

# Bald Eagle

## *Haliaeetus leucocephalus*

### **REGULATORY STATUS**

USFWS: Delisted; Migratory Bird  
USFS R2: Sensitive  
USFS R4: Sensitive  
Wyoming BLM: Sensitive  
State of Wyoming: Protected Bird

### **CONSERVATION RANKS**

USFWS: Bird of Conservation Concern  
WGFD: NSS3 (Bb), Tier II  
WYNDD: G5, S4B/S5N  
Wyoming Contribution: LOW  
IUCN: Least Concern  
PIF Continental Concern Score: 9

### **STATUS AND RANK COMMENTS**

Bald Eagle (*Haliaeetus leucocephalus*) is provided international protection under the Federal Migratory Bird Treaty Act of 1918, as amended <sup>1</sup>. In 1940, Bald Eagle was provided protection under the Bald and Golden Eagle Protection Act <sup>2</sup>. In 1966, the southern subspecies was listed as federally endangered under the Endangered Species Preservation Act; the entire population in the contiguous United States was listed as endangered in 1978 under the 1973 Endangered Species Act (ESA). A significant increase in numbers of nesting pairs, productivity, and distribution allowed Bald Eagle to be reclassified from Endangered to Threatened in 1995 under the ESA <sup>3</sup>. Bald Eagle was delisted in 2007, and numbers are considered to be stable to increasing across its range <sup>4</sup>. The species has been assigned different state conservation ranks by the Wyoming Natural Diversity Database for the breeding season and nonbreeding season because the abundance of the species is different between seasons.

### **NATURAL HISTORY**

#### **Taxonomy:**

Bald Eagle is a member of the family Accipitridae, which includes kites, eagles, harriers, and hawks <sup>5</sup>. There are two subspecies of Bald Eagle; *H. l. alascanus* is found north of 40 degrees latitude across North America, including Wyoming, while *H. l. leucocephalus* is found south of 40 degrees latitude in the Gulf coast states <sup>6</sup>.

#### **Description:**

Bald Eagle is the second largest bird of prey in North America; only the California Condor (*Gymnogyps californianus*) is larger. Bald Eagle reaches full adult plumage at age 5.5 years <sup>7</sup>. Identification is possible in the field. Adults are characterized by a distinctive white head and tail, dark brown body and wings, and large yellow beak and legs. Body size is variable throughout the species' range; larger individuals occur in the northern portion of the range and

smaller birds occur in the southeast and southwest regions of the United States<sup>6</sup>. Sexual dimorphism of plumage does not occur; however, females are approximately 25% larger than males<sup>8</sup>. Total length ranges from 71–96 cm, wingspan ranges from 168–244 cm, and body mass ranges from 3.0–6.3 kg<sup>8</sup>. Juvenile Bald Eagle plumage is similar to that of an adult Golden Eagle (*Aquila chrysaetos*), with the exception of unfeathered lower tarsi in juvenile Bald Eagles. Juvenile Bald Eagles have a dark brown head, body, wings, tail, and irises; white mottling on the underwings and belly; and a blackish gray cere and beak<sup>6</sup>. Appearance of older immature Bald Eagles changes considerably and progressively between the juvenile and full adult plumages. The head molts progressively from dark brown to white; the beak and cere change progressively from blackish gray to yellow; the iris changes from dark brown to buffy brown to cream to yellow; and the body of immature Bald Eagles varies in the amount and distribution of white mottling<sup>6</sup>.

### **Distribution & Range:**

During the breeding season, Bald Eagle occupies aquatic habitats with forested shorelines or cliffs in Alaska, across most of Canada, in the Pacific Northwest, in the Rocky Mountain states, in the northern portion of the Midwest, and along the eastern coast<sup>6</sup>. Breeding has not been recorded outside of North America. Wyoming is on the southern portion of Bald Eagle's northern breeding range, although the entire state is part of the species' wintering range. Bald Eagle nests along major river drainages and lakes throughout Wyoming. The species has been documented in all 28 of Wyoming's latitude/longitude degree blocks, with breeding confirmed in 20 of the 28 degree blocks<sup>9</sup>. The northwestern and east central portions of Wyoming continue to have the highest concentrations of nesting Bald Eagles in the state. The most significant concentrations occur in Teton, Sublette, and Carbon counties, including a substantial number of nesting pairs in Grand Teton and Yellowstone National Parks<sup>10-12</sup>. Migration is variable and complex, and depends on the age of the individual, location of breeding territory, climate severity at the breeding site, and year-round food availability<sup>6</sup>. Adult Bald Eagles in some northern populations, including Wyoming, may not migrate at all; rather, they move locally to take advantage of available food sources or stay on territory where rivers remain open throughout the winter season<sup>13, 14</sup>.

### **Habitat:**

Bald Eagle typically nests in forested areas adjacent to rivers and large bodies of water, although a small number are found nesting along smaller drainages and lakes. For nesting, it selects mature and old-growth trees capable of supporting large nest structures in forest stands that have some habitat edge and are fairly close (typically < 2 km) to water with suitable foraging opportunities<sup>6</sup>. Distance from human developments and disturbance is an important factor in nest site selection<sup>6</sup>. In Wyoming, the number of nest sites is limited by the territorial behavior of Bald Eagle<sup>15</sup>. In Colorado and Wyoming, forest stands containing nest trees varied from old-growth or mature ponderosa pine to riparian corridors surrounded by rangeland<sup>16</sup>. Highly productive nesting areas in the Greater Yellowstone Ecosystem (GYE) have open water in winter; low severity of early spring weather, although this can be quite variable in terms of high productivity; limited human activity; and high river sinuosity with an abundance of islands, riffles, runs, and pools within the river<sup>14, 15</sup>. For perching and roosting, Bald Eagle prefers tall, mature coniferous or deciduous trees that provide a wide view of the surrounding terrain. Roosts are usually associated with aquatic foraging areas, although roost trees are not necessarily located as close to water as are nest trees<sup>6</sup>.

**Phenology:**

Bald Eagle is diurnal and crepuscular. Adult Bald Eagles in Wyoming's GYE do not migrate. Bald Eagles in other parts of Wyoming generally migrate from late March through early April, and again from early September through October<sup>17</sup>. Although breeding phenology varies with latitude, nest building typically begins 1–3 months prior to egg laying<sup>6</sup>. In Wyoming, courtship typically occurs from January through early or mid-March, and fledging is completed by mid-July<sup>18</sup>. One brood is produced per year; however, a replacement clutch is possible if eggs are destroyed or removed during incubation<sup>6</sup>.

**Diet:**

As an opportunistic forager, Bald Eagle selects a variety of foods across its range, which may be site-specific based on prey items available<sup>19</sup>. In most areas, Bald Eagle prefers fish, but also selects waterfowl and other birds, small and mid-sized mammals, and carrion<sup>6</sup>. Bald Eagles in the GYE are known to use over 100 different prey items, but 89% are fish<sup>14</sup>. It hunts live prey, scavenges on carrion, and pirates food<sup>20</sup>.

**CONSERVATION CONCERNS**

**Abundance:**

**Continental:** WIDESPREAD

**Wyoming:** UNCOMMON

Using Breeding Bird Survey data, the Partner's in Flight Science Committee estimated the global population of Bald Eagle to be 250,000 birds<sup>21</sup>. Although a population estimate was not provided, about 0.5% of the global population is estimated to breed in Wyoming<sup>22</sup>. The statewide rank of UNCOMMON is based on the limited area of the state known to be occupied in any given season, and the relatively small coverage of suitable habitat within that area. Within suitable habitat in the occupied area, Bald Eagle also appears to be uncommon, occurring in relatively low densities and requiring intensive survey efforts to detect the species, with the exception of the GYE<sup>9</sup>. During the breeding season, Bald Eagle nests along all major river systems in Wyoming, with the largest number of nesting pairs occurring in the GYE along the Snake River drainage and its tributaries. The minimum number of nesting territories in the state is estimated at 101<sup>10-12</sup>. Nesting data from 83 territories checked in western Wyoming in 2015 showed 74 occupied territories (89%)<sup>12</sup>. Of the 67 territories checked for productivity, 57 (85%) produced a total of 81 mature young, or 1.42 mature young per nest<sup>12</sup>. Bald Eagle has widespread distribution in North America<sup>20</sup>.

**Population Trends:**

**Historic:** LARGE DECLINE

**Recent:** INCREASE

Bald Eagle populations have fluctuated over the past 200 years, and the species became rare in the mid- to late 1900s due to widespread use of pesticides (especially DDT) and human persecution<sup>6</sup>. Since 1980, as DDT levels in the environment dropped and human persecution decreased, Bald Eagle populations have rebounded. In the 1980s, the population of Bald Eagles in North America was estimated to be 80,000 individuals<sup>19</sup>. Since its ESA listing, Bald Eagle populations have been increasing in the contiguous 48 states; the number of nesting territories nearly tripled between 1980 and 1990<sup>23</sup>. In 1999, the population was estimated to be 100,000 birds<sup>6</sup>. In Wyoming, the number of nesting pairs of Bald Eagles appears to have stabilized in the

Snake River drainage, but the nesting population is still increasing in the Green River Basin and likely at other locations in the state <sup>10</sup>.

**Intrinsic Vulnerability:**

**MODERATE VULNERABILITY**

In Wyoming, Bald Eagle is mainly restricted to major river drainages and lakes for nesting, although as the population has increased a few pairs are being found located along riparian stream corridors and smaller lakes and reservoirs. Although Bald Eagle has a long lifespan, it has a relatively low reproductive rate, producing only 1 brood per year <sup>6</sup>, and exhibits a delayed age of first reproduction. Bald Eagle feeds at a high trophic level, making it more susceptible to negative effects from bioaccumulation <sup>24</sup>.

**Extrinsic Stressors:**

**SLIGHTLY STRESSED**

Humans cause the most significant source of mortalities for Bald Eagle <sup>6</sup>. The negative impacts of human disturbance increase with increasing duration and frequency of the disturbance events <sup>25</sup>. Bald Eagle is particularly susceptible to human disturbance during the breeding season, and may abandon a nest if its disturbance threshold is exceeded <sup>6</sup>. In addition to disturbance by humans, major threats range-wide include habitat loss, biocide contamination, a decrease in prey availability, and illegal shooting <sup>26</sup>, as well as vehicular collisions, electrocution, and wind farms. Bald Eagle can also be highly vulnerable to West Nile virus <sup>27</sup>. Organophosphorus and carbamate pesticides, heavy metals, and other environmental toxins threatened Bald Eagle survival and reproduction <sup>6</sup>. Lead poisoning can cause a significant amount of injury and death to Bald Eagle <sup>24, 28</sup>. In some areas, expansion of Bald Eagle breeding populations and carrying capacity may be limited by human development <sup>29</sup>. In Wyoming, nesting Bald Eagles continue to experience some site-specific risks from increasing energy development, rural development, recreational activities, and environmental contaminants <sup>10-12</sup>. Loss of older-aged cottonwood and conifer trees suitable for nesting near major rivers and lakes as a result of climate change and large-scale, more frequent forest fires, and changing hydrological conditions may also limit nesting habitat in the future <sup>30</sup>.

**KEY ACTIVITIES IN WYOMING**

The Wyoming Game and Fish Department (WGFD) initiated monitoring for Bald Eagle statewide in 1978, and continues to conduct annual nesting surveys for the species with most effort concentrated in western Wyoming. Currently, Wyoming participates in the National Post-delisting Monitoring Plan for Bald Eagle by contributing survey data to the monitoring effort <sup>31</sup>. WGFD nest survey objectives include monitoring Bald Eagle occupancy and productivity at nesting territories in the Snake River, Salt River and Green River Basin, south to Seedskaadee National Wildlife Refuge <sup>10-12</sup>. Additional nesting and surveillance data are collected around the state by WGFD personnel. Data are also collected from Bald Eagle nest sites in Yellowstone National Park and by private consultant groups in other parts of Wyoming in association with energy development. The WGFD is actively involved in reviewing new federal regulations pertaining to Bald Eagle through participation in the Central Flyway Nongame Migratory Bird Technical Committee. The WGFD also provides information to the public, federal agencies, and other state agencies on the status of Bald Eagle nests, and provides recommendations on mitigation measures to conserve nest sites in Wyoming <sup>10, 12</sup>. Management guidelines have been developed for Bald Eagle nest sites for the GYE, which provide valuable information for avoiding disturbance to nesting eagles <sup>32</sup>. The United States Army Corp of Engineers provides

support for Bald Eagle monitoring in the Jackson area to help schedule maintenance work along the diked portions of the Snake River where a concentration of nest sites are found <sup>11, 12</sup>.

### **ECOLOGICAL INFORMATION NEEDS**

Bald Eagle has been widely studied, and over 2,000 studies related to this species have been published <sup>6</sup>. Additional research is needed to assess the viability of Bald Eagle populations in landscapes altered by human developments, and to determine tolerance limits of Bald Eagle to human developments and activities <sup>6</sup>. Some productive Bald Eagles in Wyoming still experience site-specific risks due to increasing energy development, rural development, recreational activities, and environmental contaminants; thus, more information on specific tolerance levels and mitigation measures is needed <sup>12</sup>. Research is also needed to assess Bald Eagle ecology and habitat use in areas of Wyoming with intense energy development, such as the Powder River Basin, and Green River/New Fork areas south of Pinedale <sup>15</sup>. Necropsies on available fresh specimens are valuable for tracking disease and contaminant levels.

### **MANAGEMENT IN WYOMING**

*This section authored solely by WGFD; Andrea C. Orabona and Susan M. Patla.* Bald Eagle is classified as a Species of Greatest Conservation Need in Wyoming due to restricted population size and sensitivity to human disturbance, especially during the breeding season <sup>15</sup>. As such, WGFD management actions include annual monitoring to determine Bald Eagle nest occupancy and productivity, especially in areas of Wyoming that are experiencing large increases in energy and housing development and recreation along major river corridors. WGFD monitors Bald Eagle populations that nest in western Wyoming on the Snake and Green River drainages, and obtain other nesting data where available <sup>12</sup>. We have detected > 139 nest sites to-date, but believe potential habitat exists to support > 200 Bald Eagle territories statewide <sup>12</sup>. In 2015, we obtained occupancy data for 101 territories and productivity data for 67 nest sites, with Bald Eagle occupying a high proportion (i.e.,  $\geq 83\%$ ) of nesting territories monitored, and producing an average of 1.6 young per successful nest <sup>12</sup>. In addition, WGFD personnel continue to work cooperatively with landowners and personnel from other agencies and organizations to ensure optimum habitat for Bald Eagle is maintained across the state. In 2016, a genetic study of eagles nesting in the GYE was initiated by the Teton Raptor Center, Oklahoma State University, WGFD, and other partners to determine genetic connectivity, inbreeding coefficients, genetic health and contribution of the GYE population to overall Bald Eagle recovery.

### **CONTRIBUTORS**

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Figure 1: Bald Eagle in Sublette County, Wyoming. (Photo courtesy of Elizabeth Boehm)

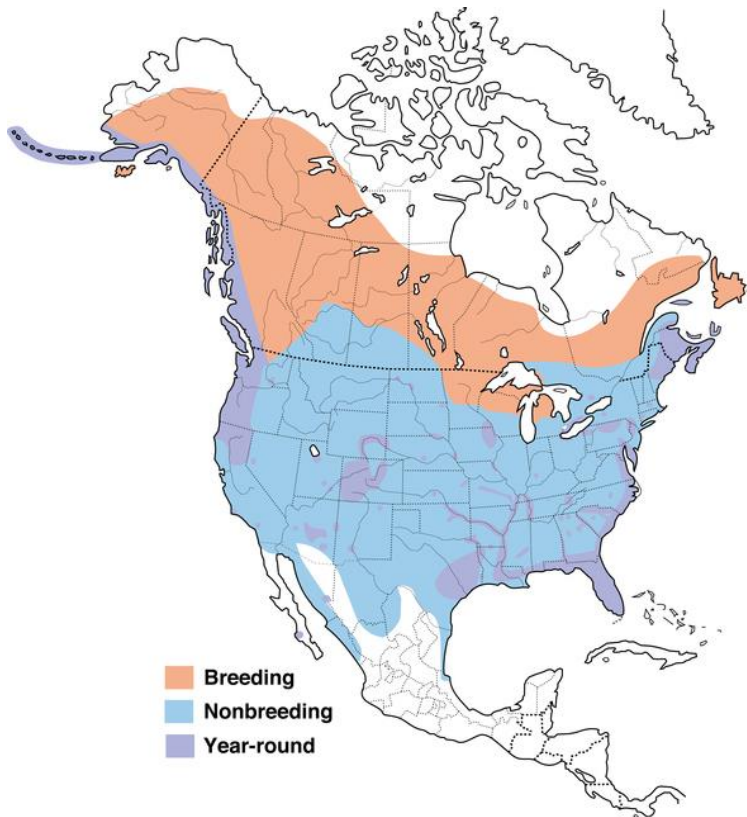


Figure 2: North American range of *Haliaeetus leucocephalus*. (Map courtesy of Birds of North America, <http://bna.birds.cornell.edu/bna>, maintained by the Cornell Lab of Ornithology)



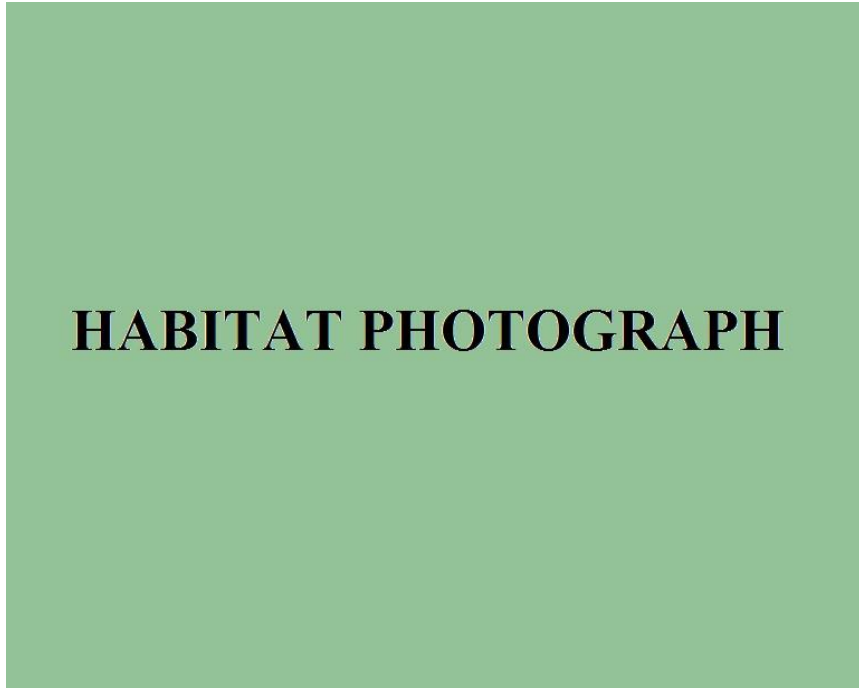


Figure 3: Photo not available.

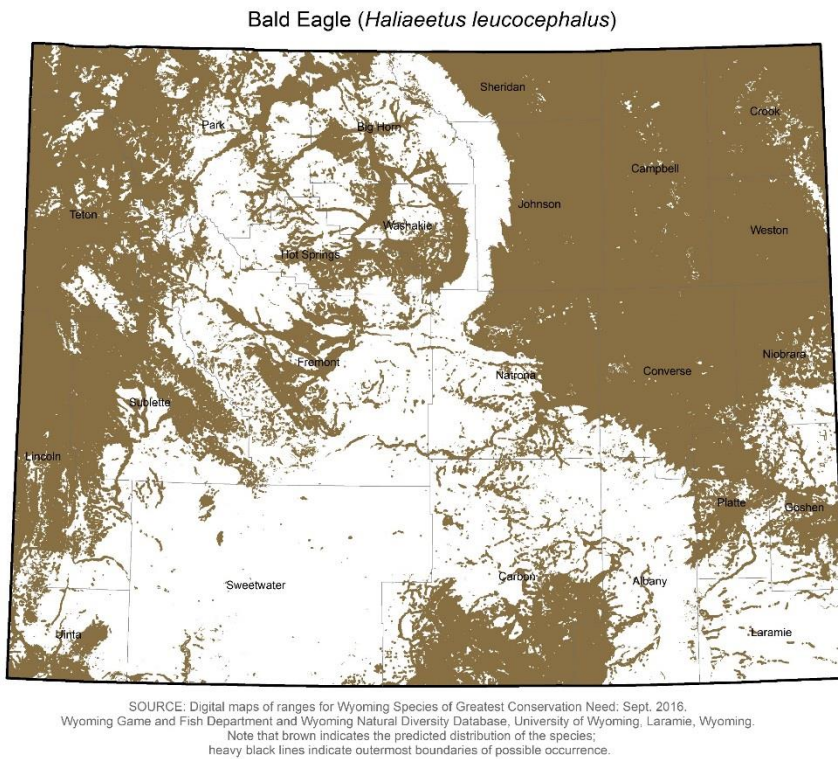


Figure 4: Range and predicted distribution of *Haliaeetus leucocephalus* in Wyoming.



Figure 5: Bald Eagle soaring over Seedskaadee National Wildlife Refuge, Sweetwater County, Wyoming. (Photo courtesy of Tom Koerner, USFWS)