Appendix L

Baseline Disturbance Inventory

APPENDIX L
BASELINE DISTURBANCE INVENTORY

INTRODUCTION

The purpose of the baseline disturbance inventory is to quantitatively assess the location, magnitude, and extent of existing surface disturbance to Greater Sage-Grouse (GRSG) habitats and populations in Utah. Understanding these factors and being able to compare differences between areas across the Utah sub-regional planning area provides overarching biological information that informs planning. Baseline disturbance information provides the decision maker with the information needed to understand more site-specific conditions and the environmental consequences of land-use planning decisions.

Therefore, we collected geospatial data representing the disturbances to GRSG as identified by scientific research and outlined in the 2010 US Fish and Wildlife Service listing decision. We measured the impacts to mapped occupied GRSG range and populations through applying buffer distances representing the footprint associated with most surface disturbing activities.

METHODOLOGY

Geospatial data were acquired for all threats identified in the US Fish and Wildlife Service listing decision that can be represented spatially. These data were acquired, as available, from both internal (BLM and Forest Service) and external sources. All data were considered the best available at the time of data collection. Data compiled from other sources were the most current available based on the supplying office, agency, or organization. Additionally, mineral materials, coal, locatable minerals, and phosphate polygons and portions of transmission and telephone lines were digitized using satellite imagery and the BLM's Master Title Plats. After data collection was complete and new features were digitized, input datasets were preprocessed. Preprocessing steps included buffering, dissolving, merging and other formatting tasks. Buffers were developed for each resource based on the amount of disturbance typically associated with their respective authorizations. Finally, all datasets were clipped to the mapped occupied range within named GRSG population areas and sorted by the population areas for analyses.

ASSUMPTIONS AND LIMITATIONS

The data and information included here were the most accurate available at the time of analysis; however, these data and associated risk assessments remain based in present knowledge. Spatial data informing these analyses were compiled to establish a consistent information and analytical basis across the Utah sub-regional planning area. This analysis takes into consideration all lands within Utah's mapped occupied range, including areas of non-habitat, potential habitat, and existing habitat. Wyoming lands in the analysis area and their estimated disturbances can be explored in the Baseline Environmental Report (Manier et al. 2013). The threats and their respective areas of influence can be found in **Table L.1**, Area of Influence by Decision Threat.

Table L.1
Area of Influence by Decision Threat

FWS Listing Decision Threat	Estimated Disturbance
Oil and Gas Wells	3 acres
Coal Mines	Polygon Area/Actual Footprint
Locatable Minerals	Polygon Area/Actual Footprint
Mineral Materials	Polygon Area/Actual Footprint
Roads	8 - 240.2 feet
Railroads	30.8 feet
Power lines	12 - 90 feet
Communication Towers	2.5 acres
Telephone lines	12 feet
Phosphate Mines	Polygon Area/Actual Footprint

Certain threats were omitted from the analysis due to lack of detailed information or absence in mapped occupied range. Pipelines were not included due to the non-inclusion of construction years in the national dataset. While areas that have been previously disturbed by pipelines may not have regained their habitat value, based on limitations in the data, we are unable to identify whether successful reclamation has occurred. Threats such as solar, wind, and geothermal are not found in the analysis since they are not present in mapped occupied range. Additionally, agriculture and urbanization were not taken into consideration as part of the baseline disturbance inventory. However, these were accounted for in the EIS when estimating the amount of habitat available or percent sagebrush on the landscape.

In addition, the buffer distances in this analysis include the following assumptions:

- Road buffers for primary and secondary roads were determined using the BLM Manual 9113 as a reference.
- Transmission line disturbance is equal to the width of the cross-arm for all datasets that were acquired from internal and external sources. Cross-arm widths typically differ by line size and were determined using NEPA related transmission documents such as Sigurd to Red Butte, Transwest Express, and Energy Gateway West EISs.

- Digitized transmission and telephone lines were given a buffer distance equal to that of a 138 kV line under the assumption that they were not large enough to include in earlier datasets.
- Remaining disturbances that were not digitized (oil and gas wells, railroads, communication towers) and their buffers are associated with the area of influence distances stated in the Baseline Environmental Report (Manier et al. 2013).

The baseline disturbance inventory is an analysis tool that allows the BLM to compare and contrast the impacts of the alternatives. The information presented in this document will not be used for plan implementation. During plan implementation disturbance will be calculated and monitored as described in **Appendix C**, Greater Sage-Grouse Monitoring Framework.

DISTURBANCES IN POPULATION AREAS

Geospatial analysis conducted using individual data layers indicates that presently, all population areas are under 3 percent disturbance with the state's total disturbance at 0.9 percent (64,115 acres). While all population areas are under the 3 percent disturbance cap, one individual sub-unit, Gordon Creek, located within the Carbon Population Area exceeded the disturbance threshold with 3.7 percent. Percent Disturbance for all population areas, including notable sub-units can be found in **Table L.2**, Percent Disturbance in Occupied Range by Population Area.

Table L.2
Percent Disturbance in Occupied Range by Population Area

Population Area	Disturbance Acres	Percent Disturbance
Uintah	21,940	1.4%
3 Corners/Browns Park	936	1.0%
Diamond Mountain	7,060	2.4%
Blue Mountain	460	0.8%
Deadman's Bench	3,430	2.5%
East Bench	2,849	2.5%
Book Cliffs	1,944	0.7%
Halfway Hollow	2,701	1.0%
South Slope Uintah	2,319	0.9%
Carbon	6,989	1.4%
Anthro	1,000	1.2%
West Tavaputs	746	0.7%
Emma Park	2,382	1.4%
Gordon Creek	1,946	3.7%
Scofield	915	1.2%
Emery	495	0.5%
Parker Mountain	6,665	0.8%
Panguitch	3,972	1.2%
Bald Hills	4,231	1.2%
Hamlin Valley	1,095	0.8%
Sheeprocks	6,446	0.8%
Ibapah	536	0.6%

Table L.2
Percent Disturbance in Occupied Range by Population Area

Population Area	Disturbance Acres	Percent Disturbance
Box Elder	3,855	0.4%
Rich	7,961	0.6%
Strawberry	697	0.4%
Lucerne	144	0.4%
Utah Statewide	**65,031**	**0.9%**

Over 85 percent of the disturbances consisted of oil and gas wells, transmission lines, and roads. Roads are the most common disturbance throughout mapped occupied range. All population areas, except Carbon, have roads as the largest disturbance with an average of 58 percent when the population area is excluded. With 17 percent of the total disturbance statewide, oil and gas wells are the dominant disturbance in the Carbon population area, accounting for more than 36 percent of its total. **Table L.3**, Percent Disturbance by Decision Threat, breaks down each disturbance discussed. The additional 0.71 percent of disturbance in the total represents areas of overlap.

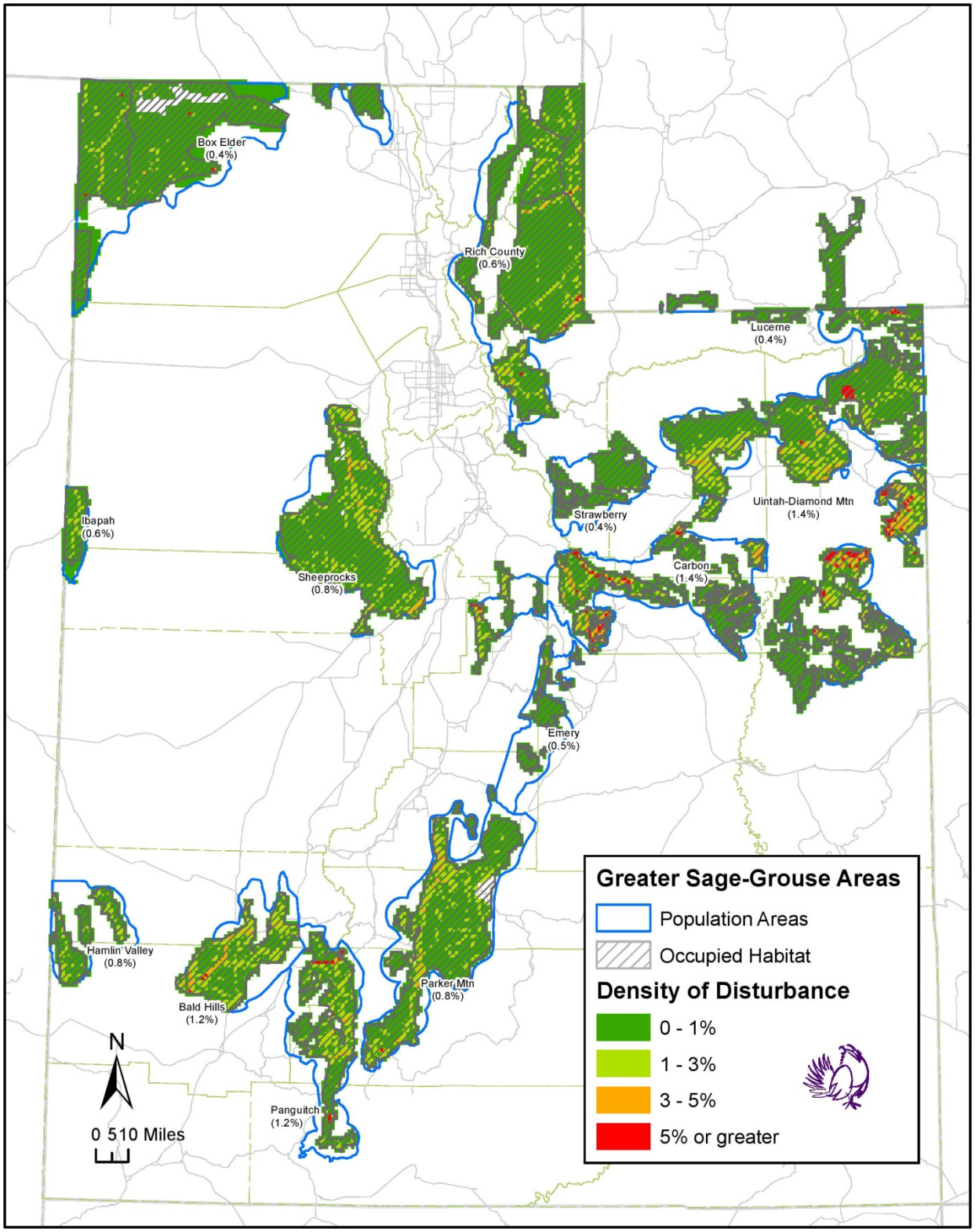
Table L.3
Percent Disturbance by Decision Threat

FWS Listing Decision Threat	Percent Disturbance
Oil and Gas Wells	17.39%
Coal Mines	0.70%
Locatable Minerals	0.34%
Mineral Materials	1.71%
Roads	55.98%
Railroads	1.86%
Power lines	12.78%
Communication Towers/Telephone Lines	1.38%
Phosphate Mines	8.36%
Total	**100.71%**

Map 1, Surface Disturbance in Occupied Habitat (Excluding Fire), shows the density of surface disturbance in mapped occupied range. However, it should be noted that the percent disturbance values associated with each population area do not reflect an even distribution of surface disturbance over the total landscape of their respective population areas. Therefore, in order to more precisely show where the disturbance is taking place, the analysis was done using density of disturbance per square mile throughout the entire mapped occupied range. This method also proved to be more favorable than presenting the actual on-ground disturbances due to the small statewide scale.

Surface Disturbance in Occupied Habitat (Excluding Fire)

Map 1



ADDITIONAL ANALYSIS

In addition to the analysis described earlier, we examined fire history because fire would be included in the disturbance calculations under Alternative C and Alternative E. In an effort to calculate fire related disturbance we looked at the last 10 years of fires in mapped occupied range. We elected to only look at the last 10 years of data on the basis that geospatial fire data is most accurate within this timeframe.

When fire history data was added we found that 87 percent of the 136,000 plus acres of fire-related disturbance were in the Box Elder, Bald Hills, and Uintah population areas. Box Elder and Bald Hills were the only population areas to exceed the 3 percent threshold when fire history was added to the calculations. Bald Hills saw the most dramatic increase from 1.2 percent to 12.8 percent after more than 40,000 acres of fire-related disturbance was added to its total. The state's total disturbance moved closer to the threshold, rising from 0.9 to 2.8 percent.

In addition to considering fire history, for comparative purposes, we also calculate disturbance using LANDFIRE developed areas to see how it matched up with our analysis, which was conducted using individual data layers. Our intent was to replicate the process used by Knick (Knick et al. 2013), but rather than limiting the evaluation area to within 5 kilometers (3.1 miles) of leks, we expanded it to include all mapped occupied range. Ultimately, the data used in Knick's analysis is less detailed than information used for our site-specific analysis due to its large pixel sizes. While LANDFIRE development acres exceed our disturbance inventory values for population areas in the southern part of the state, the opposite is the case for those area located in the north. Regardless of the level of detail, the LANDFIRE development inventory also did not surpass the 3 percent threshold.

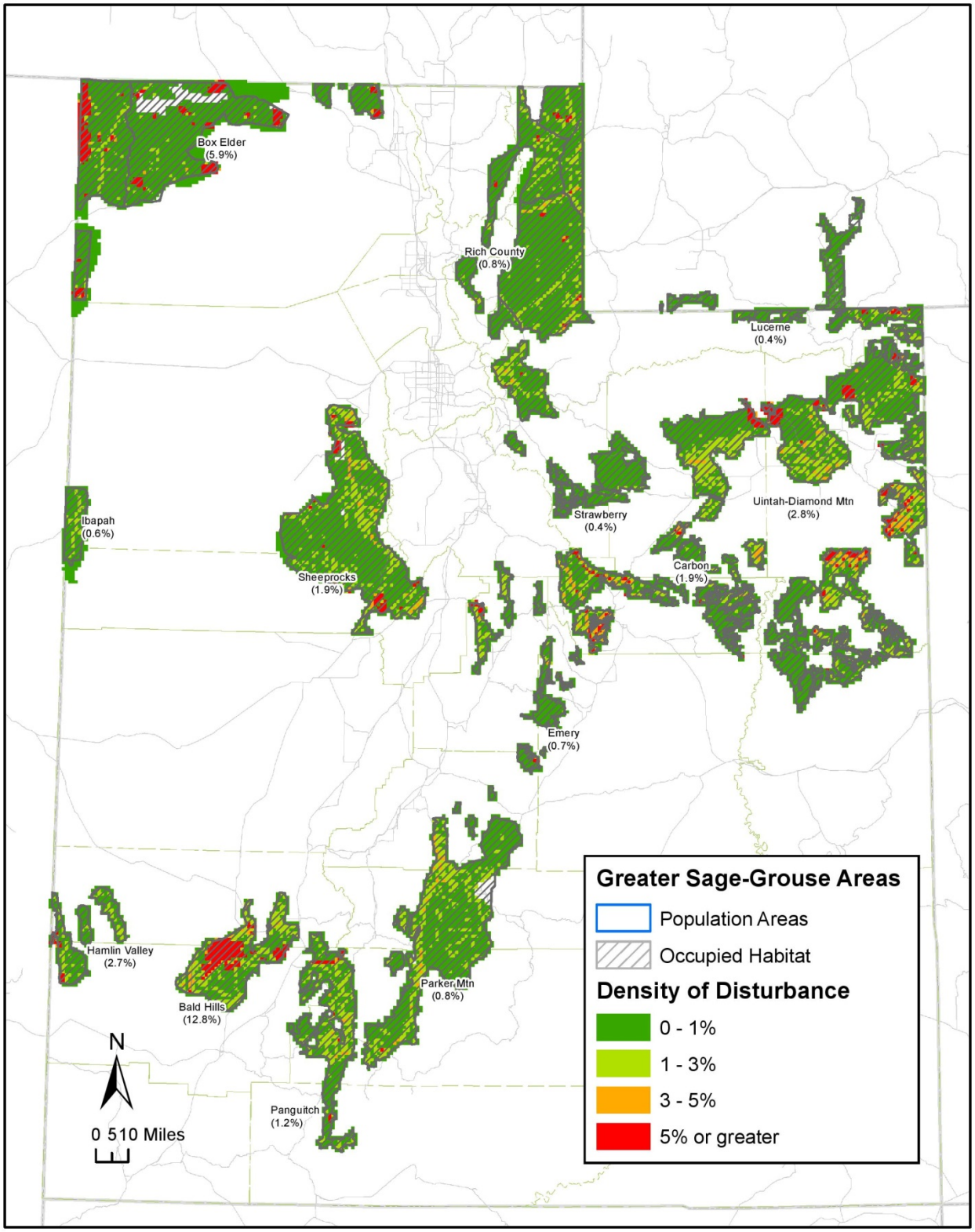
Below in **Table L.4**, Percent Disturbance in Mapped Occupied Range, is the percent disturbance findings from each of the three analyses discussed in this appendix. **Map 2**, Surface Disturbance in Occupied Habitat (Including Fire), and **Map 3**, Surface Disturbance in Occupied Habitat (LANDFIRE), are also included to display density of disturbance for the fire history and LANDFIRE analyses.

Table L.4
Percent Disturbance in Mapped Occupied Range

Population Area	Percent Disturbance Using Individual Data Layers and Excluding Fire	Percent Disturbance Including Fire History	Percent Disturbance using LANDFIRE Developed Areas
Uintah	1.4%	2.8%	0.9%
3 Corners/Browns Park	1.0%	1.4%	0.2%
Diamond Mountain	2.4%	3.3%	0.9%
Blue Mountain	0.8%	1.0%	0.4%
Deadman's Bench	2.5%	2.6%	0.6%
East Bench	2.5%	2.5%	0.0%
Book Cliffs	0.7%	0.8%	0.0%
Halfway Hollow	1.0%	5.3%	1.8%
South Slope Uintah	0.9%	3.4%	1.6%
Carbon	1.4%	2.0%	1.5%
Anthro	1.2%	1.2%	0.5%
West Tavaputs	0.7%	0.8%	0.9%
Emma Park	1.4%	1.6%	1.3%
Gordon Creek	3.7%	3.7%	0.4%
Scofield	1.2%	4.1%	0.3%
Emery	0.5%	0.8%	1.1%
Parker Mountain	0.8%	0.8%	2.3%
Panguitch	1.2%	1.2%	2.9%
Bald Hills	1.2%	12.8%	1.8%
Hamlin Valley	0.8%	2.7%	0.6%
Sheeprocks	0.8%	1.9%	0.8%
Ibapah	0.6%	0.6%	0.7%
Box Elder	0.4%	5.9%	0.4%
Rich	0.6%	0.8%	1.7%
Strawberry	0.4%	0.4%	1.4%
Lucerne	0.4%	0.4%	0.4%
Utah Statewide	**0.9%**	**2.8%**	**1.3%**

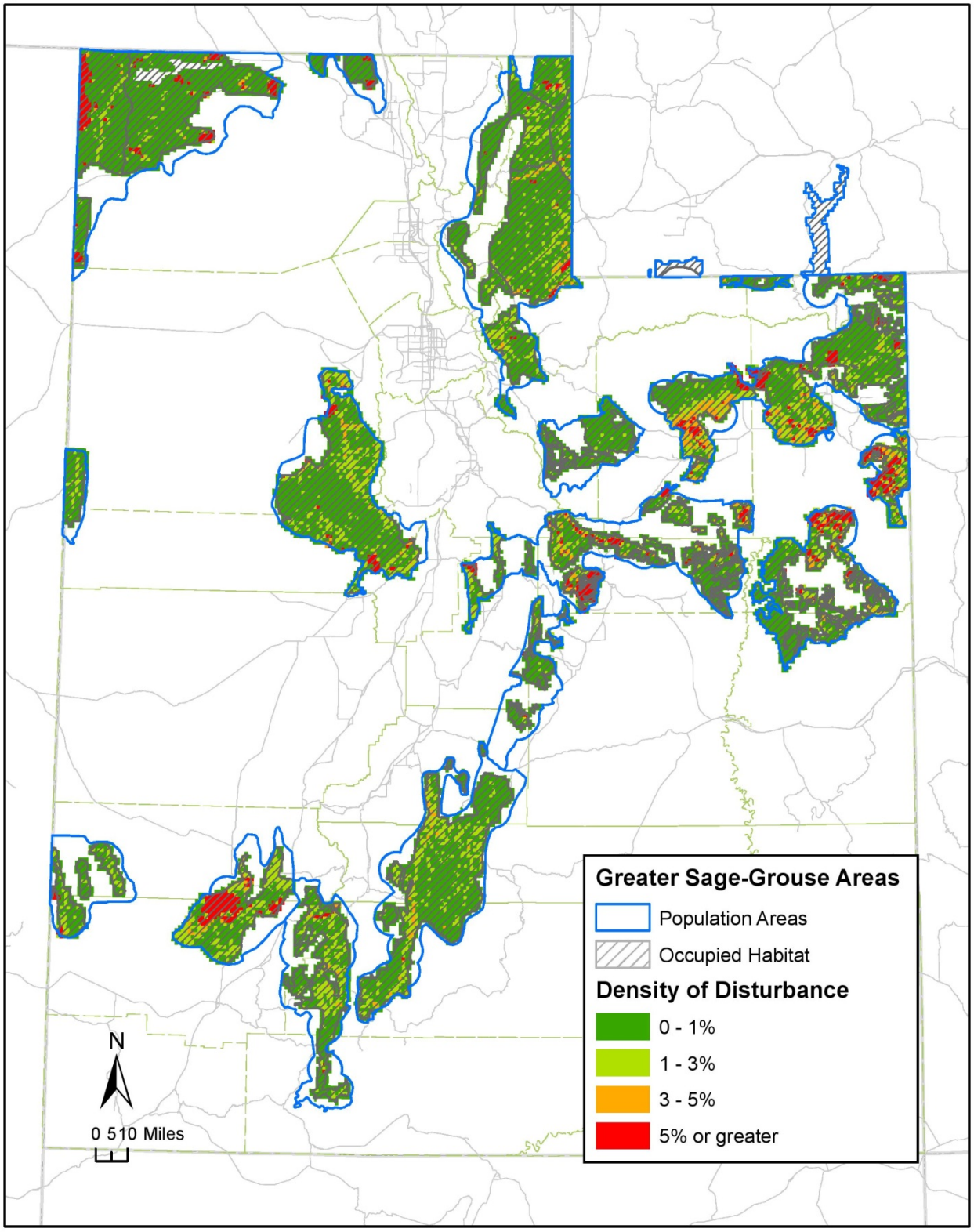
Surface Disturbance in Occupied Habitat (Including Fire)

Map 2



Surface Disturbance in Occupied Habitat (Landfire)

Map 3



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