



Mule Deer Working Group Fact Sheet

HABITAT CONVERSION BY WILDFIRE AND INVASIVE SPECIES Fact Sheet #22

OVERVIEW

Many large ungulates, including mule deer, tend to thrive after natural disturbances (e.g. wildfires) that reset plant communities to early stages of succession. However, the introduction of invasive species has changed the natural cycle for ecosystems with dire consequences for mule deer habitat. Increasingly, after wildfires today, native shrub and grass communities are being replaced by invasive plants such as cheatgrass (*Bromus tectorum*), red brome (*Bromus rubens*), medusahead (*Taeniatherum caput-medusae*), mesquite (*Prosopis* spp), and others. This phenomenon scientist's term "habitat type conversion" or simply "type conversion". The altered landscapes resulting from these large-scale habitat conversions may not provide the necessary nutritional requirements for healthy mule deer populations, and can lead to more frequent fires that further degrade habitat quality and displace wildlife.



An example of a native sagebrush stand (left) at high risk for take-over by cheatgrass and wildfire and a past burn site (right) with a monoculture of cheatgrass in late spring/early summer.

ALTERED FIRE REGIMES AND INVASIVE SPECIES

Throughout many regions of the western U.S., wildfires have grown larger and are occurring more frequently in shrub-steppe habitats fueled, in part, by invasive species such as cheatgrass. Invasive species are non-native plants that grow fast and outcompete native species for soil moisture and nutrients. Further exacerbating the problem, many invasive species cure quickly and create "fine fuels" during the hot and dry fire season, which results in more frequent fires in future years. For example, natural fire return intervals in the Great Basin sagebrush communities have been reduced from historic cycles of 60–110 years to 3–5 years in annual grasslands. Native vegetation may take decades to recover naturally or may not recover at all without management intervention. Factors contributing to the spread of invasive weeds and annual grasses on public lands include: increased recreational use of motorized and non-motorized vehicles; grazing and movements by both domestic livestock and wild ungulates; and surface disturbing activities associated with mineral and energy development.

NUTRITION EFFECTS

Mule deer must have high quality forages to meet their nutritional requirements. Habitats that provide those requirements typically are early to mid stage successional communities such as sagebrush (*Artemisia* spp.) shrublands and mountain shrublands or those that have a rich diversity of plant communities providing diets high in digestible protein and metabolizable energy (e.g., bitterbrush, *Purshia tridentata*). Mule deer require a diversity of plants for both forage and cover to conserve body

fat levels for survival during harsh winters. When native habitats are converted to invasive weeds and annual grasses, vast monocultures of less palatable and less nutritious plant species dominate the landscape resulting in reduced carrying capacity.

RESTORATION EFFORTS

For many habitat types, disturbance such as fires, avalanches, floods, or moderate levels of herbivory are a necessary part of the natural processes that can move plant succession to early phases, thereby helping to create nutritious forage for mule deer. Research suggests some vegetation communities may be less resilient to habitat conversion, while others may be more resistant.



However, a major concern with certain types of disturbance is that irreversible damage and reduced productivity occurs. In those circumstances, land managers might consider restoring ecological function by planting other cover types that provide some nutritional value, or cultivars of native species (e.g. sandberg bluegrass, *Poa secunda*) that are resistant to competition with annuals. Timing of reseeding efforts can also play a crucial role in the success of restoration efforts. Generally, reseeding should occur soon after fires and during periods of consistent moisture (e.g. in the Great Basin ecosystem between autumn and late spring). Livestock grazing should be avoided post-fire for 2-3 growing seasons to allow plant communities time to recover.

CONCLUSIONS AND RECOMMENDATIONS

Wildfire and invasive species represent one of the greatest threats to mule deer populations in the western U.S. Land managers, wildlife managers, and the public must continue to proactively engage in activities to reduce the spread of invasive weeds if mule deer populations are to be sustained at or near current populations. Some management actions that can reduce the threat of habitat type conversions include the following:

- Using post-fire recovery strategies that include reseeding with desirable plant species to maintain soil stability, provide forage, and minimize the risk of type conversion
- Strategically applying chemical control and herbicides such as Imazapic, glyphosates, or rimsulfurons, or using other approaches (e.g., biological controls) as new technology develops
- Managing off-road use by recreational vehicles in high risk areas to minimize spread of seeds
- Promoting education programs designed to reduce spread of invasive weeds
- Creating “green-strips” in high risk area for wildfires and cheatgrass invasion
- Hand planting desirable shrub species such as bitterbrush and sagebrush seedlings
- Timing restoration efforts immediately after disturbance and during seasons with consistent moisture patterns using the best management practices
- Restricting livestock grazing for 2-3 growing seasons to protect recovering landscapes

More information on mule deer can be found at www.muledeerworkinggroup.com

*A product of the Mule Deer Working Group - Sponsored by the Western Association of Fish & Wildlife Agencies.
Produced with support from the Mule Deer Foundation (www.muledeer.org) - January 2017*