

Redundancy = A species' ability to withstand catastrophic events, spreading the risk.
Resiliency = A species' ability to withstand environmental or demographic stochasticity.
Representation = A species' ability to adapt to changing environmental conditions over time.

Impact Summary Table

IMPACT	MZ	MECHANISM	SUMMARY 2010	Δ SUMMARY 2015	2015
Fire			<i>Summary of determination category (e.g. Threat, Not a threat) goes here</i>	<i>Summary of determination category (e.g. Threat, Not a threat) goes here</i>	FIRE
					Scope:
					Magnitude:
					Timing:
					Redundancy:
					Resiliency:
					Representation:
Invasive Plants / Annual Grasses					INVASIVE PLANTS
					Scope:
					Magnitude:
					Timing:
					Redundancy:
					Resiliency:
					Representation:
Conifer					CONIFER ENCROACHMENT

IMPACT	MZ	MECHANISM	SUMMARY 2010	Δ	SUMMARY 2015	2015
Encroach.						Scope:
						Magnitude:
						Timing:
						Redundancy:
						Resiliency:
						Representation:
Agricultural Conversion	I IV VI		<p>Estimated 10% historic losses due to ag conversion.</p> <p><input type="checkbox"/> Direct loss of habitat, indirect impacts of predation, disturbance</p> <p><input type="checkbox"/> Estimated ¾ of all habitat directly or indirectly impacted</p> <p><input type="checkbox"/> Greatest losses in MZ I, IV, and VI</p> <p><input type="checkbox"/> Some conversion continues, but rate in 2010 and into the future is unknown.</p>			AGRICULTURAL CONVERSION
						Scope:
						Magnitude:
						Timing:
						Redundancy:
						Resiliency:
						Representation:
Nonrenewable Energy						NONRENEWABLE ENERGY

IMPACT	MZ	MECHANISM	SUMMARY 2010	Δ	SUMMARY 2015	2015
Development						Scope:
						Magnitude:
						Timing:
						Redundancy:
						Resiliency:
						Representation:
Mining		<ul style="list-style-type: none">• Habitat Destruction• Roads / Powerlines Footprints• Overburden (tailings)• Noise• Direct Collisions with Vehicles / Nest Crushing• Fences		IMPACTS INDIVIDUALS, MAY IMPACT SOME POPULATIONS		MINING
			Note: No definitive summary statement in 2010 Finding)	Localized impacts where minerals are located. Regulatory: Federal agencies have discretionary authority over most mineral exploration and production; Federal agencies have little discretionary authority over locatable minerals & notice–level activities. Range-wide - direct footprints from mineral mining vary locally or regionally from very large to very small; But indirect effects are potentially large. Difficult to predict future mining use with precision, but generally mining production has remained amazingly stable for the last decade. Future mining impacts to sage-grouse will be primarily determined by the location of the minerals with the range.		Scope
						Magnitude:
						Timing:
						Redundancy:
						Resiliency:
						Representation:

IMPACT	MZ	MECHANISM	SUMMARY 2010	Δ	SUMMARY 2015	2015
					Mining will continue to provide incremental impacts to sage-grouse populations or regional groups of populations and their habitat, and to interact with other impacts (e.g., energy development, infrastructure development, etc.)	
Renewable Energy Development						RENEWABLE ENERGY
						Scope:
						Magnitude:
						Timing:
						Redundancy:
						Resiliency:
Infrastructure						Representation:
						INFRASTRUCTURE
						Scope:
						Magnitude:
						Timing:
						Redundancy:

IMPACT	MZ	MECHANISM	SUMMARY 2010	Δ	SUMMARY 2015	2015
						Resiliency:
						Representation:
Fences	All	<ul style="list-style-type: none">• Injury and death due to collisions• Risk variable depending on topography, proximity to leks, fence design• Presence of fences can increase predation risk• Creates predator perches• Fragments habitat	THREAT	IMPACTS INDIVIDUALS, NOT POPULATIONS	FENCES	
			<ul style="list-style-type: none">• We grouped fences with roads, communication towers, and powerlines under Infrastructure, which concluded that linear structures:<ul style="list-style-type: none">○ Encouraged presence of raven;○ Fragmented habitat; and○ Contributed to destruction, modification, curtailment of habitat.	<ul style="list-style-type: none">• New science shows fence marking can reduce collision by ~83% but it is unlikely to eliminate it.• Population level repercussions of reduced collisions not well understood.• Fence Collision Risk Tool available to identify high risk areas.• No new science on indirect threats from fences.• We lack 1) demographic data to know whether populations can compensate for mortality via increased productivity, 2) data on proportional mortality of male and female grouse, and 3) data on fence location and density across the species range.• No evidence to indicate that fences impact more than individual sage-grouse.	Scope: Rangewide	
					Magnitude: Individuals	
					Timing: Year-round	
					Redundancy:	
					Resiliency:	
			Representation:			
Grazing and Rangeland Management					GRAZING AND RANGELAND MANAGEMENT	
					Scope:	
					Magnitude:	
					Timing:	

IMPACT	MZ	MECHANISM	SUMMARY 2010	Δ	SUMMARY 2015	2015
						Redundancy: Resiliency: Representation:
Free-Roaming Equids	II III V	Can seriously degrade sage-grouse habitat at local scales: Decreasing grass cover; Fragmenting shrub canopies; Altering soil characteristics; Decreasing plant diversity; Degrading riparian areas; Increasing probability of invasive species incursion Forage differently than cattle: Forage longer Crop vegetation closer to the ground Populations can increase 15 to 20% annually.	POTENTIAL FOR POPULATION-LEVEL IMPACTS			FREE-ROAMING EQUIDS
			2010 36,000 free-roaming equids occurred in 10 Western States on BLM-managed lands. Impact 12% of the sage-grouse's range. Free-roaming equid population on BLM-managed lands was 134% of the recommended maximum appropriate management level (AML). Grazing has the potential for population-level impacts. Conservation Two horse gathers (2,957 equids) were reported. 13,919 acres of brood-rearing areas were fenced to exclude equids.	57,000 free-roaming equids occur on BLM- and FS-lands. Impact 12% of the sage-grouse's current range; However, actual impact may be much higher Current population is double the recommended AML and increasing. Nevada is home to half of the free-roaming equids. MZs II, III, V are more heavily impacted than in other MZs. BLM is limited in management options to control equid populations Without additional management actions by BLM, FS, and other entities, the impact of free-roaming equids will increase.		Scope:
						Magnitude:
						Timing:
						Redundancy:
						Resiliency:
						Representation:
Urban and			THREAT		IMPACTS	URBANIZATION

IMPACT	MZ	MECHANISM	SUMMARY 2010	Δ	SUMMARY 2015	2015
Exurban Development			urban/exurban development, contribute individually and collectively to the present and threatened destruction, modification, and curtailment of sage-grouse habitat and range.		Since the 2010 12-month finding, the NRCS has enrolled more than 450,000 ac within the species’ current range in permanent conservation easements, protecting these lands from future development. Urban and exurban development directly impact anywhere from approximately 0.2% to 1% of the various management zones. Approximately 0.4% of the species’ current habitat is impacted rangewide. Urban/exurban development is considered the primary stressor to the Eagle-South Routt and Middle Park sage-grouse populations in Colorado (Wyoming Basin MZ 2). However, we conclude that, by itself, urban/exurban development is not a threat at a management zone or rangewide scale. Urban/exurban development exacerbates several other stressors including: infrastructure, fences, predation, invasive species, and recreation.	Scope:
						Magnitude:
						Timing:
						Redundancy:
						Resiliency:
						Representation:
Recreation	All	<ul style="list-style-type: none">Habitat Degradation – vegetation alteration, garbage, invasive speciesFragmentation – trails, roads, campgroundsDisturbance to individuals<ul style="list-style-type: none">Noise and movementIncreased predatorsMortality from crushing or collisions	NO CHANGE	NO CHANGE	IMPACTS INDIVIDUALS <ul style="list-style-type: none">Recreational use impacts from lek viewing are negligibleRecreational activities in GRSG habitat occurs across the range, unlikely that these have large-scale impacts on GRSG populationsBLM and FS plans will likely play role in reducing impact of OHVsNo major changes since 2010.	RECREATION
			Scope: Rangewide, but often concentrated in specific areas, such as trails and campgrounds.			
			Magnitude: Limited severity.			
			Timing: Occurs year-round. Temporary duration.			
			Redundancy:.			
			Resiliency:			
			Representation:			
					CLIMATE CHANGE	

IMPACT	MZ	MECHANISM	SUMMARY 2010	Δ	SUMMARY 2015	2015
Climate Change						Scope:
						Magnitude:
						Timing:
						Redundancy:
						Resiliency:
						Representation:
Drought		Natural occurrence throughout the GRSG range Impacts magnified when natural event is combined with other stressors Can result in increased loss of sagebrush, forbs, and grasses, reduced insect production, and potential exacerbation of WNV infections				DROUGHT
				Future impacts to GRSG from drought are likely to increase from climate change and increasing demand for water. Since 2010, climate models have continued to predict increased drought risk, including potential for decade and multidecadal scale drought within the GRSG range Difficult to completely ameliorate drought impacts, through proper grazing and water management reduces impacts on GRSG. Current levels of drought unlikely to have large-scale impacts on GRSG populations, but increased drought severity and duration, combined with additional stressors may result in impacts on populations in the future, especially within the southern Management Zones.		Scope: Rangewide
						Magnitude:
						Timing:
						Redundancy:
						Resiliency:
						Representation:

IMPACT	MZ	MECHANISM	SUMMARY 2010	Δ	SUMMARY 2015	2015
Hunting		Direct mortality.			IMPACTS INDIVIDUALS, MAY IMPACT SOME LOCAL POPULATIONS	HUNTING
						Scope:
						Magnitude:
						Timing:
						Redundancy:
						Resiliency:
						Representation:
Scientific and Education Purposes						SCIENTIFIC USE
						Scope:
						Magnitude:
						Timing:
						Redundancy:
						Resiliency:
						Representation:

IMPACT	MZ	MECHANISM	SUMMARY 2010	Δ SUMMARY 2015	2015
Disease	All	<ul style="list-style-type: none"> High mortality, very low resistance Greatest impacts to small, isolated populations Occurrence influenced by temperature, mosquito breeding habitat, precipitation 	NO CHANGE	IMPACTS INDIVIDUALS, SOME SMALL ISOLATED POPULATIONS	DISEASE
			NO CHANGE	<ul style="list-style-type: none"> WNV is not currently a significant, rangewide threat to sage-grouse. No change since 2010. WNV will remain a localized threat to sage-grouse, esp. small, isolated populations Other threats to sage-grouse could exacerbate impacts of WNV in the future 	Scope: Rangewide, but localized, especially in small, isolated populations. Not widespread.
					Magnitude: High mortality when infected, but localized.
					Timing: July – September transmission season
					Redundancy: Sufficient population redundancy across the range to withstand localized outbreaks
					Resiliency: Multiple populations spread across the range to withstand stochastic, or spatially isolated outbreaks.
Predation					Representation:
					PREDATION
					Scope:
					Magnitude:
					Timing:
					Redundancy:
					Resiliency:

IMPACT	MZ	MECHANISM	SUMMARY 2010	Δ	SUMMARY 2015	2015
						Representation:
Small Populations						SMALL POPULATIONS
						Scope:
						Magnitude:
						Timing:
						Redundancy:
						Resiliency:
						Representation:
Contaminants		<p>Direct exposure can cause mortality, abnormal behavior, and increased risk of predation of individuals</p> <p>Exposure of GRSG habitat may result in: increased loss of sagebrush, forbs, and grasses, reduced insects, and degraded water sources</p>	NOT A THREAT NO CHANGE		IMPACTS INDIVIDUALS	CONTAMINANTS
			<p>2010: Identified as continuing indefinitely, but no evidence that contaminants resulted in local or range-wide declines</p>		<p>Conservation Proper placement and management of sources of contaminants (oil and gas, agriculture, infrastructure, development, wildfire) outside of GRSG habitat</p> <p>Current Impacts individuals sporadically at a local scales Unlikely that contaminants cause widespread mortality or declines in sage-grouse populations across management zones (MZ).</p>	Scope: Rangewide, but Sporadic.
						Magnitude: Localized, low severity
						Timing: Sporadic, temporary duration
						Redundancy:
						Resiliency:
						Representation:

IMPACT	MZ	MECHANISM	SUMMARY 2010	Δ	SUMMARY 2015	2015
Military Activities						MILITARY ACTIVITIES
						Scope:
						Magnitude:
						Timing:
						Redundancy:
						Resiliency:
						Representation: