

Red Crossbill

Loxia curvirostra

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 II
WYNDD: G5, S5
Wyoming Contribution: LOW
IUCN: Least Concern
PIF Continental Concern Score: 10

STATUS AND RANK COMMENTS

Red Crossbill (*Loxia curvirostra*) has no additional regulatory status or conservation rank considerations beyond those listed above.

NATURAL HISTORY

Taxonomy:

There are eight subspecies of Red Crossbill that have been identified¹. These subspecies are primarily based on flight call and morphology (body size, bill size, and bill shape), and exhibit little genetic differentiation². Subspecies of Red Crossbill have also been proposed as pseudo-species based upon lack of subspecies isolation¹. Additional work needs to be completed on taxonomy. For this account, flight call variation (call type) will be used to describe intraspecific variation. It is believed that flight calls are imprinted within flocks and trend towards localized adaptations for feeding upon variations in conifer cones³. Learned flight call type (within flock) could promote reproductive isolation and localized adaptation, although there is widespread sympatry between call types^{1, 3-5}. Five flight call types have been observed in Wyoming⁶. An additional call type has been observed close to the northwestern border, and may occur in the state⁶.

Description:

All crossbills can be identified in the field by their distinctive curved bill, which is crossed at the tip. Red Crossbill is known for its extreme phenotypic variability^{4, 5}. Individuals of each call type have variations in bill shape and size from other call types^{1, 3, 5}. Adult male Red Crossbills are typically red to reddish-yellow; have dark brown flight feathers; and a dark, deeply notched tail¹. Females are gray to olive in coloration, with a green to yellow breast and rump. Immature Red Crossbills resemble adult females, and may exhibit coloration similar to adults based upon sex and age. Juveniles are typically distinguished from adults by buffy edgings on the wing

coverts¹. Adult Red Crossbills are typically 14–20 cm in total length and weigh 24–45 g¹. White-winged Crossbill (*L. leucoptera*) is similar in appearance, but can easily be distinguished from Red Crossbill by its two bold, white wing-bars⁷.

Distribution & Range:

Red Crossbill is widespread throughout Eurasia and North America. Within North America, Red Crossbill is a permanent resident in Alaska, Canada, states adjacent to the Canadian border, western states, and throughout the Appalachian Mountains⁸. Crossbills are considered a nomadic species⁵. Wandering Red Crossbills have been observed throughout North America¹. Within Wyoming, Red Crossbill occurs in all mountain ranges and lower elevation pine (*Pinus* spp.) forests^{6,9}. The distributions of call types within the state follow key conifer species in which the specific call types specialize in. Call types 2 and 5 are the most widely distributed in Wyoming⁶. Call types 4, 3, and 1 are found within the state in respective decreasing abundance. Red Crossbill has been observed in all of Wyoming's 28 latitude/longitude degree blocks, with confirmed or circumstantial evidence of breeding occurring in 23 of the 28 degree blocks⁹.

Habitat:

In general, Red Crossbill prefers mature conifer forests. The exact conifer species and microhabitat are determined by call type and morphological bill specialization. Within Wyoming, call types 2 and 5 specialize on Ponderosa Pine (*P. ponderosa*) and Lodgepole Pine (*P. contorta*)⁶. Call type 3 specializes on Western Hemlock (*Tsuga heterophylla*), and call type 4 specializes on Douglas-fir (*Pseudotsuga menziesii*). However, both call type 3 and 4 have additionally been observed in association with Engelmann Spruce (*Picea engelmannii*) in the state. Call type 1 does not appear to specialize on a single species of conifer, and has been documented feeding from a variety of conifer species^{1,10}. Females build nests from conifer twigs, grasses, lichen, and other plant materials¹. The nest is often lined with feathers.

Phenology:

Red Crossbill is primarily diurnal. This species is considered nomadic and does not seasonally migrate^{1,5,6}. Red Crossbill is found in Wyoming year-round but shifts its range based primarily upon food availability and seed production of key forage species¹. The species is thought to breed opportunistically throughout the year as food resources allow^{1,11}. Red Crossbill breeding is tied to photo cycles, as with most other temperate birds, and more information is needed to determine factors which allow this species to breed at any time of the year¹¹. Typically, 3 eggs are laid per clutch¹. Incubation lasts for approximately 14 days, with nestlings fledging within 35 days of hatching¹.

Diet:

Red Crossbill feeds primarily on conifer seeds, with different call types foraging from different conifer species based on bill morphology (see Habitat).

CONSERVATION CONCERNS

Abundance:

Continental: WIDESPREAD

Wyoming: ABUNDANT

Using North American Breeding Bird Survey (BBS) data, the Partners in Flight Science Committee estimated the global population of Red Crossbill to be 20 million birds¹².

Approximately 1.1% of the global population, or around 300,000 birds, is estimated to breed in

Wyoming¹³. The statewide rank of ABUNDANT is based on the 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, Red Crossbill appears to be common and is usually encountered during surveys that could be expected to indicate its presence⁹. Red Crossbill 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 2009–2015¹⁴.

Population Trends:

Historic: UNKNOWN

Recent: MODERATE DECLINE

Red Crossbill population trend data from the BBS in Wyoming are available from 1968–2013, and suggest a statistically insignificant decline of 1.16% annually ($N = 36$ routes, 95% CI: -4.61–2.14), although results fall within a regional credibility category containing data with deficiencies, so must be interpreted with caution¹⁵. Western region BBS data indicate a statistically insignificant annual population decline of 1.11% ($N = 541$ routes; 95% CI: -3.58–0.57)¹⁵.

Intrinsic Vulnerability:

MODERATE VULNERABILITY

Within call types, Red Crossbill is dependent on a narrow suite of conifer species¹. In addition, Red Crossbill prefers older tree stands for foraging¹⁶, because older conifer stands produce larger cones that are thought to decrease foraging effort. Conifer specialization, in addition to their nomadic life history, makes Red Crossbill susceptible to changes in forest stand management and age across a large landscape. If the conifer assemblage for which a given call type is impacted, this will have impacts on the call type population. Red Crossbill is also known to feed on salt deposits¹⁷, which could make the species vulnerable to vehicle mortality on seasonally salted roads.

Extrinsic Stressors:

MODERATELY STRESSED

Extrinsic stressors to Red Crossbill include degradation of habitat and disturbance to nesting and roost sites¹. Any alteration to Red Crossbill habitat which reduces forest age or area could have an impact on this species. Loss of mature conifer stands could reduce Red Crossbill food resources. Red Crossbill has shown reduced abundance in younger and more fragmented forests¹⁶, and the species was found to avoid young stands even when other cone sources were limited¹⁸. The nomadic nature of Red Crossbill means it requires intact older conifer stands across a large geographic scale.

KEY ACTIVITIES IN WYOMING

Red Crossbill is classified as a Species of Greatest Conservation Need (SGCN) in Wyoming by the Wyoming Game and Fish Department. Current statewide activities for monitoring annual detections and population trends for Red Crossbill 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 Geologic Survey BBS website¹⁵, and occupancy, density, population estimates, and decision support tools are available through the Rocky Mountain Avian Data Center¹⁴. No systematic surveys of the Red Crossbill have been conducted in Wyoming.

ECOLOGICAL INFORMATION NEEDS

More information is needed to determine the breeding status and range of specific call types within Wyoming. Information is still needed on how forest management, drought, fire suppression, conifer disease, and pine beetle outbreaks affect this species in the state.

MANAGEMENT IN WYOMING

This section authored solely by WGFD; Andrea C. Orabona. Red Crossbill is classified as a SGCN in Wyoming due to reported population declines within the state, and possible reductions to habitat and food availability. Two separate but compatible survey programs are in place to monitor populations of many avian species that breed in Wyoming. The first is the long-term BBS started in Wyoming in 1968 with 108 established routes¹⁵. Species must be detected on at least 14 routes for data analyses to be significant for tracking population status and trend over time. The IMBCR program was established in 2009 in Wyoming with many state, federal, and nongovernmental organization partners that contribute funding, field personnel, technical assistance, or in-kind services. Data analyses produce estimates of density, occupancy, and population size at various scales; present habitat associations; and provide decision support tools for managers¹⁴. Management priorities for Red Crossbill in the short-term will focus on addressing data deficiencies. More detailed information should be gathered on species presence, distribution, population status, and the impact of potential stressors in order to develop management and conservation recommendations for this species in Wyoming.

CONTRIBUTORS

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Figure 1: Adult male (left) and female (right) Red Crossbills in Jefferson County, Colorado. (Photos courtesy of Bill Schmoker)

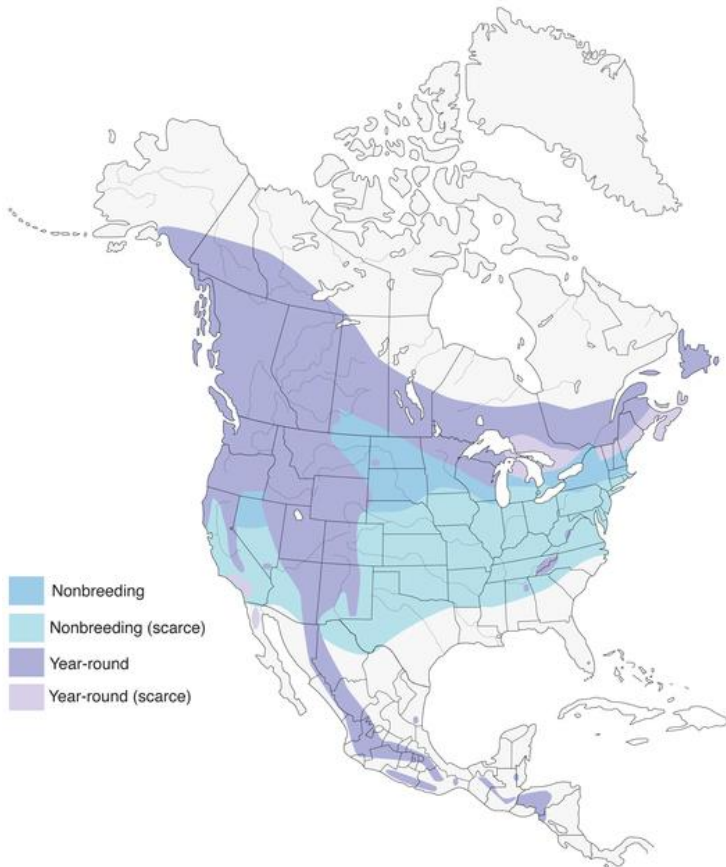


Figure 2: North American range of *Loxia curvirostra*. (Map courtesy of Birds of North America, <http://bna.birds.cornell.edu/bna>, maintained by the Cornell Lab of Ornithology)

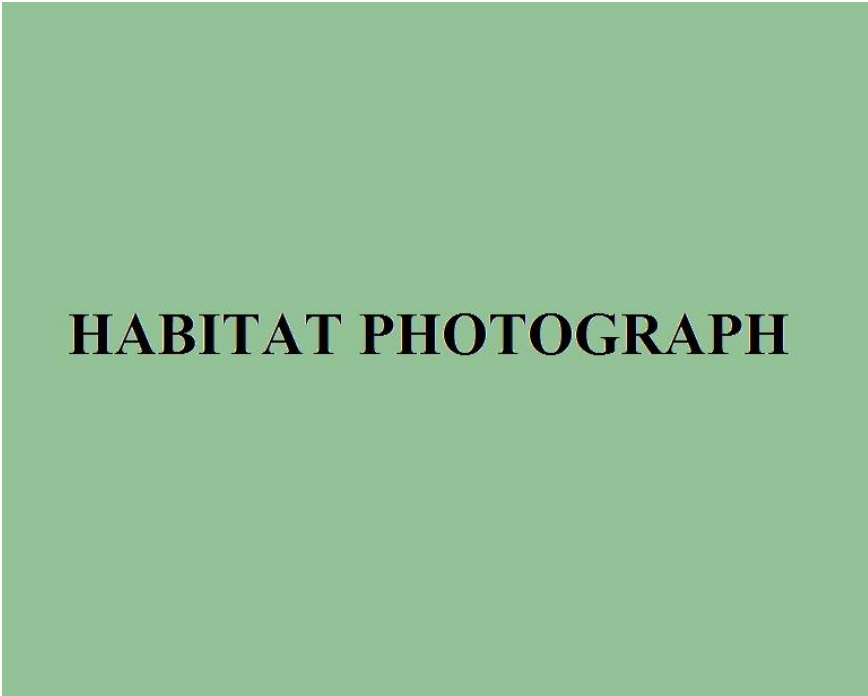


Figure 3: Photo not available.

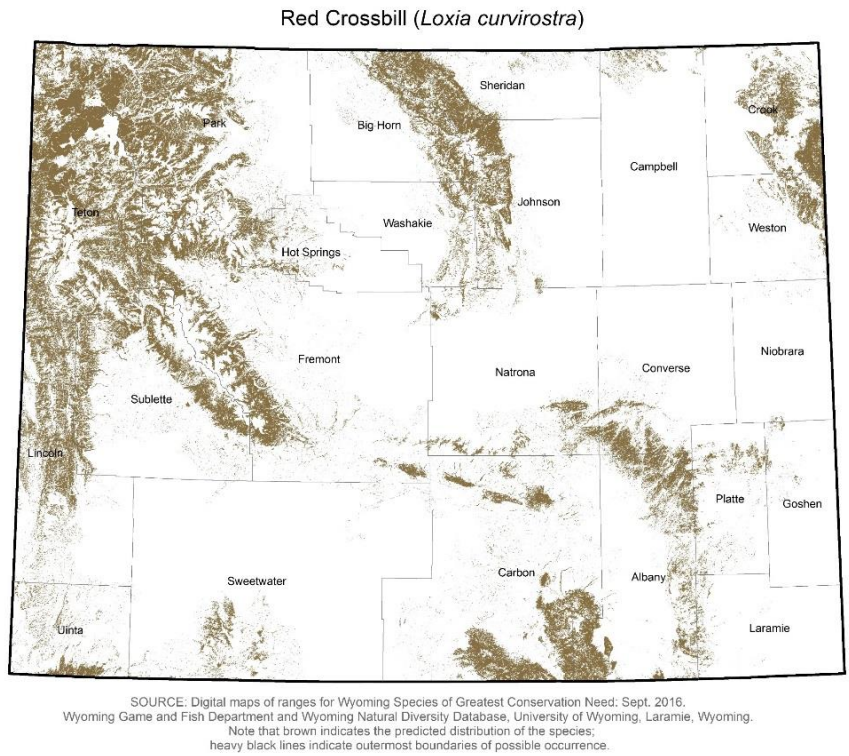


Figure 4: Range and predicted distribution of *Loxia curvirostra* in Wyoming.