Black Tern

Chlidonias niger

REGULATORY STATUS

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

CONSERVATION RANKS

USFWS: No special status
WGFD: NSS3 (Bb), Tier II
WYNDD: G4, S1
Wyoming Contribution: LOW
IUCN: Least Concern
PIF Continental Concern Score: Not ranked

STATUS AND RANK COMMENTS

Black Tern (*Chlidonias niger*) has no additional regulatory status or conservation rank considerations beyond those listed above.

NATURAL HISTORY

Taxonomy:

There are two recognized and geographically distinct subspecies of Black Tern, but only *C. n. surinamensis* is found in Wyoming [1, 2]. This New World subspecies breeds across southern Canada and the northern United States, and winters in Mexico and northern and northwestern South America [1].

Description:

Identification of Black Tern is possible in the field. It is a small marsh tern; adults weigh between 50–60 g, range in length from 23–26 cm, and have a wingspan of approximately 61 cm [1, 3]. The sexes are similar in appearance, with only slight differences in color saturation and males averaging 1–5% larger than females [1, 4]. In the breeding season, Black Tern has a solid black head and underbody (with the exception of a white undertail), dark gray wings, back and tail, dark brown eyes, reddish black legs and feet, and a small black bill [1, 3]. In the non-breeding season, the wings and back remain dark gray, but the underbody fades to white and the black head is reduced to a black hind-crown [1, 3]. Two other species of tern are considered Wyoming summer residents and are known to breed in the state: Caspian Tern (*Hydroprogne caspia*) and Forster's Tern (*Sterna forsteri*) [5, 6]. Black Tern is easily distinguished from both Caspian Tern and Forster's Tern during the breeding season by its distinctive black head and underbody [3].

Distribution & Range:

Black Tern is a localized breeder from central Canada to as far south as southern Colorado in the western United States and the Great Lakes in the east, but the core of their range is in the Prairie

Potholes Region (PPR) [1]. Wyoming lies within the southern edge of its breeding range. Black Tern migrates through the state in the spring and fall and is a summer resident [5, 6]. Although this species has been observed at waterbodies across the state, confirmed or suspected breeding has been documented in just 7 of the 28 latitude/longitude degree blocks [6].

Habitat:
Black Tern breeds in productive freshwater habitats with emergent and floating aquatic vegetation, including ponds, lakes, marshes, wetlands and occasionally peripheral marsh habitat along rivers and islands [1]. This species is more likely to occur in hemi-marsh stage wetlands (roughly 50% open water and 50% interior emergent vegetation) that are part of larger wetland complexes with little to no anthropogenic activity or disturbance [7, 8]. Black Tern has been shown to differentially select habitats for breeding and foraging based on local wetland characteristics, with breeding terns selecting for wetlands with more emergent vegetation and foraging terns selecting for larger wetlands with areas of open water [9]. Structure is more important than the species of emergent vegetation, with breeding terns often selecting short-dense or tall-sparse vegetation for nesting sites [10]. Black Tern favors areas of calm freshwater with 25–75% emergent vegetation to serve as a floating substrate for nesting, although non-floating substrates may also be used depending on habitat [1]. Nests are usually formed from piled dead emergent vegetation, and are typically just 2–5 cm above the surface of the water [1].

Phenology:
In Wyoming, spring arrival of migrating and breeding Black Terns typically begins the second week of May, with peak migration occurring from late May to early June [5]. Very little is known about the specific nesting and breeding habits of this species in Wyoming. Clutches are typically initiated in early June, and usually contain 2 or 3 eggs [1]. Eggs hatch from late June to early July, and young fledge from mid- to late July [1]. Black Tern is considered a single-brood species, but will often renest following loss of the first clutch [1]. Fall migration from Wyoming starts in August, with all migrants and residents leaving by the end of September [5].

Diet:
Black Tern feeds primarily on insects and small freshwater fish during the breeding season, and insects and small marine fish during the non-breeding season [1].

CONSERVATION CONCERNS

Abundance:
Continental: WIDESPREAD
Wyoming: VERY RARE
There are no robust estimates of abundance available for Black Tern in Wyoming. The statewide abundance rank of VERY 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 habitats in the occupied area, Black Tern appears to be uncommon, occurring at relatively low density and requiring intensive survey efforts to detect [6]. Detections of Black Tern in Wyoming are limited. Colonial nesting waterbird surveys conducted from 2002–2006 by the Wyoming Game and Fish Department (WGFD) recorded a range of 12 to 100+ individuals annually across all surveyed sites [11-15]. From 1968–2015, annual Wyoming Breeding Bird Survey (BBS) detections of Black Tern ranged from 0 to 6, with none recorded in most years [16]. Just 1 Black Tern was detected during surveys for the Integrated Monitoring in Bird Conservation Regions (IMBCR) program between 2009–2015 [17]. While surveys conducted

as part of the BBS and IMBCR programs may occasionally detect this species, neither is specifically designed to capture tern observations.

Population Trends:
Historic: LARGE DECLINE
Recent: STABLE
Robust population trends are not available for Black Tern in Wyoming due to low detection rates during monitoring efforts, and uncertainty exists even in larger scale estimates. However, Black Tern is believed to have a decreasing population trend across much of its North American and global distribution [1]. Survey-wide trend data from the North American BBS indicate that Black Tern numbers experienced a statistically significant annual decline of 2.33% from 1966–2013 and a non-significant annual increase of 3.35% from 2003–2013; however, these data have deficiencies and should be viewed with caution [18]. In the PPR, Black Tern numbers declined annually by 1.18% from 1966–2013 and increased annually by 2.55% from 2003–2013, but neither trend estimate was statistically significant [18].

Intrinsic Vulnerability:
HIGH VULNERABILITY
Black Tern has high intrinsic vulnerability in Wyoming due to selective habitat requirements which limit its distribution and abundance in the state, and colonial nesting and nest-building behaviors that potentially leave the species susceptible to disturbance. Large, productive wetland complexes are uncommon in Wyoming, which is one of the most arid states in the country [5, 19, 20]. Natural or anthropogenic disturbance to breeding colonies can potentially affect large numbers of nesting individuals and negatively impact local populations of Black Tern. In addition, Black Tern nests are often insubstantial and constructed on floating vegetation just a few centimeters above the surface of the water [1]. These characteristics can leave nests highly vulnerable to damage or loss from surface disturbance and fluctuating water levels [21], which commonly occur on waterbodies in Wyoming.

Extrinsic Stressors:
MODERATELY STRESSED
Black Tern is moderately stressed by extrinsic stressors in Wyoming, where already limited natural wetland habitat is potentially vulnerable to climate change and drought, invasive plant species, and development for infrastructure, energy, and agriculture [19, 20]. Natural wetlands in Wyoming are declining in size and number, with less than 2% of the total state area classified as wetland habitat [19, 20]. 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 [8, 22, 23]. One study found that under modeled drier conditions in the United States portion of the PPR, Black Tern lost close to 100% of its current range [22]. Large-scale conversion of wetlands for development leads to fragmentation and direct loss of Black Tern habitat, while anthropogenic activity on adjacent lands can lead to avoidance and changes to water quality and availability, vegetation structure, and food availability [1, 7, 24].

KEY ACTIVITIES IN WYOMING

Black Tern is classified as a Species of Greatest Conservation Need (SGCN) by the WGFD, and as a Level I Priority Bird Species requiring conservation action in the Wyoming Bird Conservation Plan [25]. Current statewide bird monitoring programs are designed for monitoring

breeding songbird populations and are unlikely to provide useful information on Black Tern. These monitoring programs include the BBS program conducted on 108 established routes since 1968 [18], and the multi-agency IMBCR program initiated in 2009 [17]. 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 (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 [26, 27]. In 2014, an online Atlas of western colonial waterbird nesting sites was produced with data collected and submitted by participating states [28]. 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 Black Tern in Wyoming.

ECOLOGICAL INFORMATION NEEDS

In Wyoming, Black Tern would benefit from research to determine its detailed distribution, the location and habitat characteristics of current nesting sites, and the annual abundance of migrating and breeding adults. Beyond approximate arrival and departure dates, very little is known about the pathways of migrants, or the specific breeding habits of this species in Wyoming. Nothing is known about nest success or fledgling survival at the few known breeding locations. It would be valuable to examine how current and future land use practices and the potential impacts of climate change could affect the availability and quality of already limited Black Tern habitat in Wyoming, as these stressors could influence the future persistence of this species in the state.

MANAGEMENT IN WYOMING

This section authored solely by WGFD; Andrea C. Orabona. The colonial nature of Black Terns 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, Black Tern 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 [19]. Two separate but compatible survey programs are in place to monitor populations of many avian species that breed in Wyoming; the BBS [18] and IMBCR [17] 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 Black Tern, from 1984–1986 [29, 30]. In 1990, WGFD summarized all information presently known on colonial nesting waterbirds in Wyoming [31]. Since 1984, WGFD has conducted annual or periodic monitoring at the most important and productive sites for colonial waterbird Species of Greatest Conservation Need. Results have shown Black Tern nesting at five sites in Wyoming; Cokeville Meadows National Wildlife Refuge near Cokeville, and four sites within the Laramie Plains Basin near Laramie [6]. 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 [26, 27]. 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 states [28]. Best management practices to benefit Black Tern include maintaining large, high quality wetland complexes; keeping water levels stable during the nesting season; installing artificial nest platforms where needed; protecting any colony site used by Black Tern; keeping human disturbance to a minimum during the breeding season, and monitoring colony sites every three years to determine Black Tern presence and estimate number of nesting pairs [19, 25].

CONTRIBUTORS

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

REFERENCES

[1] Heath, S. R., Dunn, E. H., and Agro, D. J. (2009) Black Tern (*Chlidonias niger*), 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/blkter.

[2] Lepage, D. (2015) Avibase: The World Bird Database, Bird Studies Canada, Birdlife International, http://avibase.bsc-eoc.org/avibase.jsp.

[3] Sibley, D. A. (2003) *The Sibley Field Guide to Birds of Western North America*, Alfred A. Knopf, New York.

[4] Shealer, D. A. (2014) Sexual size dimorphism and the relationship between timing of breeding and size-assortative mating in a monogamous, marsh-nesting bird, *Evolutionary Ecology Research 16*, 37-49.

[5] Faulkner, D. W. (2010) *Birds of Wyoming*, Roberts and Company Publishers, Greenwood Village, CO.

[6] Orabona, A., Rudd, C., Grenier, M., Walker, Z., Patla, S., and Oakleaf, B. (2012) Atlas of birds, mammals, amphibians, and reptiles in Wyoming, p 232, Wyoming Game and Fish Department Nongame Program, Lander, WY.

[7] Shealer, D. A., and Alexander, M. J. (2013) Use of aerial imagery to assess habitat suitability and predict site occupancy for a declining wetland-dependent bird, *Wetlands Ecology and Management 21*, 289-296.

[8] Forcey, G. M., Thogmartin, W. E., Linz, G. M., and McKann, P. C. (2014) Land use and climate affect Black Tern, Northern Harrier, and Marsh Wren abundance in the Prairie Pothole Region of the United States, *The Condor: Ornithological Applications 116*, 226-241.

[9] Steen, V. A., and Powell, A. N. (2012) Wetland selection by breeding and foraging Black Terns in the Prairie Pothole Region of the United States, *The Condor 114*, 155-165.

[10] Naugle, D. E., Higgins, K. F., Estey, M. E., Johnson, R. R., and Nusser, S. M. (2000) Local and landscape-level factors influencing Black Tern habitat suitability, *Journal of Wildlife Management 64*, 253-260.

[11] Cerovski, A., and Van Fleet, L. (2003) Colonial Waterbird Surveys, In *Threatened, Endangered, and Nongame Bird and Mammal Investigations: Annual Completion Report* (Cerovski, A. O., Ed.), pp 36-39, Wyoming Game and Fish Department.

[12] Cerovski, A. (2004) Colonial Waterbird Surveys, In *Threatened, Endangered, and Nongame Bird and Mammal Investigations: Annual Completion Report* (Cerovski, A. O., Ed.), pp 43-48, Wyoming Game and Fish Department.

[13] Cerovski, A. O. (2005) Colonial Waterbird Surveys, In *Threatened, Endangered, and Nongame Bird and Mammal Investigations: Annual Completion Report* (Cerovski, A. O., Ed.), pp 41-48, Wyoming Game and Fish Department.
[14] Cerovski, A. O. (2006) Colonial Waterbird Surveys, In *Threatened, Endangered, and Nongame Bird and Mammal Investigations: Annual Completion Report* (Cerovski, A. O., Ed.), pp 63-70, Wyoming Game and Fish Department.
[15] Cerovski, A. O. (2007) Colonial Waterbird Surveys, In *Endangered, Threatened, and Nongame Bird and Mammal Investigations: Annual Completion Report* (Cerovski, A. O., Ed.), pp 58-64, Wyoming Game and Fish Department.
[16] 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/.
[17] Bird Conservancy of the Rockies. (2016) The Rocky Mountain Avian Data Center [web application], Brighton, CO. http://adc.rmbo.org.
[18] 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.
[19] Wyoming Game and Fish Department. (2010) State Wildlife Action Plan, p 512.
[20] Wyoming Joint Ventures Steering Committee (WJVSC). (2010) Wyoming wetlands conservation strategy. Version 1.0, p 109, Wyoming Game and Fish Department, Cheyenne, WY.
[21] Desgranges, J.-L., Ingram, J., Drolet, B., Morin, J., Savage, C., and Borcard, D. (2006) Modelling wetland bird response to water level changes in the Lake Ontario - St. Lawrence River hydrosystem, *Environmental Monitoring and Assessment 113*, 329-365.
[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] 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.
[24] Naugle, D. E. (2004) Black Tern (*Chlidonias niger surinamensis*): a technical conservation assessment, USDA Forest Service, Rocky Mountain Region, [Online]. http://www.fs.fed.us/r2/projects/scp/assessments/blacktern.pdf.
[25] Nicholoff, S. H., compiler. (2003) Wyoming Bird Conservation Plan, Version 2.0, Wyoming Partners In Flight, Wyoming Game and Fish Department, Lander, Wyoming.
[26] Jones, S. (2008) Western Colonial Waterbird Survey Protocols, U.S. Department of the Interior, Fish and Wildlife Service, Region 6, Denver, Colorado, USA.
[27] 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.
[28] 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.
[29] 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.
[30] 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.
[31] 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: Black Tern with breeding plumage in Lacreek National Wildlife Refuge, South Dakota. (Photo courtesy of Tom Koerner, USFWS)

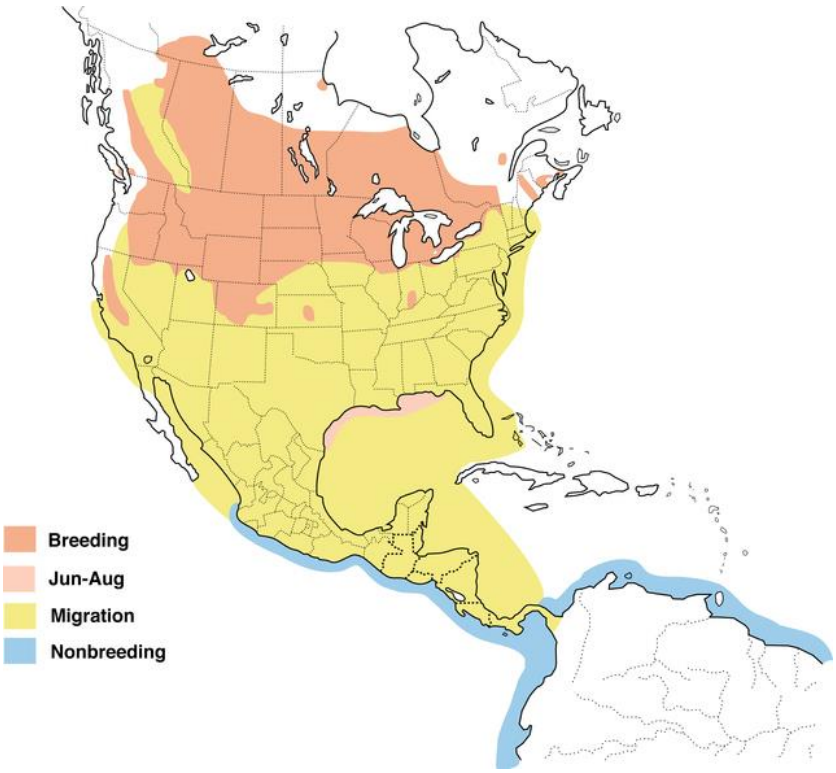

Figure 2: North American range of *Chlidonias niger*. (Map courtesy of Birds of North America, http://bna.birds.cornell.edu/bna, maintained by the Cornell Lab of Ornithology)

HABITAT PHOTOGRAPH

Figure 3: Photo not available.

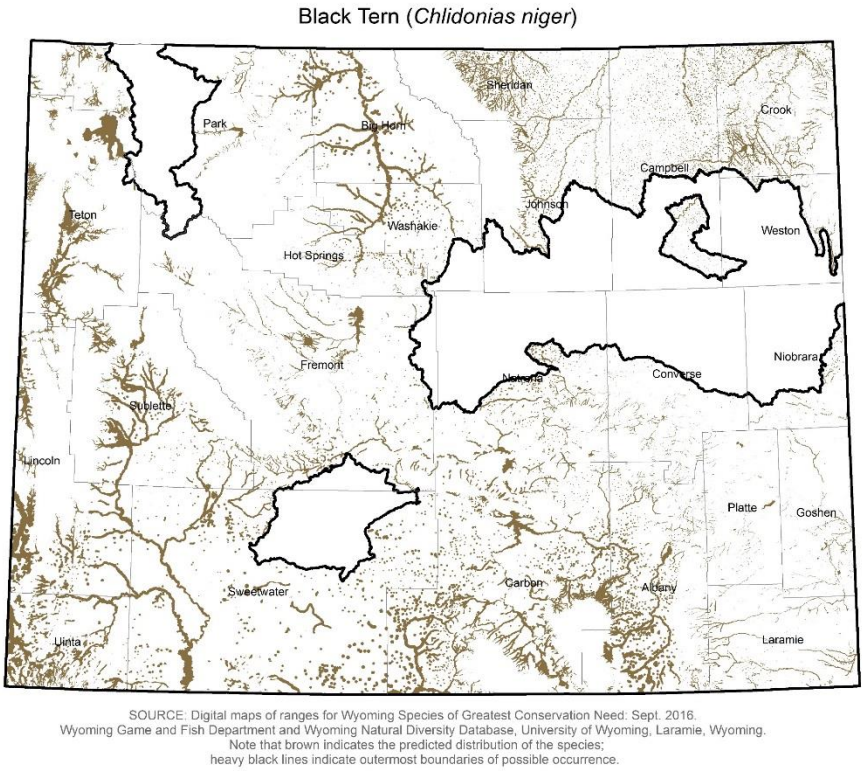

Figure 4: Range and predicted distribution of *Chlidonias niger* in Wyoming.

Figure 5: Black Tern nest with eggs in Malheur National Wildlife Refuge, Oregon. (Photo courtesy of Lauren B. Harter)