Conservation Objectives Team Report Threat Characterizations for Montana Greater Sage-Grouse Populations

Threats per COT Report	N. MT	Powder River Basin	Yellowstone Watershed	Wyoming Basin	SW MT	Belt Mtns.
Fire Fire (both lightning-caused and human-caused fire) in sagebrush ecosystems is one of the primary risks to the greater sage-grouse, especially as part of the positive feedback loop between exotic invasive annual grasses and fire frequency. As the replacement of native perennial bunchgrass communities by invasive annuals is a primary contributing factor to increasing fire frequencies in the sagebrush ecosystem, every effort must be made to retain and restore this native plant community, both within and outside of PACs. **Conservation Objective:** Retain and restore healthy native sagebrush plant communities within the range of sage-grouse.	L	L	L	L	L	L
Non-native, Invasive Plant Species The increase in mean fire frequency has been facilitated by the incursion of nonnative annual grasses, primarily Bromus tectorum and Taeniatherum asperum, into sagebrush ecosystems (Billings 1994; Miller and Eddleman 2001). Exotic annual grasses and other invasive plants also alter habitat suitability for sage-grouse by reducing or eliminating native forbs and grasses essential for food and cover (75 FR 13910, and references therein). Annual grasses and noxious perennials continue to expand their range, facilitated by ground disturbances, including wildfire (Miller and Eddleman 2001), improper grazing (Young et al. 1972, 1976), agriculture (Benvenuti 2007), and infrastructure associated with energy development (Bergquist et al. 2007). Management of this threat is two-pronged: (1) control, or stopping the spread of invasive annual grasses, and (2) reduction or elimination of established invasive annual grasses. These activities should be prioritized in all sagebrush habitats, both within and outside of PACs because once established, invasive annual grasses are extremely difficult to control. **Conservation Objective:** Maintain and restore healthy, native sagebrush plant communities.	L	**Y**	**Y**	L	**Y**	**Y**
Energy Development The increasing demand for renewable and non-renewable energy resources is resulting in continued development within the greater sage-grouse range, resulting in habitat loss, fragmentation, direct and indirect disturbance. Development results in sage-grouse population declines. **Conservation Objective:** Energy development should be designed to ensure that it will not impinge upon stable or increasing sage-grouse population trends.	**Y**	**Y**	**Y**	**Y**	L	L

Threats per COT Report	N. MT	Powder River Basin	Yellowstone Watershed	Wyoming Basin	SW MT	Belt Mtns.
Sagebrush Removal The intentional removal or treatment of sagebrush (using prescribed fire, or any mechanical and chemical tools to remove or alter the successional status of the sagebrush ecosystem) contributes to habitat loss and fragmentation, a primary factor in the decline of sage-grouse populations. Removal and manipulation of sagebrush may also increase the opportunities for the incursion of invasive annual grasses, particularly if the soil crust is disturbed (Beck et al. 2012). Although many treatments are often presented as improving sage-grouse habitats, data supporting the positive impacts of sagebrush manipulation on sage-grouse populations is limited (Beck et al. 2012). **Conservation Objective:** Avoid sagebrush removal or manipulation in sage-grouse breeding or wintering habitats. Exceptions to this can be considered where minor habitat losses are sustained while implementing other habitat improvement or maintenance efforts (e.g., juniper removal) and in areas used as late summer brood habitat (Connelly et al. 2000). Appropriate regulatory and incentive-based mechanisms must be implemented to preclude sagebrush removal and manipulation for all other purposes.	L	L	L	L	L	L
Grazing Livestock grazing is the most widespread type of land use across the sagebrush biome (Connelly et al. 2004) and almost all sagebrush areas are managed for livestock grazing (Knick et al. 2003). Improper livestock management, as determined by local ecological conditions, may have negative impacts on sage-grouse seasonal habitats (75 FR 13910 and references therein), and management to enhance populations of wild ungulates may also have negative impacts (e.g. removal of sagebrush overstory in an attempt to increase forage production for wild ungulates). **Conservation Objective:** Conduct grazing management for all ungulates in a manner consistent with local ecological conditions that maintains or restores healthy sagebrush shrub and native perennial grass and forb communities and conserves the essential habitat components for sagegrouse (e.g. shrub cover, nesting cover). Areas which do not currently meet this standard should be managed to restore these components. Adequate monitoring of grazing strategies and their results, with necessary changes in strategies, is essential to ensuring that desired ecological conditions and sage-grouse response are achieved.	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**

Threats per COT Report	N. MT	Powder River Basin	Yellowstone Watershed	Wyoming Basin	SW MT	Belt Mtns.
Range Management Structures Structures which support range management activities can have negative impacts on sage-grouse habitats by increasing fragmentation (e.g., fences and roads) or diminishing habitat quality (e.g., concentrating ungulates in winter habitats). Typical range management structures include fences, water developments and mineral licks. As fences can be both a positive and negative impact on sage-grouse and their habitats, depending on their location and use, they are addressed in a separate section below. **Conservation Objective:** Avoid or reduce the impact of range management structures on sagegrouse.	NR	NR	NR	NR	NR	NR
Free-Roaming Equid Management (NA)	N	N	N	N	N	N
Pinyon-juniper Expansion Greater sage-grouse are negatively impacted by the expansion of pinyon and/or juniper in their habitats, even if the underlying sagebrush habitats remain (Freese et al. 2009). Sage-grouse avoid these areas of expansion (Casazza et al. 2010), and as the pinyon and/or juniper increases in abundance and size, the underlying habitat quality for sage-grouse diminishes. **Conservation Objective:** Remove pinyon-juniper from areas of sagebrush that are most likely to support sage-grouse (post-removal) at a rate that is at least equal to the rate of pinyon-juniper incursion. Treatments to remove pinyon and/or juniper trees in phase 1 (trees present but shrubs and herbs are the dominant vegetation that influence ecological processes) and phase 2 (trees are codominant with shrubs and herbs and all three vegetation layers influence ecological processes; Miller et al. 2008) state of incursion should match the rate of incursion (minimally 200,000 acres per year; Stiver et al. 2006). Removal should be prioritized by seasonal habitats, based on the habitat that is locally limiting populations. Removal techniques should not include prescribed fire in low elevation, xeric sagebrush communities. Pinyon and/or juniper removal activities should focus initially on areas within PACs, but all opportunities to remove this threat should be considered if resources are available.	N	L	L	L	L	L

Threats per COT Report	N. MT	Powder River Basin	Yellowstone Watershed	Wyoming Basin	SW MT	Belt Mtns.
Agricultural Conversion Agricultural conversion is typically defined as the conversion of sagebrush habitats to tilled agricultural crops or re-seeded exotic grass pastures, resulting in habitat loss and fragmentation. Agricultural conversion can also be the conversion of conservation (e.g., those enrolled in the Conservation Reserve Program (CRP) or State Acres for Wildlife Enhancement (SAFE)) when such lands are providing important habitat components for sage-grouse. This type of conversion could be detrimental to sage-grouse in areas where the birds depend on these interim successional habitats (such as in Washington). C**onservation Objective:** Avoid further loss of sagebrush habitat for agricultural activities (both plant and animal production) and prioritize restoration. In areas where taking agricultural lands out of production has benefited sage-grouse, the programs supporting these actions should be targeted and continued (e.g. CRP/SAFE). Threat amelioration activities should, at a minimum, be prioritized within PACs, but should be considered in all sage-grouse habitats.	L	N	**Y**	N	N	**Y**
Mining Surface mining and appurtenant facilities within sage-grouse habitats result in the direct loss of habitat, habitat fragmentation, and indirect impacts from disturbance (e.g., noise, dust). Current reclamation activities do not always consider sage-grouse habitat needs. Those that do may take decades to restore habitats and experience the same limitations as restoration activities. Surface facilities supporting underground mining activities can have similar impacts. **Conservation Objective:** Maintain stable to increasing sage-grouse populations and no net loss of sage-grouse habitats in areas affected by mining. Reclamation of mined lands within sage-grouse habitats should be focused on restoring habitats usable by sage-grouse, and the re-establishment of sage-grouse in these areas.	N	**Y**	N	L	L	N
Recreation Recreational activities within sage-grouse habitats can result in habitat loss and fragmentation (e.g., creation of off-road trails, camping facilities) and both direct and indirect disturbance to the birds (e.g., noise, disruptive lek viewing, hunting dog trials, and dispersed camping). **Conservation Objective:** In areas subjected to recreational activities, maintain healthy native sagebrush communities based on local ecological conditions and with consideration of drought conditions, and manage direct and indirect human disturbance (including noise) to avoid interruption of normal sage-grouse behavior. Threat amelioration for recreation should be implemented in PACs, but considered in all sagegrouse habitats.	L	**Y**	L	**Y**	L	L

Threats per COT Report	N. MT	Powder River Basin	Yellowstone Watershed	Wyoming Basin	SW MT	Belt Mtns.
Ex-Urban Development Ex-urban development (dispersed homes on small acreages) results in direct habitat loss, habitat fragmentation, and the introduction of invasive plant species. Urban and exurban activities also increase the presence of predator subsidies (e.g., trash, landfills, bird feeders) allowing for increased predators associated with humans that may have disproportionate impacts on greater sage-grouse (e.g., red fox, skunks, raccoons). Additionally, pets may have negative impacts on sage-grouse through direct predation or disturbance (e.g., chasing birds). Infrastructure associated with exurban development (e.g., powerlines, roads) also results in habitat loss and fragmentation, subsidies for avian predators such as ravens, and possible disturbance to sagegrouse. Moreover, concentration of hobby livestock on small acreages can result in habitat loss and the introduction of invasive annual grasses and weeds. **Conservation Objective:** Limit urban and exurban development in sage-grouse habitats and maintain intact native sagebrush plant communities.	N	L	N	L	L	L
Infrastructure Development of infrastructure for any purpose (e.g., roads, pipelines, powerlines, and cellular towers) results in habitat loss, fragmentation, and may cause sage-grouse habitat avoidance. Additionally, infrastructure can provide sources for the introduction of invasive plant species and predators. **Conservation Objective:** Avoid development of infrastructure within PACs.	**Y**	**Y**	**Y**	**Y**	L	L
Fences Fences can be deleterious to sage-grouse populations and habitats, with threats including habitat fragmentation and direct mortality through strikes (Stevens et al. 2012). Fences can improve habitat conditions for sage-grouse (e.g. by protecting riparian areas providing brood-rearing habitats from overgrazing). The assessment of the impact or benefit of fences must be made considering local ecological conditions and the movement of sage-grouse within local areas (Stevens et al. 2012). **Conservation Objective:** Minimize the impact of fences on sage-grouse populations.	NR	NR	NR	NR	NR	NR

L = Present but localized; Y = Present and widespread; N = Threat is not known to be present; NA = Not applicable; NR = Not rated