



Greater Sage-grouse Translocations: The Science Behind Utah's Conservation Policy

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Wildlife translocations are a direct management action used to either restore extirpated or augment declining wildlife populations. In Utah, the Division of Wildlife Resources (UDWR) and their partners have translocated a variety of wildlife species which range from big game species such as mule deer (*Odocoileus hemionus*), moose (*Alces alces*), bighorn sheep (*Ovis canadensis*), and mountain goats (*Oreamnos americanus*) to smaller species such as quail (*Callipepla* spp.), wild turkey (*Meleagris gallopavo*), and greater sage-grouse (*Centrocercus urophasianus*; sage-grouse).

A study published in 1997 about sage-grouse locations reported that over 7,200 sage-grouse had been translocated across the range of the species (Reese et al. 1997). These translocations occurred in New Mexico, Oregon, Montana, Wyoming, Utah, Colorado, Idaho, and British Columbia. The authors estimated that only 5-12% of all these translocation efforts had been successful. Of these, only efforts in Colorado, Idaho, and Utah were reported to be successful, with Utah reporting more success than any other western state. Since the 1997 study, additional translocations have now occurred in California, Washington, Alberta, Utah, and North Dakota. This continued use of translocations raises questions regarding the best management practices for sage-grouse translocations, their effectiveness, and their role in long-term conservation of the species.

Translocation History in Utah

The first sage-grouse translocations in Utah occurred in 1976 when 48 females and their chicks were moved from Wayne County to San Juan County. Between 1987 and 1990, 43 birds were translocated by UDWR biologists from Uintah and Carbon Counties to Sevier County. In 2003, the UDWR, Brigham Young University (BYU), and the U.S Forest Service (USFS) partnered in a long-term study and translocation effort to restore the sage-grouse populations in the Strawberry Valley Sage-grouse Management Area (SGMA) located in Wasatch County in northcentral Utah. Between 2003 and 2008, these cooperators translocated 336 female sage-grouse from Diamond Mountain in the



Utah Division of Wildlife and Utah State University biologists release sage-grouse at dawn on the Sheeprocks Sage-grouse Management Unit. Photo Credit: UDWR

Uintah SGMA, Deseret Land and Livestock in the Rich SGMA, the West Box Elder SGMA, and Parker Mountain SGMA to the Strawberry Valley SGMA (Baxter et al. 2013).

In 2009-2010, the UDWR partnered with Utah State University (USU), the U.S. Forest Service (USFS), and Berry Petroleum LLC to translocate 60 female sage-grouse from the Parker Mountain SGMA to Anthro Mountain (Gruber-Haden et al. 2016, Duvuvuei et al. 2017). Most recently, in 2016, the UDWR, partnered with USU, the USFS, the West Desert Adaptive Resources Management Local Working Group, and the Bureau of Land Management to translocate sage-grouse to the Sheeprock Mountains SGMA from the Parker Mountain and West Box Elder SGMAs as part of a comprehensive management strategy to reverse the a decade long population decline. Since 2016, 30 male and 90 female sage-grouse have been translocated (Chelak and Messmer 2017). In addition to the translocations, the partners have implemented management projects to improve and restore habitats and remove potential predators.

How Do We Translocate Sage-grouse?

All of the sage-grouse translocations completed in Utah since 2003 have followed the same general protocols. The sage-grouse to be translocated are captured on their leks at night from March – May using all-terrain vehicles, spotlights, and long handled nets near active leks (Connelly et al. 2003). At the time of capture, researchers take a number of measurements including weight, age, and sex of the birds. Feathers are collected from translocated grouse for genetic analysis. Captured sage-grouse are fitted with either very-high frequency (top photo) or global positioning system radio-transmitters (bottom photo) at the capture location to monitor translocated bird movements, nest and brood success, and survival. Radio-marked birds are then placed into individual boxes and moved overnight to their release sites. The release sites are within 200 yards of an active lek, and the birds are released at sunrise when resident birds are most active on the lek.

What We Have Learned: Demographics

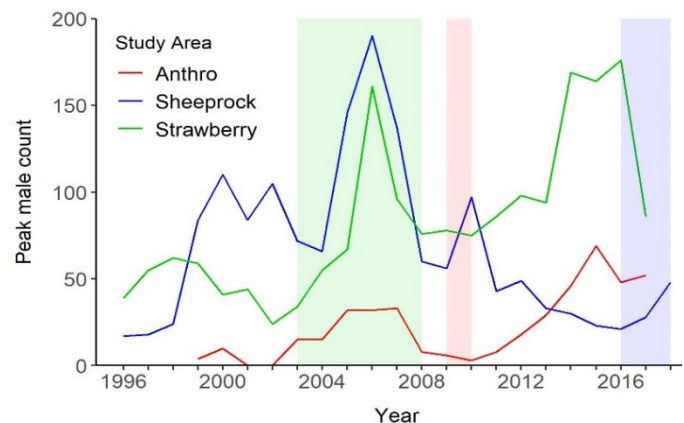
All of the sage-grouse translocations in Utah appear to be successful except for the San Juan County translocation. This translocation may have failed because the sage-grouse population in San



Photo credits: UDWR

Juan County was subsequently recognized as a unique species. Generally, the research suggests it may take 3 to 5 years after the initial translocation into resident populations to stabilize and reverse the population declines. Researchers believe this lag time may be attributed to translocated birds unfamiliarity with new area. If the newly translocated birds survive through the first year post-release, they exhibit survival and nesting success rates similar to resident birds. These observations suggest the need to monitor translocated populations for 2 or more years post-translocation to fully understand the success of these efforts.

The graph below shows the highest number of males counted for the Strawberry Valley and Sheeprock Mountains SGMAs, and Anthro Mountain between 1996 and 2018. Each of the



sage-grouse populations in these areas were declining, thus prompting the translocations. The Strawberry Valley SGMA translocations occurred from 2003 to 2008 during which 336 female sage-grouse were translocated (light green bar; Baxter et al. 2013). The Anthro Mountain translocations consisted of 60 female sage-grouse; 30 in 2009 and 30 in 2010 (light red bar; Gruber-Hadden et al. 2016, Duvuvuei et al. 2017). The Sheeprock Mountain SGMA project translocated 120 sage-grouse (90 females and 30 males) from 2016 to 2018 (light blue bar).

What We Have Learned: Genetics

The Strawberry Valley SGMA translocations provide the best information to date on the effect of sage-grouse translocations on population growth and genetics. This population declined from more than 3,000 individuals in the 1930s to approximately 150 in 1998, creating a genetic bottleneck that may have led to reduced survival and reproductive output. Following the translocations, researchers at BYU demonstrated increased (16 – 25%) genetic diversity validating the use of sage-grouse translocations as an effective tool for increasing population size and genetic diversity.

It is important to note, however, that although translocations are a valuable tool for restoring declining populations, sage-grouse translocations in Utah and in neighboring states may also complicate range-wide genetic analyses that are currently underway. These analyses are attempting to provide better information regarding genetic connectivity so that managers are better able to identify and subsequently conserve critical areas that serve as hubs of genetic exchange between populations. However, due to the success of translocations in Utah and elsewhere, genetic connectivity analyses may suggest a population is highly connected when in reality, it is geographically and genetically

isolated but received translocations that contribute to the false impression of high genetic connectivity.

What Do Translocations Mean for the Future of the Species in Utah?

The science is clear that translocations in concert with adaptive management can reverse sage-grouse populations in Utah. However, it has been suggested that Utah translocations may be more successful than other states simply because our populations occupy more isolated islands of habitat surrounded by non-habitat. This geographic isolation of populations across the landscape may have prevented translocated birds from moving back to capture sites following release and contributed to or higher success compared to other states. Regardless, translocations have demonstrated they are an important component of the State of Utah's sage-grouse conservation strategy.

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