

MEMORANDUM

To: Thomas G. Kennedy, Esq.
Law Offices of Thomas Kennedy

From: Alexander Nees, Senior Ecologist
SGM, Inc.

Date: November 11, 2021

Re: **Consideration of Road Design and Development Impacts at Society Turn on Large Ungulate Movement Patterns**

This memorandum was prepared to provide additional discussion of the potential for impact to local mule deer and elk (ungulate) populations as a result of the proposed development on the Society Turn parcel. This memorandum is an addendum to the more generalized and extensive Wildlife Impact Report prepared for the project in support of the Sketch Plan submittal to San Miguel County (SGM, Alex Nees, 2019).

Background

The Wildlife Impact Report discussed the likely impact of the proposed development on deer and elk habitat utilization and regional movement (pgs. 5-9 through 5-14), given that the parcel is mapped by Colorado Parks and Wildlife (CPW) as Elk Severe Winter Range and Mule Deer Winter Range. This addendum tiers to that discussion and will not recapitulate it in detail. In summary, the assessment in the 2019 report is that the habitat currently existing in the proposed development area is minimally effective for ungulate foraging due to the extensive surrounding development, high level of human activity, high level of traffic on Colorado State Highway 145 (HWY 145), and the ongoing cattle grazing.

In the course of the County's review of the Sketch Plan submittal, comments were raised by the public expressing concern for the level to which the development could impede the movement of ungulates from upland habitats across the parcel to reach the riparian corridor of the San Miguel River. The issue is therefore not utilization of the parcel, per se, but rather the extent to which ungulates cross the parcel currently, and the likely impact on that utilization as a result of the development. The development proposed is not limited to road construction and increased traffic, and includes commercial and residential buildings, increased anthropogenic activity, and landcover changes. As discussed in the Wildlife Impact Report, the development of the parcel would preclude most big game use, and therefore this memo investigates how development would additionally create hazardous conditions or even barriers to movement to the San Miguel River. We conducted a scientific literature review of how ungulates respond to road and traffic impacts (which would be the primary mortality threat and movement barrier), and utilize the best scientifically available information to assess how the proposed development and associated increases in road use would affect ungulate movement patterns and mortality risks.

General Ungulate Response to Development

Roads and land development in Colorado are often a leading indirect impact to wildlife habitat and wildlife mortality. Highways and busier roads are often located in areas of flat benches adjacent to river systems, which bisect upland habitats from riparian habitats, as is the case with the Society Turn parcel and HWY 145. Riparian habitats attract upland wildlife species, and in some cases wildlife congregate for significant periods of time within riparian habitats for foraging, shelter, and loafing activities. Therefore, new

development, and the resulting increased traffic levels on existing roadways, can either dissuade wildlife from crossing roadways, or in the most extreme cases create effective barriers to wildlife movement and thereby fragment habitats. In some cases, the draw of riparian habitats or water can override the fear of traffic, and wildlife will then attempt to cross busy roadways, incurring mortality and thus negatively impacting population levels as well as presenting a public safety risk to the traveling public. For large-bodied species such as deer and elk, vehicle strikes can often cause significant financial impacts to commuters, through increased insurance rates, direct costs of repairing or “totaling” of vehicles, costs of hospitalization, injury, and even death to drivers and passengers in vehicles. Elk specifically are known to avoid areas in vicinity to roads, and when forced to inhabit areas with higher road density, elk display higher movement patterns and increased stress levels (Rowland, 2005).

Research on traffic impacts to habitat connectivity and wildlife use patterns indicate that traffic levels of 4,000 to 5,000 vehicles per day (VPD) begin to create significant deterrents to wildlife crossings (Alexander, 2005) (Gagnon J. T., 2007). Some of the other actions that wildlife take when having to cross a road with 4,000-5,000 VPD includes animals avoiding highways altogether (not even trying to cross), failed attempts (animal tries to cross, but turns around due to traffic), injury in crossing (from vehicles strikes), or death. The available CDOT data indicate that HWY 145 already supports in excess of 7,500 VPD in the vicinity of Society Turn, and therefore should be expected to function as a significant barrier to wildlife movement regardless of any additional development.

Road effects on elk movement and habitat use patterns generally extend to at least 1 kilometer (km) from the road. In other words, at road densities greater than approximately 1.6km of road per km² of land, road effects saturate the landscape, and there are no refuges where elk are unaffected by the presence of roads (Frair, 2008). The degree of road effects are partially modulated on a site-specific basis by the degree of local hunting pressure experienced by elk. However, in the case of the Society Turn parcel, HWY 145 alone creates sufficient road density such that the saturation level has already been surpassed (not even considering the 145 Spur, Last Dollar Road, and Society Drive). The addition of further development within Society Turn can be expected to have minimal additional impacts on elk movement, which are already highly affected by existing roads.

Wildlife underpasses have been used with success in some locations to mitigate the effect of road barriers by allowing wildlife safe passage across busy travel corridors while providing some level of visual shielding from traffic. Underpasses also have the benefit of reducing wildlife-vehicle collisions when they are utilized by animals. However, wildlife underpasses are only recommended for installation in areas of low overall human activity, generally where multi-lane high-speed highways bisect otherwise intact areas of habitat. In areas where the road is only one component of an overall high level of anthropogenic activity, underpasses are poorly utilized since wildlife continue to avoid the region regardless of the availability of a crossing (Gagnon J. W., 2011). Further, deer and elk generally do not enter underpasses unless they are forced to (through extensive fencing), when their migration patterns through the area are well established, and when the underpass is large and has room for these large animals. The Society Turn parcel certainly qualifies as a site where the road and traffic volume constitute only one component of an overall level of human presence, and deer and elk use patterns would not be conducive to the effective utilization of an underpass.

Existing Data for Ungulate Crossings at Highway 145

The majority of the basic research and fundamental understandings summarized above are derived from research in heavily-forested ecosystems with a lesser degree of development than the Telluride Valley, and should be considered in the context of locally-derived data where available. A systematic survey of wildlife movement and occupancy on the Society Turn parcel is beyond the scope of this report. However, there

are two existing local data sets available that can be used to quantify the frequency of ungulate movement in the Society Turn vicinity, in comparison to the surrounding area and statewide baselines.

1. CDOT collects and maintains a database of “carcass data”; the dataset is derived from road maintenance crew records. When a road crew removes an animal carcass from the road surface, the location and species of that incident is recorded. The CDOT data apply only to state highways, and only record incidents where the carcass is on the travel lane. Carcasses in roadside ditches are not recorded as they require no action by the CDOT road crew. A systematic analysis has never been performed, but CDOT estimates that approximately 50% of all animal collisions are captured in these data. Wildlife flushing, near-misses, and avoidance behavior are of course not captured in these data to any degree.
2. Colorado State Patrol (CSP) maintains records of reported accidents involving wildlife. These accidents are recorded by location and typically include the species of wildlife involved. These data include only accidents that result in a report to CSP. Minor collisions, wildlife flushings, unreported strikes, and fence entanglements are not captured.

CDOT and CSP records for State Highway 145, State Highway 62, and the Highway 145 Spur (CSP only) were retrieved, cleaned, and sorted to provide the location of all deer and elk incidents to within 0.1 miles along the roadways that have been recorded within the past decade. The data are illustrated in **Figure 1** (which provides wildlife accident rates for all highways within eastern San Miguel County) and **Figure 2** (which provides wildlife accident rates specifically in the vicinity of the Society Turn parcel). Although the existing data have limitations as discussed, they do provide indices of the rate at which ungulates are crossing highways in the County.

According to CDOT traffic data and the SGM traffic study (SGM, Dan Cokley, 2020), HWY 145 carries commuter traffic from downvalley communities, recreational and tourist vehicles, and regional travel. Much of the existing traffic is generated during the morning and evening rush hours, coinciding with daily commuter traffic to and from work destinations in the Telluride area. This results in daily traffic volumes of approximately 7,500 VPD, which are concentrated in distinct AM and PM peak commute times. As detailed in the SGM traffic report, these peak traffic periods are relatively short-lived, and during much of the day and especially at night, traffic patterns would be relatively low. The proposed development is expected to add to total traffic volumes but the roadway would continue to function at an acceptable level with the additional traffic, and auxiliary turn lanes are proposed to maintain levels of service. The existing traffic volume on the road is sufficiently high to create a significant barrier and deterrent to ungulate populations already, and the minor increases that would result from the proposed development would not change that level of impact.

CDOT has completed and published a report evaluating wildlife crossing rates for all state highways on the western slope of Colorado (Kintsch, 2019). This Western Slope Wildlife Prioritization Study emerged from a collaboration between CDOT and CPW to address wildlife conflicts on roads with the objective of identifying wildlife-highway conflict areas where targeted mitigation could have the greatest impact on reducing animal collisions. The methods and findings of this report will not be repeated here, but in summary the document identifies the top 5% of state highways on the western slope where animal collisions occur, totaling 185 miles of roadway. These priority segments are where CDOT and CPW will typically consider measures such as wildlife exclusionary fencing, speed controls, or wildlife crossing corridors. In that report, the section of HWY 145 adjacent to Society Turn was classified in the 50th-60th percentile, in other words having approximately average rates of wildlife accident risk. The only section of highway in the surrounding

area that was classified as a top 5% priority segment is a 3-mile section of HWY 550 at the northern border of Ouray County in the vicinity of the community of Colona.

In summary, when using ungulate traffic impacts as a proxy for ungulate movement prevalence, the data indicate the following:

- The level of recorded animal incidents in this stretch is slightly elevated compared to other areas of eastern San Miguel County (**Figure 1**), but the rate is still very low compared to the Western Slope as a whole. The highest accident rates are along the 1-mile stretch of HWY 145 adjacent to Skunk Creek and the Lawson Hill development, and only amount to approximately 5 accidents per decade, or less than one animal per year (**Figure 2**). Correcting for unrecorded accidents per CDOT's 50% metric, there is approximately one ungulate accident per year on this mile of highway.
- Specifically within the stretch of HWY 145 adjacent to Society Turn (milepost 71-72), CDOT/CSP data record **only four ungulate accidents in the past decade**.
- According to CDOT's analysis, rates of wildlife accidents, and risk to wildlife populations, are average in this area for the Western Slope, and are not sufficient to justify the expense of specific mitigation measures such as fencing.
- HWY 145 has already created a significant movement barrier in the vicinity of Society Turn, given the existing road density and the existing traffic levels. Ungulate populations have already modified movement and migration routes to avoid large stretches of HWY 145, and the proposed development and traffic increases anticipated from the development would not be expected to substantially increase the level to which ungulate populations already avoid the HWY 145 corridor and/or avoid crossing the road.

Evaluation of Potential Impacts of Society Turn Development on Ungulate Populations and Movement Patterns

1. CDOT/CSP road accident data were reviewed and indicate that the ungulate accident rate in the specific vicinity of Society Turn is on the order of one vehicle strike per year. This is slightly elevated compared to nearby areas but is not at a level that indicates the Society Turn parcel is within a ungulate movement or migration corridor that would be disrupted by the proposed development.
2. An existing regional analysis of wildlife - traffic conflicts has not identified the Society Turn parcel, or the surrounding vicinity, as a high-risk area. HWY 145 throughout eastern San Miguel County has been classified in the 50th-60th risk percentile for highways in CDOT Regions 3 and 5. In summary, CDOT and CPW have already evaluated this road section and determined that wildlife movement patterns and accident rates are average for the western slope, and are not nearly sufficient to justify the installation of wildlife mitigation measures.
3. The traffic volume and road density in the vicinity of the Society Turn parcel is such that ungulates are already avoiding the area and are deterred from crossing the road. These road impacts have already reached saturation level in the immediate vicinity, and it is unlikely that the proposed development would lead to further significant increases in avoidance.
4. It is unlikely that a wildlife underpass structure would be effective, given the level of anthropogenic disturbance outside of and in addition to HWY 145. Ungulate avoidance of the general area would be sufficient to overcome the attraction of a specific crossing location.

In summary, while the Society Turn parcel lies at the western edge of a CPW-mapped Elk Migration Corridor, the presence of surrounding road densities, development, and lack of effective elk habitats in and around the parcel has already reduced the effectiveness of this area as an ungulate movement

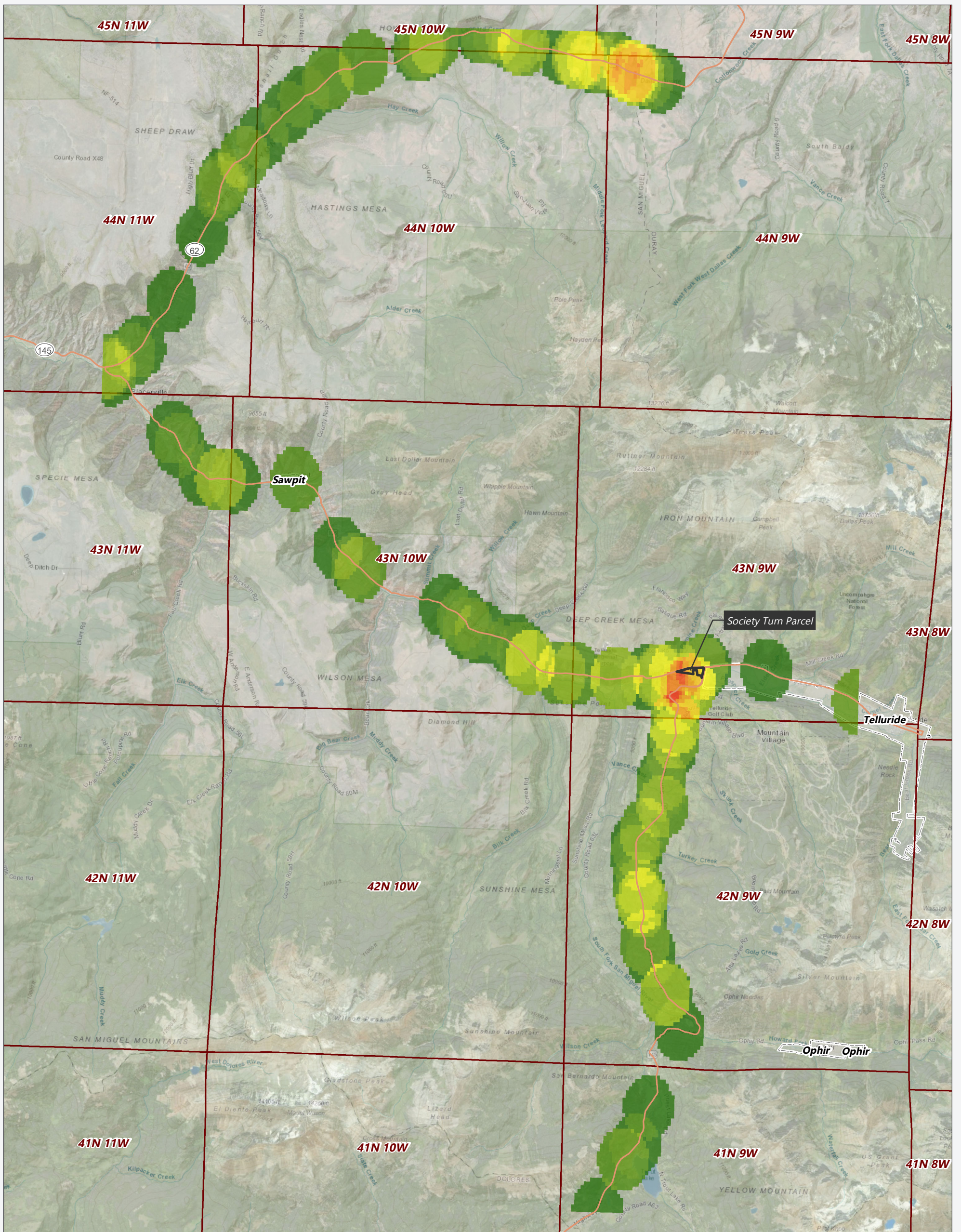
corridor, or as a desirable are for ungulate foraging or loafing. The existing 7,500 VPD in this area has already created an effective movement barrier, or at least has resulted in wildlife heavily modifying their crossing of the highway to the nighttime hours, when traffic levels are at their lowest. The increase in traffic generated by Society Turn is not expected to result in a level of traffic different or more impactful than existing conditions. The existing CDOT and CSP data further support that ungulates are avoiding or have modified their movements through this area, given the very low vehicle strike rates in this area.

The Society Turn parcel development is not expected to meaningfully or measurably create additional wildlife crossing hazards in this area, beyond current conditions. Wildlife mortality rates in this area are currently low, likely due to the low level of wildlife crossings resulting from the poor habitat effectiveness of habitats in and around the parcel, and the high level of traffic on HWY 145. Development of the parcel would not likely result in impacts to wildlife beyond existing levels, and mitigation through an underpass (or overpass) would not likely result in meaningful benefit to ungulate use patterns in the Society Turn area, given the low level of ungulate movement or migration across HWY 145 in this area.







References

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Attachments: Figure 1 - HWY 145 Wildlife Crossing Accident Density
Figure 2 - Project Vicinity Wildlife Crossing Accident Density



LEGEND

-  Society Turn Parcel
-  US or State Highway
-  County Highway
-  Local Road
-  Municipal Boundary
-  Township/Range/Section

Elk & Deer Accidents (CSP and CDOT 2012-2021)

-  0-1 accidents per decade, within 1 miles
-  1-2 accidents per decade, within 1 miles
-  2-3 accidents per decade, within 1 miles
-  3-4 accidents per decade, within 1 miles
-  4-5 accidents per decade, within 1 miles

SOCIETY TURN

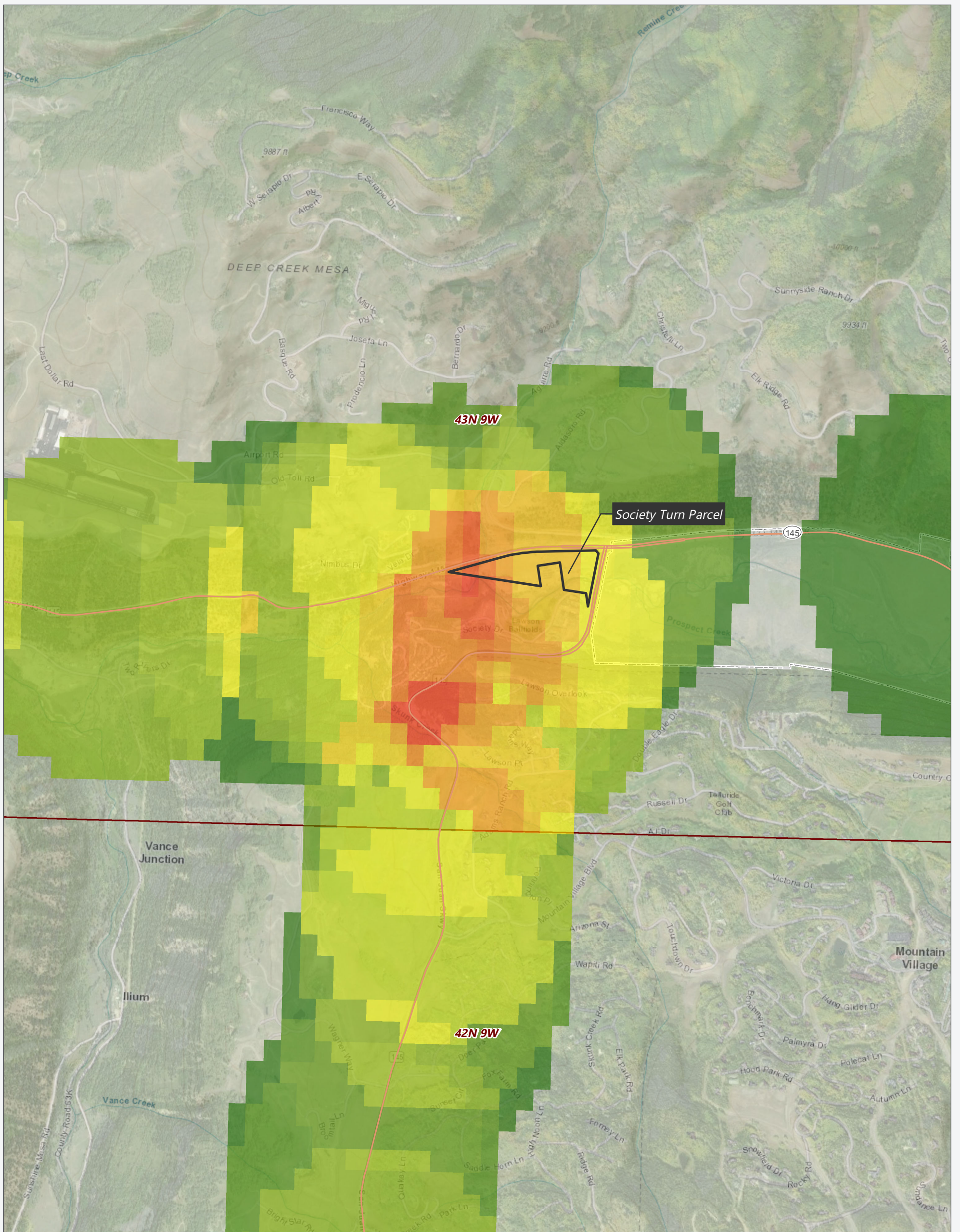
Figure 1 - HWY 145 Wildlife Crossing Accident Density

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- LEGEND**
- Society Turn Parcel
 - US or State Highway
 - County Highway
 - Local Road
 - Municipal Boundary
 - Township/Range/Section

Elk & Deer Accidents (CSP and CDOT 2012-2021)

- 0-1 accidents per decade, within 1 miles
- 1-2 accidents per decade, within 1 miles
- 2-3 accidents per decade, within 1 miles
- 3-4 accidents per decade, within 1 miles
- 4-5 accidents per decade, within 1 miles

SOCIETY TURN

Figure 2 - Project Vicinity Wildlife Crossing Accident Density

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