

## Golden Eagle (*Aquila chrysaetos*)

### Species Status Statement

#### Distribution

Golden eagle lives throughout the northern hemisphere, across Europe, central Asia, northern Africa, and North America (Kochert et al. 2002). In North America, this species is more common in the west, breeding as far north as Alaska, and residing year-round from southwestern Canada to central Mexico (Kochert et al. 2002). Utah hosts wintering golden eagles, as well as resident breeding populations statewide.

Table 1. Utah counties currently occupied by this species.

Golden eagle
ALL

#### Abundance and Trends

U.S. Fish & Wildlife Service (2016a, 2016b) estimated the total population size for golden eagle in the contiguous United States and Alaska was 39,000 in 2009 and 41,500 in 2014. However, recent research indicates that the population in the western United States might be declining toward a lower equilibrium size of about 26,000.

WEST, Inc. conducted aerial surveys across four Bird Conservation Regions (BCRs) in the western U.S. and produced an estimated high abundance of approx. 27,000 in 2003 and low estimate of approx. 19,500 in 2008, using the same methodology for surveys in 2003 and 2006-2012 (Good et al. 2007, Nielson et al. 2012). Though populations in each BCR appear stable, there may not be enough years of data to detect substantial changes in abundance (Nielson et al. 2012). Millsap et al. (2013) used the WEST, Inc. data and BBS survey data from 1968-2010 to estimate trends for all of the western BCRs combined, and found stable populations both for the period of 1968 to 2010 (0.4% [-0.3, 1.0] per year) and for 1990-2010 (0.5% [-0.3, 1.3] per year).

- Partners in Flight (2019) has given this species a High Regional Concern Score of 16 (high), but does not give it a special conservation status.
- Kochert and Steenhof (2002) found that nesting territory occupancy and productivity were at best stable to declining in four regions of the western U.S., including north-central Utah, as part of a review of the species' status and trends.
- Early analyses of long-term migration-station counts across the western United States indicate that abundance has declined during fall migration (Hoffman and Smith 2003, Smith et al. 2008).

- Breeding Bird Survey (BBS) results for the Western BBS Region show a non-significant decline of -0.2% (-1.3, 0.5) per year from 1966 to 2015 and a non-significant increase of 0.5% (-0.9, 2.4) per year from 2005 to 2015, though these estimates should be taken with caution due to low abundance (<1.0 birds/route; Sauer et al. 2017).
- BBS results for Utah only show greater, but still non-significant declines of -1.2% (-2.6, 0.2) per year from 1966 to 2015 and of -1.5% (-4.9, 1.5) per year from 2005 to 2015, though these results also have issues related to low abundance (Sauer et al. 2017).

## **Statement of Habitat Needs and Threats to the Species**

### Habitat Needs

Golden eagles are habitat generalists that primarily use open to semi-open landscapes such as tundra, shrublands, grasslands, woodland-brushlands, and coniferous forests from sea level to 12,000 ft. in elevation (Kochert et al 2002). In Utah, they breed mainly in desert lowland, grassland, shrubland, pinyon-juniper, and aspen-conifer vegetation types (Kochert et al. 2002, Keller 2018). Golden eagles prefer to forage in open areas such as desert lowland and grasslands (Kochert et al. 2002). Nests are usually placed on cliffs, but trees, the ground, and human-made structures (e.g. nesting platforms and electrical transmission towers) also have been used (citations within Kochert et al. 2002).

Rabbits and squirrels are the main food source for golden eagles (Kochert et al. 2002, Bedrosian et al. 2017). In the central Great Basin of Utah, black-tailed jackrabbit (*Lepus californicus*; 61.5%), cottontail (*Sylvilagus* spp.; 8.3%), and rock squirrel (*Otospermophilus variegatus*; 6.1%) comprised the greatest proportion of food items found in nests from 1970 to 2018 (Keller 2018). Other mammals, birds, reptiles, fish, and carrion are consumed in lesser proportions (Kochert et al. 2002, Bedrosian et al. 2017, Keller 2018).

### Threats to the Species

The Bald and Golden Eagle Protection Act (BGEPA, 1962) requires documentation of causes of eagle mortality in the United States. A pair of recent summaries concluded anthropogenic factors were responsible for about 56% of satellite-tagged eagle mortalities (USFWS 2016a, 2016b). Citations within Kochert and Steenhof (2002), and articles from a special issue of the *Journal of Raptor Research* in 2017 demonstrate that accidental trauma (e.g., collisions with vehicles, fences, wires, and wind turbines), electrocutions, intentional shooting, and incidental poisoning from lead and anticoagulant rodenticide were the leading causes of death for this species nationwide. In Utah, collisions with vehicles are the leading cause of reported mortality, followed by electrocutions (UDWR unpublished data).

Unpermitted human-caused mortality is the leading cause of death of golden eagles in the United States, and can lead to population declines for this species (U.S. Fish & Wildlife Service 2016a, 2016b). Loss of breeding adults to anthropogenic factors is major threat to populations. Breeding adult survival has the greatest relative effect on population growth rate. Even minor

reductions in breeding adult survival (<4.5%) cannot be made up with increases in productivity, and therefore cause otherwise stable populations to decline (Tack et al. 2017). Furthermore, Wiens et al. (2017) produced a population simulation model that reinforced the analyses presented by the U.S. Fish and Wildlife Service (2016b) that any increases in mortality to current populations will worsen the potential for future declines, or steepen the rate of current declines.

Beyond direct mortality, human disturbance from recreational use (OHV and pedestrians) reduces territory occupancy, the probability of egg laying, and nest survival (Steenhof et al. 2014, Spaul and Heath 2016). Urban, agricultural, and energy development, accelerated fire regimes due to invasive grasses in shrublands and woodlands, and drought are drivers of habitat loss and degradation, another set of threats to golden eagles (Kochert et al. 2002). This species depends on rabbits and squirrels as its main food source, and these prey species are not as abundant in areas degraded by cheatgrass, fire, or prolonged drought (Steenhof et al 1997, Kochert et al. 1999, Kochert et al. 2002). While adults can forage widely for prey, their ability to provide for dependent nestlings is reduced when prey are limited.

Table 2. Summary of a Utah threat assessment and prioritization completed in 2014. This assessment applies to the species' entire distribution within Utah. For species that also occur elsewhere, this assessment applies only to the portion of their distribution within Utah. The full threat assessment provides more information including lower-ranked threats, crucial data gaps, methods, and definitions (UDWR 2015; Salafsky et al. 2008).

<b>Golden Eagle</b>
<b>Medium</b>
Excessive Harvest – Unregulated / Illegal
Inappropriate Fire Frequency and Intensity
Incidental Poisoning
Invasive Plant Species – Non-native
OHV Motorized Recreation
Roads – Energy Development
Utility and Service Lines

### **Rationale for Designation**

Golden eagle population trends have been apparently relatively stable nationally, but recent research indicates western populations are in a non-statistical decline and may decline further in the immediate future, mostly due to anthropogenic causes. One of these threats is the increased development of renewable energy sources that produce incidental “take”. The Western Golden Eagle Team (WGET) was established in 2013 by 4 western U.S. Fish and Wildlife Service Regions to “proactively address energy-related threats to golden eagle populations in the western U.S. by developing conservation strategies at appropriate scales.” WGET is in the final stages of making its products (e.g., models of breeding and wintering

habitat and movement, threat assessments) and decision tools available to partners such as other State and Federal eagle teams and agencies, land management agencies, and research institutions. Some of this related work has already been published in various peer-reviewed journals, including in a special issue of the *Journal of Raptor Research* dedicated to golden eagle conservation. The WGET products should be very useful in directing proactive steps to help keep this species from declining to the point of federal intervention. Inclusion of golden eagle on the Utah Sensitive Species list will allow the State to provide comments and recommendations during the planning stage of renewable and other energy development, which will be imperative in preventing the decline of this species.

### **Economic Impacts of Sensitive Species Designation**

Sensitive species designation is intended to facilitate coordinated management of this species, which is required to comply with the Bald and Golden Eagle Protection Act, to develop robust environmental assessments, and to lessen the potential for economic impacts. Further declines in Utah populations would trigger increased management and development compliance costs across a wide range of industries and activities, but mostly in the energy sector (fossil fuels and renewables alike).

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