



Greater Sage-grouse Status Review

Urban & Ex-Urban Development

The Impact

Urban Development

- Densely developed residential, commercial, industrial, & other built up areas
- Residential density of > one unit/ac

Exurban Development

- Urban fringe and rural residential development
- Residential density of one unit/1-40 ac



Location / Extent

- Dispersed unevenly across the range
- Primarily including (but not limited to) areas of the Columbia River Valley (WA; MZ VI), Snake River Valley (ID; MZ IV), and the Bear River Valley (UT; (MZ II; Connelly *et al.* 2004)

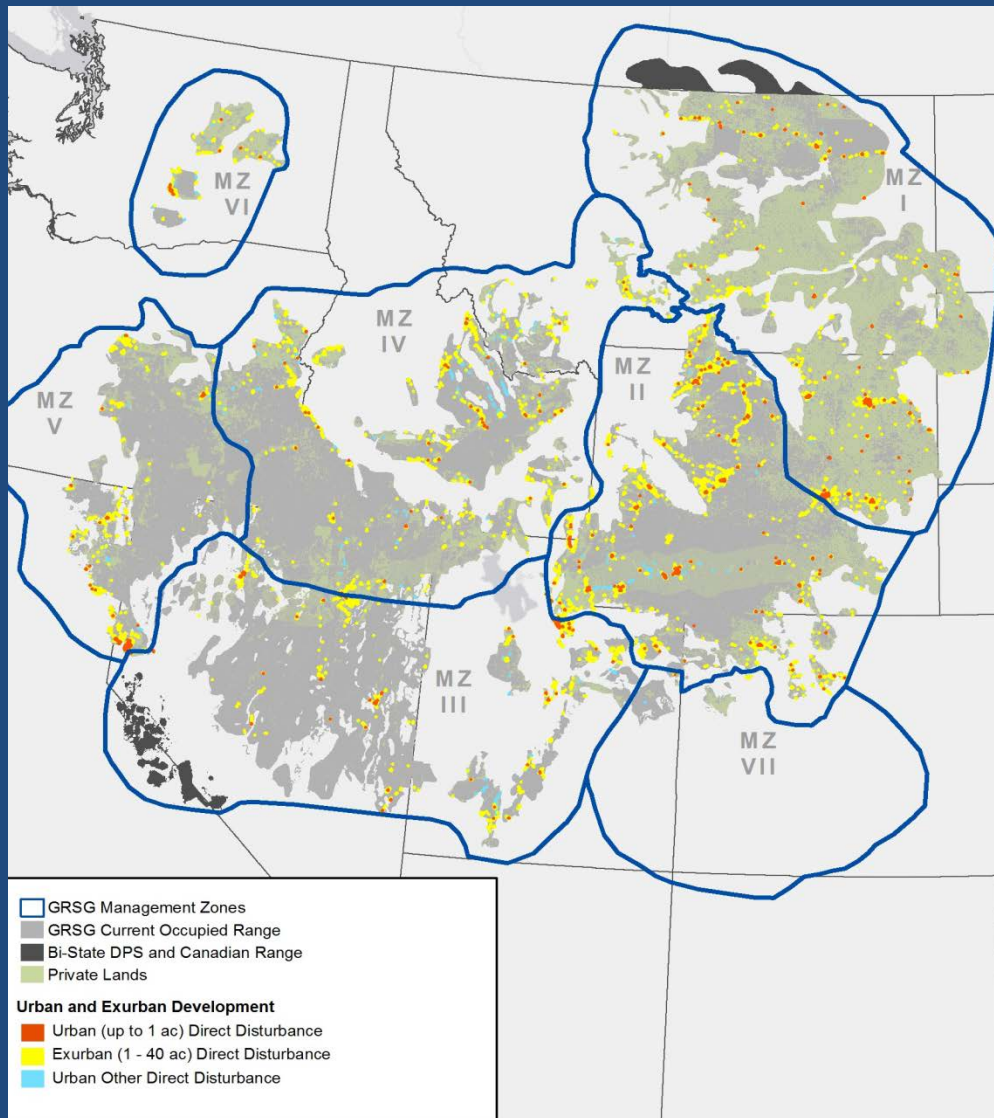
Impact	Modeled Breeding Distribution	
Urban & Ex-Urban	Direct (ac)	Potential Indirect Area of Influence (ac)*
Urban (<1 ac)	2,286	-
Ex-Urban (1-40 ac)	71,067	-
Other Urban	3,143	-
Total	76,696	353,259**

* A 3.0-km buffer was applied to quantify the potential indirect area of influence, specifically where increased predator (corvid) densities may exist (Bui *et al.* 2010).

** All indirect areas of influence were combined



Location / Extent



Impacts to Sage-Grouse

Urban Development

- Intensive impact (eliminates habitat)
- Urban footprint doubled from 1950-2000 (Brown *et al.* 2005)
- Permanent & increasing impacts

Exurban Development

- More diffuse (modifies, fragments, or eliminates habitat), but nearly 8x more land affected than urban
- Exurban footprint increased five-fold from 1950-2000 (Brown *et al.* 2005)
- Permanent & increasing impacts



Impacts to Sage-Grouse

- Direct habitat loss and fragmentation
- Increased human activity and additional anthropogenic structures may attract additional predators to the area which may forage into sage-grouse habitats (Bui *et al.* 2010)
- The aforementioned structures and activities may impact use patterns and demographics while not directly eliminating seasonal habitats
- Sage-grouse avoid anthropogenic development and increased density could result in loss of leks and/or seasonal use (Aldridge and Boyce 2007, Wisdom *et al.* 2011, Knick *et al.* 2013)



Since 2010...

- Largely restricted to private land (Knick et al. 2011)
- Populations continue to increase

Conservation

- NRCS/SGI has enrolled 451,884 acres within the current occupied sage-grouse range in permanent conservation easements
- Rangewide, potentially >1,000,000 acres enrolled in similar easements (pending evaluation)
- CCAAs on private lands



Summary

- 2010: concluded that urban/exurban development, agriculture, infrastructure, fire, invasives, pinyon–juniper encroachment, grazing, energy development, & climate change all contribute individually & collectively to the present & threatened destruction, modification, & curtailment of habitat & range.
- Likely a population-level impact, not affecting sage-grouse rangewide, although urban and ex-urban development exacerbates several other stressors including: infrastructure, fences, predation, invasive species, & recreation.
- We conclude that while impacts from urbanization are not universal across the range, local areas of impacts have been realized and additional impacts are anticipated.

