

Wildlife Management – Overview of White Papers Provided by WAFWA

Augmenting Populations

Translocations

- Sage-grouse translocations have been attempted since the 1930s by wildlife agencies to augment populations
 - Approximately 56 translocations have been attempted moving around 7,200 individuals
 - Some success observed in Idaho, Utah and Colorado
 - Largely unsuccessful due to high adult mortality post-release, significant migration from release site (often back from where it was captured) due to high site fidelity, and females often have very low nest initiation and success rates
 - Selecting high quality site locations, those with natural boundaries to deter emigration, and artificial insemination or translocating females early during the lekking period increases chances of success

Captive breeding and rearing

- Sage-grouse have been hatched, reared, and bred successfully in captivity
- Eggs collected from wild grouse are larger and have a higher chance of hatching
- Brood-rearing in captivity has not been very successful
- One study has looked at releasing captive reared juvenile sage-grouse to the wild
 - Chicks were younger than 5 days old
 - Chicks had a high adoption rate
 - However, locations of radio-collared females with broods are required to successfully release chicks to the wild, which results in small scale projects that are not feasible to scale up to large projects
- One study raised Gunnison sage-grouse to 5-7 weeks post-hatch and released to the wild, however they all died
- The number of wild collected eggs and number of captive or wild caught adults in captivity would be substantial, primarily due to higher mortality associated with captive (wild and captive reared) adult and juvenile sage-grouse, reduced hatchability, and reduced chick survival
- More research and technique development will be needed to establish an effective captive, breeding program for sage-grouse

In conclusion, translocations and captive breeding and release have been successful but are going to face significant challenges if the underlying conditions causing population declines are not addressed in conjunction with these methods.

Predator Control

- Predator control programs can result in short term benefits, but unless constant control is established long term success will be limited
- Predator control during nesting season has been shown to improve nest success. In some populations this vital rate could be at a critically low level where predator control would be effective during this season
- Predator control following translocations may increase survival of translocated individuals due to their increased probability of depredation
- Likely to have significant public opposition to lethal predator control
- Long term application of the reduction of anthropogenic subsidies should be considered in tandem with other predator control methods

***Response to secretarial order focuses on how localized predation can impact small, isolated Sage-Grouse populations; however ravens can affect expansive, intact Sage-Grouse populations over larger geographic regions.**

Population Targets

- Population goals typically used for species of economic importance (big game species), for conservation reliant species (endangered species with recovery plans), or when recreational demand exceeds or creates demand (game farms or release of game species such as pheasant or trout)
- A mixed population and habitat based approach is usually employed
- As sage-grouse are becoming a conservation reliant species, a population based management approach could benefit its management
- However, these goals could not be achieved without proper habitat management and restoration range wide
- This approach is only feasible if accurate population estimates can be obtained, and sage-grouse present a difficult species to obtain accurate population estimates
- Currently, research and modeling is being conducted range wide to develop a platform where state agencies can estimate population size. This is expected to be completed within the next year or two

Hunting

- State's manage sage-grouse hunting conservatively
- Mortality from hunting is primarily compensatory and not likely to increase mortality rates as a whole for a given population
- Hunters are important supporters of conservation and a source of information when state agencies assess population dynamics from harvested birds

Topics Specific to Nevada to Provide Additional Guidance to S.O. 3353

Triggers

Coates, P.S., Prochazka, B.G., Ricca, M.A., Wann, G.T., Aldridge, C.L., Hanser, S.E., Doherty, K.E., O'Donnel, M.S., Edmunds, D., and Espinosa, S. 2017. Hierarchical population monitoring of greater sage-grouse (*Centrocercus urophasianus*) in Nevada and California – identifying populations for management at the appropriate spatial scale: U.S. Geological Survey Open-File Report 2017-1089, 49 p., <https://doi.org/10.3133/ofr20171089>.

- Hierarchical and spatially nested monitoring framework for estimating annual rates of population change (λ)
- Framework is structured to accomplish three objectives:
 - Allows for partitioning of local compared to regional effects; this can help identify the appropriate scale for management actions
 - Incorporates temporal thresholds, so multiple years of declines are required before management action is taken, this prevents random demographic stochasticity or inaccurate lek counts during a year
 - Quantifies the duration and magnitude of decline at the identified spatial scale; this will help inform when and where to apply actions
- Analysis based on a cluster lek analysis where populations are grouped based on landscape and climatic characteristics that influence spatial connectivity between populations
- Developed three scales: individual lek, a neighborhood cluster, and a climate cluster
- Used 17 years of lek data (2000–2016)
- Three step evaluation process: threshold, warnings, signals
 - Thresholds – describe population declines
 - Destabilizing – identify significant population decline at a particular nested scale
 - Decoupling – identify when rates of population decline at a local scale detrend significantly from median rates of population change at a larger spatial scale
 - Warnings
 - Slow or fast warnings activate if both destabilizing and decoupling threshold are crossed
 - Signals
 - When a temporal threshold is crossed – several consecutive years of warnings have occurred
- Results from Nevada analysis
 - Soft signals were activated across 17 leks and 7 neighborhood clusters

- Hard signals were activated across 5 leks and 0 neighborhood clusters
 - Sage grouse populations have declined by 3.86% annually over 17 years
- This approach aims to target management actions at the appropriate scale and guards against implementing actions misaligned with the size of disturbances driving local populations.
- Prevents misinterpretation of observed patterns as it accounts for both spatial and temporal scales where management may be unsuccessful

Lek Buffers

The CCS provides full habitat function for habitat within 6km of a lek and extends out to 10km. This is based on research identifying that Sage-grouse breeding habitat is spatially tied to lek locations; the majority of females breeding on a given lek nest within 3.73 miles (6 kilometers) of that lek (Colorado Greater Sage-grouse Steering Committee 2008). However, a portion of the female population will move farther than 3.73 miles (6 kilometers) from a lek to nest (Holloran and Anderson 2005, and see Doherty et al. 2011). The HQT therefore modifies breeding habitat function based on distance to closest known lek as follows: map units within 3.73 miles (6 kilometers) of a lek receive a score of 1.0 followed by a decline between 3.73 and 6.21 miles (6 and 10 kilometers) from a lek, map units farther than 6.21 miles (10 kilometers) from a known lek receive a score of 0.25 (Figure 9). The distance to lek score is multiplied by all other local-scale attribute scores to calculate overall local-scale habitat function for breeding habitat. In addition, Coates et al. (2013) identified that about 90% of total space-use (Utilization Distribution) of sage-grouse in Nevada during all seasons was identified within 5km of leks. However, significant use exceeded 8km. They recommended optimal surface use designation to be between 5 and 7.5 km depending on the migratory status of the population.