a nest is lost². Fall migration from Wyoming peaks in October, but flocks in reduced numbers can remain on large bodies of water until late November when freeze-up occurs³.

Diet:

Western Grebe is primarily piscivorous, consuming a variety of small fish species, as well as salamanders (*Ambystoma* spp.), crustaceans, worms, aquatic insects and grasshoppers (*Melanoplus* spp.)².

CONSERVATION CONCERNS

Abundance:

Continental: WIDESPREAD

Wyoming: RARE

Global abundance estimates of Western Grebe vary from over 120,000¹⁰ to less than 110,000¹¹ to 130,000¹². There are no abundance estimates for Western Grebe in Wyoming. The statewide abundance rank of RARE is based on the rather small area of the state known to be occupied in any given season, and the small coverage of suitable habitat within that area. However, within suitable habitat in the occupied area, Western Grebe appears to be common and is usually encountered during surveys that could be expected to indicate its presence⁶. Western Grebe is

gregarious and has a widespread continental distribution where preferred habitat is present². In Wyoming, colonial nesting waterbird surveys conducted nearly annually from 1997–2010 by the Wyoming Game and Fish Department (WGFD) recorded a range of 4 to 100 breeding individuals annually across all surveyed colonial waterbird breeding sites, indicating that number of nesting Western Grebe pairs fluctuates with water levels and breeding site condition in any given year. Results from annual Breeding Bird Survey (BBS) data combine both the Western and Clark's Grebes, so population trend by species cannot be determined¹³. From 1987–2015, following Clark Grebe's split from Western Grebe, annual Wyoming Breeding Bird Survey (BBS) detections of Western Grebe ranged from 2 to 45¹⁴. There is no current information available on abundance, occupancy, or density of Western Grebe in Wyoming from the Integrated Monitoring in Bird Conservation Regions (IMBCR) program¹⁵.

Population Trends:

Historic: UNKNOWN

Recent: UNKNOWN

Historic and recent population trends for Western Grebe in Wyoming are unknown. Robust population trends are not available for the species in Wyoming due to low or inconsistent detection rates during monitoring surveys.

Intrinsic Vulnerability:

MODERATE VULNERABILITY

Western Grebe has moderate intrinsic vulnerability in Wyoming due to a narrow range of habitat requirements; uncertain density of breeding occurrence; and susceptibility of nesting sites to human disturbance, stochastic weather events, site contamination, decreased water quality, and prey availability^{2, 3}. Western Grebe abundance and breeding distribution is limited by a preference for large, productive wetlands and marshes^{3, 16}. These habitat types are naturally uncommon in Wyoming, which is one of the most arid states in the country^{16, 17}. As a primarily piscivorous species, Western Grebe is inherently at risk for physiological and reproductive stress caused by bioaccumulation of environmental contaminants^{18, 19}. The extent to which Western Grebe is exposed to environmental contaminants in Wyoming is unknown.

Extrinsic Stressors:

MODERATELY STRESSED

Western Grebe is moderately stressed by extrinsic factors in Wyoming, where naturally occurring or high quality human created wetland habitat is limited, disjunct, and potentially vulnerable to climate change and drought, invasive plant species, stochastic weather events that can change habitat conditions, prey availability, and human disturbance that can cause nest abandonment and vulnerability to predation²⁰. The availability and suitability of breeding sites can be unstable between years as a result of fluctuating water levels and changes in land use practices²⁰. Drought can render previously productive migration, breeding, and foraging sites unsuitable through the contraction or complete loss of wetland habitat and changes to the structure and availability of emergent aquatic vegetation^{21, 22}. Winter kill of prey in shallow marshes can be problematic².

KEY ACTIVITIES IN WYOMING

Western Grebe is classified as a Species of Greatest Conservation Need (SGCN) by the WGFD, and as a Level III Priority Bird Species in the Wyoming Bird Conservation Plan. Current statewide activities for monitoring annual detections and population trends for Western Grebe in

Wyoming include the BBS program conducted on 108 established routes since 1968¹³, and the multi-agency IMBCR program initiated in 2009¹⁵. 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 U.S. Fish and Wildlife Service (USFWS) 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^{23, 24}. In 2014, an online Atlas of western colonial waterbird nesting sites was produced with data collected and submitted by participating states²⁵. 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 Western Grebe in Wyoming.

ECOLOGICAL INFORMATION NEEDS

In Wyoming, Western Grebe would benefit from research to determine its detailed distribution, the location and habitat characteristics of all current breeding locations, and the annual abundance of breeding adults. More information is needed on the specific breeding phenology of Western Grebe in Wyoming, nest success, predation risk, fledgling survival, and risk of exposure to aquatic contaminants at known breeding locations in the state. Wyoming's wetland and marsh habitats are scarce and inherently vulnerable, and current and future anthropogenic and natural stressors should be identified to ensure the persistence of breeding habitat for Western Grebe in the state.

MANAGEMENT IN WYOMING

This section authored solely by WGFD; Andrea C. Orabona. Western Grebe is classified as a SGCN in Wyoming due to limited information on breeding, distribution, and population status and trends. The colonial nature of Western 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. Less than 2% of the state's total area is classified as wetland habitat¹⁷. In Wyoming, Western 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^{7, 20}. Two separate but compatible survey programs are in place to monitor populations of many avian species that breed in Wyoming; the BBS¹³ and IMBCR¹⁵ 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. WGFD conducted inventories of nesting colonial waterbirds, including Western Grebe, from 1984–1986^{26, 27}. In 1990, WGFD summarized all information presently known on colonial nesting waterbirds in Wyoming²⁸. Since 1984, WGFD has conducted annual or periodic monitoring at the most important and productive sites for colonial waterbird SGCN. Results have shown confirmed nesting of Western Grebe at a minimum of three sites in Wyoming; Ocean Lake near Riverton, Bucklin Reservoir near Muddy Gap, and Caldwell Lake near Laramie⁶. Due to their sensitivity to human disturbance during the nesting season, the survey technique used for

colonial waterbirds is minimally invasive and provides only an estimate of the number of breeding pairs and coarse habitat associations of each waterbird species present in the colony. Actual nests, eggs, or young are not located or counted to prevent colony disruption and reduce predation risk. From 2009–2012, WGFD and USFWS cooperated to conduct a rigorous 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^{23, 24}. A total of 90 sites were evaluated in Wyoming; 86 potential colonial waterbird nesting sites and 4 known nesting sites. A lack of adequate emergent vegetation to provide secure nesting areas for colonial waterbirds was noted at most potential sites visited. An online Atlas of western colonial waterbird nesting sites was produced with data collected and submitted by participating states²⁵. Best management practices to benefit Western 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 Western Grebe; keeping human disturbance to a minimum during the breeding season; , and monitoring colony sites every three years to determine Western Grebe presence and estimate number of nesting pairs²⁰.

CONTRIBUTORS

Andrea C. Orabona, WGFD
Kaylan A. Hubbard, WYNDD

REFERENCES

- [1] Dickerman, R. W. (1986) Two hitherto unnamed populations of *Aechmophorus* (Aves: Podicipitidae), *Proceedings of the Biological Society of Washington* 99, 435-436.
- [2] LaPorte, N., Storer, R. W., and Nuechterlein, G. L. (2013) Western Grebe (*Aechmophorus occidentalis*), In *The Birds of North America* (Rodewald, P. G., Ed.), Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America: <https://birdsna.org/Species-Account/bna/species/wesgre>.
- [3] Faulkner, D. W. (2010) *Birds of Wyoming*, Roberts and Company Publishers, Greenwood Village, CO.
- [4] American Ornithologists' Union. (1985) Thirty-fifth Supplement to the American Ornithologists' Union Checklist of North American Birds, *The Auk* 102, 680-686.
- [5] Sibley, D. A. (2003) *The Sibley Field Guide to Birds of Western North America*, Alfred A. Knopf, New York.
- [6] Orabona, A. C., Rudd, C. K., Bjornlie, N. L., Walker, Z. J., Patla, S. M., and Oakleaf, R. J. (2016) *Atlas of Birds, Mammals, Amphibians, and Reptiles in Wyoming*, Wyoming Game and Fish Department Nongame Program, Lander, Wyoming.
- [7] Nicholoff, S. H., compiler. (2003) Wyoming Bird Conservation Plan, Version 2.0, Wyoming Partners In Flight, Wyoming Game and Fish Department, Lander, Wyoming.
- [8] Ehrlich, P. R., Dobkin, D. S., and Wheye, D. (1988) *The Birder's Handbook*, Simon and Schuster, Inc., New York, NY.
- [9] NatureServe. (2015) NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1, <http://explorer.natureserve.org>, NatureServe, Arlington, Virginia.
- [10] O'Donnel, C., and Fjeldsa, J. (1997) Grebes: Status Survey and Conservation Action Plan, IUCN/SSC Grebe Specialist Group, Gland and Cambridge.
- [11] Kushlan, J. A., Steinkamp, M. J., Parsons, K. C., Capp, J., Cruz, M. A., Coulter, M., Davidson, I. J., Dickson, L., Edelson, N., Elliot, R., Erwin, R. M., Hatch, S., Kress, S., Milko, R., Miller, S., Mills, K., Paul, R., Phillips, R., Saliva, J. E., Syderman, B., Trapp, J. L., Wheeler, J., and Wohl, K. (2002) Waterbird conservation for the Americas: The North American Waterbird Conservation Plan, Version 1, Waterbird Conservation for the Americas, Washington.
- [12] BirdLife International. (2016) Species factsheet: *Aechmophorus occidentalis*, <http://www.birdlife.org>.

- [13] Sauer, J. R., Hines, J. E., Fallon, J. E., Pardieck, K. L., Ziolkowski, D. J., Jr., and Link, W. A. (2014) The North American Breeding Bird Survey, Results and Analysis 1966 - 2013. Version 01.30.2015, USGS Patuxent Wildlife Research Center, Laurel, MD.
- [14] Pardieck, K. L., Ziolkowski, D. J., Jr., Hudson, M.-A. R., and Campbell, K. (2016) North American Breeding Bird Survey Dataset 1966 - 2015, version 2015.0, U.S. Geological Survey, Patuxent Wildlife Research Center, www.pwrc.usgs.gov/BBS/RawData/.
- [15] Bird Conservancy of the Rockies. (2016) The Rocky Mountain Avian Data Center [web application], Brighton, CO. <http://adc.rmbo.org>.
- [16] Wyoming Game and Fish Department. (2010) State Wildlife Action Plan, p 512.
- [17] Wyoming Joint Ventures Steering Committee (WJVSC). (2010) Wyoming wetlands conservation strategy. Version 1.0, p 109, Wyoming Game and Fish Department, Cheyenne, WY.
- [18] Lindvall, M. L. (1976) Breeding biology and pesticide-PCB contamination of Western Grebe at Bear River Migratory Bird Refuge, p 105, Utah State University, Logan, Utah.
- [19] Elliott, J. E., and Martin, P. A. (1998) Chlorinated hydrocarbon contaminants in grebes and seaducks wintering on the coast of British Columbia, Canada: 1988-1993, *Environmental Monitoring and Assessment* 53, 337-362.
- [20] Wyoming Game and Fish Department. (2005) A comprehensive wildlife conservation strategy for Wyoming, Wyoming Game and Fish Department, Cheyenne, WY.
- [21] Johnson, W. C., Werner, B., Guntenspergen, G. R., Voldseth, R. A., Millett, B., Naugle, D. E., Tulbure, M., Carroll, R. W. H., Tracy, J., and Olawsky, C. (2010) Prairie wetland complexes as landscape functional units in a changing climate, *BioScience* 60, 128-140.
- [22] Steen, V., and Powell, A. N. (2012) Potential effects of climate change on the distribution of waterbirds in the Prairie Pothole Region, U.S.A., *Waterbirds* 35, 217-229.
- [23] Jones, S. (2008) Western Colonial Waterbird Survey Protocols, U.S. Department of the Interior, Fish and Wildlife Service, Region 6, Denver, Colorado, USA.
- [24] Seto, N. (2008) Coordinated Colonial Waterbird Inventory and Monitoring in the Western United States: Comprehensive Breeding Season Surveys. Project Prospectus, unpublished report, U.S. Department of the Interior, Fish and Wildlife Service, Region 1, Portland, OR.
- [25] Cavitt, J. F., Jones, S. L., Wilson, N. M., Dieni, J. S., Zimmerman, T. S., Doster, R. H., and Howe, W. H. (2014) Atlas of breeding colonial waterbirds in the interior western United States, Research Report, U.S. Department of the Interior, Fish and Wildlife Service, Denver, CO.
- [26] Findholt, S. L. (1985) Status and Distribution of Colonial Nesting Waterbirds in Wyoming, Nongame Special Report, p 68, Wyoming Game and Fish Department, Lander, USA.
- [27] Findholt, S. L., and Berner, K. L. (1987) Update on the Status and Distribution of Colonially Nesting Waterbirds in Wyoming, Nongame Special Report, Biological Services, Wyoming Game and Fish Department, Lander, USA.
- [28] Ritter, S. A., and Cerovski, A. O. (1990) Update on the Status and Distribution of Colonially Nesting Waterbirds in Wyoming, Nongame Special Report, Wyoming Game and Fish Department, Lander, USA.



Figure 1: Adult Western Grebe in Boulder County, Colorado. (Photo courtesy of Bill Schmoker)



Figure 2: North American range of *Aechmophorus occidentalis* and *A. clarkii*, whose ranges overlap. (Map courtesy of Birds of North America, <http://bna.birds.cornell.edu/bna>, maintained by the Cornell Lab of Ornithology)

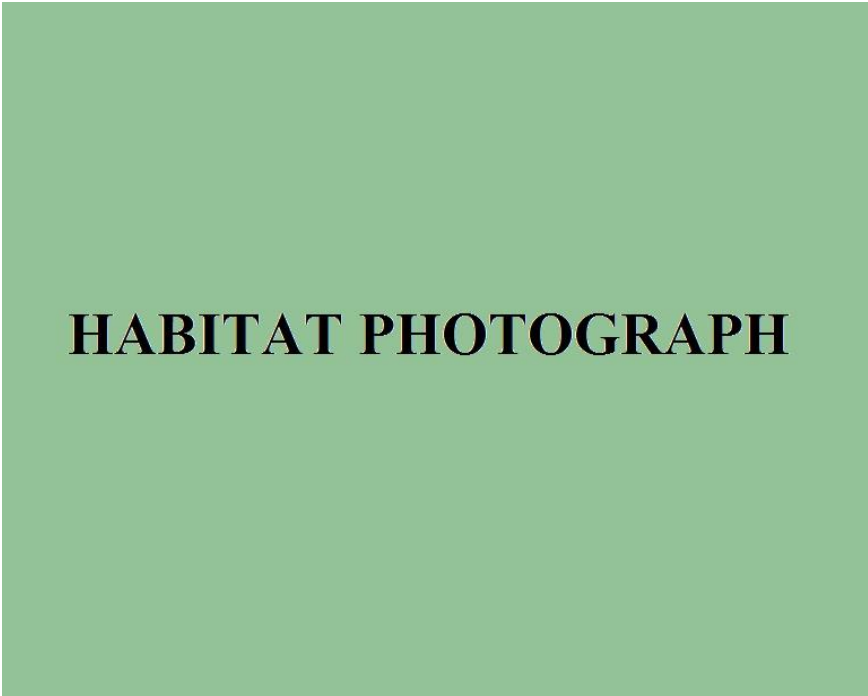


Figure 3: Photo not available.

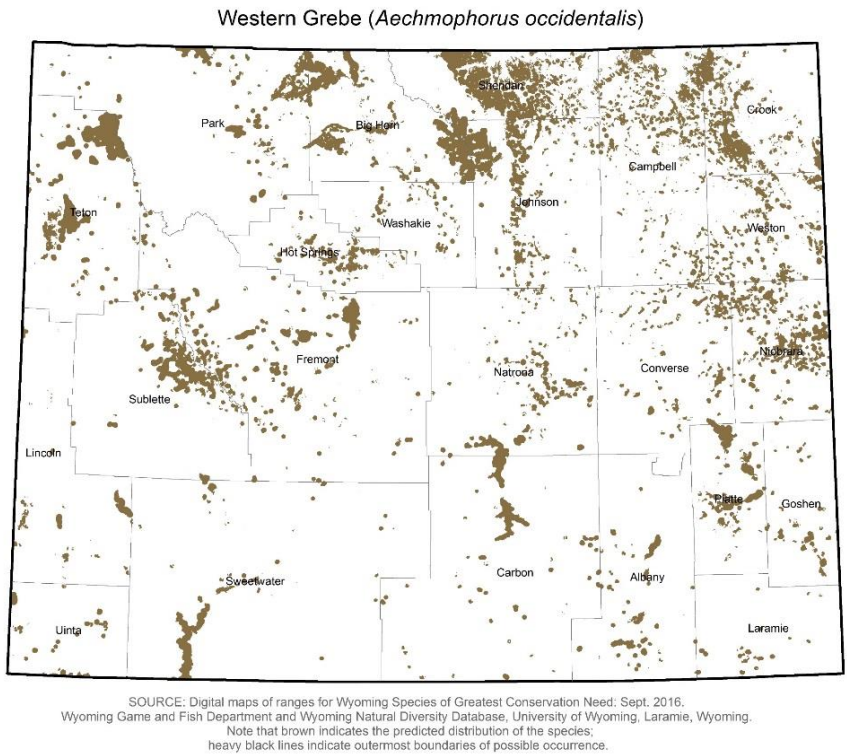


Figure 4: Range and predicted distribution of *Aechmophorus occidentalis* in Wyoming.