

## **DIRECTION ON APPLYING THE SAGE GROUSE GUIDELINES IN RELATION TO FIRE AND HERBACEOUS HIDING COVER**

The guidelines to manage sage grouse populations and their habitats were published by The Wildlife Society (Connelly et al. 2000). They are available on the Internet at NDOW.ORG or SAGEMAP and in print from Nevada Division of Wildlife (775-688-1914). The guidelines are "GUIDELINES" they are not standards. The guidelines are group of criteria that were based on the best available data regarding conservation of sage grouse and management of habitat. Most of it was published in scientific literature or came from graduate theses. The guidelines were designed, when used with local expertise and common sense, to provide the best management prescriptions for sage grouse populations and habitats. As stated in the guidelines:

*"Thus, state and federal natural resource agencies and private landowners must coordinate efforts over at least an entire seasonal range to successfully implement these guidelines. Based on current knowledge of sage grouse population and habitat trends, these guidelines have been developed to help agencies and landowners effectively assess and manage populations, protect and manage remaining habitats, and restore damaged habitat. Because of gaps in our knowledge and regional variation in habitat characteristics (Tisdale and Hironaka 1981), the judgment of local biologists and quantitative data from population and habitat monitoring are necessary to implement the guidelines correctly. Further, we urge agencies to use an adaptive management approach (Macnab 1983, Gratson et al. 1993), using monitoring and evaluation to assess the success of implementing these guidelines to manage sage grouse populations."*

### **FIRE:**

Wildfire is generally recognized as one of the major plant community disturbance factors prior to European contact in Nevada (Miller and Eddleman 2000, Miller and Rose 1999, Miller and Wigand 1994). Although fire has been instrumental in the development and maintenance of Great Basin sagebrush communities over time, the fire intervals and fire intensity under natural conditions varied greatly between the different sagebrush communities. Historically and under natural conditions (pre-settlement) fire performed essential functions relative to the conditions of sagebrush communities including providing variable age and structural diversity and plant species composition, influencing community health by conversion of late seral stands to earlier seral stages, probably resulting in lowered risks of catastrophic impacts associated with insects and diseases, and reducing the occurrence of catastrophic wildfire. Fire intervals and fire intensity are functions of fuel loads, climatic factors, topographic characteristics and the composition of fuels in the plant community.

The incidence of fire in sagebrush communities varies considerably depending on the type of sagebrush community. It ranges from insignificant and extremely rare (low sagebrush) to highly significant and frequent (mountain and basin big sagebrush). Although fire kills most sagebrush taxa, the influence of fire also varies. It can completely kill sagebrush over wide areas, making sagebrush reestablishment very slow or virtually impossible in some areas. Whereas in other areas, highly patchy or mosaiced burns with long islands or peninsulas leave unburned shrubs that provide abundant seed for reestablishment after fire removes competition from neighbors.

Today however, the landscape has been modified and many of the factors and impacts associated with the once natural occurrence of fires in these communities have significantly changed (Crowley and Connelly 1996, Knick and Rottenberry 1997, USDI Bureau of Land Management 1999 Miller and Tausch 2001). These conditions and impacts need to be considered when prescribing fire as a sage grouse habitat management tool. The Guidelines caution about the use of prescribed fire, and that caution is echoed in this guidance. Fire is not good or bad; fire under specific conditions can be used to achieve certain land use objectives, but it can also prevent reaching certain land use objectives if used improperly. Accumulation of fuels in the absence of fire (or other disturbances) and the risk of conversion of burned areas to invasive exotic species can similarly prevent reaching many land use objectives.

Different sagebrush communities and areas of the State vary significantly in their response to fire and other disturbances because of differences in precipitation, soils, site productivity and their present plant community (especially in regard to the density and diversity of perennial herbaceous plants, including bunchgrasses and forbs). Thus in evaluating community responses to disturbances and/or management treatments, it is critical to apply locally relevant science-based information, scientific studies or quantitative data to create site specific objectives and specific action plans.

The following direction is to assist in conservation planning efforts relative to the use of prescribed fire in the sagebrush communities of Nevada.

#### I. General Direction

The use of prescribed fire in sagebrush communities should only be used with a high degree of caution. However, the long-term exclusion of disturbance, including fire, from these types can lead to overly mature and/or decadent conditions. Landscape, Statewide and National fire control policies have exacerbated this problem. Therefore, both prescribed fire and fire exclusion should be planned at the site-specific level. Some land management approaches lead to accumulation of woody fuels and/or promote the conversion to highly flammable fine fuels

such as cheatgrass. These approaches lead to a high fire risk, especially at a landscape level and should not be practiced.

Specific needs and habitat objectives must be well defined prior to determining the proper tool for achieving the objectives on specific ecological sites and for broad landscapes encompassing many seasonal habitats. On broad landscapes, fragmentation and/or continuity relative to past disturbances should influence objectives and management. This process must include the assessment of the site condition and the identification of the causative agent(s) if less than desirable conditions occur.

Fire should not be the tool of choice in any sagebrush habitats where the conditions would cause fire to lead to invasion and domination by cheatgrass and/or other exotic invasive weeds. Local ecological knowledge and observations must be applied to make this determination. Pilot projects with follow-up monitoring or research should be done to enhance technologies and our understanding for management of these threatened sites. Weed control and follow up must be planned components of vegetation management projects if noxious weeds are on site or nearby.

Where sage grouse are occupying habitat, fire should be used only as a last resort when it is determined to be the best tool available to meet specific habitat objectives. And then, because of nest site area fidelity, only used on a very small scale when in occupied sage grouse nesting/early brood rearing habitat. In areas where nesting/early brood rearing habitats overlap other seasonal sage grouse habitats, management should focus on providing for characteristics associated with quality nesting/early brood rearing habitat.

In occupied winter habitats fire should only be used as a last resort in late seral sagebrush stands with the desired plant community objective of re-establishing the sagebrush community. An example of such use could be to provide fuel breaks to prevent wildfire from taking large areas or large proportions of locally available winter habitat. Planning the size, shape, and appropriate management tools (e.g. greenstripping) in these situations must consider the availability of intact sagebrush stands remaining in close proximity to the treatment allowing appropriate wintering habitat for local birds.

Mechanical, chemical or biological techniques should be considered where vegetation management is needed yet fire is not a viable or preferred option. Mechanical treatments include chaining, brush beating, root plowing, imprinting or crushing, and hand cutting or thinning. Chemically based methods for vegetation management include herbicidal

weed control, low-rate use of herbicides to thin sagebrush or the use of herbicides to clear shrubs or trees in strips or small patches. Biological vegetation management includes biological weed control with insects, or selective herbivory by adjusting the kind or class of livestock or the season or intensity of their grazing. These techniques are the subject of other publications or may be the subject of future information leaflets.

All uses of prescribed fire, or any other vegetative treatment, must be accompanied by appropriate post-treatment management and a vegetation monitoring strategy designed to clearly assess accomplishment of objectives. Sage grouse response should also be monitored when practicable.

Sagebrush communities with canopy cover between 15-25 percent and containing a perennial herbaceous cover approaching the composition, cover and diversity of the ecological site potential should be a high priority for wildfire suppression and other protective actions such as greenstripping. These areas should not be considered for any vegetation treatments unless it is clear that the perennial herbaceous vegetation is declining under present management and that simply making a change in management will not retain habitat quality.

## II. Low sagebrush Types

Because low sagebrush types in Nevada are highly susceptible to fire mortality, and because these types with little production (low sagebrush and usually black sagebrush) did not burn frequently under historic conditions, fire should usually not be used in low sagebrush types. Exceptions occur where these sites are relatively more productive (such as the calcareous 12-14 ecological site) and they are threatened by invasion of pinyon or juniper trees. Even there, alternative treatments should be considered first.

## III. Wyoming sagebrush Types

Wyoming sagebrush is readily killed by fire. The Wyoming big sagebrush communities in Nevada most commonly occur in lower elevation and drier sites that are subject to cheatgrass invasion and domination. Most of these areas have lost most of their native perennial herbaceous understory and fire would leave open niches for rapid explosion of cheatgrass. Fire should not be used in these areas as a management tool. Fire in these areas should only be used on a strictly experimental basis unless restoration and reseeding is the objective.

Some Wyoming big sagebrush occurs at the upper elevations in transition with mountain big sagebrush, and may not be threatened by cheatgrass domination. If sage grouse only marginally occupy such habitat, fire may be used cautiously to achieve specific objectives. Because of the seed dispersal characteristics of sagebrush species, prescribed burns should be narrow enough to allow for natural seed dispersal and recovery of the burned area unless reseeding is planned.

Where the perennial understory of bunchgrasses and forbs is not dense enough to compete successfully with cheatgrass, reseeding is necessary after fire. These burned areas must be reseeded with adapted species of shrubs, perennial grasses and forbs during the first fall or winter after wildfire.

#### IV Mountain and Basin Big Sagebrush Types

As a result of higher elevation, deeper soils, and more effective moisture, most mountain and basin big sagebrush communities were adapted to more frequent fire intervals. As fire played a more significant role in the maintenance of these big sagebrush communities, fire may be a more appropriate tool in these communities. However, use caution in planning and implementing prescribed fire or other vegetation treatments and follow the guidance provided above under general direction.

#### IV. Sagebrush Sites Invaded by Pinyon and/or Juniper Trees

Pinyon pine and juniper trees typically spread onto adjacent sagebrush sites but do not persist after the area burns. In the absence of a natural fire regime, the trees continue to grow. Sage grouse then lessen their use of these areas. As the trees grow, they come to dominate the site and their competitive use of soil moisture excludes or severely diminishes shrubs and native perennials on many ecological sites. As the understory vegetation fades away, the capability of the vegetation to respond favorably to fire diminishes.

Treating this problem early allows a wide array of vegetation management tools, prescribed fire, hand clearing or killing individual trees, mechanical methods, or herbicides. Killing or at least thinning pinyon and/or juniper trees releases

understory vegetation. Killing the trees after the native perennial understory has been lost requires reseeding a perennial plant community and shrubs. This is both more expensive and more dependent on seeding methods and weather conditions.

Not treating this problem leads to continued loss of sage grouse habitat as:

1. New adjacent areas become encroached,
2. Accumulation of woody fuels continues,
3. Risk of landscape scale uncontrollable wildfires increases,
4. Risk of repeated fires increases in the highly flammable annual vegetation like cheatgrass that dominates after a wildfire where the perennial understory was lost,
5. Risk of invasion by other exotic invaders increases, and
6. Ultimately cost increases.

### **PERENNIAL HERBACEOUS COVER:**

Hiding cover is important to nesting success because many predators eat eggs and young chicks. Hiding cover becomes even more important when or where predator populations increase to abnormal levels. There has been much consternation and confusion over the “7 inch stubble height” issue. The sage grouse guidelines do not use the term “stubble height”, but are talking about perennial herbaceous cover. These two terms, stubble height and perennial herbaceous cover, are not the same. The scientific literature summarized in Connelly et. al. (2000) indicate that sagebrush canopy cover and composition, as well as the cover and diversity of perennial herbaceous species in the understory are significantly important to sage grouse nesting success. They recommended a range of 15 – 25 percent sagebrush canopy cover and a perennial herbaceous canopy cover composition of 15% grasses and 10% forbs with an average height of 18 cm (approximately 7 inches). These conditions correlated with higher nesting success than habitats with lesser structural characteristics. **The significance of this assessment is that sage grouse require sagebrush community structure in both the canopy and the understory to enhance nesting success.** It is suggested that these structural characteristics provide overhead and lateral concealment from predators and may also provide scent and physical barriers to potential predators.

The guidelines (Connelly et al. 2000) state, ...”local biologists and range ecologists should develop height and cover requirements that are reasonable and ecologically defensible.” Therefore, the following direction provides help to local groups, agencies, and others for developing site-specific plans for meeting perennial herbaceous cover and height requirements. Such requirements are vital for conservation of sage grouse and management of sagebrush communities in Nevada.

#### I. General Direction

In areas where nesting/early brood rearing habitat overlap other seasonal sage grouse habitats, management should focus on providing characteristics associated with quality nesting/early brood rearing habitat.

Ecological site potentials vary considerably in Nevada sagebrush communities. Furthermore, the plant communities and/or soils in many areas have crossed an ecological threshold to new communities of plant species (states) that will not relinquish their domination without focused investment. Therefore, the broad application of understory height objectives is not recommended across all sites and areas where sagebrush once grew. However, with the application of local ecological knowledge, data, or research, and use of the ecological site descriptions, an understory height objective often provides focus for management. This is especially so, for those areas likely to provide the majority of nesting habitat. This type of objective then guides management planning. It must be fit into monitoring protocols and be within the responsible parties' abilities to implement and monitor.

To develop habitat objectives for nesting habitat areas, consider the sage grouse guidelines, present vegetation, site potential based on the ecological site description and other relevant factors such as legally authorized land uses and the habitat needs of other species. Then, develop desired plant community composition and structure objectives consistent with the multiple needs. Recognize that the desired plant community described by these objectives may be different than objectives stated previously or in future plans as the vegetation goes through plant succession. Understory (excluding seed stalks) height characteristics of 7 inches or more may not be possible or practicable in all ecological sites or habitat areas. However, they clearly are possible and practical in many areas, especially under the dripline of sagebrush with suitable structure for nesting habitat. Habitat objectives for nesting/early brood rearing habitats should describe sagebrush conditions and understory composition.

Monitoring of perennial herbaceous cover objectives could emphasize key areas within important and representative nesting or potential nesting habitat. Furthermore, in a local key area, the monitoring of herbaceous cover could be done by monitoring utilization or residual forage levels set as appropriate for the health of the local plant community

Where habitat condition objectives are not being met, including habitat areas where utilization levels are too high for their season or type of use, local groups should consider adjusting livestock grazing seasons, periods of use, periods of rest and/or deferment, stocking rates, kind and class of livestock, and distribution of use (by adjusting salting and watering locations, livestock handling techniques, season of use, etc.). This approach can provide for habitat enhancement and helps maintain authorized utilization levels. Concentrated livestock use can be used as a vegetation management tool.

However, caution should be used in project planning to not create persistent livestock overuse areas where important sage grouse habitat occurs.

Wild horse and burro AML should be established and/or modified where habitat objectives are not being met due to use by these animals.

Big game management should focus on herd reduction strategies or big game habitat improvement projects when these animals utilize sage grouse habitats to a level preventing attainment of vegetation management objectives.

In areas where the above actions are implemented to achieve specific habitat objectives, monitoring strategies for adaptive management must be implemented to check for if attainment of objectives was successful or not.

When utilization levels or other management strategies are implemented to achieve understory composition and cover objectives, that monitoring should include sage grouse nesting success (such as by observing local chick to hen ratios or other scientifically accepted methods). Appropriate site-specific correlations may be determined for future application in management.

The application of the above recommendations is most appropriately applied at a site-specific planning level, e.g. allotment evaluation and multiple use decision or land use planning effort. Because some to many of the population management units or other planning areas will not have been through such a process, the conservation plan should, at a minimum, adopt a strategy or process for applying the above recommendations.

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