

Scientific and Educational Purposes

Scientific Research and Monitoring

Greater sage-grouse are the subject of many scientific research studies and monitoring efforts. We were aware of well over 50 studies ongoing or completed since 2010. Eight of the 11 western States where sage-grouse currently occur and Alberta, Canada reported some type of field studies that included the capture, handling, and subsequent banding, or banding and radio-tagging of sage-grouse. These activities have the potential to negatively impact sage-grouse directly and indirectly.

In 2005, the overall direct mortality rate due to the capture, handling, and/or radio-tagging process was calculated at approximately 2.7 percent of the birds captured (68 mortalities of 2,491 captured). A survey of State agencies, BLM, consulting companies, and graduate students involved in sage-grouse research was conducted for the Service's 2010 Finding. Results indicated little change in direct handling mortality since 2005. Since 2010 reported direct mortality from capture and handling remains low. For example, Idaho reported 14 capture-related mortalities among 1,606 birds (0.8 percent) trapped and radio-collared from 2010 to 2014.

Researchers have long been aware of potential indirect impacts (e.g., altered behavior, reduced survival) from radio transmitters and various marking methods on wildlife which can bias research results. Changes in technology have likely reduced but not eliminated this potential for sage-grouse. Early transmitters used on sage-grouse were relatively heavy (5 percent or more of a bird's body mass) and during the 1970s to the early 1980s were attached using a type of backpack harness that was later shown to increase the vulnerability of birds to predation (Amstrup 1980, p. 214; Connelly *et al.* 2003, p. 32). The methods now most commonly used to mark and track adult and juvenile sage-grouse include metal leg bands and battery-powered radio transmitters attached around the bird's neck by a necklace usually made of plastic-coated cable. Necklace radio transmitters can have negative impacts to individuals when not attached properly, potentially resulting in suffocation or starvation. Impacts to males are likely different than those for females because males perform elaborate mating displays that involve the swelling of neck and breast tissues. Recent research showed that the use of necklace radio-transmitters on male sage-grouse altered male behavior (lek attendance) during the breeding season (Gibson *et al.* 2013, p. 773). Based on these results, Wyoming no longer permits necklace collaring of male sage-grouse (WYGD 2015, p. 253). Lek attendance of females with necklace radio transmitters does not appear to be affected (Walsh *et al.* 2004, p. 63). Additionally, radio collars do not appear to alter flushing behavior of sage-grouse; altered flushing behavior could increase vulnerability to predation (Frye *et al.* 2014, p. 436).

Solar-powered, global positioning system (GPS) satellite transmitters, a more recently developed technology, are now being used on sage-grouse with increasing frequency. The use of GPS transmitters provides information on bird locations multiple times per day and reduces the logistical problems and potential disturbance associated with tracking birds. These transmitters cannot be attached on the neck, but instead are positioned on the rump of the bird and secured with a leg-loop harness. Because of their similarity to backpack-style transmitters used in the past, there are questions about their impact on sage-grouse (CDOW 2013, p. 48).

Despite the potential for negative impacts to individuals from handling and marking, information gained through these methods has directly benefited the species. Information on the location and characteristics of seasonal habitats essential for sage-grouse persistence continues to be collected and used to inform

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conservation plans for sage-grouse. State conducted annual leks counts provide invaluable information on population status, trends, and population response to disturbance. In recognition of the importance of research to sage-grouse conservation, the 2013 Greater Sage-grouse Conservation Objectives Team (COT) Final Report identified the following as an important conservation objective: Prioritize, fund, and implement research to address existing uncertainties.

Translocations

Greater sage-grouse have been translocated in ~~multiple~~^{several} U.S. States and ~~the~~^{several} Canadian Provinces ~~of British Columbia~~ (Reese and Connelly 1997, p. 235; [Alberta Environment and Sustainable Resource Development 2013, p. viii](#)). ~~Reese and Connelly (1997, pp. 235–238) documented the translocation of Over~~ 7,200 birds ~~were translated~~ between 1933 and 1990 ([Reese and Connelly 1997, p. 235 – 238](#)). Only 5 percent of the translocation efforts documented by Reese and Connelly (1997, p. 240) were considered to be successful in producing sustained, resident populations at the translocation sites. From 2003 to 2005, 137 adult female sage-grouse were translocated to Strawberry Valley, Utah and had a 60 percent annual survival rate (Baxter *et al.* 2006, p. 182).

Since 2004, ~~Oregon and Nevada have supplied~~^{translocation efforts moving sage-grouse to} the State of Washington ~~with 75 sage-grouse have occurred~~ to increase the genetic diversity of the geographically isolated Columbia Basin populations (MZ VII). Since 2006, ~~15528~~ sage-grouse (from Nevada, Oregon, and Wyoming) were translocated to the Yakima Nation in an effort to reestablish birds to a portion of historical range ([Yakama Nation 2015](#))([WDFW 2014, p. 8](#)). ~~Sage-grouse were translocated to Yakima Training Center. A sage-grouse augmentation project from 2004 – 2007 introduced 62 sage-grouse from Oregon and Nevada into the Yakima Training Center population (White 2013, p. 9), with an additional 10 females translocated from southern Idaho to the Yakima Training Center in 2014 (Schroeder et al. 2014, p. 8).~~ In 2008, Washington Department of Fish and Wildlife, in cooperation with the U.S. Bureau of Land Management, initiated a project to reintroduce greater sage-grouse to the Swanson Lakes Wildlife Area in Lincoln County, Washington. The goal of the project was to establish a third population in MZ VII. From 2008 to 2014, 240 sage-grouse were translocated from southern Oregon to the Washington release site and their movements, productivity, habitat use, and survival have been monitored. All birds are banded with a unique numbered metal band; all hens and a subset of males receive necklace-mounted, battery-powered radio transmitters (predicted duration of 24 months) prior to release. Two birds died prior to release, and as anticipated annual mortality for translocated birds is higher than for resident birds (WDFW 2014, pp 17, 21). Translocated birds have now established a lek and successful nests have been documented (n=27, from 2009-2013). The population, however, is still too small to be considered viable and future translocations are planned.

As of 2012, 38 female and 3 male sage-grouse have been translocated from a genetically similar population in Montana to Alberta, Canada ([Alberta Environment and Sustainable Resource Development 2013, p. viii](#)). ~~Monitoring of the translocated birds with satellite telemetry units is underway. Monitoring of the translocated birds using telemetry is underway, however, the average mortality rate of translocated sage-grouse over 3 years was 36.2 percent from 2011 – 2013 (Alberta Environment and Sustainable Resource Development 2014, p. 6).~~ This project is in direct response to the steep population decline. Translocation is considered an

emergency measure to attempt to prevent extirpation of sage-grouse in Alberta (Alberta Environment and Sustainable Resource Development 2013, p. viii).

Given the low numbers of birds that have been used for translocation spread over many decades and taken from multiple trapping locations, it is unlikely that the removals from source populations have contributed to sage-grouse declines, while the limited success of translocations also has likely had nominal impact on rangewide population trends. Translocations in MZ VII and Canada, however, may be critical for population persistence.

Use for Educational purposes

Lek viewing is occasionally occurs for educational purposes. Lek viewing is limited and does not likely have any measurable impact on sage-grouse (See Recreation).

Literature Cited

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