

- ADDRESSING ANTHROPOGENIC DISTURBANCES WITHIN THE CCS

Finding

Some anthropogenic disturbances associated with linear rights of way (ROW) such as pipelines, buried transmission lines, etc., as well as landfills are not analyzed as anthropogenic disturbances within the CCS, primarily due to the lack of science.

- A. Disturbances within linear ROWs such as pipelines, buried transmission lines, etc., (other than transmission lines and roads) are currently not calculated as an anthropogenic disturbance category within the HQT; however, residual impacts are often associated with these impacts and should be accounted for when analyzing anthropogenic disturbances in the CCS.
 - Pipelines are specifically identified as an anthropogenic disturbance within the State Plan and CCS Manual; however, there is no weight or distance associated with pipelines.
- B. Landfills are identified as an anthropogenic disturbance within the State Plan and CCS Manual; due to the lack of scientific literature on their direct and indirect impacts, there is no weight or distance associated with landfills and therefore are not calculated as a disturbance within the HQT.

Improvement Recommendation

Summary

A. Linear ROWs

The SETT recommends that linear ROWs be classified as a new anthropogenic disturbance category within the CCS in two categories: Linear ROW – High and Linear ROW – Low. The Linear ROW – High impact category would classify disturbances within linear ROWs that meet one of the following criteria: 1) surface disturbance exceeding 25 feet in width, or 2) infrastructure exceeding 48 inches in height. Disturbances with less than 25 feet of ground disturbance or structures under 48 inches in height would receive the Linear ROW – Low classification. Infrastructure associated with a linear ROW disturbance including maintenance, transfer, or monitoring stations would receive the Linear ROW – High classification.

B. Landfills

The SETT recommends that landfills and transfer stations that are either permitted or approved by Nevada Division of Environmental Protection be classified the same as the Urban – Low anthropogenic category (75% weight, 3 km), if not already within an Urban – Low disturbance footprint, due to their similar impacts to urban areas, of which some impacts include noise, traffic, and ravens. Existing landfills and transfer stations are likely to already be in close proximity to urban areas; the Urban – Low database in the HQT will be updated to include these footprints.

Specific Improvement Recommendation

A. Linear ROWs

The SETT recommends that anthropogenic disturbances associated with linear ROWs should be accounted for and analyzed within the CCS. Two categories have been identified: Linear ROW – High (50%, 1km) and Linear ROW – Low (25%, 500m). Linear ROW – High will include disturbances meeting one of the following criteria: 1) surface ground disturbance exceeding 25 feet in width, or 2) infrastructure exceeding 48 inches in height. Disturbances with less than 25 feet of ground disturbance and structures under 48 inches in height would receive the Linear ROW – Low classification.

Pipelines, buried transmission lines, and other linear features that are not already associated with another anthropogenic disturbance category operation (e.g. Mine, Geothermal) will receive an independent weight and distance corresponding to one of the Linear ROW classifications.

The Linear ROW – High classification would include disturbances such as large scale above ground pipelines or buried pipelines with significant ground disturbance (width greater than 25 feet). The Linear ROW – Low classification would include disturbances such as buried transmission lines, small above ground pipelines, or buried fiber optic cables. Associated infrastructure to the linear ROW disturbances that would encompass maintenance, transfer, monitoring stations in operation with the specific linear ROW activity would receive the Linear ROW – High classification. Infrastructure associated with a linear ROW that may not be appropriate to receive the higher weight and distance may be categorized as a Linear ROW – Low in some circumstances after consultation and at the discretion of the SETT.

Table 1 in the User's Guide regarding pipelines will be updated to contain the following information:

TYPE	SUBTYPE	TYPE CODE ^t	SUBTYPE CODE ^t	WEIGHT (%)	DISTANCE (Meters)
Linear ROW	Linear ROW – High	LROW	LROW_High	50%	1000 m
Linear ROW	Linear ROW – Low	LROW	LROW_Low	25%	500 m

B. Landfills

The SETT recommends that landfills, transfer stations, and other waste disposal sites requiring a permit or approval by the Nevada Division of Environmental Protection should be included within the Urban – Low anthropogenic disturbance category and receive a 75% weight, 3 km distance. The Urban – Low database within the HQT will be updated to include footprints of landfills and transfer stations if they are not already included within an Urban – Low delineation.

Rationale Supporting Recommendation Details

A. Linear ROWs

Linear ROW features that are associated with a mining or geothermal operation are either considered part of that disturbance category or ancillary to the operation if they are located outside the primary disturbance footprint. However, a proposed linear ROW, above or below ground, independent of other main disturbances classified in the CCS are not currently calculated in the HQT.

Other than transmission lines and roads, there is little science directly on how some linear features, such as pipelines, affect sage-grouse populations. However, looking at the components of what we would expect to find for pipelines, buried transmission lines, and other linear features, we would anticipate similar direct and indirect effects as the literature has shown roads and tall structures to have. There is direct surface area loss of habitat from the linear feature itself, whether above or below ground, as well as other infrastructure associated with the linear feature. Ground disturbance and potential for invasive species establishment and spread can be significant depending on the extent of ground disturbance, existing soil types, local environmental conditions, and other factors. In addition to direct impacts, there are potential indirect impacts from spread of invasive species into surrounding habitat, operation or traffic noise from maintenance of the linear feature, as well as from ravens and other birds of prey that may use above ground infrastructure for perching or nesting. Required operation and maintenance of stations or associated infrastructure can represent continued disturbance for potentially the lifetime of the project.

A Linear ROW – Low, is likely to have a similar direct impact as a low use road due to ground disturbance, of which would likely become a vector for weed and cheatgrass establishment and spread. Periodic activity for maintenance of the linear feature may also be expected. However, indirect impacts are expected to be lower than a low use road; there would likely be less activity (e.g. traffic, noise) and no or shorter infrastructure that would limit perching opportunities for ravens and raptors. The CCS identifies fences as de minimus, and the legal standard for fence height in Nevada is 48 inches (NRS 569.431). Features that are lower than 48 inches may still provide opportunities for perching, but the reduced height likely decreases scanning and hunting opportunities from a low perch, as compared to a transmission line for example. A low use road would have periodic to relatively constant local traffic, which would be considerably more noise than can be expected from a buried transmission line or small water pipeline. For these reasons, Linear ROW – Low would be assigned a 25% weight, similar to a low use road, but a lower indirect impact of 500 m.

Linear ROW – High, would have either taller infrastructure (greater than 48 inches in height) or significantly more ground disturbance (greater than 25 feet in width) that would likely have greater activity or maintenance as compared to Linear ROW – Low. Linear ROW – High will receive a higher weight of 50% impact and distance of 1km. ROW features in this category are likely to have increased maintenance associated with above ground infrastructure or surface disturbance. There is also an increase in potential indirect impacts associated with raven and raptor use and abundance. Ravens and raptors may have more opportunities to use infrastructure that is accessible for either perching or nesting. Ravens are intelligent, visually cued predators that select edge-dominated or fragmented areas with changes in vegetation, particularly non-native vegetation (Coates et al., 2014); ravens therefore may be more likely to use linear ROW corridors that have either perching infrastructure or have significant ground disturbance that is largely removed of vegetation as well as cheatgrass establishment that provides access and opportunities for hunting and scavenging.

B. Landfills

Landfills are an important anthropogenic disturbance category that are identified within the State Plan, but do not have an assigned weight or distance. Landfills and transfer stations are often associated with urban areas, even if located some distance away from populated areas. Disturbances associated with landfills include traffic, equipment operation, etc., that produces noise and activity similar to what can be expected within urban areas. Landfills also can attract large concentrations of ravens. Ravens are very successful nest predators of sage-grouse, and anthropogenic food and perching subsidies such as landfills have been shown to attract large concentrations of ravens which can lead to increases in juvenile survival and local populations (Webb et al. 2004, Kristan and Boarman 2007, Peebles and Conover 2017; see CCS HQT Document for additional references).

Due to the relatively close proximity of existing landfills and transfer stations to towns and communities and similar impacts to urban areas, this disturbance type should be included within the Urban – Low disturbance category that is defined in the CCS. Most towns and communities in rural Nevada that meet the criteria are already classified as Urban – Low. In addition to landfills and transfer stations having a similar impact as Urban – Low areas, the attraction to landfills by ravens creates additional food subsidies for ravens and can have significant indirect impacts to local sage-grouse populations.

Existing landfills and transfer stations will be incorporated into the Urban – Low disturbance category and removed from the landscape as habitat within the Habitat Management Categories. This would not include dead animal pits and other waste sites associated with agricultural or ranching activities. If landowners choose to participate in the CCS, the landowner and SETT will discuss ways to cover or mitigate dead livestock and other waste to lower raven occurrence within the project area.

Literature Cited

- Coates, P.S., Howe, K.B., Casazza, M.L., and Delehanty, D.J. 2014. Common raven occurrence in relation to energy transmission line corridors transiting human-altered sagebrush steppe. *Journal of Arid Environments* 111:68–78.
- Kristan, W.B., and Boarman, W.I. 2007. Effects of Anthropogenic Developments on Common Raven Nesting Biology in the West Mojave Desert. *Ecological Applications* 17:1703–1713.
- Peebles, L.W., and Conover, M.R. 2017. Winter Ecology and Spring Dispersal of Common Ravens in Wyoming. *Western North American Naturalist* 77:293–308.
- Webb, W.C., Boarman, W.I., and Rotenberry, J.T. 2004. Common Raven Juvenile Survival in a Human-Augmented Landscape. *The Condor* 106:517–528.