

American Kestrel

Falco sparverius

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: NSS4 (Bc), Tier III
WYNDD: G5, S5
Wyoming Contribution: LOW
IUCN: Least Concern
PIF Continental Concern Score: 11

STATUS AND RANK COMMENTS

American Kestrel (*Falco sparverius*; kestrel) does not have any additional regulatory status or conservation rank considerations beyond those listed above.

NATURAL HISTORY

Taxonomy:

American Kestrel is one of 13 kestrel species found throughout the world and thought to be the most recently evolved^{1, 2}. Seventeen subspecies have been recognized³. *F. s. sparverius* breeds across North America, except for the southeastern United States where *F. s. paulus* is resident from southern Louisiana east to Florida^{4, 5}. Only *F. s. sparverius* is found in Wyoming⁶.

Description:

Identification of American Kestrel is possible in the field. American Kestrel is the smallest falcon in North American, with long, narrow, pointed wings; a small, toothed bill; and a long, square-tipped tail. It is approximately the size of a Mourning Dove (*Zenaida aurita*) with females averaging larger than males. Kestrels are easily identified due to their bright colors and tendency to perch on wires and poles in open habitat. While foraging, they often hover facing into the wind using their wings and tails to stay in one place. Both males and females have two bold, black, vertical lines on their pale faces (one forming a “mustache” and the other extending through the auricular region), black “eye-spots” on the nape, and rusty colored backs with black spots (males) or barring (females). The male has slate-blue wings with black spots, while the female’s wings are reddish-brown with black barring. Males have a rufous tail with a black subterminal band and a light terminal band that ranges from white to rufous. Females also have a rufous tail but it is completely barred with black. Underparts of males range from buff to orange with varying amounts of black spotting on the sides and belly, while female underparts are ivory to buff with substantial brown streaking on the breast and belly².

Distribution & Range:

American Kestrel is a common summer resident in Wyoming, with breeding documented in all 28 latitude/longitude degree blocks in the state⁷. It is the most widespread North American falcon, with a breeding range extending from central Alaska through most of forested Canada south through most of North, Central, and South America to Tierra del Fuego and the West Indies^{2,8}. Northern birds from Alaska, Canada, and parts of the northern United States migrate south in winter to the southern United States and Mexico with some birds moving perhaps as far as Panama and northern South America⁸. A male kestrel nesting in Jackson, Wyoming marked with a GPS Pinpoint tag in 2015 wintered approximately 130 km south of Mexico City (R. Crandall, pers. comm.).

Habitat:

In Wyoming, breeding occurs usually below 2,590 m, but migrants can be found at higher elevations. American Kestrel breeds statewide in a variety of open and semi-open habitats that also contain trees, cliffs, or other man-made structures that provide nesting cavities⁶. Kestrels will use nest boxes and often nest close to human habitation⁶. Range-wide, they can be found in a variety of semi-open habitats including meadows, grasslands, deserts, agricultural fields, cottonwood riparian, open parkland, and urban areas. Habitat is characterized by short ground vegetation, either in small or large patches, with suitable trees or other structures to provide perches and nest cavities².

Phenology:

A few American Kestrels winter in Wyoming, but most breeding birds return in April and May⁶. Males arrive on territories before females often reusing the same territory in multiple years⁹. When a female arrives, males initiate aerial displays, courtship feeding and lead females to different nest cavities for her selection². The species lays a clutch usually consisting of 4–5 eggs¹⁰. Most eggs are laid every other day but can be 1 or 3 days apart¹⁰. Kestrels readily renest if a clutch is lost. Incubation duration is usually 30 days, with young typically fledging at age 28–31 days². Young are dependent on adults for food for about 12–14 days post-fledging. Siblings stay together during the first 2 weeks and then associate with other nonrelated juveniles 2–3 weeks after fledging¹¹.

Diet:

The main foods taken by kestrels include terrestrial arthropods and small vertebrates¹². Primarily a “sit and wait” diurnal predator, individuals can use the same perch all day or change locations frequently². Hover-hunting is much less common¹³. Insect prey species include grasshoppers (Orthoptera), cicadas (Cicadidae), beetles (Coleoptera), dragonflies (Odonata), spiders (Arachnida), and butterflies and moths (Lepidoptera)¹². Small mammalian prey includes voles and mice (Cricetidae, Muridae), shrews (Soricidae), and bats (Chiroptera). Birds taken are mostly small passerines¹². Diet varies by season and location. Mean diet composition based on number of prey items from 6 food-habits studies in the United States and Canada was 74% invertebrates, 16% mammals, 9% birds, and 1% herptiles¹².

CONSERVATION CONCERNS

Abundance:

Continental: WIDESPREAD

Wyoming: COMMON

The total wintering population of American Kestrel is estimated to be 236,000 in the United States and southern Canada⁹. The North American breeding population is estimated to be greater than 1.2 million pairs¹⁴. Using North American Breeding Bird Survey (BBS) data, the Partners in Flight Science Committee estimated the global population of American Kestrel to be 4 million birds¹⁵. Approximately 2.1% of the global population, or approximately 90,000 birds, is estimated to breed in Wyoming¹⁶. The statewide rank of COMMON is based on the relatively large area of the state known to be occupied in any given season, and the large coverage of suitable habitat within that area. Within suitable habitat in the occupied area, American Kestrel also appears to be common and is usually encountered during surveys that could be expected to indicate its presence⁷. American Kestrel density (number of birds per square km) and population size estimates for Wyoming are available from the Integrated Monitoring in Bird Conservation Regions (IMBCR) program for the years 2009–2015¹⁷.

Population Trends:

Historic: UNKNOWN

Recent: MODERATE DECLINE

Statistically significant population trends calculated from BBS data from 1968–2013 indicate that American Kestrel numbers in Wyoming declined by 1.30% annually (95% CI: -2.08 to -0.53)¹⁸. Trends from BBS data from 1966–2008 in the Northern Rockies Bird Conservation Region (BCR 10) indicated a 55% population decline (*N* = 202 routes), while in the Badlands and Prairies Conservation Region (BCR 17) a smaller decline of 3% was estimated (*N* = 96 routes)^{18, 19}.

Intrinsic Vulnerability:

MODERATE VULNERABILITY

As North America's most abundant bird of prey, with a distribution across most of North America, American Kestrel would appear to be a species at little to no risk. However, BBS data have shown steep declines in breeding adults in a number of widespread regions from New England to the Rocky Mountains^{18, 19}. Many aspects of its life history increase the vulnerability of the American Kestrel compared to other raptor species: it is the smallest North American falcon and a secondary cavity nester that is vulnerable to disease. It also forages on insects and small mammals which can expose it to a variety of contaminants and secondary poisoning. It also can nest and forage close to human developments and busy roads which expose it to additional hazards.

Extrinsic Stressors:

MODERATELY STRESSED

Although causes for population declines have not been determined, four major factors have been suggested: 1) habitat loss such as conversion of agricultural fields to urbanization or habitat degradation/change (succession of fields to forests) which can lead to a lack of nesting cavities or greatly reduce food resources, 2) contaminants such as flame retardant chemicals and pesticides which can impact reproductive success or cause direct mortality, 3) increased predation by other raptors especially Cooper's Hawk which has been increasing in numbers in some areas of the country, and 4) exposure to the West Nile virus to which kestrels are highly susceptible^{2, 9, 19}. Other possible factors for population declines include decreases in Northern Flicker nesting populations which would reduce the number of nesting cavities, vehicle collisions as kestrels often forage on wires along roadways, and climate change effects that can result in drought and disruption of traditional movement and breeding patterns^{2, 19}. It has also

been shown that captive kestrels have reduced hatching success and other physiological changes after exposure to electric and magnetic fields from electrical transmission lines². Take for falconry or from shooting are thought to be minimal².

KEY ACTIVITIES IN WYOMING

The Wyoming Game and Fish Department (WGFD) designates American Kestrel as a Species of Greatest Conservation Need (SGCN). Current statewide activities for monitoring population trends for American Kestrel in Wyoming include the BBS program conducted on 108 established routes since 1968 and the multi-partner IMBCR program initiated in 2009. Trend data are available on the United States Geological Survey BBS website¹⁸, and occupancy, density, population estimates, and decision support tools are available through the Rocky Mountain Avian Data Center¹⁷. The only ongoing research on kestrels in Wyoming is the Teton Kestrel Project by Craighead Beringia South, a nonprofit wildlife research institute in Jackson, Wyoming²⁰. This multi-year project is focused on monitoring known territories of kestrels using natural cavities and over 50 nest boxes throughout the county on private lands to support monitoring, research, and education objectives (Ross Crandall, pers. comm.).

ECOLOGICAL INFORMATION NEEDS

Although American Kestrel has been studied extensively in some areas, information on this species in Wyoming is lacking. In order to understand apparent ongoing declines, data are needed on adult and juvenile survivorship, nest site and habitat selection, prey use, availability of suitable cavities for nesting, causes of mortality, identification of wintering areas and migration routes, and how contaminants, predation and disease may be affecting the state's breeding population.

MANAGEMENT IN WYOMING

This section authored solely by WGFD; Susan M. Patla. The WGFD classifies American Kestrel as a SGCN due to limitations on the availability of large diameter trees and snags for nesting and perch sites (lack of available cavities can result in population declines); elimination of mature coniferous forest habitat from beetle kill, disease, and logging; and the effects of climate change, which can reduce nesting habitat. Given the lack of ecological information on American Kestrel in Wyoming, research projects that focus on collecting basic data on survivorship, productivity, movements, and bird health should be encouraged at different sites across the state. BBS and IMBCR data should also be reviewed to determine if additional survey work is needed to better document population trend in the state. The need to maintain an adequate supply and distribution of older aspen and conifer trees across the state that will support robust populations of nesting woodpeckers (primary cavity nesters), specifically in close proximity to open areas used by American Kestrel for hunting, should be a key objective of forest habitat projects. Where natural cavities are known to be in short supply, constructed nest boxes could provide additional nest sites but would require annual maintenance.

CONTRIBUTORS

Susan M. Patla, WGFD
Andrea C. Orabona, WGFD
Kaylan A. Hubbard, WYNDD
Ross Crandall, Craighead Beringia South

REFERENCES

- [1] Boyce, D. A., and White, C. W. (1987) Evolutionary aspects of kestrel systematics: a scenario, In *The Ancestral Kestrel* (Bird, D. M., and Bowman, R., Eds.), pp 1-21, Raptor Research Report 6.
- [2] Smallwood, J. A., and Bird, D. M. (2002) American Kestrel (*Falco sparverius*), 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/amekes>.
- [3] White, C. M., Olsen, P. D., and Kiff, L. F. (1994) Family Falconidae (falcons and caracaras), In *Handbook of the Birds of the World. Vol. 2* (del Hoyo, J. A., and Sargatal, J., Eds.), pp 216-275, Lynx Edicions, Barcelona, Spain.
- [4] Bond, R. M. (1943) Variation in western Sparrow Hawks, *Condor* 45, 168-185.
- [5] Smallwood, J. A. (1990) Kestrel and Merlin, In *Proceedings of the Southeast Raptor Management Symposium* (Giron Pendelton, B. A., Ed.), pp 29-37, National Wildlife Federation, Washington, D.C.
- [6] Faulkner, D. W. (2010) *Birds of Wyoming*, Roberts and Company Publishers, Greenwood Village, CO.
- [7] 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.
- [8] NatureServe. (2015) NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1, <http://explorer.natureserve.org>, NatureServe, Arlington, Virginia.
- [9] Johnsgard, P. A. (1990) *Hawks, Eagles, and Falcons of North America: Biology and Natural History*, Smithsonian Institution Press, Washington, D.C.
- [10] Bird, D. M., and Palmer, R. S. (1988) American Kestrel, In *Handbook of North American Birds. Vol. 5: Diurnal Raptors. Part 2* (Palmer, R. S., Ed.), pp 253-290, Yale University Press, New Haven CT.
- [11] Cade, T. J. (1955) Experiments on winter territoriality of the American Kestrel, *Falco sparverius*, *Wilson Bulletin* 67, 5-17.
- [12] Sherrod, S. K. (1978) Diets of North American Falconiformes, *Raptor Research* 12, 49-121.
- [13] Bildstein, K. L., and Collopy, M. W. (1987) Hunting behavior of Eurasian (*Falco tinnunculus*) and American Kestrels (*F. sparverius*): a review, In *The Ancestral Kestrel* (Bird, D. M., and Bowman, R., Eds.), pp 66-82, Raptor Research Report 6.
- [14] Cade, T. J. (1982) *Falcons of the World*, Cornell University Press, Ithaca, NY.
- [15] Partners in Flight Science Committee. (2012) Species Assessment Database, <http://rmbo.org/pifassessment/>.
- [16] Partners in Flight Science Committee. (2013) Population Estimates Database, version 2013, <http://rmbo.org/pifpopestimates>.
- [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] American Kestrel Partnership. (2016) The American Kestrel Partnership, <http://kestrel.peregrinefund.org/index.php?action=intro>.
- [20] Craighead Beringia South. (2016) Kestrel Project, <http://www.beringiasouth.org/teton-kestrel-project>.



Figure 1: Adult American Kestrels: male (top) in Laramie County, Wyoming and female (bottom) in Boulder County, Colorado. (Photos courtesy of Pete Arnold (top) and Bill Schmoker (bottom))

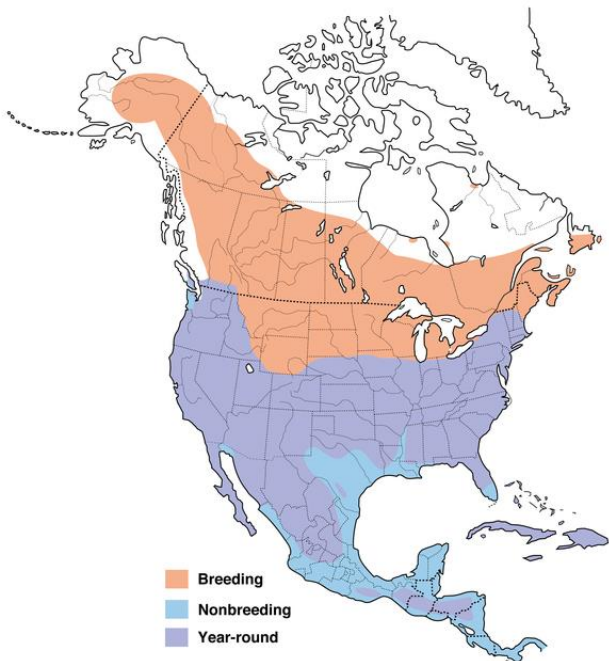


Figure 2: North American range of *Falco sparverius*. (Map courtesy of Birds of North America, <http://bna.birds.cornell.edu/bna>, maintained by the Cornell Lab of Ornithology)

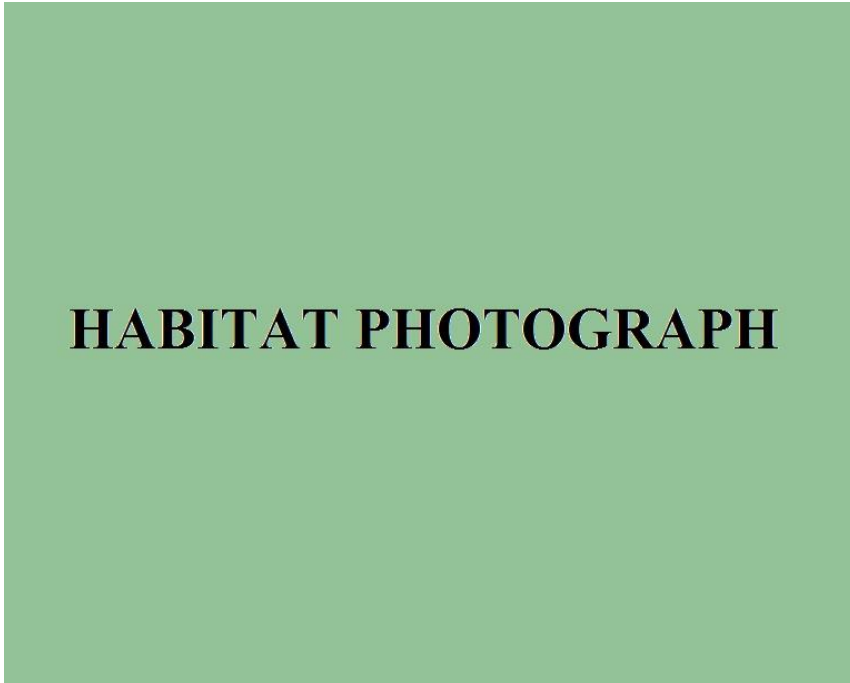


Figure 3: Photo not available.

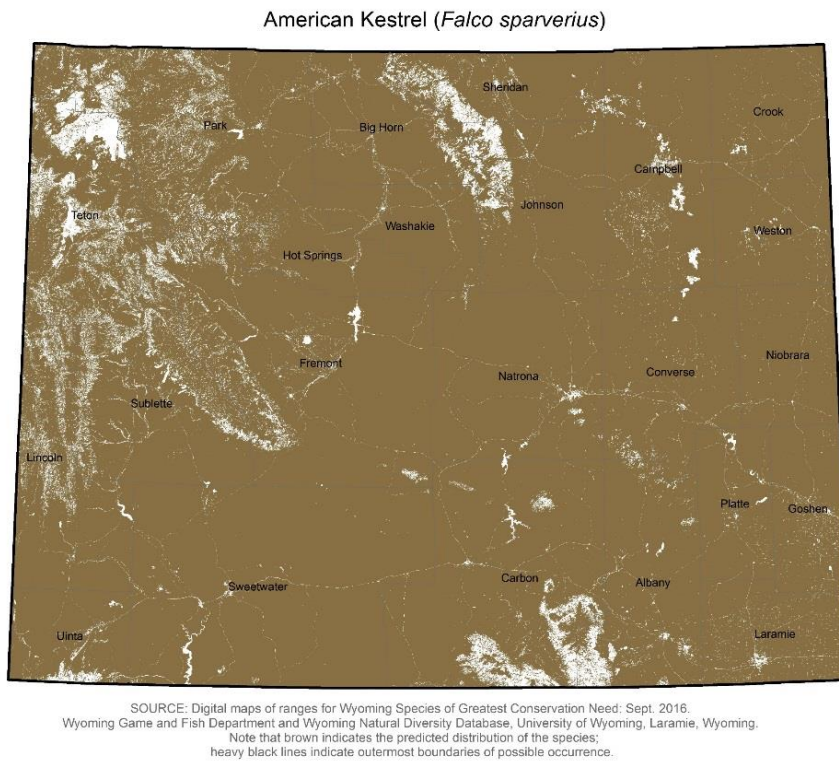


Figure 4: Range and predicted distribution of *Falco sparverius* in Wyoming.