WHERE DOES A DEER CROSS A ROAD?

ROAD AND LANDCOVER CHARACTERISTICS AFFECTING DEER CROSSING AND MORTALITY ACROSS THE US 93 CORRIDOR ON THE FLATHEAD INDIAN RESERVATION, MONTANA

by

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ABSTRACT

Reducing deer vehicle collisions (DVCs) on highways is an issue facing highway planners and wildlife managers. In western Montana, federal, state and tribal governments intend to reduce DVCs along a 51-mile stretch of US Highway 93 (US 93) on the Flathead Indian Reservation using on site reconstruction and highway engineering. This project was part of pre-construction wildlife monitoring that forms the baseline for evaluating effectiveness of mitigation measures associated with the US 93 reconstruction project. Road and landcover variables were recorded at randomly sampled locations along US 93. DVC site selections were made based on Montana Department of Transportation maintenance and Montana Highway Patrol accident reports from 1998-2003. Observed crossing areas were based on 32 sand tracking beds (each 100 m long) placed randomly in three key areas along the route. Variables collected included habitats types, topography, and rural residential developments and anthropogenic effects. A geographic information system was used to determine proportion of landcover variables at three spatial scales centered on the highway, encompassing 0.16 km (0.5 mi), 0.32 km (1 mi), 0.64 km (2 mi). Local scale habitat characteristics were collected in the field including presence of specific variables directly adjacent and up to 100 meters from the pavement edge. *A priori* models were developed to determine useful variables for predicting deer crossing and collision locations. Akaike's Information Criterion for small sample size (AIC_c) was used to rank best overall models and determine variables with a greater ability to predict crossing or collision occurrence. The results showed that landcover variables could be used to predict crossing or kill location. Top predictors included a positive correlation to forest cover, distance to the nearest city, and low intensity residential development. Negative correlations were found for distance to nearest water and population density. Results of this project will be used for comparison to post-construction movement patterns. This project is unique in that data are available from another related concurrent project providing OCA data, which allows us to look at both observable crossing rates as well as collision rates, in relation to landscape and road variables.

CHAPTER 1

INTRODUCTION

Wildlife populations worldwide are impacted by human related activities such as urban sprawl, conversion of land for human food production, and vast networks of roads to move people and products. Not only do these landscape modifications fragment the natural habitats and wildlife populations, roads can act as barriers and compound natural wildlife mortality rates. For example, the transportation research in Europe has identified animal vehicle collisions (AVCs) as a significant safety issue for wildlife movement and road travelers, and also resulted in significant habitat fragmentation (Groot Bruinderink and Hazebroek 1996). The major public road system in the United States (U.S.) is potentially affects >3.9 million miles (6.276 million kilometers) of the land base (Federal Highway Administration (FHWA) 2006), and likely has potential to affect even larger areas. The US road network has been shown to have detrimental effects on wildlife, and can exacerbate negative wildlife/human interactions (Andrews 1990, Forman and Alexander 1998, Noss 2001). An estimated one million animals are killed each day on highways in the U.S. (Noss 2001).

The impacts of roads on local wildlife species and populations can have a variety of effects associated with road maintenance, construction, the resulting road surface, and traffic volumes. Actual construction and maintenance activities can alter animal movement patterns, result in area avoidance, and directly kill slow moving or sessile species (Andrews 1990; Beier and Loe 1992; De Santo and Smith 1993; Forman and

Alexander 1998; Reilly and Green 1974; Trombulak and Frissell 2000). Roads alter, destroy, and fragment habitats at and around road surfaces. Fragmentation refers to natural areas of larger contiguous tracts of land, which are diminished into progressively small remnants (Clevenger and Waltho 2000; De Santo and Smith 1993). The result can be reduced or isolated wildlife populations where extant populations can be more susceptible to biogeographical and environment changes (Andrews 1990; Forman and Alexander 1998; Saunders et al. 1991). A road may create barriers to effective movement, and may cause direct animal mortality, local population reductions, local extirpation, human injury and economic loss (Allen and McCullough 1976; Andrews 1990; Bashore et al. 1985; Bellis and Graves 1971; Case 1978; Carbaugh et al. 1975; Chruszcz et al. 2003; Clevenger and Waltho 2000; Conover et al. 1995; Conover 1997; Finder et al. 1999; Forman and Alexander 1998; Groot Bruinderink and Hazebroek 1996; Hansen 1983; Hubbard et al. 2000; Malo et al. 2004; Nielsen et al. 2003; Putman 1997; Reed et al. 1982; Reilly and Green 1974; Romin and Bissonette 1996; Singer 1978; Stout et al. 1993).

Roads that create wildlife barriers may eliminate or restrict access to important habitat elements like water and food. Barriers can impede movement between habitats during dispersal and migration, reduce genetic diversity; as well as elevate risk of local extinctions and amplification of catastrophic effects (Andrews 1990; Beier and Loe 1992; Clevenger and Waltho 2000; Forman and Alexander 1998; Rowland et al. 2000; Yanes et. al. 1995). Furthermore, conservation of ecological integrity and regional biota in a fragmented landscape may strongly depend on maintaining sufficient habitats and connectivity among smaller, local populations (Saunders et al. 1991).

Other negative effects from roads on adjacent ecological systems (*e.g.,* waterways) can occur at varying distances from the road-side disturbance. Impacts can include, but are not limited to, hydrologic alterations and associated roadway runoff, increased sedimentation, and altered surface flows affecting aquatic and associated vegetative communities (Andrews 1990; Forman and Alexander 1998; Jones et al. 2000; Spellerberg 1998; Trombulak and Frissell 2000). Finally, roads may also facilitate dispersal of invasive pest species including, pest grassland weedy species and feral predators (Andrews 1990; De Santo and Smith 1993; Trombulak and Frissell 2000).

Animal Vehicle Collisions

Animals involved in collisions with vehicles are either immediately killed upon impact or travel some distance and perish later from injuries. According to Andrews (1990), "road-kills, taken in conjunction with fragmentation of habitat, could have a significant adverse impact on populations of larger mammals." Sensitive or threatened species may be particularly susceptible, and researchers have documented adverse population impacts on many vertebrate species such as Florida panthers (*Puma concolor coryi*) (Foster and Humphrey 1995; Maehr and Cox 1995), black bears (*Ursus americanus*) (Trombulak and Frissell 2000; van Manen et al. 2001), grizzly bears (*Ursus acrtos*) (Chruszcz et al. 2003; Gibeau et al. 2002), hedgehogs (*Erinaceus europeaus*) (Huijser 2000), Florida Scrub-Jays (*Aphelocoma coerulescens*) (Mumme et al. 2000) and numerous other small mammal (Clevenger et al. 2003), avian, amphibian, and reptile species (Clevenger et al. 2001; Forman and Alexander 1998;).

In the US, mule deer (*Odocoileus hemionus*) and White-tailed deer (*Odocoileus virginianus*) comprise a prevalent and visible portion of wildlife killed on roads, as shown by state highway maintenance records, highway patrol accident reports, and visible road-killed deer along highways (Hansen 1983, Conover 1997, Conover et. al. 1995). Impacts of these deer-vehicle collisions (DVCs) include personal injury or loss of human life, property damage, and deer mortality. In 1991, 538,000 DVCs were reported in 35 states; extrapolated to include the 14 states that did not provide data and adjusting for the estimated undocumented collisions (an estimate that only half of all DVCs are documented), Conover et al. (1995) estimated >1 million DVCs occur annually in the U.S.

Property damage from DVCs can range from a few hundred dollars for a dented fender or broken headlights to estimates above $4,000 for major damage (Hansen 1983, converted into present day dollar amount). Conover et al. (1995) provided a nationwide property damage estimate from deer collisions in excess of $1 billion annually. A relatively small proportion of DVCs result in major human injuries or loss of life. However, the numbers are still significant with an estimated 29,000 annual injuries and approximately 200 deaths annually (Conover 1997). Deer killed or injured by vehicle collisions also represent a loss to local wildlife resources. The value of a single deer has been estimated to range between $860 to $1,880 (converted from 1996 dollars to 2006 dollars), including some estimates of expenditures associated with hunting activities (Schwabe and Schuhmann 2002).

Wildlife Collision Issues in Montana

The issue of DVCs exists throughout Montana, for example, deer mortality has been reported as higher on two-lane paved highways, than on divided highways (Allen and McCullough 1976). For US 93, the narrow 2-lane highway bisecting the Flathead Indian Reservation (FIR), increased traffic volume, coupled with inadequate turning and passing lanes (or shoulders) has resulted in one of Montana's most dangerous highways (Moler 2002). This highway is a key transportation link between I-90, western Montana's major east-west thoroughfare, and northern recreational sites including Flathead Lake and Glacier National Park. Numerous accidents, many fatal and frequently involving head-on collisions often occur.

With US 93 accident percentages above national highway levels, the Montana Department of Transportation (MDT) initially proposed a highway expansion to a four-lane undivided highway (Moler 2002). The Confederated Salish and Kootenai Tribes (CSKT) objected to the plan fearing increased traffic volume, adverse effects on wildlife and wetlands, increased fragmentation of the reservation's wildlife habitat, and damage to tribal cultural and spiritual sites (Becker 2003; Moler 2002). Two decades of disagreements on lane configuration reconstruction between tribal and state governments has resulted in prolonged detrimental effects (Marshik et al. 2001). In December of 2000 a compromise was reached and a memorandum of agreement was signed enabling construction of sections of partial modified two-lane highway and partial four-lane divided highway. In addition at least forty-two fish and wildlife-crossings structures and an accompanying wildlife-proof fence will be constructed (Moler 2002; Skillings-Connely 2000a).

Highways and adjacent habitats differ in associated flora, fauna, human land use practices, and highway type, all of which can influence wildlife use and movement patterns (Bashore et al. 1985; Nielson et al. 2003; Chruszcz et al. 2003; Clevenger et al. 2002). Past DVC studies have focused primarily on DVC occurrence in relation to time (daily and yearly), place, and characteristics of traffic and deer. Numerous studies have shown that DVCs are not temporally or spatially random (Allen and McCullough 1976; Bellis and Graves 1971; Gleason and Jenks 1993; McCaffery 1973; Puglisi et al. 1974; Reed 1981; Reilly and Green 1974; Rost and Bailey 1979). Some research has studied the landcover adjacent to the road surface and road characteristics for clues to crossing and DVC location (Bashore et al. 1985; Carbaugh et al. 1975; Hubbard et al. 2000; Nielsen et al. 2003). Few studies have coupled road and landcover characteristics with varying spatial scales (Malo et al. 2004). No intensive studies of this nature have been done for deer in relation to US 93 on the FIR.

As part of pre-construction wildlife monitoring efforts initiated by the Western Transportation Institute (WTI), my research was initiated to explore deer movement patterns in relation to the US 93 travel corridor to better predict deer vehicle collision (DVC) sites as well as potential deer crossing locations. Mitigation measures, in the form of wildlife crossing structures and wildlife fencing are part of the US 93 reconstruction plan, and their effectiveness can be assessed by comparing pre-construction deer movement and DVC location preference to post–construction movement and DVC patterns.

Habitat use by organisms, including ungulates, can be described using four habitat selection scales (Johnson 1980): the overall geographic range of the species; the home range within the geographic range; various habitat components within the home range, and specific foraging locations within the habitat componens (Franklin et al. 2000; Johnson 1980). I was influenced by Johnson's (1980) orders of habitat selection, thus my research focused at three orders of habitat selection for deeer that potentially crossed the study section of US 93: 1) habitat measurements included features at the home range scale for a typical deer resident within the geographic range included by my US 93 study area; 2) I also selected variables to describe habitat patches, or components included within a typical deer home range adjacent to US 93 in my study area; and 3) the habitat variables I measured were selected to represent specific foraging locations within a habitat patch included in my study area.

My research objectives were to (i) identify road sections of US 93 with DVCs and observed crossing areas (OCA), (ii) evaluate the relationships of DVCs/OCAs to road/landcover variables at multiple spatial scales using binary logistic regression and multiple linear regression, for DVC and OCA locations, respectively, (iii) investigate relationships between DVC and OCA and explanatory variables using an information theoretic approach with Akaike's information criterion for small sample size (AIC_c) (Burnham and Anderson 2002) to evaluate *a priori* and exploratory models to select models that represented the most potentially influential habitat variables to identify DVC and OCA locations, and (iv) compare the DVC and OCA data sets to evaluate whether they are similar in their ability to accurately predict DVC and OCA locations along the 51 mile study section of US 93.

Given the potential effects of US 93 road construction on wildlife, specifically deer, I developed several pertinent research questions designed to explore relationships between deer highway crossings and both road and landcover habitat characteristics. Are DVCs occurring along US 93 in random locations? If not, are there associated landcover and/or road variables that are similar between DVC locations? Are there associated landcover and/or road variable similarities at OCAs? Do important road and landcover variables differ when comparing DVC and OCAs? Based on available data, can the best approximating models be developed to predict where either DVC or OCAs occur?

I hypothesized that deer are crossing US 93 in specific areas related to topography and habitat characteristics, i.e., deer do not cross in random locations along the study sections. Furthermore I speculated that the location of a deer crossing areas may be associated functionally with specific road and land cover habitat characteristics so that prediction of DVCs or OCA sites is possible using regression techniques. I further hypothesize that differences in vegetation, topography, and road characteristics will exist between DVC and OCA locations. To explore these ideas hypothesized relationships between the DVC and OCA response variables and habitat measurements, *a priori* regression based models were developed for each crossing outcome, DVC or OCA, at several spatial scales. Candidate regression model sets were created at both the local

(Table 1.1) and landscape scale (Table 1.2), including categorical and continuous response variables selected to represent my hypothesized relationships and the influenced of Johnson's (1980) orders of selection. Predicted direction of effects of the explanatory variables included in the candidate models was influenced strongly by previous findings (e.g. Huijser et al. 2006) from available literature (Table 1.3 and 1.4).

Table 1.1. Local-level road and landcover variables measured on US 93 at DVC and OCA study sites. Presence (P) of the variable was recorded where appropriate. (Huijser et al. 2006)

Variable	Definition
Continuous	
Road width	Width of the road (meters) from one edge of the pavement to the other side of the pavement
Road sight	Shortest sight distance on road (pavement) measured in meters. Measured from the tenth-of-a-mile location to where the yellow center line disappears. Estimated with a laser range finder (distance measured in meters).
Side sight	Shortest sight distance to side (meters), maximum value is 101m. Estimated with a laser range finder (distance measured in meters).
Categorical	
Dominant Landcover Type	*Greater than 50 % coverage in the study zone*
Grassland/ Agriculture	Natural grassland, meadow, pastures, crops, horticulture, nursery. Does not include the grass-herb vegetation in the right-of-way (P)
Urban/ Residential	Towns or rural residential development (P)
Forest	Forest or woodland (width >20 meters) (P)
Riparian/ Wetland	Inundated vegetation, but not open water. Riparian habitat or water's edge (P)

Table 1.1 continued.

Speed Limit	Posted speed limit, in miles/hour
Street lights	Street lights (P)
Guard	Guard rail along pavement edge (P)
G_ROW	Grass in right-of-way (P)
Road	Road other than US 93 either parallel or perpendicular to highway (paved, gravel, driveway) (P)
Forest Type	Deciduous (1), Conifer (2), Mixed forest (3)
Forest Burn	Evidence of recent forest fire. (1)Burn not visible; (2) visible, but new growth; (3) visible, no new growth.
Forest Cut	Evidence of the forest being cut for forestry purposes. (1)Cut not visible; (2) visible, but new growth; (3) visible, no new growth.
Buildings	Houses, barns, etc., paved premises (P)
Fence	Impermeable fence (mesh design) and buried underground, ≥ 6 ft high (P)
Open water	Open water (>10 m wide and >1 m deep) (P)
Railroad	Railroad tracks (P)
Slope	Slope (> 45 degrees, ≥ 5 m) (P)
Orchard	Orchard (P)
Green	Urban green yard, garden or vegetated premises (P)
Water	Permanent or seasonal water source (P)
Gully	Linear depression (≥ 2 m deep, no riparian or water) (P)
Ridge	Linear upheaval (≥ 2 m high) (P)
Edge	Transition between cover (forest, woodland, hedgerow) and open habitat (P)

Table 1.1 continued.

Tree line	Line of trees (no cover < 2 m wide) (P)
Hedgerow	Hedgerow (cover < 2 m, width ≤ 20 m) (P)

Table 1.2. Landcover variables used in the GIS analysis at three spatial scales for both DVC and OCA sites. (USGS 2006) See Chapter 3 for detailed description of data layer used.

Landcover Type	Definition
Distance to cities (m)	Shortest distance to cities created from cities layer.
Distance to water (m)	Shortest distance to water for each buffer circle.
Population Density	2000 population density.
Elevation (m)	Elevation at the study site. Determined from 10 m Digital Elevation Model.
Slope	Degrees of slope. 90 = vertical cliff, 0 = flatland. Generated from the 10m DEM
Open water	All areas of open water, generally with less than 25 % cover of vegetation/land cover.
Low Intensity Residential	Includes areas with a mixture of constructed materials and vegetation. Constructed materials—for 30–80 % of cover. Vegetation—20–70 % of cover. Areas most commonly include single-family housing units. Population densities will be lower than in high intensity residential areas.
High Intensity Residential	Includes highly developed areas where people reside in high numbers. Vegetation accounts for less than 20 % cover. Constructed materials account for 80–100 % of cover.
Commercial/ Industrial/ Transportation	Includes infrastructure and all highly developed areas not classified as High Intensity Residential.

Table 1.2 continued.

Barren	Perennially barren areas of bedrock, desert pavement, scarps, talus, slides, or other accumulations of earthen material.
Transitional	Areas of sparse vegetation cover (less than 25 % cover) that are dynamically changing from one land cover to another, often because of land use activities. Examples include forest clear cuts, a transition phase between forest and agriculture land, and the temporary clearing of vegetation.
Deciduous Forest	Areas dominated by trees where 75 % or more of the tree species shed foliage simultaneously in response to seasonal change.
Conifer (Evergreen) Forest	Areas dominated by trees where 75 % or more of the tree species maintain their leaves all year. Canopy is never without green foliage.
Mixed Forest	Areas dominated by trees where neither deciduous nor conifer species represent more than 75 % of the cover present.
Shrubland	Areas dominated by shrubs; shrub canopy accounts for 25–100% cover. Shrub cover is generally greater than 25% when tree cover is less than 25 %. Shrub cover bay be less than 25% in cases when the cover of other life forms (*e.g.* herbaceous or tree) is less than 25 % and shrub cover exceeds the cover of the other life forms.
Grassland/ Herbaceous	Areas dominated by upland grasses and forbs. In rare cases, herbaceous cover is less than 25 %, but exceeds the combined cover of the woody species present. These areas are not subject to intensive management, but they are often utilized in grazing.
Pasture/Hay	Areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops.

Table 1.2 continued.

Row Crops	Areas used for the production of crops, such as corn, soybeans, and vegetables.
Urban/ Recreational Grasses	Vegetation (primarily grasses) planted in developed settings for recreation, erosion control, or aesthetic purposes. Examples include parks, lawns, golf courses, airport grasses, and industrial site grasses.
Woody Wetlands	Areas where forest or shrub land vegetation accounts for 25-100% of the cover and the soil or substrate is periodically saturated with or covered with water.
Emergent Herbaceous Wetlands	Areas where perennial herbaceous vegetation account for 75-100% of the over and the soil or substrate is periodically saturated with or covered with water.

Predicted Effects of Habitat Variables on Deer-Vehicle Collisions

Predictions for effects of habitat covariables on the locations of DVCs are described in the as following section (Table 1.3 contains a list of literature sources that support these predictions). The presence of a higher amount of forest, including conifer or mixed forest, adjacent to the highway can increase the chance of a DVC. Deer seek cover and habitat elements in forested areas, and associated vegetation growing directly adjacent to the road surface can cause a visual barrier for drivers and deer which could increase the probability of a collision. Edge describes a transition area between forested cover and areas of lower vegetation, such as open fields or grasslands. Deer use forests for cover and browse, and open fields and grasslands for grazing. The presence of edge habitat could lead to an increase in DVCs due to increased frequency of travel within the area, coupled with obstructed views due to associated vegetation. Shrub lands can increase the chance of DVCs due to deer browsing on shrub species, seeking cover in the area, and the cover reducing a driver's ability to see deer approaching the roadway. Shrub lands can also be concentrated along riparian corridors, which may also be in attractant. Deer graze on grass and forb species in grasslands, pasturelands and agricultural areas. Though drivers may have an increased ability to see deer, due to a more open area, deer movements in and out of the areas can be frequent, and may occur between dawn and dusk. Though deer could travel through or around wetlands, few of their preferred browse or grazing species fall within this cover type. Water next to or near the road could attract deer to the area, in search of habitat elements associated with water (*e.g.*, woody vegetation, forbs, grasses, water).

If the area has a slope, a natural topographic variation on the landscape, deer may follow natural contours of the land that lead to the highway. Slope also could prevent the deer or the driver from seeing one other approaching. If the road edge is a slope it may act as an obstacle for escape from the highway surface, due to steepness of terrain. Ridges can be useful in predicting where a DVC will occur because of the topography leading deer to an intersection with US 93, and/or creating a visual obstacle for both driver and deer. Lower local elevation could have a higher occurrence of DVCs due to more favorable forage species growing in lower areas such as riparian areas and grazing pastures. The farther a driver can see down the highway to upcoming obstacles (*e.g.*, deer), the greater the reaction time for avoiding a collision. With a shorter road sight there is a greater chance of a DVC due to the inability of a driver to detect and react to a deer approaching the roadside.

The closer the area is to a city; the less likely a DVC due to increased human activity (*e.g.,* traffic and residences) and lower deer abundance. As distance increases away from the city, moderately high traffic levels could persist, and deer density could increase, resulting in an increase in DVC occurrence. If human population density is high in an area, then fewer DVCs could occur. As human population density decreases, DVCs could increase if there is still a moderate human density in the area; coupled with a higher deer density away from high concentrations of people. When there is low intensity residential development in an area, DVCs can be higher due to the amount of rural human activity coupled with an increase in deer presence. Deer may be attracted to human settlements to browse on ornamental greenery or for a possible decrease from hunting pressure. There can be fewer DVCs in barren areas due to decreased forage species and increased disturbance if the area is being used for material extraction or development. Human activities associated with home sites, small rural communities, or towns may deter deer from that area, leading to fewer DVCs. Roads other than US 93 (*e.g.*, driveways or frontage roads) to could lead deer to intersect US 93, if they are following an unobstructed path along the auxiliary road. Also traffic on these roads could startle deer into running onto US 93.

Table 1.3. Prediction of regression explanatory variable coefficient for variables included in candidate DVC models across all spatial scales, along with supporting literature.

Prediction	Support from Previous Literature
Positive correlations	
Forest/conifer cover/mixed forest cover	Bashore et al. 1985; Bellis and Graves 1971; Clevenger et al. 2003; Finder et al. 1999; Lehnert et al. 1996; Malo et al. 2004; Puglisi et al. 1974

Table 1.3 continued

Edge	Andrews 1990; Bashore et al. 1985; Finder et al. 1999; Hubbard et al. 2000; Huijser et al. 2006
Shrub lands	Huijser et al. 2006; Lehnert et al. 1996
Grasslands	Bashore et al. 1985; Malo et al. 2004
Pastureland	Bashore et al. 1985; Carbaugh et al. 1975; Malo et al. 2004
Agriculture lands	Bashore et al. 1985; Carbaugh et al. 1975; Malo et al. 2004
Water	Finder et al. 1999; Huijser et al. 2006
Elevation	Bellis and Graves 1971; Carbaugh et al. 1975
Population Density	Finder et al. 1999; Huijser et al. 2006; Malo et al. 2004; Nielsen et al. 2003
Auxiliary roads	Finder et al. 1999; Lehnert et al. 1996; Puglisi et al. 1974; Rost and Bailey 1979
Negative correlation	
Wetlands	Finder et al. 1999; Huijser et al. 2006
Distance to nearest water	Finder et al. 1999; Huijser et al. 2006
Slope	Bellis and Graves 1971; Carbaugh et al. 1975; Finder et al. 1999; Lehnert et al. 1996; Puglisi et al. 1974; Rost and Bailey 1979
Ridge	Bellis and Graves 1971; Carbaugh et al. 1975; Finder et al. 1999; Lehnert et al. 1996; Puglisi et al. 1974; Rost and Bailey 1979
Road Sight	Bashore et al. 1985; Finder et al. 1999
Distance to nearest city/Residential Urban Development	Bashore et al. 1985

Table 1.3 continued

Buildings/ Low intensity residential development	Finder et al. 1999; Huijser et al. 2006; Malo et al. 2004; Nielsen et al. 2003
Barren ground cover	Finder et al. 1999; Huijser et al. 2006; Malo et al. 2004; Nielsen et al. 2003

Predicted Effects Habitat Covariables
on Presence of Deer Crossing Locations

Forested areas, including conifer and mixed forest, act as movement corridors and contain habitat elements, thus deer are likely to be moving through and cross US 93 in forested locations. Highway crossings may be high in habitat edge areas, e.g., the interface between forested and open areas for deer in search of cover and food. Water adjacent to or near the highway can attract deer to the areas in search of water and associated vegetation. Shrub lands can provide cover and browse for local deer, increasing the chance of presence and OCA. Deer graze on grass and forb species in pasturelands, grasslands, and agricultural areas, thus deer may move into and out of these types of habitats regularly. Deer probably cross infrequently in wetland areas due to few forage or grazing vegetative species associated with this cover type.

In areas adjacent to US 93 with low slopes there could be more OCAs due to ease of movement along flatlands coupled, with greater potential for drivers to see and avoid deer approaching the highway. In contrast, ridges and steep slope lines can create a movement corridors along the landscape, potentially leading deer to US 93. Elevation may affect deer movements, where higher elevations may be used less by deer, thus I predict lower use by deer and fewer highway movements, with deer are more likely to be move at lower elevations where main habitat elements are located. Areas with high slope may possess less deer movement across US 93 due to steep terrain where it is difficult maneuver. Road engineering, visibility, and other human factors could affect deer crossing frequency. For example, along sections of US 93 with relatively high visibility, i.e. a longer road sight, deer may have the potential to be detected by a driver and a collision can potentially be avoided, leading the area to be a higher OCA area. The presence of buildings may deter deer activity and highway crossing in the area if the buildings are associated with a high level of human activity. With home sites, small rural communities, or towns, OCAs may be lower due to less deer activity in the area. With an increased distance to city there could be an increase in deer crossings due to lower traffic volumes and less human disturbance. Increased human population density could result in fewer deer crossings due to disturbances associated with higher levels of human presence (*e.g*., housing, dogs, or increased traffic). Low intensity residential development can attract deer through ornamental vegetation, chemical attractants (*e.g*., salt, antifreeze spills, etc.), and possible release from hunting pressure. Deer presence and OCA occurrence in barren areas may be low due to these areas having few vegetation species and can be the site of human disturbance (*e.g*., gravel pit, construction site, etc.). Auxiliary roads can be associated with residential developments (*e.g*., driveways or frontage roads), thus deterring deer from the area and reducing OCAs.

Table 1.4. Prediction of coefficient sign direction for all variables in OCA models across all spatial scales, along with supporting literature.

Prediction	Support from Literature Review
Positive correlations	
Forest/conifer cover	Bashore et al. 1985; Bellis and Graves 1971; Finder et al. 1999; Puglisi et al. 1974
Edge	Andrews 1990; Bashore et al. 1985; Carbaugh et al. 1975
Water	Finder et al. 1999
Pastureland	Bellis and Graves 1971; Carbaugh et al. 1975; Hubbard et al. 2000; Lehnert et al. 1996
Grassland	Bellis and Graves 1971; Hubbard et al. 2000; Lehnert et al. 1996
Agricultural lands	Bellis and Graves 1971; Carbaugh et al. 1975; Hubbard et al. 2000; Lehnert et al. 1996
Road Sight	Bashore et al. 1985
Distance to nearest city	Finder et al. 1999
Shrub lands	Huijser et al. 2006; Lehnert et al. 1996
Negative correlation	
Distance to nearest water	Finder et al. 1999
Slope	Carbaugh et al. 1975; Finder et al. 1999; Lehnert et al. 1996; Puglisi et al. 1974
Ridge	Bellis and Graves 1971; Carbaugh et al. 1975; Finder et al. 1999; Lehnert et al. 1996; Puglisi et al. 1974;
Elevation	Carbaugh et al. 1975; Finder et al. 1999; Lehnert et al. 1996; Puglisi et al. 1974
Buildings	Malo et al. 2004; Bashore et al. 1985; Nielsen et al. 2003
Population density	Malo et al. 2004; Bashore et al. 1985; Nielsen et al. 2003

Table 1.4 continued.

Low intensity residential development	Malo et al. 2004; Bashore et al. 1985; Nielsen et al. 2003
Bare ground	Finder et al. 1999; Huijser et al. 2006; Malo et al. 2004; Nielsen et al. 2003
Auxiliary roads	Andrews 1990

CHAPTER 2

STUDY AREA

The Flathead Indian Reservation (FIR) was created as the permanent homeland for the Salish, Kootenai, and Pend O'Reille Native American peoples under the terms of the Treaty of the Hellgate of 1855 (Bigart and Woodcock 1996). Currently the reservation encompasses 505,875 ha (1,250,000 acres) of forested mountains and open valleys west of the Continental Divide in Montana. It is located north of Missoula, Montana and also includes the southern half of Flathead Lake (Figure 2.1). A dominant feature forming the eastern boundary of the reservation is the Mission Mountain Range, with elevations up to 2,994 m (Becker 2003). Agriculture, primarily irrigated and dryland farming along with livestock production, are the prevailing land uses on the FIR. Numerous land cover types ranging from semi-arid shrub-grasslands to diverse wetlands and riparian habitats to sub alpine conifer habitats make up the FIR landscape (Becker 2003). US 93 winds through forested mountainous areas dominated by mixed conifer stands comprised of Douglas Fir (*Pseudotsuga menziesii*), Ponderosa Pine (*Pinus ponderosa*), and Western Larch (*Larix occidentalis*); largely impacted palouse prairie comprised of a mix of native wheat grasses, bunch grasses, and needle grasses as well as non-native grassland species; livestock grazing pastures and croplands; and riparian areas along Post Creek, Mission Creek, and the Jocko River.

The Reservation is home to a large number of wildlife species, including 309 species of birds, 66 species of mammals, 9 species of reptiles and 9 species of amphibians (Becker 2003). These abundant wildlife resources provide for the subsistence, cultural, and spiritual needs of the native people residing there. A major motor vehicle transportation route, US 93 runs through the FIR impacting numerous local wildlife species. The maximum posted speed limit for US 93 on the FIR is 65 miles per hour, with average yearly speeds of 61mph (MDT unpublished data). Traffic volume has increased steadily over the past six years; from 7,754 vehicles per day in 1998 to 9,676 vehicles per day in 2003 (MDT unpublished data). Numerous straight-aways, sharp curves, and hills along the highway may affect a driver's ability to see wildlife on or approaching the road. The fifty-one mile study section of US 93 between Evaro, MT and Polson, MT was chosen for this study as it follows the proposed US Highway 93 reconstruction project that began fall 2004.

Both white-tailed deer (*Odocoileus virginianus*) and mule deer (*Odocoileus hemionus*) are found on the FIR. Carcasses and tracks of both deer species were recorded for this study. Though similar in appearance and size, there are distinguishing physical characteristics as well as differences in habitat preferences between the two species. White-tailed deer are very adaptable when it comes to habitat and can be found in marshes, forested areas, river bottoms, or the edges of open plains. They have adapted to human activities and are often found living in close proximity to settled areas (Deal 1998). Mule deer are less tolerant of human settlements and prefer mountain forests, brushy desert areas, and wooded hills (Deal 1998). Although habitat preferences are slightly different, lack of clear identification of species carcasses on the animal vehicle collision reports and lack of means to distinguish between species tracks, lead to both species being combined as a single "deer" species for the scope of this study.

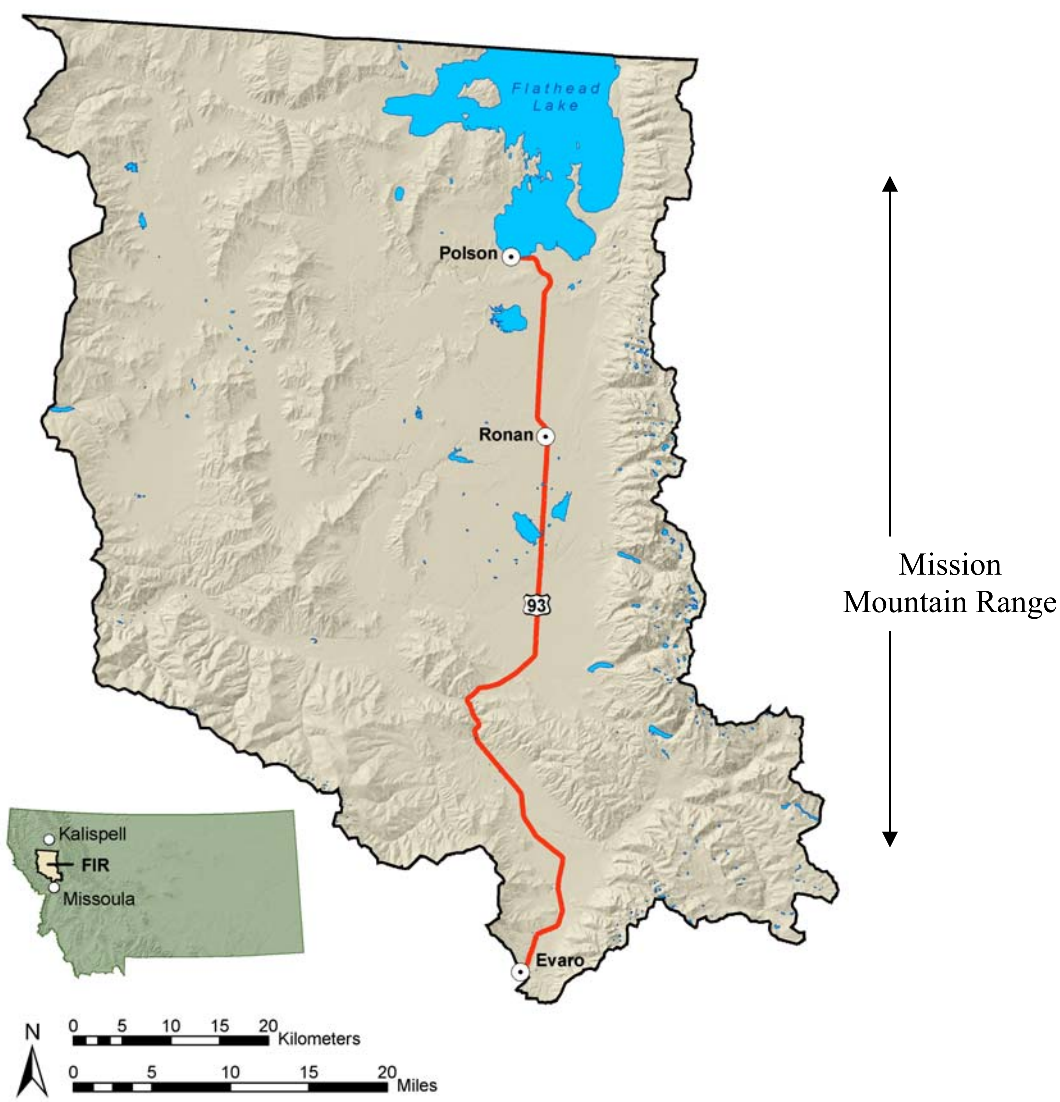

Figure 2.1. US 93 study area and reconstruction location on the Flathead Indian Reservation, Montana. The focus of this study ranges from Evaro, Montana in the south to Polson, Montana to the north.

CHAPTER 3

METHODS

Habitat use by organisms, such as deer, has been described on four nested scales (Franklin et al. 2000; Johnson 1980): the overall geographic range of the species; the home range within the geographic range; various habitat components or patches within the home range, and specific foraging locations within those habitats patches. This project explores three scales, the home range within the geographic range, the various habitat components, and specific foraging locations of deer that potentially used the 51-mile study area along US 93. Between the DVC and OCA studies, variables were similarly measured at four increasing spatial scales centered on US 93, attempting to explore local and landscape level variation. The local-level scale was evaluated directly adjacent to the pavement at each study site, and was collected in the field. In addition, three landscape scale distances were derived using ARC/MAP GIS (ARC GIS 9.1: ESRI, Redlands, California) and were generated in a buffered configuration around each study site at: 0.80 km (0.5-mi), 1.609 km (1-mi), and 3.219 km (2-mi). These three study levels will hereafter be referred to as half-mile level, one-mile level, and two-mile level.

In the DVC study, sites for data collection were randomly chosen on US 93 between mile marker 7 and 58.1. Data from a concurrent study also being conducted on US 93 with identical methods was added to this data set. OCA study locations were concurrent with tracking bed locations. There were 60 tracking beds at the beginning of the study and 32 active beds at the conclusion, so 32 study locations were chosen for completeness of the data set.

<u>Information Theoretic Model Selection</u>

To investigate whether there are associated land cover and road variable similarities among DVC or OCA locations, and to estimate the best approximating model for predicting DVC versus OCA sites, an information theoretic approach was used to evaluate *a priori* models representing the hypothesized relationship between and DVC or OCA and habitat measures (Burnham and Anderson 1998). An information theoretic model selection criterion, Akaike's Information Criterion (AIC), was used to rank the candidate suite of *a priori* models developed separately for each of the four spatial scales. AIC was chosen to estimate the amount of information that was lost when using a particular model to approximate reality compared to other models (Welch and MacMahon 2005); AIC_c was employed due to the small sample size for this study (Burnham and Anderson 2002, Welch and MacMahon 2005). Results depend on an entire suite of candidate models, so *a priori* models were developed from results of previous studies to evaluate the US 93 data. When exploring species-habitat associations, information theoretic methods can quantify the relative importance of habitat variables; provide evidence for hypothesized associations, and identity combinations of variables best used for prediction (Welch and MacMahon 2005). Traditionally, the use of null-hypothesis testing, which only allowed for rejection or failure to reject two models at a time, was used to screen habitat data for statistically significant variables and to develop predictive models (Burnham and Anderson 2002, Welch and MacMahon 2005). As an alternative, AIC provides a simple, effective, and objective means for comparing multiple hypotheses at one time. Model building and selection followed the principle of parsimony, under which the smallest possible number of parameters were used to adequately represent the data.

This approach was used to investigate how combinations of variables associated with known DVC and OCA locations could be used to explain selection of crossing sites along US 93. To begin, I reviewed existing literature to identify possible road and landcover variables that might represent where deer cross or collisions occur. Also consulted was a simultaneous study exploring the same questions, but conducted on US 83 in the Swan Valley, Montana (Huijser et al. 2006). Next, *a priori* models were developed with the identified variables of interest. Following collection of variables (details to follow), and to reduce the number of highly correlated ($r > 0.8$) continuous variables included in the data set, covariation was described using a Pearson's correlation matrix (Statistica 5.5 StatSoft, Inc. Oklahoma). A correlation matrix could not be done on the categorically classified local level data set, so inclusion in the *a priori* models was determined based on a review of existing literature. One global model contained all variables previously included within each spatial scale. No other model contained more variables. Predictions for coefficients were developed (Table 1.3 and 1.4) and relative importance of variables was determined by summing the Akaike weights (W_i) of all models containing each individual explanatory variable. The importance of variables was a tool to evaluate *a priori* models and was used to construct exploratory models.

An Akaike information criterion for small sample size was calculated for each model with the following algorithm: $\mathbf{AIC_c} = -2 \log(£) + 2K + (2K(K+1)/(n-K-1))$. AIC_c and associated weights were derived for each model. Log (L) is the log-likelihood function calculated for the maximum likelihood parameter estimates, K is the number of parameters in the model (number of explanatory variables + 1 for logistic regression), and n is the number of the observation (Welch and MacMahon 2005). Akaike weights (W_i) were also evaluated for each model with the following formula: $\mathbf{W_i} = \exp(-½\{AIC_c - \min(AIC_c)\}) / \Sigma \exp(-½\{AIC_c - \min(AIC_c)\})$. The weights represent the probability that the model is the best among the whole candidate suite. Models were ranked based on the highest W_i values. Individual variables included in the models were evaluated with summed W_i across the suite of models containing that individual explanatory variable. This was done to determine total support for individual explanatory variables contributing to over all prediction of DVCs. The models with the highest ranking W_i were selected to represent the best approximating models for prediction; also included were models with a ΔAIC_c within 2 points of the top ranked model. Other model evaluation criteria included models with coefficient SE greater than 1 and p-values less than or equal to 0.19 were preferred. Parsimony was considered in groups of closely ranked models.

Local Level Variables

Along the targeted fifty-one mile stretch of US 93, local-level road and landcover characteristics were recorded in the field between 20 July and 5 August 2004. Randomly selected study sites were located and variables were measured. At each site along the highway, 22 categorical and 3 continuous variables were measured (Table 1.1). Categorical variables included dominant landcover type (forest, agricultural, residential, prairie, wetland); forest characteristics (tree type and forestry practices); and the presence of grasslands, grass in the right-of-way, arable lands, buildings, wildlife proof fencing, open water, other roads, railroads, slope, orchards, greenery associated with human developments, water, riparian characteristics, gullies, ridges, edge habitat, tree lines, hedgerows, guardrails, and streetlights. Continuous variables were road sight, side sight, and road width.

Following the methods of Huijser el al. (2006), the local variables were recorded in “study zones” placed at each randomly selected study site (i.e. mile markers and 0.10 mi segments). A study zone started and ended halfway between each selected mile marker, for example, at a randomly selected site at mile marker 12.7, a study zone would start at 12.65 mi and ended at 12.75 mi (Figure 3.1). Each study zone extended up to 100 m perpendicular from the edge of the pavement on both sides of the road. Thus a zone measured 0.16-km by 200-m plus the road width at the random study site (Figure 3.1). Because deer may have been killed anywhere within the 0.10 mi (0.16 km) reported area, the two adjacent road length units within a 100 m radius (measured from the edge of the pavement at the beginning or end of a road length unit) were evaluated if a road or landcover feature was not present within the study zone. Thus the variables obtained through direct field observation were taken at each 0.1 mi marker and related to an oval shaped area (Figure 3.1).

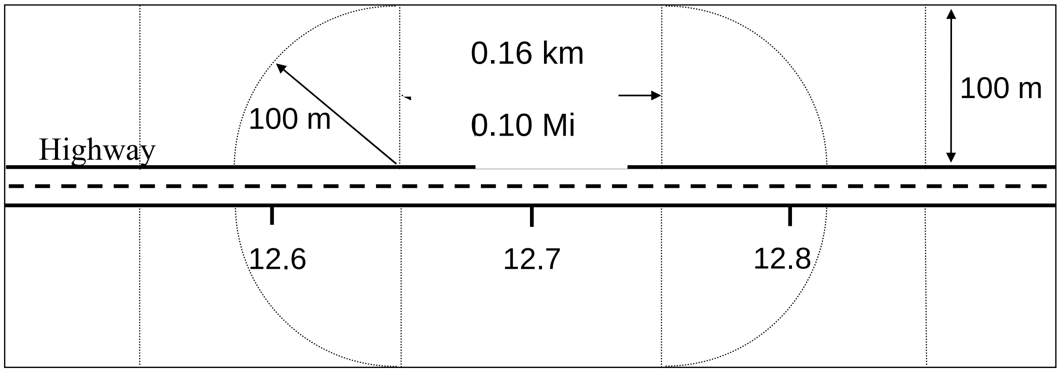

Figure 3.1. Hypothetical example of a road section at a 0.16 km (0.1 Mi) study sites, with a 0.16 km road length unit and a 100 m wide zone with a 100 m radius on either side of the road (from Huijser et al. 2006).

The four continuous variables were also recorded in the study zone, but with different methods. The continuous road characteristics included 0.10 mile, mile posts numbers, road width, road sight, and side sight. Road width was measured with a Rolatape Master Measure (Rolatape, Watseka, Illinois) and extrapolated for other sites with identical lane configuration. Road sight and side sight followed the methods of Huijser et al. (2006). Road sight was the shortest sight distance on the road, estimating the distance until the yellow center line disappeared from sight. Of the two sight distances measured for the two opposite directions for a given study site, the shorter of the two distances was used. Shortest side sight distance, perpendicular to the highway was also recorded. This variable was measured from the edge of the pavement to the edge of the closest visual barrier. Visual barriers included buildings, trees, and tall grass-herb vegetation.

Landscape-Level Variables

A GIS was used to quantify landcover variables summarized within circular buffers applied at three spatial scales over each randomly selected mile marker: half-mile, one-mile, and two-mile level, centered at each 0.16 km study site. Six digital thematic data layers were used in this analysis: (1) the CSKT buildings layer was digitized from 1962, 1972, 1984, 1990, and 1998 1:24,000 color aerial photographs, orthophoto quadrangle maps, and 1992 1:24,000 digital orthophoto quarter quads; (2) the U.S. Geological Survey (USGS) National Land Cover Dataset was compiled from 1992 Landsat satellite TM imagery with a spatial resolution of 30 m and supplemented by various ancillary data; (3) USGS 10 m Digital Elevation Model (DEM) of the Flathead Indian Reservation was derived from hypsographic data and photogrammetric methods using 1990 USGS 1:250,000 topographic quadrangle maps; (4) Natural Resource Information System (NRIS) provided 2000 Montana population density, which was derived from U.S. Census Bureau 2000 TIGER files (100 m grid); (5) Montana Department of Fish, Wildlife, and Parks (MT-FWP) 2003 streams and lakes layers, in which lakes were digitized from 1:24,000 Ortho quadrangle maps from the National Hydrology Database (NHD), U.S. Forest Service (USFS), and Bureau of Indian Affairs (BIA) and all Montana streams digitized from 1:100,000 NHD Ortho quadrangle maps; and (6) NRIS 1991 Montana cities and towns layer, originated from the Montana State Library from the 1990 Census blocks (1:24,000 scale).

All layers were converted to NAD 83 State Plane (UMT 11) coordinate system for use in analysis. Layers included landcover types, presence of structures, elevation, slope, distance to the nearest town, population density, and shortest distance to water (Table 1.2).

Deer Vehicle Collisions

All DVC data between mile markers 7 at the south end of the study area (Evaro, MT) and 58.1 at the north end of the study area (Polson, MT), between 12 January 1998 and 29 December 2003 was obtained from MDT carcass removal reports and Montana Highway Patrol (MHP) accident reports (unpublished data). Of the entire fifty-one mile study area on US 93, 35 % of the area was reported to have at least one DVC occurrence. The two data sets were combined to produce a pooled set of DVC observations along US 93 (Figure 3.2). Maintenance workers picking up deer carcasses and recording occurrence did not or could not always distinguish between the specific deer species. For the purpose of this study either species of deer, mule or white tailed, will be considered as a general deer record. This is a conservative data set due to many DVCs going unreported, with deer often succumbing to their injuries away from the highway or being picked up by highway travelers or local residents. Animal vehicle collision records are recorded year round.

The combination of the MDT and MHP data sets could contain double counts of road-kills because the agencies recorded data along the same highway. Criteria were established to remove possible double count observations. A record was considered a double count and one was removed if: (i) two records had identical data (*e.g.* exact same day, same location or same animal code), (ii) two records were recorded on the same day, within 0.16 km, and had the same animal code, or (iii) two records were within two days of each other, were at the same location or within 0.16 km of each other, and had the same animal code. If three records meet the above criteria, then two were preserved and one was removed. The thought is that this could represent multiple kills at the same location, with the potential for double recording.

A random subset of both DVC and locations were no DVC were recorded were selected for study sites. The study included 108 DVC and 158 no DVC sites between mile marker 7 and 58.1 on US 93. One hundred eight of the total 180 DVC sites were included in this analysis. At the 108 sites, 179 DVCs occurrences were recorded. All DVC locations and concentrations along US 93 were mapped and analyzed with a GIS (Figure 3.2). All variables were collected as described in the previous section.

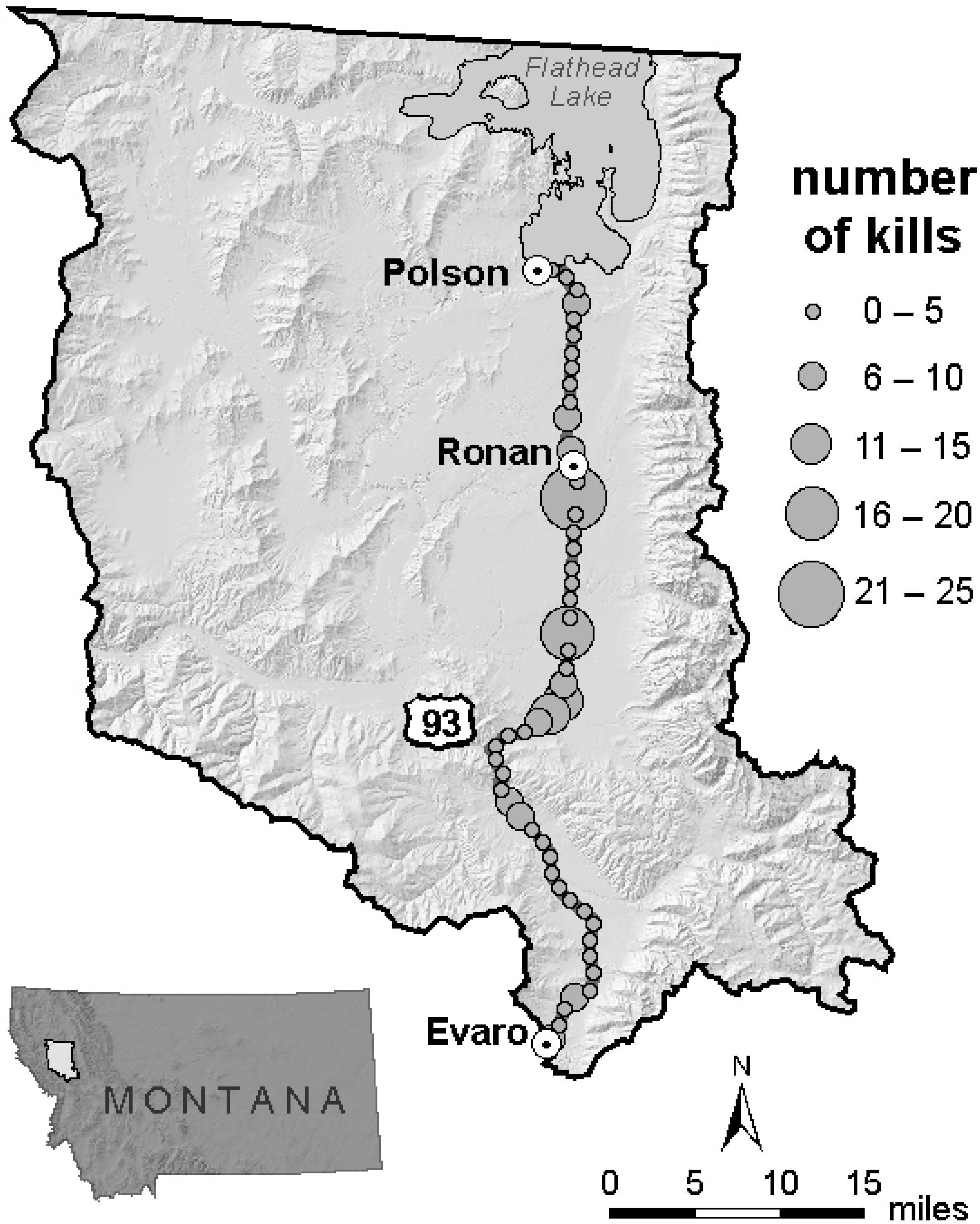

Figure 3.2. Relative density of deer killed along Highway 93 between 1998 and 2003. The data are from the MDT and the MHP and were recorded as the number of individual DVCs per 0.16 km (0.1 mile).

Statistical Analysis

Separate *a priori* models were developed for each level at the four spatial scales (Table 3.1). These suites of models were evaluated with a binary logistic regression, followed by an information theoretic model selection criterion, Akaike's Information Criterion (AIC_c) for small sample size. The results were then used to rank the candidate suite of models. Direction of slope and negative log likelihood values were determined, and used to evaluate and rank models with the AIC_c. Variables were ranked by their AIC_c weights, and returned to the binary logistic regression for inclusion in exploratory models (Burnham and Anderson 2000).

To reduce the number of highly correlated ($r > 0.6$) continuous landscape level variables included in the analysis a Pearson's correlation matrix was computed in Statistica 5.5 (StatSoft, Inc. Oklahoma). Local data were categorically classified, so their inclusion in the *a priori* models was determined based on a review of existing literature. Ten local variables remained in the analysis after the removal of fifteen variables not identified by the literature as significant for describing deer crossing or collision location. At the three landscape levels, the same nine variables were removed due to correlation issues.

At the local scale the presence of forest, edge habitat, buildings, residential/urban developments, other roads, ridges, slope, waterways, as well as posted speed limit and road sight (Table 1.1) were used to develop models (Table 3.1). At the three landscape scales, the thirteen variables were included in the models: distance to nearest city, distance to nearest water (includes streams, rivers, lakes, and ponds), elevation, population density, slope (in degrees), light residential settlements, barren land, Conifer forest, grasslands, pasture, agriculture, woody wetlands, and at the two-mile level, mixed forest. (See Table 1.2 for variable descriptions; Table 3.1 for models)

MiniTab 14 (MiniTab Inc., England) was used to perform a binary logistic regression on DVC data. A binary response variable (y) is defined for each record, such that y=1 if a DVC occurred at the location and y=0 if no DVC was recorded at the location. Associated coefficients, standard errors (SE), p-values, and negative log likelihoods were recorded for each model.

Table 3.1. Description and representation of *a priori* models predicting the effects of road and landcover variables on DVC location at each 0.16 km study site along US 93.

	Local-level	
	Hypothesis	Model
1)	Presence of edge, auxiliary roads, and water.	$\beta_0 + \beta_1$ (edge) + β_2 (road) + β_3 (water)
2)	Presence of forest, edge, buildings, and slope.	$\beta_0 + \beta_1$ (forest) + β_2 (edge) + β_3 (buildings) + β_4 (slope)
3)	Presence of forest, edge, buildings, decreased distance of road sight, and slope.	$\beta_0 + \beta_1$ (forest) + β_2 (edge) + β_3 (buildings) + β_4 (road sight) + β_5 (slope)
4)	Presence of edge, auxiliary roads, water, slope, and buildings.	$\beta_0 + \beta_1$ (edge) + β_2 (road) + β_3 (water) + β_4 (slope) + β_5 (buildings)
5)	Presence of forest, edge, buildings, slope, decreased distance of road sight, and higher posted speed limit	$\beta_0 + \beta_1$ (forest) + β_2 (edge) + β_3 (buildings) + β_4 (slope) + β_5 (road sight) + β_6 (speed limit)

Table 3.1 continued

	Hypothesis	Model
6)	Presence of forest, edge, buildings, slope, residential/urban areas, auxiliary roads, and decreased distance of road sight.	$\beta_0 + \beta_1$ (forest) + β_2 (edge) + β_3 (buildings) + β_4 (slope) + β_5 (residential/urban) + β_6 (road) + β_7 (road sight)
7)	Presence of forest, edge, buildings, slope, residential/urban areas, auxiliary roads, water, ridges, and decreased distance of road sight.	$\beta_0 + \beta_1$ (forest) + β_2 (edge) + β_3 (buildings) + β_4 (slope) + β_5 (residential/urban) + β_6 (road) + β_7 (water) + β_8 (ridge) + β_9 (road sight)
8)	Presence of forest, edge, buildings, slope, residential/urban areas, auxiliary roads, ridge, water, decreased distance of road sight, and higher posted speed limit.	$\beta_0 + \beta_1$ (forest) + β_2 (edge) + β_3 (buildings) + β_4 (slope) + β_5 (residential/urban) + β_6 (road) + β_7 (ridge) + β_8 (water) + β_9 (road sight) + β_{10} (speed limit)

Landscape Level

Half-mile, One-mile and Two-mile combined unless otherwise noted.

	Hypothesis	Model
1)	Decreased distance to nearest city and elevation	$\beta_0 + \beta_1$ (nearest city) + β_2 (elevation)
2)	Increased population density and conifer forest; decreased low intensity residential development.	$\beta_0 + \beta_1$ (population density) + β_2 (conifer) + β_3 (residential:low)
3)	Decreased elevation and slope of local topography; increased conifer forest.	$\beta_0 + \beta_1$ (elevation) + β_2 (slope) + β_3 (conifer)
4)	Decreased distance to nearest city and elevation; increased shrub land and conifer forest.	$\beta_0 + \beta_1$ (nearest city) + β_2 (elevation) + β_3 (shrub) + β_4 (conifer)
5)	Decreased grassland, pasture, agriculture; increased barren land.	$\beta_0 + \beta_1$ (grass) + β_2 (pasture) + β_3 (agriculture) + β_4 (bare)

Table 3.1 continued

	Half-mile	*One-mile*	*Two-mile*
6)	Increased shrub lands, conifer forest, wetlands, and population density; decreased grasslands.	Increased shrub lands and conifer forest; decreased grassland and pasture.	Increased shrub lands, conifer forest, and wetland; decreased grasslands and population density.
	$\beta_0 + \beta_1$ (shrub) + β_2 (conifer) + β_3 (wetland) + β_4 (population density) + β_5 (grass)	$\beta_0 + \beta_1$ (shrub) + β_2 (conifer) + β_3 (grass) + β_4(pasture)	$\beta_0 + \beta_1$ (shrub) + β_2 (conifer) + β_3 (wetland) + β_4 (grass) + β_5 (population density)
7)	Increased conifer forest and shrub land; decreased grassland and pasture.	Increased shrub lands, conifer forest, wetlands, local population density; decreased grasslands.	Increased conifer forest, mixed forest, and shrub land; decreased grasslands and pasture.
	$\beta_0 + \beta_1$ (conifer) + β_2 (shrub) + β_3 (grass) + β_4 (pasture)	$\beta_0 + \beta_1$ (shrubs) + β_2 (conifer) + β_3 (wetland) + β_4 (population density) + β_5 (grass)	$\beta_0 + \beta_1$ (conifer) + β_2 (mixed) + β_3 (shrub) + β_4 (grass) + β_5 (pasture)

Half-, One-, and Two-mile levels

	Hypothesis	Model
8)	Increased Conifer forest and wetlands; decreased low intensity residential development, slope, and distance to nearest water.	$\beta_0 + \beta_1$ (conifer) + β_2 (wetland) + β_3 (residential:low) + β_4 (slope) + β_5 (nearest water)
9)	Decreased distance to nearest city, low intensity residential development, grassland, and barren land; increased population density.	$\beta_0 + \beta_1$ (nearest city) + β_2 (residential:low) + β_3 (grass) + β_4 (bare) + β_5 (population density)

Table 3.1 continued

	Half-mile and One-Mile	*Two-mile*
10)	Decreased distance to nearest city, distance to nearest water, elevation, slope, low intensity residential development, barren land, grassland, pasture, agriculture; increased population density, conifer forest, shrub lands, and wetlands	Decreased distance to nearest cities, distance to nearest water, elevation, slope, low intensity residential development, barren areas, grassland, pasture, and agriculture; increased population density, conifer forest, mixed forest, shrub lands, and increased wetlands.
	$\beta_0 + \beta_1$ (nearest city) + β_2 (nearest water) + β3 (elevation) + β_4 (slope) + β_5 (residential: low intensity) + β_6 (bare) + β_7 (grass) + β_8 (pasture) + β_9 (ag) + β_{10} (population density) + β_{11} (conifer) + β_{12} (shrub) + β_{13} (wetland)	$\beta_0 + \beta_1$ (nearest city) + β_2 (nearest water) + β3 (elevation) + β_4 (slope) + β_5 (residential: low) + β_6 (bare) + β_7 (grass) + β_8 (pasture) + β_9 (ag) + β_{10} (population density) + β_{11} (conifer) + β_{12} (mixed) + β_{13} (shrub) + β_{14} (wetland)

Exploratory models were developed following analysis of *a priori* models. Three techniques were used to explore combinations of explanatory variables that may be helpful in predicting where DVCs could occur: 1) highest ranked summed W_i, 0.21 and higher (Table 4.2), were added to a binary logistic regression and subtracted in a stepwise manner; 2) all *a priori* models were individually added to binary logistic regression and variables were subtracted in stepwise manner; and 3) a global model comprised of all included and previously excluded variables was created, and a backwards stepwise regression was preformed. In the last method, if a good model was found that included previously excluded variables, the previously generated Pearson's correlation matrix was consulted to avoid highly correlated variables in the same model. The models with the highest ranking W_i were chosen as the best exploratory models. Also included were models with a ΔAIC_c within 2 points of the top ranked model. Other model evaluation criteria included coefficients with standard errors less than 1, and p-values less than or equal to 0.19. The most parsimonious model was selected in groups of closely ranked models. A multi-level scale was also included in the exploratory phase. A backwards stepwise regression was used to explore variable combinations from the four spatial scales. *A priori* models were also used as templates for multi-level exploration, where variables from the four levels were used as opposed to a single spatial level. Previously excluded variables were added to the exploratory analysis, some of which were highly correlated, so an additional correlation matrix was run on the entire set of data at all levels.

Observed Crossing Areas

The term *observed crossing area* (OCA) refers to the areas along US 93 where sand tracking beds were established, that allowed researchers to observe what species of wildlife were approaching the highway and allowed for interpretation of behavioral patterns (*e.g.* crossing the highway) between the animal and the highway surface with associated vehicular traffic. These OCAs were then used as a comparison of perceived "successful" highway crossings compared to a DVC as an "unsuccessful" crossing attempt. The sand tracking beds were part of the pre-construction wildlife monitoring project conducted by the WTI to establish animal road-crossing rates before and after the highway mitigation measures are implemented as a means of assessing how well the wildlife fencing and crossing structures accommodate wildlife movement across the highway (Hardy and Huijser 2003). This project was done in accordance with the Design Guidelines and Recommendations in the Memorandum of Agreement for US 93 Reconstruction to evaluate the effectiveness of the wildlife crossing structures and wildlife fencing (Hardy and Huijser 2003; Skillings-Connely (b) 2000).

Three landcover types were sampled for wildlife movement patterns; Evaro area as a forested landcover type, Ravalli curves as a riparian cover type and Ravalli hill as grassland cover type. Tracking bed placement in the Evaro (Figure 3.3), Ravalli Curves, and Ravalli Hill areas (Figure 3.4) was determined by randomly selecting locations parallel to and approximately 6' from the highway, that sub sampled 30% (6200 meters) of the total length of US 93 originally planned to have wildlife proof fencing. The 32 sand tracking beds used in my study were a subset of the original 60 sand tracking beds developed at the beginning of the WTI study. Modifications to the highway mitigation measures in the form of a reduction in wildlife proof fencing resulted in the abandonment of twenty-eight tracking beds from the original study. Each tracking bed was approximately 100 m long and 2 m wide, with an underlining of unwoven filter fabric topped with ~ 10.16 cm of a 7:1 mixture of sand and 1/8" crushed aggregate material.

Tracking beds were visited between May and August/September from 2003-2005. On the first day of data collection all tracking beds were visited and sand was raked to erase all existing tracks. No data was collected on the first day. Subsequent visits occurred early in the morning, two times per week approximately three days apart. This interval was used to minimize effort (time and money) while still having identifiable tracks in the tracking medium. Each bed was monitored for new tracks visible in the sand medium. If tracks were present, data were collected on various aspects, including track bed location, species, track location within the track bed relative to the ends of the beds, and movement behavior while in the sand substrate.

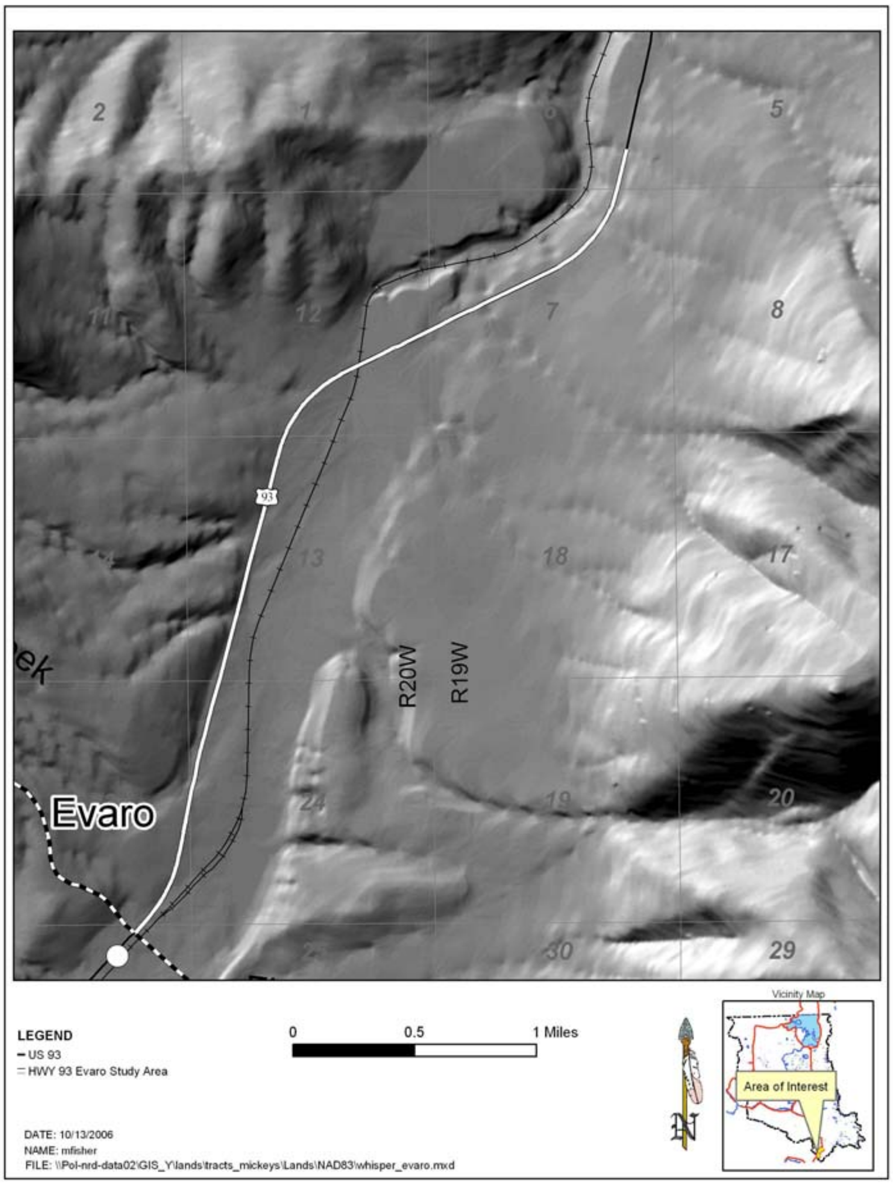

Figure 3.3. Evaro Study Area. Area where sand tracking beds were placed and recorded for animal movement across US 93. Evaro represented forested habitat.

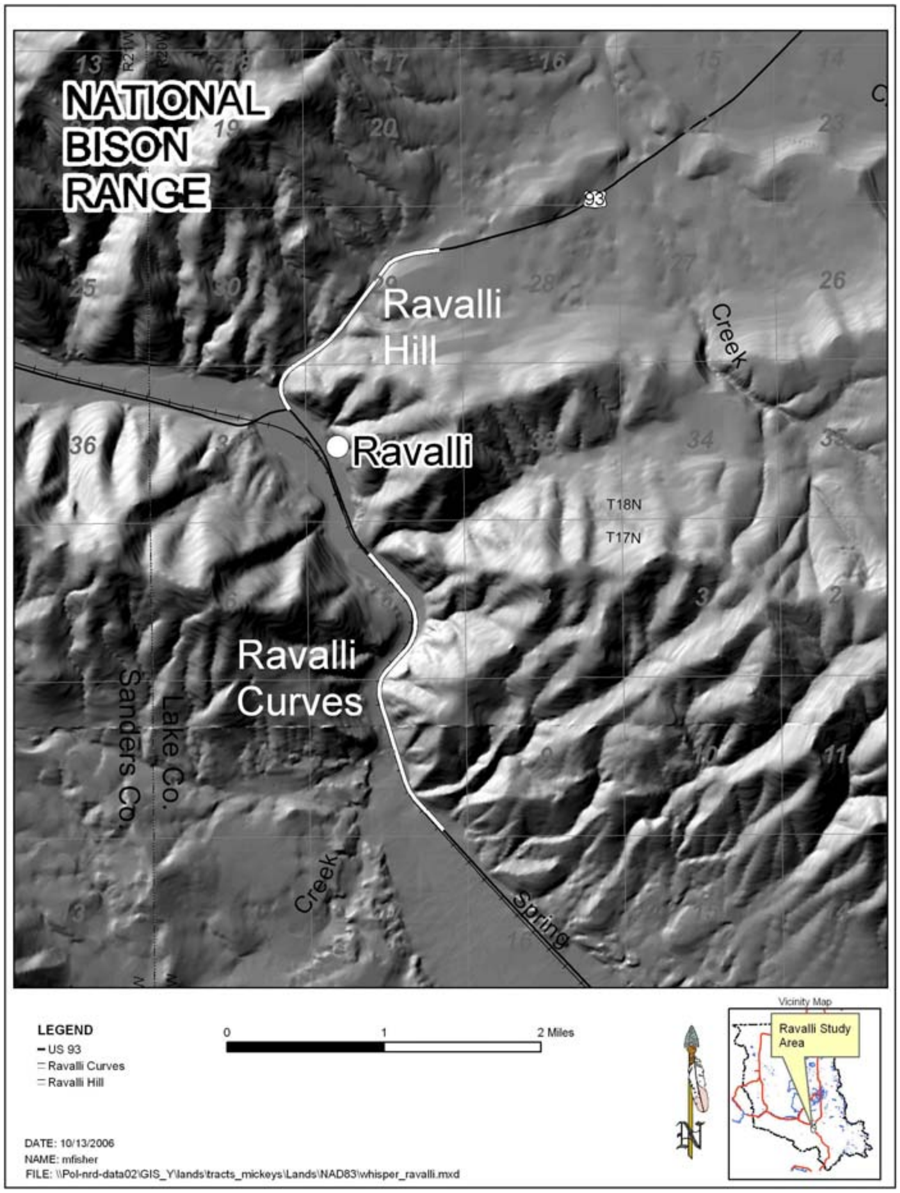

Figure 3.4. Ravalli Study Areas. Ravalli Curves at southern portion of map represents riparian habitat; Ravalli Hill at northern portion of map represents grassland habitat.

As in the DVC locations, local landcover and road variables were recorded at the OCA locations. Variables collected were the same as previously reported, but the distance recorded differed slightly. Distance considered in the study zone was 100 m parallel to the highway, with the study site at the midpoint of the track bed. Variables were recorded in a zone that extended up to 100 m perpendicular from the edge of the pavement on both sides of the road. Thus a zone measured 100 m along the road by 200 m across the road corridor, plus the road width. Variables not within the study zone were considered in the two adjacent road length units within a 100 m, again relating to an oval shaped area (Figure 3.1).

Mile markers were assigned to each tracking bed as the mile marker closest to the center point of the tracking bed. The associated landscape level landcover data were then considered for the specific tracking bed.

Statistical Analysis

An investigation of possible associations between landcover and road variable similarities among OCA locations was conducted. The best approximating model was sought with an information theoretic approach, evaluating *a priori* models predicting which variables may be the best indicators of OCA location, based on a literature review. Separate *a priori* models were developed for each level of the four spatial scales (Table 3.2). The models were evaluated with a multiple linear regression. Response variable was total number of deer occurrence recorded in the tracking beds between 2003 and 2004; evaluated against explanatory variables representing road (e.g. road width, auxiliary roads, and speed limit) and landcover (e.g. landcover types, land use, and topography) characteristics. An information theoretic model selection criterion, AIC_c, was used to rank the candidate suite of *a priori* models developed for each spatial scale.

The regression results were used to define the direction of slope for coefficients, standard errors (SE), and p-values; and to obtain the residual sums of squares used to derive the negative log likelihood value; which was then used to evaluate and rank models with the AIC_c and associated AIC_c weights (W_i). The models with the highest ranking W_i were chosen as the best models, also included were models with a ΔAIC_c with in 2 points of the top ranked model. Other model evaluation criteria included models with coefficient standard errors less than 1 and p-values less than or equal to 0.19 were preferred. Parsimony was considered in groups of closely ranked models.

Due to the low number of sand tracking beds, 32, an additional Pearson's correlation matrix was generated for this smaller, continuous data set, again highly correlated ($r > 0.8$) variables were not evaluated in the same models. Categorical variables were also removed if there were no records of presence in the reduced data set.

Across all spatial scales, six categorical variables (forest, grass, buildings, riparian or wetlands, slope, and waterways) of the original nineteen and twelve continuous variables (road sight, distance to nearest city, distance to nearest water, elevation, population density, slope, low intensity residential development, conifer forest, grasslands, agriculture, shrub lands, and deciduous forest) from the original twenty-two variables remained for analyses. Tables 1.1 and 1.2 present the variable descriptions and Table 1.4 presents predictions of coefficient signage. Individual variables included in the models were evaluated with the summed W_i across the suite of models containing that individual explanatory variable. This was done to determine total support for individual explanatory variables contributing to over all prediction of OCAs. The models will not be directly compared between OCA and DVC due to differing response variables, thus different regression analysis.

Table 3.2. Description and representation of *a priori* models predicting the effects of road and landcover variables on OCA location at each 0.16 km study site along US 93.

	Hypothesis	Model
Local-level		
1)	Presence of grassland and an increased road sight.	$\beta_0 + \beta_1$ (grassland) + β_2 (road sight)
2)	Presence of forest, auxiliary roads, and water.	$\beta_0 + \beta_1$ (forest) + β_2 (road) + β_3 (water)
3)	Presence of forest, buildings, slope and riparian or wetland areas.	$\beta_0 + \beta_1$ (forest) + β_2 (buildings) + β_3 (slope) + β_4 (riparian/wetland)
4)	Presence of forest, buildings, slope, and an increased road sight.	$\beta_0 + \beta_1$ (forest) + β_2 (buildings) + β_3 (slope) + β_4 (road sight)
5)	Presence of auxiliary roads, water sources, slope, and buildings.	$\beta_0 + \beta_1$ (road) + β_2 (water) + β_3 (slope) + β_4 (buildings)
6)	Presence of forest, buildings, slope, auxiliary roads, and riparian or wetland areas.	$\beta_0 + \beta_1$ (forest) + β_2 (buildings) + β_3 (slope) + β_4 (road) + β_5 (riparian/wetland)
7)	Presence of forest, grasslands, buildings, an increased road sight, slope, auxiliary roads, water sources, and riparian or wetland areas.	$\beta_0 + \beta_1$ (forest) + β_2 (grassland) + β_3 (buildings) + β_4 (road sight) + β_5 (slope) + β_6 (road) + β_7 (water) + β_8 (riparian/wetland)
Half-mile level		
1)	Increased distance to nearest city and distance to nearest water; decreased elevation.	$\beta_0 + \beta_1$ (nearest city) + β_2 (nearest water) + β_3 (elevation)
2)	Increased grassland, agricultural areas, and distance to nearest water.	$\beta_0 + \beta_1$ (grass) + β_2 (agriculture) + β_3 (nearest water)

Table 3.2 continued

	Hypothesis	Model
3)	Increased low intensity residential development and grassland; decreased population density and Conifer forest	$\beta_0 + \beta_1$ (residential:low) + β_2 (grassland) + β_3 (population density) + β_4 (conifer)
4)	Decreased elevation, Conifer forest, and population density; increased distance to nearest water.	$\beta_0 + \beta_1$ (elevation) + β_2 (conifer) + β_3 (population density) + β_4 (nearest water)
5)	Increased distance to nearest city and agricultural areas; decreased elevation and Conifer forest.	$\beta_0 + \beta_1$ (nearest city) + β_2 (agriculture) + β_3 (elevation) + β_4 (conifer)
6)	Decreased Conifer forest, shrub lands, population density, and distance to water.	$\beta_0 + \beta_1$ (conifer) + β_2 (shrub) + β_3 (population density) + β_4 (nearest water)
7)	Decrease in population density, shrub land, and elevation; increase in agriculture and distance to nearest water.	$\beta_0 + \beta_1$ (population density) + β_2 (shrub) + β_3 (elevation) + β_4 (agriculture) + β_5 (nearest water)
8)	Increased distance to nearest city, low intensity residential development, and distance to water; decreased population density and Conifer forest.	$\beta_0 + \beta_1$ (nearest city) + β_2 (residential:low) + β_3 (nearest water) + β_4 (population density) + β_5 (conifer)
9)	Increased distance to nearest cities, distance to nearest water, low intensity residential development, grasslands, and agricultural areas; decreased elevation, Conifer forest, population density, and shrub land.	$\beta_0 + \beta_1$ (nearest city) + β_2 (nearest water) + β3 (residential:low) + β_4 (grassland) + β_5 (agriculture) + β_6 (elevation) + β_7 (conifer)+ β_8 (population density) + β_9 (shrub)
One-Mile Level		
1)	Increased distance to nearest city and distance to nearest water; decreased elevation.	$\beta_0 + \beta_1$ (nearest city) + β_2 (nearest water) + β_3 (elevation)

Table 3.2 continued

	Hypothesis	Model
2)	Decreased shrub land; increased grassland and distance to nearest water.	$\beta_0 + \beta_1$ (shrub) + β_2 (grass) + β_3 (nearest water)
3)	Increased grasslands, distance to nearest water, and agricultural areas.	$\beta_0 + \beta_1$ (grass) + β_2 (nearest water) + β_3 (agriculture)
4)	Increase low intensity residential development, distance to nearest city, distance to nearest water; decreased Conifer forest.	$\beta_0 + \beta_1$ (residential:low) + β_2 (nearest city) + β_3 (nearest water) + β_4 (conifer)
5)	Decreased elevation and Conifer forest; increased distance to nearest water and distance to nearest city.	$\beta_0 + \beta_1$ (elevation) + β_2 (conifer) + β_3 (nearest water) + β_4 (nearest city)
6)	Increased distance to nearest city, distance to nearest water, and agricultural areas; decreased Conifer forest.	$\beta_0 + \beta_1$ (nearest city) + β_2 (nearest water) + β_3 (agriculture) + β_4 (conifer)
7)	Decreased Conifer forest and shrub lands; increased grasslands and distance to nearest water.	$\beta_0 + \beta_1$ (conifer) + β_2 (shrub) + β_3 (grassland) + β_4 (nearest water)
8)	Decreased shrub lands, Conifer forest, and grasslands; increased distance to nearest water and distance to nearest city.	$\beta_0 + \beta_1$ (shrub) + β_2 (conifer) + β_3 (grassland) + β_4 (nearest water) + β_5 (nearest city)
9)	Increased distance to nearest cities, distance to nearest water, low intensity residential development, grasslands, and agricultural areas; decreased elevation, Conifer forest, and shrub land.	$\beta_0 + \beta_1$ (nearest city) + β_2 (nearest water) + β3 (residential: low intensity) + β_4 (grassland) + β_5 (agriculture) + β_6 (elevation) + β_7 (conifer)+ β_8 (shrub)
	Two-mile Level	
1)	Increased distance to nearest city and decreased elevation.	$\beta_0 + \beta_1$ (nearest city) + β_2 (elevation)
2)	Increase in nearest city; decreased population density and Conifer forest.	$\beta_0 + \beta_1$ (nearest city) + β_2 (population density) + β_3 (conifer)

Table 3.2 continued

3)	Decreased elevation, Conifer forest, and population density.	$\beta_0 + \beta_1$ (elevation) + β_2 (conifer) + β_3 (population density)
4)	Decreased slope and Conifer forest; increased distance to water.	$\beta_0 + \beta_1$ (slope) + β_2 (conifer) + β_3 (nearest water)
5)	Increased low intensity residential development, grassland, and distance to nearest water; decreased Conifer forest.	$\beta_0 + \beta_1$ (residential:low) + β_2 (grass) + β_3 (nearest water) + β_4 (conifer)
6)	Increased nearest city and agriculture land; decreased shrub land and Conifer forest.	$\beta_0 + \beta_1$ (nearest city) + β_2 (agriculture) + β_3 (shrub) + β_4 (conifer)
7)	Decreased deciduous forest and Conifer forest; increased grassland and distance to nearest water.	$\beta_0 + \beta_1$ (deciduous) + β_2 (conifer) + β_3 (grass) + β_4 (nearest water)
8)	Increased agriculture, nearest city, distance to water and grassland; decreased Conifer forest	$\beta_0 + \beta_1$ (agriculture) + β_2 (nearest city) + β_3 (nearest water) + β_4 (grass)+ β_5 (conifer)
9)	Increased nearest city, distance to nearest water, low intensity residential development, agriculture areas, and grasslands; decreased population density, elevation, slope, Conifer forest, deciduous forest, and shrub land,	$\beta_0 + \beta_1$ (nearest city) + β_2 (nearest water) + β3 (population density) + β_4 (elevation) + β_5 (slope) + β_6 (residential:low) + β_7 (conifer) + β_8 (deciduous) + β_9 (agriculture) + β_{10} (shrub) + β_{11} (grass)

Exploratory models were developed following analysis of *a priori* models. Three techniques were used to explore combinations of variables that may be helpful in predicting where OCAs could occur: 1) highest ranked W_i, 0.21 and higher (Table 4.5), were added to a multiple linear regression and subtracted in a stepwise manner; 2) all *a priori* models were individually added to multiple linear regression and variables were subtracted in stepwise manner; and 3) a global model comprised of all included and previously excluded variables was created, and a stepwise subtraction of variables was preformed. In the last method, if a good model was found that included previously excluded variables, the previously generated Pearson's correlation matrix was consulted to avoid highly correlated variables in the same model. The models with the highest ranking W_i were chosen as the best models, also included were models with a ΔAIC_c with in 2 points of the top ranked model. Other model evaluation criteria included models with coefficient standard errors > 1 and p-values 0.19 and below were preferred. Parsimony was considered in groups of closely ranked models.

CHAPTER 4

RESULTS

Deer Vehicle Collision

A priori Models

At the local level, Model 7 ranked highest from the suite as useful in predicting where DVCs might occur (Table 4.1). Six models, Models 1-6, ranked lowest of the suite; scoring poorly with Akaike weights (W_i) less than 0.0001. Model 7 possessed a AIC weight of W_i =0.747; I interpreted this as support for Model 7 identified as the best approximating model, given the data, from the candidate suite of models. Upon evaluation of variable significance from the summed W_i table (Table 4.2), all nine variables included in Model 7 were considered significant. Explanatory variables contained in the best approximating Model 7 with positive coefficients included forest cover, auxiliary roads, and water; and negative coefficients for residential/urban all performed as predicted. Edge, predicted to have a positive coefficients, and building, road sight, slope, and ridge predicted to have negative coefficients, deviated from my prediceted results (Table 1.3, Table 4.5). All SE were less than 1 and three p-values were greater than 0.19. Model 8, the global model, ranked second on the W_i scale, 2.1 points below Model 7.

At the half-mile analysis scale, six of the ten models were closely ranked as top competing models using AIC ranks (Table 4.1). Model 2, 8, 1, 3, 9, and 5 (Table 4.1) all ranked highest on the list within 2.0 AIC_c values of the highest ranked model. The global model, Model 10 was not among the highest ranked models. Model 2, the top ranked model ($W_i = 0.19$), included the habitat variables population density, low intensity residential development, and conifer forest. All variables scored high on the individual variable summed W_i table (Table 4.3). Coefficients coincided with predicted effects for low intensity residential development and conifer forest cover for having positive correlations with the DVC occurrence; while population density differed from predicted positive effect, with the observed effect negative (Table 1.3 and Table 4.3). All standard errors were less than 1 and only one p-value associated with a coefficient was greater than 0.19 (Table 4.3). Model 8, $W_i = 0.19$, included five variables, with positive correlations predicted for low intensity residential development, conifer forest, and negative correlations predicted for slope, wetland, and distance to nearest water. Shrub and distance to nearest water scored low to very low on the individual variable W_i table (Table 4.2). All variable coefficients performed as predicted. Five out of six p-values were greater than 0.19, and no SE were over 1 (Table 4.3). Model 1 ranked third with a W_i of 0.16, and included variables distance to nearest city as a negative predictor and elevation as a positive of DVC occurrence. Both variables deviated from these predicted coefficient signage. One SE was greater than 1 and all p-values were greater than 0.19 (Table 4.3). Model 3 ranked with $W_i = 0.1369$, and included variables elevation, slope, and conifer. Coefficients differed from the predicted signage for elevation which was predicted as positive, while slope, predicted negative relationship, and conifer, predicted positive, resulted in these predicted signages (Table 1.3 and Table 4.3). One standard error and one p-value were over the preferred value (Table 4.3). Model 9 was the fifth ranked model with W_i 0.1224 (Table 4.1). This model contained five variables grouped by predicted coefficient signage, positive and negative, respectively: population density, low intensity residential development, grassland, and barren land; distance to nearest city. Low intensity residential development and barren land performed as predicted, while the population density, grassland and distance to nearest city deviated from predicted signage (Table 4.3). All SE were less than 1, while four p-values were greater than 0.19 (Table 4.3). The final model, Model 5 ranked lowest with a W_i of 0.08. Predictor variables included grassland, pasture land, agriculture land, and barren ground. Agriculture land and barren land performed as predicted, positive correlations; while positive correlation predicted grassland and pasture land, deviated from this prediction (Table 4.3). No SE were greater than 1 and all four p-values were greater than 0.19 (Table 4.3).

At the one-mile level the majority of the models ranked poorly with W_i of 0.08 and lower. One model ranked highest, Model 8 with W_i of 0.56 (Table 4.1). Variables included conifer forest and low intensity residential development, which were predicted to have positive correlations with DVC; slope, wetland, and distance to nearest water were predicted to have negative relationships. All predicted variables coincided with actual variable coefficients (Table 1.3 and Table 4.3). All SE were less than 1, and two p-values were greater than 0.19. The global model scored low with a W_i of 0.0082.

At the two mile level the majority of *a priori* models ranked very low. Seven out of ten models ranked a W_i below 0.04, including the global model. Two models ranked highest, Model 2 and Model 9 with W_i of 0.51 and 0.28, respectively (Table 4.1). Model

2 contained variables population density, low intensity residential development, and Conifer forest. Conifer and low intensity residential development coincided with the predicted effect of positive correlations; while positive prediction for population density deviated from the actual relationship (Table 4.3). There where no SE greater than 1, and two p-values were greater than 0.19 (Table 4.3). Model 9 included two variables predicted to have negative effects with DVC location, distance to nearest city, population density, and two variable predicted to have positive correlations with DVC location, low intensity residential development, grassland, and barren land. Low intensity residential development is the only variable corresponding to the predicted coefficient signage. All variables ranked mid to high on the summed W_i scale (Table 4.3). One SE was greater than 1, and four p-values are greater than 0.19.

Table 4.1. Binary logistic regression output and *a priori* models for DVCs locations along US 93 as a function of road and land cover variables and ranked according to W_i for each spatial level. See Appendix C for full table of model results.

	Local-Level			
	Model	AIC_c	ΔAIC_c	W_i
7	$\beta_0 + \beta_1$ (forest) $+\beta_2$ (edge) $+ \beta_3$ (building) $+ \beta_4$ (road sight) $+ \beta_5$ (slope) $+ \beta_6$ (res/urban) $+ \beta_7$ (road) $+ \beta_8$ (water) $+ \beta_9$ (ridge)	332.0	0.0	0.747
8	$\beta_0 + \beta_1$ (forest) $+\beta_2$ (edge) $+ \beta_3$ (building) $+ \beta_4$ (road sight) $+ \beta_5$ (slope) $+ \beta_6$ (res/urban) $+ \beta_7$ (road) $+ \beta_8$ (water) $+ \beta_9$ (ridge) $+ \beta_{10}$ (speed limit)	334.2	2.1	0.2522
6	$\beta_0 + \beta_1$ (forest) $+ \beta_2$ (edge) $+\beta_3$ (building) $+ \beta_4$ (road sight) $+ \beta_5$ (slope) $+ \beta_6$ (res/urban) $+ \beta_7$ (road)	346.9	14.8	0.0004
1	$\beta_0 + \beta_1$ (edge) $+ \beta_2$ (road) $+ \beta_3$ (water)	349.1	17.0	0.0001
5	$\beta_0 + \beta_1$ (forest) $+ \beta_2$ (edge) $+ \beta_3$ (building) $+ \beta_4$ (road sight) $+ \beta_5$ (slope) $+ \beta_6$ (speed limit)	351.3	19.3	0.0000

Table 4.1 Local Level continued

	Model	AIC_c	ΔAIC_c	W_i
4	$\beta_0 + \beta_1$ (edge) + β_2 (road) + β_3 (water) + β_4 (slope) + β_5 (buildings)	353.0	20.9	0.0000
2	$\beta_0 + \beta_1$ (forest) + β_2 (edge) + β_3 (building) + β_4 (slope)	354.0	21.9	0.0000
3	$\beta_0 + \beta_1$ (forest) + β_2 (edge) + β_3 (building) + β_4 (road sight) + β_5 (slope)	356.1	24.0	0.0000
	Half-Mile Level			
2	β_0 + β_1 (pop density) + β_2 (residential:low) + β_3 (conifer)	365.9	0.0	0.1906
8	$\beta_0 + \beta_1$ (conifer) + β_2 (residential:low) + β_3 (slope) + β_4 (wetland) + β_5 (nearest water)	365.9	0.0	0.1879
1	$\beta_0 + \beta_1$ (nearest city) + β_2(elevation)	366.2	0.3	0.1619
3	$\beta_0 + \beta_1$ (elevation) + β_2 (slope) + β_3 (conifer)	366.6	0.6	0.1369
9	$\beta_0 + \beta_1$ (nearest city) + β_2 (pop density) + β_3 (residential:low) + β_4 (grass) + β_5 (barren)	366.8	0.8	0.1224
5	$\beta_0 + \beta_1$ (nearest city) +β_2 (elevation) + β_3 (shrub) + β_4 (conifer)	367.6	1.7	0.0805
7	$\beta_0 + \beta_1$ (conifer) + β_2 (shrub) + β_3 (grass) + β_4 (pasture)	368.5	2.6	0.0517
4	$\beta_0 + \beta_1$ (nearest city) + β_2 (elevation) + β_3 (shrub) + β_4 (conifer)	369.0	3.0	0.0406
10	$\beta_0 + \beta_1$ (nearest city) + β_2 (nearest water) + β3 (pop density) + β_4 (elevation) + β_5 (slope) + β_6 (residential:low) + β_7 (barren) + β_8 (conifer) + β_9 (shrub) + β_{10} (grass) + β_{11} (pasture) + β_{12} (ag) + β_{13} (wetland)	371.1	5.2	0.0139
6	$\beta_0 + \beta_1$ (shrub) + β_2 (grass) + β_3 (conifer) + β_4 (wetland) + β_5 (pop density)	371.2	5.3	0.0132

Table 4.1 continued

	One-Mile Level			
	Model	AIC_c	ΔAIC_c	W_i
8	$\beta_0 + \beta_1$ (conifer) + β_2 (residential:low) + β_3 (slope) + β_4 (wetland) + β_5 (nearest water)	360.7	0.0	0.5627
6	$\beta_0 + \beta_1$ (shrub) + β_2 (grass) + β_3 (conifer) + β_4 (wetland) + β_5 (pop density)	363.1	2.4	0.1694
2	$\beta_0 + \beta_1$ (pop density) + β_2 (residential:low) + β_3 (conifer)	364.5	3.8	0.0834
3	$\beta_0 + \beta_1$ (elevation) + β_2 (slope) + β_3 (conifer)	365.1	4.4	0.0613
1	$\beta_0 + \beta_1$ (nearest city) + β_2 (elevation)	366.2	5.4	0.0366
9	$\beta_0 + \beta_1$ (nearest city) + β_2 (pop density) + β_3 (residential:low) + β_4 (grass) + β_5 (barren)	366.3	5.6	0.0336
4	$\beta_0 + \beta_1$ (nearest city) + β_2 (elevation) + β_3 (shrub) + β_4 (conifer)	367.2	6.5	0.0212
5	$\beta_0 + \beta_1$ (grass) + β_2 (pasture) + β_3 (agriculture) + β_4 (barren)	368.3	7.5	0.0127
7	$\beta_0 + \beta_1$ (conifer) + β_2 (shrub) + β_3 (grass) + β_4 (pasture)	368.6	7.9	0.0105
10	$\beta_0 + \beta_1$ (nearest city) + β_2 (nearest water) + β3 (pop density) + β_4 (elevation) + β_5 (slope) + β_6 (residential:low) + β_7 (barren) + β_8 (conifer) + β_9 (shrub) + β_{10} (grass) + β_{11} (pasture) + β_{12} (ag) + β_{13} (wetland)	369.1	8.4	0.0082
	Two-Mile Level			
2	$\beta_0 + \beta_1$ (pop density) + β_2 (residential:low) + β_3 (conifer)	352.9	0.0	0.5107
9	$\beta_0 + \beta_1$ (nearest city) + β_2 (pop density) + β_3 (residential:low) + β_4 (grass) + β_5 (barren)	354.0	1.1	0.2821
8	$\beta_0 + \beta_1$ (conifer) + β_2 (residential:low) + β_3 (slope) + β_4 (wetland) + β_5 (nearest water)	355.4	2.5	0.1416

Table 4.1 Two-Mile Level continued

3	$\beta_0 + \beta_1$ (elevation) + β_2 (slope) + β_3 (conifer)	358.0	5.1	0.0399
4	$\beta_0 + \beta_1$ (nearest city) + β_2 (elevation) + β_3 (shrub) + β_4 (conifer)	359.3	6.4	0.0206
6	$\beta_0 + \beta_1$ (shrub) + β_2 (grass) + β_3 (conifer) + β_4 (wetland) + β_5 (pop density)	363.5	10.6	0.0025
5	$\beta_0 + \beta_1$ (grass) + β_2 (pasture) + β_3 (agriculture) + β_4 (barren)	365.4	12.5	0.0010
1	$\beta_0 + \beta_1$ (nearest city) + β_2 (elevation)	366.0	13.1	0.0007
10	$\beta_0 + \beta_1$ (nearest city) + β_2 (nearest water) + β3 (pop density) + β_4 (elevation) + β_5 (slope) + β_6 (residential:low) + β_7 (barren) + β_8 (conifer) + β_9 (mixed) + β_{10} (shrub) + β_{11} (grass) + β_{12} (pasture) + β_{13} (ag) + β_{14} (wetland)	366.0	13.14	0.0007
7	$\beta_0 + \beta_1$ (conifer) + β_2 (mixed) + β_3 (shrub) + β_4 (grass) + β_5 (pasture)	368.2	15.31	0.0002

Table 4.2. Summed Akaike weights (W_i) ranked by significance for evaluation of relative importance of individual explanatory variables for DVC sites at each spatial scale.

Local Level		*Half-Mile Level*	
Variable	Summed W_i	Variable	Summed W_i
Edge	1	Conifer forests	0.635
Auxiliary Road	0.9999	Residential: low	0.515
Buildings	0.9999	Elevation	0.353
Slope	0.9999	Population density	0.340
Forest	0.9998	Nearest city	0.339
Road sight	0.9998	Slope	0.339
Residential /urban development	0.9998	Grass	0.282
Water	0.9995	Bare	0.217
Ridge	0.9993	Wetland	0.215
Speed Limit	0.2523	Nearest water	0.202
		Pasture	0.146
		Shrub	0.119

Table 4.2 continued.

One-Mile Level		*Two-Mile Level*	
Variable	Summed W_i	Variable	Summed W_i
Conifer forests	0.747	Residential: low	0.935
Wetland	0.740	Population density	0.796
Residential: low	0.688	Conifer	0.716
Slope	0.632	Nearest city	0.304
Nearest water	0.571	Grassland	0.286
Population density	0.295	Bare	0.284
Grassland	0.235	Slope	0.182
Shrub	0.209	Wetland	0.145
Elevation	0.127	Nearest water	0.142
Nearest city	0.100	Elevation	0.062
Bare	0.055	Shrub	0.024
Pasture	0.031	Pasture	0.002
Agriculture	0.021	Agriculture	0.002
		Mixed forest	0.001

Table 4.3. Betas, standard errors, and p-values for the top W_i ranked *a priori* model(s) at each spatial scale for DVC location.

	Local				
	Model	K	B estimate	Standard Error	P-value
7	β_0	11	-1.38276	0.473219	0.003
	β_1 (forest)		0.75451	0.301488	0.012
	β_2 (edge)		-1.86934	0.510843	0.000
	β_3 (building)		0.23299	0.318998	0.465
	β_4 (road sight)		0.00081	0.0009661	0.401
	β_5 (slope)		-0.47068	0.363099	0.195
	β_6 (res/urban)		-1.62437	0.554109	0.003
	β_7 (road)		0.47472	0.330172	0.150
	β_8 (water)		0.7231	0.339540	0.033
	β_9 (ridge)		1.94976	0.590641	0.001

	Half-Mile				
	Model	K	B estimate	Standard Error	P-value
2	β_0	5	-0.30072	0.17679	0.089
	β_1 (pop density)		-0.00099	0.00071	0.162
	β_2 (residential:low)		0.18899	0.10898	0.083
	β_3 (conifer forest)		0.00031	0.00517	0.952

Table 4.3 continued.

	Model	K	B estimate	Standard Error	P-value
8	β_0	7	0.27024	0.32951	0.412
	β_1 (conifer forest)		0.00208	0.00559	0.709
	β_2 (residential:low)		0.05671	0.06269	0.366
	β_3 (slope)		-0.02899	0.02692	0.282
	β_4 (wetland)		-0.03376	0.06108	0.580
	β_5 (nearest water)		-0.00213	0.00096	0.027
1	β_0	4	0.04228	1.07464	0.969
	β_1 (nearest city)		0.00005	0.00005	0.330
	β_2 (elevation)		-0.00065	0.0011	0.553
3	β_0	5	2.31734	1.85335	0.211
	β_1 (elevation)		-0.00280	0.00197	0.155
	β_2 (slope)		-0.03960	0.02835	0.162
	β_3 (conifer forest)		0.01431	0.00995	0.151
9	β_0	7	-0.15753	0.42399	0.710
	β_1 (nearest city)		0.000001	0.00006	0.988
	β_2 (pop density)		-0.00110	0.00082	0.181
	β_3 (residential:low)		0.18369	0.11426	0.108
	β_4 (grass)		-0.00947	0.00794	0.233
	β_5 (barren)		0.71299	0.56469	0.207
5	β_0	6	-0.15578	0.38406	0.685
	β_1 (grass)		-0.01092	0.00899	0.224
	β_2 (pasture)		-0.00334	0.00572	0.559
	β_3 (agriculture)		0.00089	0.00572	0.876
	β_4 (barren)		0.641965	0.54205	0.236
	One-Mile				
8	β_0	7	0.61709	0.37347	0.098
	β_1 (conifer forest)		0.00386	0.00506	0.446
	β_2 (residential:low)		0.09242	0.13347	0.489
	β_3 (slope)		-0.03811	0.02893	0.188
	β_4 (wetland)		-0.20562	0.10274	0.045
	β_5 (nearest water)		-0.00234	0.00112	0.037

Table 4.3 continued.

	Two-Mile				
	Model	K	B estimate	Standard Error	P-value
2	β_0	5	-0.30249	0.24076	0.209
	β_1 (pop density)		-0.00474	0.00230	0.039
	β_2 (residential:low)		2.33202	0.67285	0.001
	β_3 (conifer forest)		0.00118	0.00491	0.810
8	β_0	7	-0.08278	0.71327	0.908
	β_1 (distance to city)		0.00002	0.00009	0.793
	β_2 (pop density)		-0.00556	0.00298	0.062
	β_3 (residential:low)		2.46542	0.73800	0.001
	β_4 (grass)		-0.01097	0.00847	0.196
	β_5 (barren)		-0.54676	4.50426	0.903

Exploratory Models

At the local level Model 1 scored the highest W_i, 0.98, of the exploratory candidate suite (Table 4.4). P-values were all less than 0.19, as well as all SE less than 1. Three of the six variables coincided with the predicted positive coefficient direction, forest, auxiliary road and water; while positively predicted edge, and negatively predicted slope and ridge deviated from actual coefficient direction (Table 1.3 and Table 4.4).

Model 3, ranked highest with a W_i of 0.69 at the half-mile level, 0.54 units above the remaining two exploratory models (Table 4.4). Explanatory variables included slope, conifer, elevation, and urban vegetation. Two variables with SE above 1 were in the resulting regression output (Table 4.4), and no p-values were greater than 0.19. Of the variables included in the prediction table (Table 1.3) slope, negative, and conifer, positive, agreed with predicted signage, while elevation, positive, differed. Urban vegetation was not in the *a priori* suite of models, and thus did not have a predicted sign direction. Model 1 had a W_i of 0.16, and contained low intensity residential development and population density as explanatory variables. Low intensity residential development supported the predicted positive sign direction; while population density differed from the predicted. The selected exploratory model contained no SE greater than 1 and no p-values greater than 0.19. Model 2, with a W_i of 0.15, was comprised of grassland and barren land. Grassland differed from the predicted positive relationship while, barren land followed the positive coefficient prediction. No SE was greater than 1 and one p-value was over 0.19 (Table 4.4).

At the one-mile level Model 5 and Model 1 ranked the highest according to Akaike weights, 0.47 and 0.28, respectively (Table 4.4). Model 5 contained variables distance to nearest water, conifer forest, grassland, pasture, and wetland. Distance to nearest water and wetland coincided with the predicted negative relationship to DVC location; while conifer forest, grassland, and pasture differ from predictions positive coefficients (Table 1.3 and Table 4.4). This model contains no SE over 1, and no p-values greater than 0.19. Model 1, also contains variables wetland, distance to nearest water, and grassland. Grassland, the only variable in the model predicted to have a positive relationship deviated from actual output. All p-values and SE fell with in the preferred range.

Two models ranked highest at the two-mile level. Model 2 and Model 4 had similar AIC_c scores and close $W_{i,}$, 0.39 and 0.35, respectively (Table 4.4). Variables between the two models were identical; with predicted negatively correlated variables including low intensity residential development and wetland, as well as predicted positively correlated variables population density and grassland. Model 4 also containing distance to nearest water, which was predicted to have a negative correlation. Low intensity residential development, wetland, and distance to nearest water all coincide with predictions, while population density and grassland disagree with predictions (Table 1.3 and Table 4.4). Standard errors and p-values were within acceptable range for both models.

At the multi-scale level, Model 6 was the top ranked model with a W_i of 0.82. Model 6 displayed no issues with SE greater than 1 or p-values greater than 0.19. Variables included at the half-mile level: conifer, grassland, and pasture; at the one-mile level distance to nearest water; and at the two-mile level woody wetland. Conifer, grassland, pasture were predicted to have positive correlations with DVC location, while distant to nearest water and wetland were predicted to have negative correlations. Woody wetland was the only variable that coincided with predicted signage (Table 1.3 and Table 4.4). For the full table of exploratory models please see Appendix E.

Table 4.4. Description and representation of highest ranked exploratory models predicting the effects of road and landcover variables on DVC location at each 0.16 km study site along US 93.

	Local Level						
	Model	Coefficient	Std Error	P-Value	AIC_c	ΔAIC_c	W_i
1)	β_0	-0.991074	0.3029	0.001	337.02	0	0.9853
	β_1 (forest)	0.740494	0.2936	0.012			
	β_2 (road)	0.397364	0.2926	0.175			
	β_3 (water)	0.645680	0.3328	0.052			
	β_4 (edge)	-1.74737	0.4992	0.000			
	β_5 (slope)	-0.727578	0.3501	0.038			
	β_6 (ridge)	2.00097	0.5621	0.000			

Table 4.4 continued

	Model	Coefficients	Std Error	P-Value	AIC_c	ΔAIC_c	W_i
	Half-Mile Level						
3)	β_0	2.65403	1.8661	0.155	360.89	0	0.6912
	β_1 (slope)	-0.0455609	0.0285	0.110			
	β_2 (conifer forest)	0.0192725	0.0104	0.066			
	β_3 (elevation)	-0.003153	0.0019	0.113			
	β_4 (urban veg)	-1.92341	1.3191	0.145			
1)	β_0	-0.295058	0.1500	0.049	363.87	2.9	0.1554
	β_1 (resid:low)	0.189369	0.1089	0.082			
	β_2 (pop density)	-0.0010045	0.0007	0.158			
2)	β_0	-0.245115	0.1828	0.180	363.90	3.0	0.1533
	β_1 (grassland)	-0.0101055	0.0073	0.171			
	β_2 (bare)	0.681499	0.5288	0.198			
	One-Mile Level						
	Model	Coefficients	Std Error	P-Value	AIC_c	ΔAIC_c	W_i
5)	β_0	-2.68381	0.9017	0.003	353.64	0	0.4728
	β_1 (near water)	-0.0032867	0.0012	0.009			
	β_2 (conifer forest)	-0.0170114	0.0087	0.052			
	β_3 (grassland)	-0.0317512	0.0104	0.002			
	β_4 (pasture)	-0.0284836	0.0129	0.028			
	β_5 (wetland)	-0.362318	0.1176	0.002			
1)	β_0	0.913118	0.3828	0.017	354.65	1	0.2855
	β_1 (wetland)	-0.245728	0.1028	0.017			
	β_2 (near water)	-0.0024602	0.0011	0.029			
	β_3 (grassland)	-0.0160995	0.0075	0.032			
	Two-Mile Level						
2)	β_0	0.522493	0.3616	0.149	348.41	0	0.3998
	β_1 (resid:low)	2.27218	0.6825	0.001			
	β_2 (pop density)	-0.0057636	0.0023	0.015			
	β_3 (grassland)	-0.0179167	0.0076	0.019			
	β_4 (wetland)	-0.384056	0.2075	0.064			

Table 4.4 continued

	Model	Coefficient	Std Error	P-Value	AIC_c	ΔAIC_c	W_i
4)	β_0	0.716747	0.3910	0.067	348.65	0.2	0.3557
	β_1 (pop density)	-0.0059607	0.0023	0.012			
	β_2 (resid:low)	2.26275	0.6769	0.001			
	β_3 (grassland)	-0.0207188	0.0079	0.009			
	β_4 (wetland)	-4.70984	0.2201	0.032			
	β_5 (near water)	-0.0910648	0.0695	0.190			
	Multi-scale						
6)	β_0	2.5636	0.76395	0.001	353.38	0	0.8221
	β_1 (0.5_conifer forest)	-0.01529	0.00785	0.051			
	β_2 (0.5_grassland)	-0.03352	0.01084	0.002			
	β_3 (0.5_pasture)	-0.025936	0.00929	0.005			
	β_4 (2_Wwetland)	-0.756439	0.24482	0.002			
	β_5 (1_Near water)	0.00278	0.0012	0.021			

Model names in the multi-scale section include numbers, 0.5, 1, and 2, that refer to the mile buffer level, half mile, one mile and two mile, respectively. Wwetland refers to woody wetland vegetation cover; pop density refers to population density; resid:low refers to low intensity residential development, urban veg refers to urban vegetation; near water refers to distance to nearest water.

Observed Crossing Area

A priori Models

At the local level analysis for OCA occurrence, Model 1 and 2 ranked highest based on Akaike weights (W_i) (Table 4.5). Model 1 ranked highest with a W_i of 0.49. Variables included grassland and road sight, with both variables ranking highest on the summed Akaike weight table (Table 4.6). Both variables were predicted to have positive correlations with OCA location. Grassland coefficient sign did not match, while road sight slope direction did support the predictions (Table 1.4 and 4.5). Grassland had a standard error of 1.006 and a p-value of 0.585, which were both higher than desired values of a standard error of 1 and p-value of 0.19. Model 2 included variables forest, auxiliary road, and water as predictors of OCA occurrence. All three variables ranked in the mid-level of the variables on the summed W_i table (Table 4.6). Forest and water were predicted to have positive relationships and auxiliary road was predicted to have negative relation with OCAs. All variables deviated from the predicted model effect (Table 1.4 and Table 4.5) Road displayed a standard error of 1.026 and a p-value of 0.530. The global model was the lowest ranking model of the suite with a W_i of 0.0002 (see appendix D).

Model 1 ranked highest of the *a priori* suite at the half-mile level (W_i = 0.47). This model included distance to nearest city, elevation, and distance to nearest water. Though it ranked the highest W_i , there were standard error and p-values over the desired values (Table 4.7). Distance to nearest water coincided with predicted negative correlation, while distance to nearest city and water deviated from the predicted positive correlation. The global model, Model 9 was the lowest ranked model with a W_i of 0.058 (see appendix D).

At the one-mile level, four models ranked highest of the *a priori* suite. Model 1 ranked the highest of the suite with a W_i of 0.25. Variables included distance to nearest water, distance to nearest city, and elevation; two of which ranked highest on the summed W_i table and one with a mid ranking (Table 4.6). Distance to nearest city (predicted positive correlation) and distance to nearest water (predicted negative correlation) agreed with predicted coefficient signage, while elevation (predicted negative correlation) deviated from prediction (Table 1.4 and Table 4.5). This model had an SE greater than 1 and p-values greater than 0.19. Model 2 (W_i = 0.18) includes shrub, grasslands, and distance to nearest water as predictors of OCA location. Variables ranked in the high to mid range of the summed W_i ranking (Table 4.6). Shrub land and grassland were predicted to have positive correlations to OCA location, and distance to nearest water was predicted to have a negative correlation (Table 1.4 and Table 4.5). Distance to nearest water deviated from predictions, while shrub land and grassland agreed with predictions. There was a SE over 1 and two p-values over 0.19. Model 3, including variables grassland, distance to nearest water, and agriculture, had a W_i of 0.17. Variables on the summed W_i scale varied in ranking (Table 4.6). Grassland and agriculture were predicted to have positive correlations with OCA, of which both deviated from model output (Table 1.4 and Table 4.5). Distance to nearest water corresponded with predicted negative correlation. Again the standard error for β_0 was greater than 1 and two p-values were greater than 0.19. Model 7, the fourth ranked model of the suite had a W_i of 0.17. Variables include conifer, shrub, grassland, and distance to nearest water, and ranged over the list of the summed W_i ranking (Table 4.6). Conifer, shrub and grassland were all predicted to have a positive correlation with OCA, and distance to nearest water was predicted to have a negative correlation. Shrub was the only variable that deviated from this prediction. The SE for the β_0 was 1.879 and all p-values were less than 0.19.

Four models ranked highest at the two-mile level, Model 1, 3, 4 and 2; with W_i of 0.32, 0.27, 0.14, and 0.13, respectively (Table 4.5). The global model, Model 9, ranked lowest from the suite of models. Model 1 is a two variable model with explanatory variables distance to nearest city and elevation. Distance to nearest city coincided with predicted effect of a positive correlation; while elevation, predicted negative correlation, deviated from the prediction (Table 1.4, Table 4.5). The SE of the β_0 was 2.953, and the model contained one p-value over 0.19 (Table 4.7). Model 3 was comprised of three variables: elevation, conifer, and population density; all of which coincided with predicted signage (Table 1.4, Table 4.7). Elevation and population density display negative correlations and conifer displayed positive correlations with OCA location. All p-values were below 0.19, but the β_0 standard error was 15.79 (Table 4.7). Model 4 comprised of slope, conifer, and distance to nearest water coincided with predicted variable effect in the model (Table 1.4 and 4.7). One SE was greater than 1 and two p-values were greater than 0.19. (Table 4.7). Lastly, Model 2 included distance to nearest city (predicted positive correlation), population density (predicted negative correlation), and conifer forest (predicted positive correlation), all coincided with predicted effects on the model (Table 1.4 and Table 4.7). One SE was greater than 1 and all p-values were less than 0.19.

Table 4.5. Multiple linear regression models of OCA *a priori* models for deer along US 93 as a function of road and land cover variables and ranked according to W_i for each spatial level. See Appendix D for full table of model results.

	Local-Level			
	Model	AIC_c	ΔAIC_c	W_i
1	$\beta_0 + \beta_1$ (grassland) $+\beta_2$ (road sight)	34.8	0	0.4890
2	$\beta_0 + \beta_1$ (forest) $+\beta_2$ (road) $+ \beta_3$ (water)	35.6	0.8	0.3310
5	$\beta_0 + \beta_1$ (road) $+ \beta_2$ (water) $+\beta_3$ (slope)	38.2	3.4	0.0895
4	$\beta_0 + \beta_1$ (forest) $+ \beta_2$ (building) $+ \beta_3$ (road sight) $+ \beta_4$ (slope)	39.5	4.7	0.0463

Table 4.5 continued

	Model	AIC_c	ΔAIC_c	W_i
3	$\beta_0 + \beta_1$ (forest) + β_2 (building) + β_3 (slope) + β_4 (riparian/wetland)	40.1	5.3	0.0343
6	$\beta_0 + \beta_1$ (forest) + β_2 (building) + β_3 (slope) + β_4 (road) + β_5 (riparian/wetland)	42.6	7.8	0.0098
7	$\beta_0 + \beta_1$ (forest) + β_2 (grassland) + β_3 (building) + β_4 (road sight) + β_5 (slope) + β_6 (road) + β_7 (water) + β_8 (riparian/wetland)	51.4	16.6	0.0001
	Half-Mile Level			
1	$\beta_0 + \beta_1$ (nearest city) + β_2 (nearest water) + β_3 (elevation)	35.840	0.0	0.477
5	$\beta_0 + \beta_1$ (nearest city) + β_2(ag)+ β_3 (elevation) + β_4 (conifer)	37.922	2.1	0.168
7	$\beta_0 + \beta_1$ (pop density) + β_2(shrub)+ β_3 (elevation) + β_4 (ag) + β_5 (nearest water)	39.211	3.4	0.088
4	$\beta_0 + \beta_1$ (elevation) + β_2 (conifer) + β_3 (pop density) + β_4 (nearest water)	39.814	4.0	0.065
2	$\beta_0 + \beta_1$ (grass) + β_2 (ag) + β_3 (nearest water)	39.928	4.1	0.062
9	$\beta_0 + \beta_1$ (nearest city) + β_2 (nearest water) + β_3 (residential:low) + β_4 (grass) + β_5 (ag) + β_6 (elevation) + β_7 (conifer) + β_8 (pop density) + β_9 (shrub)	40.070	4.3	0.058
3	$\beta_0 + \beta_1$ (residential:low) + β_2 (grass) + β_3 (pop density) + β_4 (conifer)	40.706	4.9	0.042
8	$\beta_0 + \beta_1$ (nearest city) + β_2 (residential:low) + β_3 (nearest water) + β_4 (pop density) + β_5 (conifer)	41.848	6.0	0.024
6	$\beta_0 + \beta_1$ (conifer) + β_2 (shrub) + β3 (pop density) + β_4 (nearest water)	42.558	6.8	0.017
	One-Mile Level			
	Model	AIC_c	ΔAIC_c	W_i
1	$\beta_0 + \beta_1$ (nearest city) + β_2 (nearest water) + β_3 (elevation)	35.032	0.0	0.216

Table 4.5 One-Mile Level continued.

	Model	AIC_c	ΔAIC_c	W_i
2	$\beta_0 + \beta_1$ (shrub) + β_2 (grass) + β_3 (nearest water)	35.400	0.4	0.180
3	$\beta_0 + \beta_1$ (grass) + β_2 (nearest water) + β_3 (ag)	35.479	0.5	0.173
7	$\beta_0 + \beta_1$ (conifer) + β_2 (shrub) + β_3 (grass) + β_4 (nearest water)	35.544	0.5	0.168
8	$\beta_0 + \beta_1$ (shrub) + β_2 (conifer) + β_3 (grass) + β_4 (nearest water) + β_5 (nearest city)	37.136	2.1	0.076
5	$\beta_0 + \beta_1$ (elevation) + β_2 (conifer) + β_3 (nearest water) + β_4 (nearest city)	37.405	2.4	0.066
4	$\beta_0 + \beta_1$ (residential:low) + β_2 (nearest city) + β_3 (nearest water) + β_4 (conifer)	37.472	2.5	0.064
6	$\beta_0 + \beta_1$ (nearest city) + β_2 (nearest water) + β_3 (agriculture) + β_4 (conifer)	37.702	2.7	0.057
9	$\beta_0 + \beta_1$ (nearest city) + β_2 (nearest water) + β_3 (residential:low) + β_4 (grass) + β_5 (ag) + β_6 (elevation) + β_7 (conifer) + β_8 (shrub)	46.999	12.0	0.001
	Two-Mile Level			
1	$\beta_0 + \beta_1$ (nearest city) + β_2 (elevation)	33.506	0.0	0.315
3	$\beta_0 + \beta_1$ (elevation) + β_2 (conifer) + β_3 (pop density)	33.821	0.3	0.269
4	$\beta_0 + \beta_1$ (slope) + β_2 (conifer) + β_3 (nearest water)	35.092	1.6	0.142
2	$\beta_0 + \beta_1$ (nearest city) + β_2 (pop density) + β_3 (conifer)	35.276	1.8	0.130
7	$\beta_0 + \beta_1$ (deciduous) + β_2 (conifer) + β_3 (grass) + β_4 (nearest water)	36.443	2.9	0.072
5	$\beta_0 + \beta_1$ (residential:low) + β_2 (grass) + β_3 (nearest water) + β_4 (conifer)	37.812	4.3	0.037
6	$\beta_0 + \beta_1$ (nearest city) + β_2 (ag) + β_3 (shrub) + β_4 (conifer)	38.420	4.9	0.027

Table 4.5 Two-Mile Level continued.

	Model	AIC_c	ΔAIC_c	W_i
8	$\beta_0 + \beta_1$ (ag) + β_2 (nearest city) + β_3 (nearest water) + β_4 (grass) + β_5 (conifer)	40.845	7.3	0.008
9	$\beta_0 + \beta_1$ (nearest city) + β_2 (nearest water) + β3 (pop density) + β_4 (elevation) + β_5 (slope) + β_6 (residential:low) + β_7 (conifer) + β_8 (deciduous) + β_9 (ag) + β_{10} (shrub) + β_{11} (grass)	61.361	27.9	0.000

Table 4.6. Summed Akaike weights (W_i) ranked to evaluate relative importance of individual explanatory variables for OCA sites.

Local Level		*Half-Mile Level*	
Variable	Summed W_i	Variable	Summed W_i
Road Sight	0.5354	Elevation	0.8562
Grassland	0.4891	Nearest water	0.7898
Auxiliary Road	0.4304	Nearest city	0.7262
Forest	0.4215	Agriculture	0.3759
Water	0.4206	Conifer Forest	0.3733
Slope	0.1800	Population density	0.2933
Building	0.1800	Shrub	0.1624
Riparian/wetland	0.0442	Grassland	0.1611
		Residential:low intensity	0.1230

One-Mile Level		*Two-Mile Level*	
Variable	Summed W_i	Variable	Summed W_i
Nearest water	1	Conifer Forest	0.6853
Nearest city	0.5831	Elevation	0.5836
Grassland	0.4744	Nearest city	0.4796
Conifer Forest	0.4305	Population density	0.3988
Shrub	0.3014	Nearest water	0.2595
Elevation	0.2925	Slope	0.1424
Agriculture	0.2396	Grassland	0.1171
Residential:low intensity	0.1681	Deciduous	0.0725
		Residential:low intensity	0.0366
		Agriculture	0.0350
		Shrub	0.0270

Table 4.7. Betas, standard errors, and p-values for the top *a priori* model(s) at each spatial scale for OCA location.

	Model	K	B estimate	Standard Error	P-value
	Local				
1	β_0	4	7.4066	0.9605	0.000
	β_1 (Grass)		-0.555	1.006	0.585
	β_2 (Road Sight)		0.003731	0.002605	0.162
2	β_0	5	8.7457	0.7904	0.000
	β_1 (Forest)		-0.8774	0.9470	0.361
	β_2 (Road)		0.652	1.026	0.530
	β_3 (Water)		-1.8711	0.8500	0.035
	Half-Mile				
1	β_0	5	6.112	3	0.050
	β_1 (Nearest city)		0.000363	0.0002381	0.137
	β_2 (Nearest water)		-0.005203	0.006330	0.417
	β_3 (Elevation)		0.001245	0.002758	0.655
	One-Mile				
1	β_0	5	7.109	3.170	0.032
	β_1 (Nearest city)		0.0001618	0.0002952	0.587
	β_2 (Nearest water)		-0.009837	0.006321	0.129
	β_3 (Elevation)		0.002708	0.003018	0.376
2	β_0	5	12.227	1.889	0
	β_1 (Shrub)		-0.0973	0.1006	0.341
	β_2 (Grassland)		0.00194	0.01606	0.904
	β_3 (Nearest water)		-0.011364	0.004757	0.023
3	β_0	5	11.670	1.601	0
	β_1 (Grassland)		-0.00637	0.01470	0.668
	β_2 (Nearest water)		-0.012252	0.005015	0.020
	β_3 (Agriculture)		-0.03865	0.04408	0.387
7	β_0	7	10.603	1.879	0
	β_1 (Conifer forest)		0.06965	0.02851	0.020
	β_2 (Shrub)		-0.2057	0.1036	0.056
	β_3 (Grassland)		0.08368	0.03665	0.029
	β_4 (Nearest water)		-0.20169	0.005708	0.001
	Two-Mile				
1	β_0	4	3.968	2.953	0.188
	β_1 (Nearest city)		0.0005385	0.0002575	0.044
	β_2 (Elevation)		0.001344	0.002672	0.618

Table 4.7 Two-Mile continued.

	Model	K	B estimate	Standard Error	P-value
3	β_0	5	53.70	15.79	0.002
	β_1 (Elevation)		-0.04832	0.01658	0.006
	β_2 (Conifer forest)		0.27121	0.08486	0.003
	β_3 (Population density)		-0.11658	0.06874	0.100
4	β_0	5	10.845	1.752	0
	β_1 (Slope)		0.0674	0.2329	0.774
	β_2 (Conifer forest)		0.02167	0.01714	0.215
	β_3 (Nearest water)		-0.01441	0.01001	0.160
2	β_0	5	6.134	1.263	0
	β_1 (Nearest city)		0.0005985	0.00027	0.034
	β_2 (Population density)		-0.09554	0.07093	0.187
	β_3 (Conifer forest)		0.04418	0.02952	0.144

Exploratory Models

Exploratory analysis performed on the OCA data at the local level produced three models, two of which were considered as good approximating models for predicting OCA occurrence. Model 1 included water as the predicted positively correlated predictor, with a W_i of 0.61. The resulting correlation for water was negative. Water ranked in the middle of the summed W_i variables. Standard errors and p-values were below the desired threshold levels of 1 and 0.19, respectively (Table 4.8). Model 2 showed road sight to be a predictor of OCA occurrence with a W_i of 0.27. Road sight was the highest ranked variable on the summed W_i list of variables (Table 4.6). The coefficient for road sight in this model was positive, which was the predicted effect. Standard errors and p-values were in acceptable range (Table 4.8).

The half-mile level exploratory analysis also produced three approximating models. Model 3, the highest ranked model, had a W_i of 0.44, and the variable slope as the predictor. Slope was not used in the *a priori* suite at this spatial scale, so was not on the summed W_i table. Standard errors and p-values were within acceptable range. Model 1, with predictor city, scored a W_i of 0.35. City was the third ranked variable on the summed W_i table. Predicted and actual coefficient signage coincided with a positive correlation when predicted OCA occurrence. Standard errors and p-values were in the acceptable range. Model 2, comprised of distance to nearest water, ranked lowest with a W_i of 0.20. The predicted and actual coefficient signage was identical with a shorter distance to nearest water leading to an increased chance of a successful crossing area. There were issues with a SE over 1, but all p-values were within the acceptable range (Table 4.8).

Seven models were discovered with the available data at the one-mile level. Three models ranked the highest of the exploratory suite. Model 6 ranked highest with a W_i of 0.24, and included the variable slope as the only predictor (Table 4.8). The coefficient for slope coincided with prediction with a negative correlation (Table 1.4). Standard errors and p-values were within acceptable range. Model 2 ranked second with a W_i of 0.20, and a single predictor of distance to nearest water. The predicted and actual values for the predictor variable differed, with the actual being positive and the predicted being negative. The β_0 had a SE of 1.38, and all p-values fell within the acceptable range (Table 4.8). The third ranked model, Model 1 had a W_i of 0.17, and distance to nearest city as the predictor variable. The predicted signage for city coincided with actual value, displaying positive values. Standard errors and p-values were within acceptable range (Table 4.8).

At the two-mile level, six models were developed from the exploration. Five models fit the criteria for consideration as best approximating model. Model 5, the top ranked model of the suite with a W_i of 0.34, contained three variables, distance to nearest city, population density , and conifer forest. Human population density was predicted to have a negative correlation, and distance to nearest city and conifer forest were predicted to have positive correlations. All three variable coefficients coincided with predicted output. There was one coefficient with a SE over 1, and all p-values were with in acceptable range (Table 4.8). Model 3, W_i of 0.19, contained two variables, distance to nearest city and agriculture. The variables ranked at opposite ends of the summed W_i table, with distance to nearest city ranking higher (Table 4.6). The predicted signs corresponded for positive correlation in distance to nearest city, but differed for agriculture with the actual effect being negative. There was a SE greater than 1, but all p-values lay below the preferred range. Model 2 was the third ranked model of the suite, and grassland was the predictor variable (Table 4.8). The actual signage of grassland, negative, did not coincide with the prediction of a positive association (Table 1.4, Table 4.8). Standard errors and p-values fell below the preferred range of 1 and 0.19, respectively. Model 1 included variables distance to nearest water and Conifer forest, and had a W_i of 0.15. Predicted and actual coefficient signage agreed. There was a standard error greater than 1, but all p-values were with in the preferred range (Table 4.8). Lastly, Model 4 with a W_i of 0.13 contained variable slope. Predicted and actual signage coincided with a negative correlation. β_0 had a SE of 1.327, but all p-values were with in the preferred range (Table 4.8).

Table 4.8. Description and representation of highest ranked exploratory models predicting the effects of road and landcover variables on OCA location at each study site along US 93.

	Model	Coefficient	Std Error	P-Value	AIC_c	ΔAIC_c	W_i
	Local Level						
1	β_0	8.4885	0.5090	0.000	30.77	0	0.611
	β_1 (water)	-1.7952	0.7408	0.021			
3	β_0	6.9992	0.6069	0.000	32.41	1.6	0.269
	β_1 (road sight)	0.003515	0.002549	0.177			
	Half-Mile Level						
3	β_0	9.2425	0.726	0.000	30.52	0	0.444
	β_1 (slope)	-0.13897	0.05434	0.015			
1	β_0	5.9634	0.8145	0.000	30.98	0.5	0.353
	β_1 (nearest city)	0.0004691	0.000202	0.027			
2	β_0	9.521	1.221	0.000	32.10	1.6	0.201
	β_1 (nearest water)	-0.009463	0.005829	0.114			
	One-Mile Level						
6	β_0	9.5716	0.8091	0.000	30.28	0	0.243
	β_1 (slope)	-0.16253	0.06082	0.011			
2	β_0	10.959	1.383	0.000	30.65	0.4	0.203
	β_1 (nearest water)	1.383	0.004494	0.018			
1	β_0	5.8329	0.8617	0.000	30.96	0.7	0.174
	β_1 (nearest city)	0.0004909	0.000211	0.026			
	Two-Mile Level						
5	β_0	6.134	1.263	0.000	30.89	0.0	0.337
	β_1 (nearest city)	0.0005985	0.000270	0.034			
	β_2 (pop density)	-0.09554	0.07093	0.187			
	β_3 (conifer)	0.04418	0.02952	0.144			
3	β_0	4.819	1.143	0.000	31.99	1.1	0.194
	β_1 (city)	0.0007648	0.00029	0.013			
	β_2 (agriculture)	-0.06892	0.05209	0.195			
2	β_0	8.5486	0.6547	0.000	32.42	1.5	0.157
	β_1 (grassland)	-0.02414	0.01418	0.098			

Table 4.8 Two-Mile Level continued.

	Model	Coefficient	Std Error	P-Value	AIC_c	ΔAIC_c	W_i
1	β_0	10.966	1.677	0.000	32.56	1.7	0.146
	β_1 (nearest water)	-0.011884	0.004803	0.019			
	β_2 (conifer)	0.01795	0.0112	0.118			
4	β_0	10.654	1.327	0.000	32.82	1.9	0.129
	β_1 (slope)	-0.2438	0.1031	0.024			

Model names in the multi-scale section include numbers, 0.5, 1, and 2 that refer to the mile buffer level, half mile, one mile and two mile, respectively. Nearest water refers to distance to nearest water; pop density refers to population density; nearest city refers to distance to nearest city

CHAPTER 5

DISCUSSION

This study demonstrated deer vehicle collision reports combined with field collected and remotely sensed landcover data could be used to create predictive regression-based models for road crossing and collision locations for deer. Three general associations that could explain deer road crossing and possible kill locations include local deer abundance, movement patterns, and visibility conditions (Finder et al. 1999). These general associations could be used for future mitigation measures on US 93 as well as other similar locations. The results of my analysis can also be used for comparison to post-construction animal movement patterns and monitoring effectiveness of mitigation measures currently being implemented. I hypothesized that deer cross US 93 in aggregated locations, specifically based on landcover and/or road characteristics. Collision sites are not random in space as was shown to be true from the MDT and MHP DVC data. Previous studies also found this, coupled with landcover variables associated with the aggregated crossing and collision areas (Bashore et al. 1985, Bellis and Graves 1971, Carbaugh et al. 1975, Clevenger et al. 2003, Finder et al. 1999, Hubbard et al. 2000, Lehnert et al. 1996, Malo et al. 2004, Nielson et al. 2003, Puglisi et al. 1974, Rost and Bailey 1979).

I also hypothesized that there were associations between landcover and road characteristics that would be useful in determining where collision and crossing locations were occurring. Variables that were found to be the highest ranked predictors of DVC and OCA occurrence coincided between data sets. Highest ranked models, however, differed between the data sets, possibly due to the difference in sample size between the two data sets. The DVC study included 266 records, while the OCA data set contained 32 records. Best models in both data sets contained combinations of the following variables. Two predominant variables useful in predicting crossing and collision areas were evident in both studies at all four spatial scales: the presence and amount of Conifer forest and the presence and distance to nearest water. In both studies, as the amount of Conifer forest increased, the probability of a location being a crossing or collision site increased. More deer are likely to be seen in Conifer forest areas, generally, where abundance is higher than other cover types (Allen and McCoullgh 1976, Bashore et al. 1985, Bellis and Graves 1971, Finder et al. 1999, Carbaugh et al. 1975, Hubbard et al. 2000, Malo et al. 2004, Reilly and Green 1974). According to Finder et al. (1999), the distance to forest cover is important to deer location because although deer typically feed on grasses and other herbaceous vegetation they will remain close to wooded cover when foraging or moving between areas. DVCs are likely to occur due to associated vegetation decreasing a driver's ability to detect a deer approaching the highway (Bashore et al 1985, Finder et al. 1999, Hubbard et al. 2000). OCA's are likely in Conifer forested areas due to the higher abundance of deer, leading to more chances of highway crossings.

Distance to nearest water source was also considered an important predictor of crossing and collision locations. This variable represents the distance from the edge of the road to the nearest water source, thus a negative coefficient is interpreted as a decreased distance to the nearest water source increased the probability that the location would be a crossing or collision location. Water sources can attract deer to an area in search of food or water, as can traveling along associated topography. Increased local deer abundance can result in more frequent crossing attempts as well as opportunities for collisions. When water courses, like rivers with associated riparian vegetation intersect or parallel highways, both DVCs and OCAs can be more frequent. Deer often use riparian areas as travel corridors for movement to and from desirable feeding, bedding and refuge habitats (Finder et al. 1999, Huijser 2005). Associated riparian vegetation and water course topography, gullies or trenches, can lead deer directly to highways and can create a visual obstacles deterring a driver's ability to see deer approaching the highway (Lehnert et al. 1996, Puglisi et al. 1974). Deer may also have a diminished ability to detect an approaching vehicle (Finder et al. 1999, Hubbard et al. 2000, Huijser et al. 2006).

Distance to nearest city, the shortest distance from any tenth-mile point along the highway to the nearest town, was another significant variable in predicting crossing and collisions locations in my analysis. For both studies, distance to nearest city had a positive coefficient, interpreted as the distance to nearest city increases, so does the potential for increased deer presence and possibility of collisions or collisions. High levels of human presence and loss of habitat reduce the amount of deer occupying an area, as distance from this disturbance increases so increases the abundance of deer, facilitating an augmented potential for collisions (Bashore et al. 1985, Malo et al. 2004, Nielsen et al. 2004). In relation to human disturbance as a predictor of deer abundance in an area, population density and low intensity residential development were variables of interest. Population density was measured as the density of people living with in each buffered spatial scale around a tenth-mile point. At both the DVC and OCA level, population density had a negative coefficient, meaning that as population density decreases the probability of a crossing or collision increases. This could be due to increased traffic speeds when travelers are farther from urban areas, as well as decreased vigilance that could accompany increased travel time and reduced traffic volume (Finder et al. 1999; Huijser et al. 2006; Malo et al. 2004; Nielsen et al. 2003). Low intensity residential development was included in most high ranking *a priori* models in the DVC study across the three landscape levels. The positive coefficient predicts that as the amount of low intensity residential developments increases so could the occurrence of DVCs. Finder et al. (1999) predicted that residential areas within wooded habitat may act as refuges from hunting, and thus account for greater numbers of DVCs occurring around them. Another possible reason for higher DVCs is with increased abundance of deer and increased traffic associated with the rural housing development results in more opportunities for collisions. Positive associations between the presence of rural buildings and higher DVC concentrations were found by other studies (Huijser et al. 2005, Malo et al. 2004, Bashore et al. 1996), but a negative association was found by Nielson et al. 2003.

Three other variables were identified as explanatory variables that could be used to predict crossing or collision locations: slope, grasslands, and elevation. Slope, in this study, referred to areas that had either an incline or decline as part of the associated local topography. Other studies also identified slope as a potential predictor of deer presence and possible collision sites. Carbaugh et al. (1975) found that on average, inclines and declines had more deer than did level areas, predicting that the slope could be providing good visibility of the vegetation across the roadway. They also predicted that deer were funneled to the highway by local topography, which was collaborated by Bellis and Graves (1971) and Lehnert et al. (1996). Finder et al. (1999) described slope being associated with gullies were also important in predicting collision sites, due to visual obstruction created by the unevenness of the topography. In this study, slope had a negative correlation to both DVC and OCA locations. Slope could be less of a predictor of DVC or OCA location due to the steep grade of the incline or decline deterring deer from crossing in that specific area. Grassland was a variable of interest in many other studies, though did not ranked high from my *a priori* suite. Bellis and Graves (1971) and Hubbard et al. (2000) found that in Pennsylvania and Iowa, respectively, abandoned fields and large cultivated crops fields corresponded with low highway mortality of deer. It is thought that deer are less likely to cross the highway when an abundant food source is present, leading to fewer collisions if adequate grasslands occupy either side of the highway (Carbaugh et al. 1975, Lehnert et al. 1996). Grass patches associated with woody patches resulted in higher collision locations, however (Hubbard et al. 2000, Malo et al. 2004, Gleason and Jenks 1993, Puglisi et al. 1974). The results of my study were grass is negatively correlated with DVC and OCA location. There could be less DVCs when grassland areas are a major cover type due to: increased visibility of deer and vehicles approaching the roadside could result in collision avoidance or crossing deterrence, or increased amount of forage could lead to fewer movements out of the area, thus leads to less collisions or crossings. Elevation was another variable of interest resulting from this study. I did not find any supporting literature from previous studies reporting elevation to be a significant predictor variable, however it was present in some of my *a priori* models that rank high on the Akaike weights tables.

Spatial scale did not appear to matter for the top ranked models or variables. In the DVC study, the local level data differed from the landscape level scales by containing more variables. This is probably due to the difference in data output, with local level variables recorded as present or not present. Among the half-mile, one-mile, and two-mile levels, in both studies, variables and models were quite similar and in some cased identical, leading to the conclusion that spatial scale did not have as great of effect on determining DVC or OCA location as hypothesized.

When results of both the DVC and OCA studies were evaluated, it was discovered that both data sets identified similar variables as significant for determining crossing or collision location. Due to these findings, it is felt that the use of DVC data would be the best data set to use for predicting future collision/crossing sites in this study area, as well as other locations. The DVC data set would be less costly to compile in terms of collection effort, study design and implementation. The accuracy and completeness of this data set rests upon the highway maintenance personnel and highway patrol accident reporting effort.

Management Implications

The US spends approximately $100 billion per year for new construction, upgrading, maintenance, and operations of roads (Forman et al. 2003). The concept of road ecology with underlying foundations in transportation, hydrology, wildlife biology, plant ecology, population ecology, soil science, water chemistry, aquatic biology and fisheries coupled with landscape ecology are directing contemporary road management planning (Forman et al. 2003). The results of this study and others like it can be applied in the following ways:

1. Have road planners consider local landcover characteristics when reconstructing or upgrading current roads. Numerous studies have shown that deer regularly cross roads in specific areas, probably associated with cover type. The specific cover type can vary between locations so some research of local needs should be conducted for appropriate application of mitigation measures. Coupling the needs of the desired reconstruction area with a previous study conducted in a similar landcover type may be desirable to achieve similar effects. Coupling a desert project with a mountain study may not be the most effective use of the tool. Invest mitigation measures on specific sections of the highway that are probable to be most effective.
2. Variable data was collected with two distinct methods for this study. Variables were recorded according to their presence at the local scale, directly adjacent and up to 100 meters from the highway edge. Variables were also recoded as a

proportion of the area included in a specific cover type extending into the landscape up to two miles, with the option for further expanse. The local data set was time consuming and dangerous to collect; and did not provide as much information as would be desired if this project were to be repeated. I feel the landcover scale data set was more useful, flexible, and provided more information and options for analysis regarding this type of study. National landcover data sets are available for most places in the US. Knowledge of geographic information systems in necessary to perform the intense operations involved with customizing the data to your specific study site and project.

3. Exploratory analysis was conducted and three variables emerged as probable useful variables in predicting crossing and collision sites. Distance to nearest water, grasslands and Conifer forest was shown in this analysis as tools to determining crossing and collision sites. Though Conifer forest and distance to nearest water were the top variables from the *a priori* model suite, grassland did not perform as well. In the exploratory analysis it was the second best predictor of the suite, and should be considered important in future analysis. A multi-scale approach was considered in the exploratory analysis, resulting in highest ranked models containing the before mentioned variables.
4. Implement public awareness campaigns to update the public on high crossing areas and mitigative measures being executed to reduce DVCs and facilitate successful OCAs. People being vigilant when driving through high DVC areas

could reduce incidence. Also informing the public of the mitigative measures design and application will lead to more acceptance and compliance.

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APPENDICES

APPENDIX A

DEER VEHICLE COLLISION DATA SET

A.1a. Local Level Raw Data

Table of raw data for the deer vehicle collision study at the local level. Abbreviations for landcover variables: MM, mile marker location; DVC, 1998-2003 DVC count data; For, forest cover; Build, buildings; Rd sight, Road sight (meters), continuous; Resid/Urban, Residential Urban area; Rd, auxiliary road. Variables coded as 1 describe the variable as present and 0 describing the variable as not present.

MM	DVC	For	Edge	Build	Rd Sight	Slope	Resid/ Urban	Rd	Ridge
7	2	0	0	1	400	0	1	1	0
7.8	1	1	0	1	400	0	0	1	0
8	0	1	1	1	500	0	0	1	0
8.1	0	1	0	1	500	1	0	1	0
8.2	1	1	0	0	500	1	0	0	0
8.3	0	1	1	0	500	1	0	0	0
8.4	1	1	0	1	500	1	0	1	0
8.5	0	1	0	0	500	0	0	1	0
8.6	0	1	0	0	500	1	0	1	0
8.7	1	1	0	1	500	1	0	1	0
8.8	1	1	0	1	400	0	0	1	0
8.9	0	1	1	1	350	0	0	1	0
9	1	1	0	0	300	0	0	0	0
9.1	1	1	0	1	200	0	0	1	0
9.2	0	1	0	0	200	0	0	1	0
9.3	0	1	0	0	200	0	0	1	0
9.4	0	1	0	1	200	0	0	0	0
9.5	1	1	0	1	200	0	0	0	0
9.6	1	1	0	1	300	0	0	1	0
9.7	0	1	0	1	250	1	0	1	0
9.8	0	1	1	1	300	0	0	1	0
9.9	0	1	1	1	350	0	0	1	0
10	1	1	0	0	500	1	0	1	0
10.1	0	1	0	0	400	0	0	1	0
10.2	1	1	0	0	400	0	0	1	0
10.3	3	1	0	0	500	0	0	0	0
10.4	1	1	0	0	250	0	0	0	0
10.5	3	1	0	0	200	0	0	1	0
10.6	1	1	0	0	100	1	0	1	0
10.7	0	1	0	0	300	0	0	0	0
10.8	0	1	0	0	200	0	0	0	0
10.9	0	1	0	0	300	0	0	0	0
11	1	1	0	0	350	0	0	0	0
11.1	2	1	1	1	400	0	0	1	0
11.2	0	1	0	1	100	0	0	1	0
11.3	0	1	0	1	100	1	1	1	0
11.4	0	1	0	1	150	0	0	0	0
11.5	0	1	0	0	150	0	0	0	0
11.6	0	1	0	0	200	0	0	1	0
11.7	0	1	0	0	200	1	0	1	0
11.8	0	1	0	0	300	0	0	1	0
11.9	1	1	0	1	200	1	0	1	0
12	0	1	0	0	400	0	0	1	0

Table A.1a. Local Level Raw Data (continued).

MM	DVC	For	Edge	Build	Rd Sight	Slope	Resid/ Urban	Rd	Ridge
12.1	0	1	1	1	400	0	0	1	0
12.2	0	1	0	1	300	0	1	1	0
12.3	0	1	1	1	500	0	0	1	0
12.4	1	1	0	1	300	0	0	0	0
12.5	1	1	0	1	300	0	0	1	0
12.6	2	0	0	1	200	0	0	0	0
12.7	0	0	0	1	400	0	0	1	0
12.8	0	0	0	0	150	0	0	1	0
12.9	0	0	0	0	300	0	0	1	0
13	0	0	0	0	200	0	0	1	0
13.1	0	1	1	0	250	0	0	0	0
13.2	1	1	1	0	250	0	0	0	0
13.3	1	1	0	1	250	0	0	0	0
13.4	0	1	1	1	200	0	0	1	0
13.5	0	1	0	1	400	0	0	1	0
13.6	1	1	0	1	300	0	0	1	0
13.7	2	1	0	1	400	0	0	1	0
13.8	0	1	0	1	300	0	0	1	0
13.9	1	1	0	1	400	0	0	1	0
14	1	0	0	1	400	0	0	1	0
14.1	0	1	0	1	500	0	0	1	0
14.2	0	1	0	1	500	0	0	1	0
14.3	0	1	0	0	500	0	0	0	0
14.4	0	1	0	0	400	0	0	0	0
14.5	0	1	1	1	500	0	0	1	0
14.6	0	1	0	0	500	0	0	0	0
14.7	0	1	1	1	500	0	0	1	0
14.8	0	1	1	1	500	0	0	1	0
14.9	1	1	0	0	500	0	0	1	0
15	1	1	0	1	300	0	0	1	0
15.1	1	0	0	1	100	0	0	1	0
15.2	0	0	1	0	300	0	0	1	0
15.3	0	0	0	1	300	0	0	1	0
15.4	1	0	0	1	400	0	0	1	0
15.5	0	1	1	0	500	0	0	0	0
15.6	0	1	0	1	500	1	0	0	0
15.7	0	0	0	1	500	0	0	0	0
15.8	0	0	0	1	500	0	0	1	0
15.9	0	0	0	1	500	0	0	1	0
16	0	0	0	1	500	0	0	1	0
16.1	0	0	0	1	500	0	1	1	0
16.2	0	0	0	1	500	0	0	1	0
16.3	0	0	0	1	500	0	0	1	0
16.4	0	0	0	1	500	0	0	1	0
16.5	0	0	0	1	500	0	0	1	0
16.6	1	0	0	0	500	0	0	1	0
16.7	0	0	0	1	500	0	0	1	0
16.8	0	0	0	1	500	0	0	1	0
16.9	0	0	0	1	500	0	0	1	0
17	0	0	0	1	500	0	0	1	0
17.1	0	0	0	1	400	0	0	0	0

Table A.1a. Local Level Raw Data (continued).

MM	DVC	For	Edge	Build	Rd Sight	Slope	Resid/ Urban	Rd	Ridge
17.2	0	1	0	0	400	0	0	0	0
17.3	1	1	0	1	90	0	0	0	0
17.4	0	1	0	1	150	0	0	1	0
17.5	0	0	0	1	200	0	1	1	0
17.6	0	0	0	1	175	0	1	1	0
17.7	0	0	0	1	300	0	1	1	0
17.8	0	0	0	1	500	0	1	1	0
17.9	0	0	0	1	500	0	1	1	0
18	1	0	0	1	500	0	0	1	0
18.1	0	0	0	1	500	0	0	1	0
18.2	0	0	0	1	400	0	0	1	0
18.3	0	0	0	1	300	0	1	1	0
18.4	0	1	0	1	200	0	0	1	0
18.5	0	1	1	0	150	0	0	0	0
18.6	1	1	0	0	80	1	0	1	0
18.7	0	1	0	0	100	1	0	0	0
18.8	0	1	0	1	250	1	0	1	0
18.9	1	1	0	1	300	0	0	1	0
19	1	1	0	1	200	0	0	1	0
19.1	0	1	1	1	100	1	0	0	0
19.2	2	1	0	0	80	1	0	0	1
19.3	0	0	1	0	150	1	0	1	0
19.4	0	0	0	0	150	0	0	0	0
19.5	1	1	0	0	200	0	0	0	0
19.6	0	1	0	0	300	0	0	0	0
19.7	0	0	0	1	200	0	0	1	0
19.8	1	0	0	1	500	0	0	1	0
19.9	0	0	0	1	500	0	0	1	0
20	3	0	0	1	400	0	0	1	0
20.1	0	0	0	0	300	0	0	0	0
20.2	0	0	0	1	200	0	0	1	0
20.3	0	0	0	0	300	0	0	1	0
20.4	1	0	0	0	400	0	0	0	0
20.5	0	0	0	0	400	0	0	0	0
20.6	1	0	0	0	200	0	0	0	0
20.7	0	0	0	0	500	0	0	0	0
20.8	0	0	0	0	500	0	0	0	0
20.9	0	0	0	0	500	0	0	0	0
21	0	1	0	1	500	0	0	0	0
21.1	0	0	0	1	100	0	0	0	0
21.2	0	0	0	1	500	0	0	1	0
21.3	1	0	0	0	500	0	0	1	0
21.4	0	0	0	0	500	0	0	0	0
21.5	0	0	0	1	500	0	0	0	0
21.6	0	0	0	0	500	0	0	0	0
21.7	0	0	0	0	500	0	0	0	0
21.8	1	0	0	0	500	0	0	1	0
21.9	0	0	0	1	500	0	0	0	0
22	1	0	0	0	500	0	0	1	0
22.1	0	0	0	0	500	0	0	0	0
22.2	0	0	0	0	500	0	0	1	0

Table A.1a. Local Level Raw Data (continued).

MM	DVC	For	Edge	Build	Rd Sight	Slope	Resid/ Urban	Rd	Ridge
22.3	1	0	0	0	500	0	0	1	0
22.4	1	0	0	0	500	0	0	0	0
22.5	1	0	0	1	500	0	0	0	0
22.6	0	1	0	1	500	0	0	0	0
22.7	0	0	0	1	500	0	0	1	0
22.8	0	0	0	0	500	0	0	1	0
22.9	0	1	0	1	500	0	0	1	0
23	1	0	1	1	400	0	0	0	0
23.1	0	0	1	1	350	0	0	0	0
23.2	2	0	0	1	100	0	0	1	0
23.3	1	0	0	0	100	1	0	1	0
23.4	0	1	1	1	100	1	0	0	1
23.5	1	0	1	1	80	0	0	1	1
23.6	0	1	1	0	200	1	0	0	1
23.7	1	1	0	1	350	1	0	1	1
23.8	2	0	0	1	200	1	0	1	1
23.9	0	1	1	1	500	1	0	1	0
24	2	1	0	1	500	1	0	1	0
24.1	2	1	1	0	400	1	0	0	0
24.2	1	1	0	1	500	1	0	1	0
24.3	0	1	1	1	500	0	0	1	0
24.4	0	1	1	0	500	0	0	0	0
24.5	2	1	0	1	80	1	0	0	1
24.6	0	1	0	0	150	1	0	0	0
24.7	0	1	0	0	100	1	0	0	0
24.8	0	1	1	1	150	1	0	1	0
24.9	1	1	0	1	200	1	0	1	1
25	1	1	0	0	500	1	0	1	0
25.1	0	1	0	0	350	1	0	0	0
25.2	1	1	0	0	150	1	0	0	0
25.3	1	1	0	0	75	1	0	0	1
25.4	0	1	0	0	100	1	0	0	0
25.5	0	1	0	0	100	1	0	0	0
25.6	1	1	0	0	100	1	0	1	1
25.7	0	1	0	0	100	1	0	0	0
25.8	0	1	0	0	100	1	0	0	0
25.9	0	1	0	0	200	1	0	0	0
26	2	1	0	0	100	1	0	0	1
26.1	1	1	1	0	300	1	0	0	0
26.2	1	1	0	0	300	1	0	1	0
26.3	0	1	1	0	250	1	1	1	0
26.4	0	1	0	0	150	1	1	1	0
26.5	0	1	0	0	100	1	1	0	0
26.6	0	1	0	1	100	1	1	1	0
26.7	0	0	0	1	100	1	1	1	0
26.8	0	1	0	1	200	1	1	1	0
26.9	2	1	0	1	450	1	1	1	0
27	0	1	1	1	350	1	1	1	0
7.1	0	1	0	1	500	1	1	1	0
27.2	0	0	0	1	500	0	1	1	0
27.3	0	1	1	1	500	1	1	1	0

Table A.1a. Local Level Raw Data (continued).

MM	DVC	For	Edge	Build	Rd Sight	Slope	Resid/ Urban	Rd	Ridge
27.4	0	1	0	1	500	1	1	1	0
28.5	0	0	0	0	30	1	0	0	1
29.2	0	0	0	1	50	1	0	1	0
29.8	0	0	0	0	150	1	0	0	1
30	0	0	0	0	200	1	0	0	1
30.7	0	0	0	0	150	1	0	1	1
31	1	0	0	0	50	0	0	0	1
31.4	0	0	0	1	100	1	0	1	1
31.8	4	1	0	1	300	1	0	1	1
32.2	0	0	0	1	400	0	0	1	0
32.3	2	0	0	1	500	0	0	1	0
32.4	4	1	0	0	500	0	0	1	0
32.5	6	1	0	0	400	1	0	1	0
32.6	1	1	0	1	250	0	0	1	0
32.7	0	1	1	1	200	0	0	1	0
33.6	5	0	0	1	80	0	0	1	0
34	0	1	1	1	500	0	0	1	0
34.1	1	1	0	1	500	0	0	0	0
34.2	3	1	0	1	500	0	0	1	0
34.3	2	1	0	1	500	0	0	1	0
34.4	1	1	0	1	500	0	0	1	0
34.5	1	0	0	0	500	0	0	1	0
34.6	2	0	0	1	350	0	0	1	0
35.4	0	0	0	1	50	1	0	0	0
36.2	1	0	0	1	100	0	0	1	0
36.7	0	0	0	1	70	0	0	1	0
37.5	3	1	0	1	200	0	1	1	0
37.6	1	1	0	1	500	0	0	1	0
37.7	3	1	0	0	350	0	0	0	0
37.8	10	1	0	1	80	0	0	1	1
37.9	3	0	0	1	100	0	0	0	0
38	2	1	0	1	100	0	0	1	0
38.5	0	0	0	1	250	1	0	1	0
39.1	0	1	0	1	400	1	0	0	0
39.4	0	0	0	0	60	0	0	0	0
39.9	1	0	0	0	200	0	0	0	0
40.3	0	0	0	0	100	1	0	0	0
41	0	0	0	1	300	0	0	1	0
41.3	2	1	0	0	100	1	0	1	0
42.2	0	0	0	1	250	0	0	1	0
43.1	0	0	0	0	400	1	0	1	0
44.1	1	0	0	1	500	1	0	1	0
44.7	0	0	0	0	500	0	0	0	0
45	1	0	0	1	500	0	0	1	0
45.5	4	0	0	1	500	1	0	1	0
45.8	10	0	0	1	500	0	0	1	0
46.1	1	0	0	1	400	0	0	1	0
46.4	0	0	0	1	500	0	1	1	0
46.7	1	0	0	1	500	0	1	1	0
47.6	0	0	0	1	250	0	1	1	0
47.8	0	0	0	0	200	1	0	0	0
48.1	1	0	0	0	150	1	0	0	1

Table A.1a. Local Level Raw Data (continued).

MM	DVC	For	Edge	Build	Rd Sight	Slope	Resid/ Urban	Rd	Ridge
48.4	1	0	0	1	100	1	0	1	1
49.4	1	0	0	0	300	1	0	0	1
49.7	0	0	0	1	300	1	0	1	0
50	3	0	0	1	400	0	0	0	0
50.2	2	0	0	0	500	1	0	1	0
50.6	1	0	0	1	500	1	0	0	1
51.3	1	1	0	1	500	1	0	1	1
51.7	0	0	1	0	500	0	0	0	0
52.2	0	1	0	1	500	0	1	1	0
52.7	0	1	0	1	500	1	1	1	0
53.6	0	1	0	1	200	1	0	1	0
53.9	1	1	0	1	300	0	0	1	0
54.5	0	1	1	1	250	0	0	1	0
55.1	0	0	0	0	200	0	0	1	0
56.8	1	1	0	1	200	0	0	1	0
57.1	0	0	0	1	70	1	1	1	0
57.6	2	1	0	0	100	1	0	0	1
58.1	1	1	0	1	150	1	1	1	1

A.1b. Local Level Raw Data

Table of raw data for the deer vehicle collision study at the local level. Abbreviations for landcover variables: MM, mile marker location; Grass/Ag, grassland or agricultural fields; Rd width, road width; Ripar/Wland, riparian wetland; and G_ROW, grass in the right of way. Road width and side sight are measured in meters and speed limit is measured in miles per hour. All other variables categorical with 1 describing the variable as present and 0 describing the variable as not present.

MM	Water	Speed Limit	Grass/Ag	Rd Width	Side Sight	Ripar/ Wland	G_ROW
7	0	65	1	11	101	1	0
7.8	0	65	1	11	15	0	0
8	1	65	1	11	8	0	0
8.1	0	65	0	11	5	0	1
8.2	0	65	0	11	5	0	1
8.3	0	65	0	11	6	0	1
8.4	0	65	0	11	4	0	0
8.5	0	65	0	11	4	0	1
8.6	1	65	0	11	3	1	0
8.7	0	65	0	11	6	0	0
8.8	0	65	0	11	5	0	0
8.9	0	65	1	11	6	0	0
9	0	65	1	11	6	1	0
9.1	0	65	0	11	6	0	0
9.2	1	65	0	11	6	0	0
9.3	0	65	0	11	6	0	0
9.4	0	65	0	11	6	0	0
9.5	0	65	0	11	6	0	0

Table A.1b. Local Level Raw Data (continued).

MM	Water	Speed Limit	Grass/Ag	Rd Width	Side Sight	Ripar/ Wland	G_ROW
9.6	1	65	1	11	5	0	0
9.7	0	65	0	13	12	0	0
9.8	0	65	0	14	8	0	0
9.9	0	65	1	13	6	0	0
10	0	65	0	11	10	0	0
10.1	0	65	0	14	6	0	0
10.2	0	65	0	14	6	0	1
10.3	0	65	0	11	10	1	0
10.4	0	65	0	14	6	0	0
10.5	0	65	0	14	6	0	1
10.6	0	65	0	11	10	0	0
10.7	0	65	0	14	8	0	0
10.8	0	65	0	14	4	0	0
10.9	0	65	0	14	6	0	0
11	0	65	0	14	6	0	0
11.1	0	65	1	14	6	0	0
11.2	0	65	0	14	6	0	1
11.3	0	65	0	14	20	0	0
11.4	0	65	0	14	6	0	0
11.5	0	65	0	14	5	0	0
11.6	0	65	0	14	6	0	0
11.7	0	65	0	14	6	0	0
11.8	0	65	0	14	6	0	0
11.9	0	65	0	14	24	0	0
12	0	65	0	14	3	0	0
12.1	0	65	0	14	6	0	1
12.2	0	65	1	14	45	0	0
12.3	1	65	1	14	5	0	0
12.4	1	65	1	14	6	0	0
12.5	0	65	1	14	7	0	0
12.6	0	65	1	14	101	0	0
12.7	0	65	1	14	15	0	0
12.8	0	65	1	14	10	0	0
12.9	0	65	1	14	6	0	0
13	0	65	1	14	8	0	0
13.1	0	65	1	14	6	0	0
13.2	0	65	1	14	6	0	0
13.3	0	65	1	14	6	0	0
13.4	0	65	1	14	8	0	0
13.5	0	65	1	14	6	0	0
13.6	0	65	1	14	3	0	0
13.7	0	65	1	14	8	0	0
13.8	0	65	1	14	6	0	0
13.9	0	65	1	14	6	0	0
14	0	65	1	14	6	0	0
14.1	0	65	1	14	8	0	0
14.2	0	65	1	11	8	0	0
14.3	0	65	1	11	6	0	1
14.4	0	65	1	11	5	0	0
14.5	0	65	1	11	6	0	0
14.6	0	65	1	11	6	0	0
14.7	0	65	1	11	6	0	0

Table A.1b. Local Level Raw Data (continued).

MM	Water	Speed Limit	Grass/Ag	Rd Width	Side Sight	Ripar/ Wland	G_ROW
14.8	0	65	1	11	6	0	0
14.9	0	65	1	11	8	0	0
15	0	65	1	11	8	0	1
15.1	0	65	1	11	101	0	0
15.2	0	65	1	11	101	0	0
15.3	0	65	1	11	20	0	0
15.4	0	65	1	11	25	0	0
15.5	0	65	1	11	25	1	0
15.6	0	65	1	11	5	0	0
15.7	0	65	1	11	101	0	0
15.8	0	65	1	11	25	0	0
15.9	0	65	1	11	25	0	0
16	0	65	1	11	12	0	0
16.1	0	65	1	11	10	0	0
16.2	0	65	1	11	20	0	0
16.3	0	65	1	11	101	0	0
16.4	0	65	1	11	8	0	0
16.5	0	65	1	11	20	0	0
16.6	0	65	1	11	30	0	0
16.7	0	65	1	13	10	0	0
16.8	0	65	1	11	40	0	0
16.9	0	65	1	11	25	0	0
17	0	65	1	11	30	0	0
17.1	0	55	1	11	45	0	0
17.2	0	45	1	11	20	0	0
17.3	0	45	1	11	15	0	0
17.4	0	45	1	11	6	0	0
17.5	0	35	0	11	20	0	0
17.6	0	35	0	11	8	0	0
17.7	0	45	0	11	15	0	0
17.8	0	45	1	11	15	0	0
17.9	0	45	1	11	40	0	0
18	0	55	1	11	20	0	0
18.1	0	65	1	11	20	0	0
18.2	0	65	1	11	50	0	0
18.3	0	45	0	11	101	0	0
18.4	0	65	1	11	101	0	0
18.5	0	65	1	11	6	1	0
18.6	1	65	1	11	10	1	0
18.7	0	65	1	11	15	0	0
18.8	1	65	0	11	5	0	0
18.9	1	65	0	11	5	0	0
19	1	65	0	11	6	0	1
19.1	0	65	1	11	6	1	0
19.2	1	65	1	11	5	0	0
19.3	0	65	1	11	6	0	0
19.4	0	65	1	11	101	0	0
19.5	0	65	1	11	60	0	0
19.6	0	65	1	11	60	1	1
19.7	1	65	1	11	20	0	0
19.8	0	65	1	11	40	0	0
19.9	0	65	1	11	60	0	0

Table A.1b. Local Level Raw Data (continued).

MM	Water	Speed Limit	Grass/Ag	Rd Width	Side Sight	Ripar/ Wland	G_ROW
20	0	65	1	11	15	0	0
20.1	0	65	1	11	20	0	0
20.2	0	65	1	11	20	0	0
20.3	0	65	1	11	20	0	0
20.4	0	65	1	11	20	0	0
20.5	0	65	1	11	20	0	0
20.6	0	65	1	11	15	0	0
20.7	0	65	1	11	20	0	0
20.8	0	65	1	11	20	0	0
20.9	0	65	1	11	20	0	0
21	0	65	1	11	20	0	0
21.1	0	65	1	11	20	0	0
21.2	0	65	1	11	20	0	0
21.3	0	65	1	11	101	0	0
21.4	0	65	1	11	101	0	0
21.5	0	65	1	11	101	0	0
21.6	0	65	1	11	20	1	0
21.7	1	65	1	11	101	1	0
21.8	1	65	1	11	101	0	0
21.9	0	65	1	11	25	0	0
22	0	65	1	11	20	0	0
22.1	0	65	1	11	101	0	0
22.2	0	65	1	11	101	0	0
22.3	0	65	1	11	10	0	0
22.4	0	65	1	11	10	0	0
22.5	0	65	1	11	101	0	0
22.6	0	65	1	11	101	0	0
22.7	0	65	1	11	10	0	0
22.8	0	65	1	11	20	0	0
22.9	0	65	1	11	12	0	0
23	0	65	1	11	25	1	0
23.1	0	65	1	11	15	0	0
23.2	1	65	1	11	15	0	0
23.3	0	65	1	11	10	0	0
23.4	0	65	1	11	5	0	0
23.5	1	65	1	11	2	0	0
23.6	0	65	1	11	20	0	0
23.7	0	65	1	11	65	0	0
23.8	1	65	1	11	3	0	0
23.9	0	65	1	11	35	0	0
24	0	65	1	11	30	0	0
24.1	0	65	1	11	30	1	0
24.2	0	65	1	11	30	1	0
24.3	0	65	1	11	60	0	0
24.4	0	65	1	11	60	1	1
24.5	1	65	1	11	2	1	0
24.6	0	65	1	11	5	1	0
24.7	1	65	1	11	4	0	0
24.8	1	65	1	11	25	1	1
24.9	1	65	1	11	2	1	0
25	1	65	1	11	15	1	0
25.1	1	65	1	11	15	1	0

Table A.1b. Local Level Raw Data (continued).

MM	Water	Speed Limit	Grass/Ag	Rd Width	Side Sight	Ripar/ Wland	G_ROW
25.2	1	65	1	11	4	1	0
25.3	1	65	1	11	1	1	0
25.4	1	65	1	11	6	1	0
25.5	1	65	1	11	6	1	1
25.6	1	65	0	11	5	1	0
25.7	1	65	0	11	4	1	0
25.8	1	65	1	11	4	1	0
25.9	1	65	1	11	5	1	1
26	1	65	1	11	1	1	0
26.1	1	65	1	11	8	1	0
26.2	1	65	1	9	15	1	1
26.3	1	45	1	9	15	1	1
26.4	1	45	1	9	3	1	1
26.5	1	45	0	9	5	1	1
26.6	1	45	1	9	5	0	1
26.7	0	45	0	9	3	1	1
26.8	1	45	0	9	15	1	1
26.9	1	45	0	9	15	1	1
27	1	45	1	9	15	1	1
27.1	1	45	0	9	20	0	1
27.2	0	45	0	9	20	1	1
27.3	1	45	1	9	4	1	0
27.4	1	45	1	9	15	0	1
28.5	0	65	1	13	1	0	0
29.2	0	65	1	11	2	0	1
29.8	0	65	1	13	4	0	0
30	0	65	1	13	2	0	0
30.7	1	65	1	11	4	0	1
31	1	65	1	11	3	0	0
31.4	1	65	1	11	25	1	0
31.8	1	65	0	11	4	0	0
32.2	0	65	1	11	7	0	1
32.3	1	55	1	9	10	1	0
32.4	1	55	1	9	10	1	0
32.5	1	65	1	11	5	1	0
32.6	0	55	1	14	101	0	0
32.7	0	55	1	14	20	0	1
33.6	0	65	1	11	15	1	0
34	1	65	1	9	6	1	0
34.1	1	65	1	9	8	1	0
34.2	0	65	1	9	6	1	0
34.3	1	65	1	9	6	1	0
34.4	0	65	1	9	101	0	0
34.5	0	65	1	9	101	0	1
34.6	0	65	1	11	2	0	0
35.4	0	65	1	11	4	0	0
36.2	0	65	1	11	2	1	1
36.7	1	65	1	11	2	1	0
37.5	1	65	0	11	8	1	0
37.6	1	65	1	9	6	1	0
37.7	1	65	1	9	5	1	0
37.8	1	65	1	11	3	0	0

Table A.1b. Local Level Raw Data (continued).

MM	Water	Speed Limit	Grass/Ag	Rd Width	Side Sight	Ripar/ Wland	G_ROW
37.9	0	65	1	9	30	1	0
38	0	65	1	9	20	0	0
38.5	1	65	1	11	2	1	1
39.1	1	65	1	11	2	0	0
39.4	0	65	1	11	2	1	0
39.9	0	65	1	11	5	0	0
40.3	0	65	1	11	2	1	0
41	0	65	1	11	5	0	0
41.3	0	65	1	11	2	1	0
42.2	0	65	1	13	10	1	0
43.1	0	65	1	11	5	0	0
44.1	1	65	1	11	2	0	0
44.7	1	65	1	11	101	1	0
45	1	65	1	11	101	0	0
45.5	0	65	1	11	2	0	0
45.8	1	55	1	11	101	0	0
46.1	1	45	1	13	101	0	0
46.4	0	45	1	13	101	0	0
46.7	0	35	0	13	4	0	0
47.6	0	45	0	13	30	0	0
47.8	0	65	1	11	15	0	1
48.1	0	65	1	11	25	0	0
48.4	1	65	1	11	2	0	0
49.4	1	65	1	11	10	0	0
49.7	0	65	1	11	5	0	0
50	0	65	1	13	20	0	0
50.2	0	65	1	13	4	0	0
50.6	0	65	1	11	24	0	0
51.3	1	65	1	11	10	0	0
51.7	0	65	1	11	101	0	0
52.2	0	45	0	13	50	0	0
52.7	0	45	0	13	5	0	0
53.6	0	45	1	11	2	0	0
53.9	0	65	1	11	30	0	0
54.5	0	65	1	11	55	0	0
55.1	0	65	1	11	2	0	0
56.8	0	55	1	13	60	0	0
57.1	0	55	1	14	5	0	0
57.6	0	55	1	13	30	1	0
58.1	0	55	1	13	5	0	0

Table A.1c. Local Level Raw Data

Additional raw data for the deer vehicle collision study at the local level. Abbreviations for landcover variables: MM, mile marker location; Guard, guardrail; Rail, railroad; Light, streetlights, O_water, open water; Green, green landscaping. All variables categorical with 1 describing the variable as present and 0 describing the variable as not present.

MM	Guard	Rail	Light	Arable	Fence	O_water	Green	Gully	Tree Line	Hedge
7	0	1	1	0	0	0	1	0	0	1
7.8	0	0	0	0	0	0	1	0	0	0
8	0	0	0	0	0	0	1	1	1	0
8.1	1	0	0	1	0	0	1	0	0	0
8.2	1	0	0	1	0	0	0	0	1	0
8.3	1	0	0	1	0	0	0	0	0	0
8.4	1	0	0	0	0	0	0	0	0	0
8.5	0	0	0	0	0	0	0	0	0	0
8.6	0	0	0	0	0	0	0	0	0	0
8.7	0	0	0	0	0	0	0	0	0	0
8.8	0	0	0	0	0	0	0	0	0	0
8.9	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0
9.1	0	0	0	0	0	0	0	0	0	0
9.2	0	0	0	0	0	0	0	0	0	0
9.3	0	0	0	0	0	0	0	0	0	0
9.4	1	0	0	0	0	0	0	0	0	0
9.5	0	0	0	0	0	0	0	0	0	0
9.6	0	0	0	0	1	0	0	1	0	0
9.7	0	0	0	0	1	0	0	0	0	0
9.8	1	0	0	0	1	0	1	0	0	0
9.9	0	0	1	0	0	0	0	0	0	0
10	1	0	1	0	0	0	0	1	0	0
10.1	0	0	0	0	0	0	0	0	0	0
10.2	0	0	0	0	0	0	0	0	0	0
10.3	1	0	0	0	0	0	0	0	0	0
10.4	0	0	0	0	0	0	0	0	0	0
10.5	0	0	0	0	0	0	0	0	0	0
10.6	0	0	0	0	0	0	0	1	0	0
10.7	0	0	0	0	0	0	0	0	0	0
10.8	0	0	0	0	0	0	0	0	0	0
10.9	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0
11.1	0	0	0	0	0	0	0	0	1	0
11.2	0	0	0	0	0	0	0	0	0	0
11.3	0	1	0	0	0	0	1	1	0	0
11.4	1	0	0	0	0	0	0	0	1	0
11.5	0	0	0	0	0	0	0	0	0	0
11.6	0	0	0	0	0	0	0	0	1	0
11.7	0	0	0	0	0	0	0	0	1	0
11.8	0	0	0	0	0	0	0	0	0	0
11.9	0	1	0	0	0	0	0	1	0	0
12	0	0	0	0	0	0	0	0	0	0
12.1	0	0	0	0	0	0	0	0	1	0

Table A.1c. Local Level Raw Data (continued).

MM	Guard	Rail	Light	Arable	Fence	O_water	Green	Gully	Tree Line	Hedge
12.2	0	1	0	0	0	0	1	0	1	0
12.3	0	0	0	1	0	0	0	0	0	0
12.4	0	0	0	1	0	0	0	0	0	0
12.5	0	0	0	0	0	0	1	0	0	1
12.6	0	0	0	1	0	0	0	0	0	0
12.7	0	0	0	1	0	0	0	0	1	0
12.8	0	0	0	0	0	0	0	0	1	0
12.9	0	0	0	1	0	0	0	0	1	0
13	0	0	0	1	0	0	0	0	1	0
13.1	0	0	0	1	0	0	0	0	1	0
13.2	0	0	0	1	0	0	0	0	0	0
13.3	0	0	0	1	0	0	0	0	0	0
13.4	0	1	0	1	0	0	0	0	0	0
13.5	0	1	0	1	0	0	1	0	0	0
13.6	0	0	0	0	0	0	1	1	0	1
13.7	0	1	0	1	0	0	0	0	0	0
13.8	0	0	0	1	0	0	0	0	1	0
13.9	0	0	0	1	0	0	1	0	0	0
14	0	0	0	0	0	0	0	1	1	0
14.1	0	1	0	1	0	0	1	0	0	0
14.2	0	1	0	1	0	0	1	0	0	1
14.3	0	0	0	1	0	0	0	0	0	0
14.4	0	1	0	0	0	0	0	0	0	0
14.5	0	1	0	1	0	0	1	0	0	0
14.6	0	1	0	1	0	0	0	0	0	0
14.7	0	1	0	1	0	0	0	0	0	0
14.8	0	1	0	0	0	0	1	0	1	0
14.9	0	1	0	0	0	0	0	0	0	0
15	0	1	0	1	0	0	0	0	0	0
15.1	0	1	0	1	0	0	0	0	0	1
15.2	0	1	0	1	0	0	0	0	0	0
15.3	0	1	0	1	0	0	0	0	0	0
15.4	0	1	0	1	0	0	0	0	0	0
15.5	0	0	0	1	0	0	0	0	0	0
15.6	0	1	0	0	0	0	0	1	0	0
15.7	0	0	0	1	0	0	1	0	0	0
15.8	0	1	0	1	0	0	1	0	1	0
15.9	0	0	0	1	0	0	0	0	0	0
16	0	0	0	1	1	0	0	0	0	0
16.1	0	0	0	0	0	0	1	0	0	1
16.2	0	0	0	1	0	0	1	0	0	0
16.3	0	0	0	1	0	0	0	0	0	0
16.6	0	0	0	1	1	0	0	0	0	0
16.7	0	0	0	0	0	0	1	0	0	0
16.8	0	0	0	1	0	0	0	0	0	0
16.9	0	0	0	1	0	0	1	0	0	0
17	0	0	0	1	0	0	0	0	0	0
17.1	0	0	0	1	0	0	0	0	0	0
17.2	0	0	0	0	0	0	0	0	1	0
17.3	0	0	0	0	0	0	1	0	0	1
17.4	0	0	0	1	0	0	0	0	1	0
17.5	0	0	1	1	0	0	1	0	0	0

Table A.1c. Local Level Raw Data (continued).

MM	Guard	Rail	Light	Arable	Fence	O_water	Green	Gully	Tree Line	Hedge
17.6	0	0	1	0	0	0	1	0	0	1
17.7	0	0	1	0	0	0	1	0	0	0
17.8	0	0	1	0	0	0	0	0	0	0
17.9	0	0	1	1	0	0	0	0	0	0
18	0	0	1	1	0	0	1	0	0	0
18.1	0	0	1	1	0	0	1	0	0	0
18.2	0	0	0	1	0	0	1	0	0	0
18.3	0	0	1	0	0	0	1	0	0	0
18.4	0	0	0	1	0	0	1	0	0	0
18.5	0	0	0	1	0	0	0	0	1	0
18.6	0	1	0	0	0	0	0	1	0	0
18.7	0	0	0	1	0	0	0	0	0	0
18.8	1	0	0	0	0	0	1	0	0	0
18.9	0	0	0	0	0	0	1	0	0	0
19	0	0	0	0	0	0	1	0	0	0
19.1	0	1	0	0	0	0	0	0	0	0
19.2	0	0	0	0	0	0	0	0	0	0
19.3	0	1	0	0	0	0	0	0	0	0
19.4	0	1	0	0	0	0	0	0	0	1
19.5	0	1	0	0	0	0	0	0	0	0
19.6	0	1	0	0	0	0	0	0	0	0
19.7	0	1	0	0	0	0	1	0	1	0
19.8	0	1	0	1	0	0	1	0	1	0
19.9	0	1	0	1	0	0	0	0	0	0
20	0	1	0	1	0	0	0	0	0	0
20.1	0	1	0	1	0	0	0	0	0	0
20.2	0	1	0	1	0	0	0	0	0	0
20.3	0	1	0	1	0	0	0	0	0	0
20.4	0	1	0	1	0	0	0	0	0	0
20.5	0	1	0	1	0	0	0	0	0	0
20.6	0	1	0	0	0	0	0	0	0	0
20.7	0	1	0	1	0	0	0	0	0	0
20.8	0	1	0	1	0	0	0	0	0	0
20.9	0	1	0	1	0	0	0	0	0	0
21	0	1	0	1	0	0	0	0	0	0
21.1	0	1	0	0	0	0	0	0	1	0
21.2	0	1	0	1	0	0	0	0	0	0
21.3	0	1	0	1	0	0	0	0	0	0
21.4	0	1	0	1	0	0	0	0	0	0
21.5	0	1	0	1	0	0	0	0	0	0
21.6	0	1	0	0	0	0	0	0	0	0
21.7	0	1	0	1	0	0	0	0	0	0
21.8	0	1	0	1	0	0	0	0	0	0
21.9	0	1	0	1	0	0	0	0	1	0
22	0	1	0	0	0	0	0	0	0	0
22.1	0	1	0	1	0	0	0	0	1	0
22.2	0	1	0	1	0	0	0	0	0	1
22.3	0	1	0	1	0	0	0	0	0	1
22.4	0	1	0	1	0	0	0	0	0	0
22.5	0	1	0	1	0	0	0	0	0	0
22.6	0	1	0	0	0	0	0	0	0	0
22.7	0	1	0	1	0	0	0	0	0	0

Table A.1c. Local Level Raw Data (continued).

MM	Guard	Rail	Light	Arable	Fence	O_water	Green	Gully	Tree Line	Hedge
22.8	0	1	0	0	0	0	0	0	0	0
22.9	0	1	0	1	0	0	0	0	0	0
23	0	1	0	1	0	0	0	0	1	0
23.1	0	1	0	1	0	0	0	0	1	0
23.2	0	1	0	0	0	0	0	0	0	0
23.4	0	1	0	1	0	0	0	0	0	0
23.5	0	1	0	0	0	0	1	1	0	1
23.6	0	1	0	0	0	0	0	0	0	0
23.7	0	1	0	0	0	0	0	0	0	0
23.8	0	1	0	0	0	0	0	0	0	1
23.9	0	1	0	0	0	0	0	0	0	0
24	0	1	0	0	0	0	0	0	0	0
24.1	0	1	0	0	0	0	0	0	0	0
24.2	0	1	0	0	0	0	0	0	0	0
24.3	0	1	0	0	0	0	0	0	1	0
24.4	0	1	0	0	0	0	0	0	0	0
24.5	0	1	0	0	0	0	0	1	0	0
24.6	0	1	0	0	0	0	0	0	0	0
24.7	0	1	0	1	0	0	0	0	0	0
24.8	0	1	0	1	0	1	1	0	1	0
24.9	0	1	0	0	0	1	1	0	1	0
25	0	1	0	0	0	0	0	0	0	0
25.1	0	1	0	0	0	0	0	0	0	0
25.2	0	1	0	0	0	0	0	0	0	0
25.3	1	1	0	0	0	0	0	0	0	0
25.4	0	1	0	0	0	0	0	0	0	0
25.5	0	1	0	0	0	0	0	0	0	0
25.6	0	1	0	0	0	0	0	0	0	1
25.7	0	1	0	0	0	0	0	0	0	0
25.8	0	1	0	0	0	0	0	0	0	0
25.9	0	1	0	0	0	0	0	0	0	0
26	0	1	0	0	0	0	0	1	0	1
26.1	0	1	0	0	0	0	0	0	0	0
26.2	0	1	0	0	0	0	0	0	0	0
26.3	0	1	0	0	0	0	0	0	0	0
26.4	0	1	0	0	0	0	0	0	0	0
26.5	0	1	0	0	0	0	0	0	0	0
26.6	0	1	0	0	0	0	1	0	0	0
26.7	0	1	0	0	0	1	1	1	0	1
26.8	0	1	0	0	0	1	1	0	1	0
26.9	0	1	0	0	0	0	0	0	0	0
27	0	1	0	0	1	0	1	0	0	0
27.1	0	1	0	0	1	0	0	0	0	0
27.2	0	1	1	0	1	0	1	0	0	1
27.3	0	1	1	0	0	0	0	0	0	0
27.4	0	1	1	1	0	0	1	0	0	0
28.5	0	0	0	0	0	0	0	1	0	1
29.2	0	0	0	0	1	0	0	1	0	0
29.8	0	0	0	0	0	0	0	1	0	0
30	0	0	0	0	0	0	0	1	0	1
30.7	0	0	0	0	0	0	0	1	0	0
31	0	0	0	0	0	0	0	1	0	0

Table A.1c. Local Level Raw Data (continued).

MM	Guard	Rail	Light	Arable	Fence	O_water	Green	Gully	Tree Line	Hedge
31.4	0	0	0	0	0	0	1	0	0	0
31.8	0	0	0	0	0	0	1	0	0	1
32.2	0	0	1	0	0	1	1	0	0	0
32.3	0	0	0	0	1	1	1	0	0	0
32.3	0	0	0	0	1	1	1	0	0	0
32.4	0	0	0	0	0	0	0	0	0	0
32.5	0	0	1	0	0	0	0	0	0	1
32.6	0	0	0	0	0	0	0	0	0	0
32.7	0	0	0	0	0	0	1	0	0	0
33.6	0	0	0	0	1	0	0	0	0	0
34	0	0	0	1	0	0	0	0	0	0
34.1	0	0	0	1	0	0	0	0	0	0
34.2	0	0	0	1	0	0	0	0	1	0
34.3	0	0	0	0	0	0	0	0	1	0
34.4	0	0	0	1	0	0	0	0	0	0
34.5	0	0	0	1	0	0	0	0	0	0
34.6	0	0	0	0	0	0	0	0	0	0
35.4	0	0	0	0	0	0	0	1	0	0
36.2	0	0	0	0	0	0	0	0	0	1
36.7	0	0	0	0	0	0	0	0	0	0
37.5	0	0	1	0	0	0	0	0	0	1
37.6	0	0	0	1	0	0	0	0	0	0
37.7	0	0	0	1	0	0	0	0	0	0
37.8	0	0	0	0	0	0	0	0	0	0
37.9	0	0	0	1	0	0	0	0	0	0
38	0	0	0	1	0	0	0	0	0	0
38.5	0	0	0	0	0	0	0	1	1	0
39.1	0	0	0	0	0	0	0	1	0	1
39.4	0	0	0	0	0	0	0	0	0	0
39.9	0	0	0	0	0	1	0	0	0	0
40.3	0	0	0	0	0	1	0	0	0	0
41	1	0	0	1	0	1	1	0	1	1
41.3	0	0	0	0	0	1	0	1	0	1
42.2	0	0	1	0	1	0	0	0	0	0
43.1	0	0	0	0	0	1	0	1	0	0
44.1	0	0	0	0	0	1	1	1	0	0
44.7	0	0	0	0	0	1	0	0	0	0
45	0	0	1	0	0	0	0	0	0	0
45.5	0	0	0	0	0	0	1	1	1	0
45.8	0	0	0	0	0	0	0	0	0	0
46.1	0	0	1	0	0	0	0	0	0	0
46.4	0	0	1	0	0	0	0	0	0	0
46.7	0	0	1	0	0	0	1	0	1	0
47.6	0	0	1	1	0	0	1	0	0	1
47.8	0	0	0	0	0	1	0	0	0	0
48.1	0	0	0	1	0	0	0	0	0	0
48.4	0	0	0	1	0	0	1	1	0	1
49.4	0	0	0	0	0	0	0	1	0	0
49.7	0	0	0	1	0	0	1	1	0	1
50	0	0	0	1	0	0	0	0	0	0
50.2	0	0	0	0	0	0	0	1	0	0
50.6	0	0	0	0	0	0	0	0	0	0

Table A.1c. Local Level Raw Data (continued).

MM	Guard	Rail	Light	Arable	Fence	O_water	Green	Gully	Tree Line	Hedge
51.3	0	0	0	0	0	0	1	0	0	1
51.7	0	0	0	1	0	0	0	0	0	0
52.2	0	0	1	0	1	0	1	0	0	1
52.7	0	0	0	0	0	0	1	1	1	1
53.6	0	0	0	0	0	0	1	1	1	0
53.9	0	0	0	0	0	0	0	0	1	0
54.5	0	0	0	1	0	0	0	0	0	0
55.1	0	0	0	0	1	0	0	0	0	0
56.8	0	0	1	0	1	0	1	0	0	1
57.1	1	0	1	0	0	0	1	1	0	1
57.6	0	1	0	0	0	0	0	1	0	1
58.1	0	1	1	0	0	0	0	1	0	0

Table A.2a. Half-Mile Level Raw Data

Table of raw data for the deer vehicle collision study at the half-mile level. Abbreviations for landcover variables: MM, mile marker; DVC, 1998-2003 DVC data; City, distance to nearest city; Water, distance to nearest water; Elev, elevation; P_Density, population density; Slope, slope; LIR, low intensity residential development; Bare, barren; and Pine, pine forest. All variables continuous and measured in proportion per buffered layer.

MM	DVC	City	Water	Elev	P_Density	Slope	LIR	Bare	Pine
7	2	646.8	584.7	1224.11	114.41	4.78	0	0	35.5516
7.8	1	1753.0	188.5	1223.42	115.12	4.87	0	0	45.2060
8	0	2051.5	205.4	1225.99	115.12	5.41	0	0	103.5445
8.1	0	2209.2	223.8	1225.84	115.12	5.48	0	0	53.0043
8.2	1	2367.5	230.2	1226.85	115.12	5.29	0	0	53.3768
8.3	0	2512.8	220.0	1226.08	115.12	5.38	0	0	51.1309
8.4	1	2671.9	199.5	1223.93	51.78	5.51	0	0	47.6835
8.5	0	2831.3	183.2	1221.90	51.78	5.60	0	0	50.0456
8.6	0	3005.1	167.5	1220.52	51.78	5.51	0	0	51.3883
8.7	1	3165.1	165.1	1219.38	51.78	5.38	0	0	52.9468
8.8	1	3325.2	170.9	1218.41	51.78	5.24	0	0	56.9897
8.9	0	3473.2	176.3	1217.27	57.80	4.97	0	0	60.0407
9	1	3633.7	172.3	1215.65	57.80	4.66	0	0	62.8313
9.1	1	3794.2	169.1	1213.21	157.11	4.40	0	0	68.1300
9.2	0	3954.8	171.6	1211.15	157.11	4.25	0	0	69.6983
9.3	0	4115.5	177.9	1209.57	157.11	4.09	0	0.0008	67.8976
9.4	0	4261.1	179.6	1207.27	157.11	4.09	0.1313	0.1672	65.7207
9.5	1	4432.2	169.4	1204.96	157.11	4.21	0.1666	0.8332	65.3892
9.6	1	4565.0	158.1	1202.90	157.11	4.29	0.1666	0.8332	65.3946
9.7	0	4685.9	147.4	1200.54	157.11	4.47	0.1666	0.8332	66.1156
9.8	0	4809.2	136.6	1198.33	157.11	4.73	0.1666	0.8332	66.7684
9.9	0	4934.7	125.8	1196.26	130.34	4.79	0.1666	0.8332	66.0161
10	1	5062.3	121.4	1194.45	136.52	4.85	0.1666	0.8332	67.2371
10.1	0	5191.8	125.2	1193.20	136.52	4.90	0.1666	0.8332	68.6199
10.2	1	5323.0	141.8	1192.41	136.52	5.01	0.1666	0.8332	71.1038

Table A.2a. Half-Mile Level Raw Data (continued).

MM	DVC	City	Water	Elev	Density	Slope	LIR	Bare	Pine
10.3	3	5455.8	166.7	1192.45	136.52	5.31	0.1666	0.7895	75.2757
10.4	1	5590.2	196.9	1193.66	136.52	5.77	0	0.6665	78.3890
10.5	3	5725.9	232.6	1194.99	136.52	6.37	0	0	81.3334
10.6	1	5863.0	278.8	1196.41	47.80	7.01	0	0	84.7137
10.7	0	6006.8	327.7	1198.88	47.80	7.40	0.4999	0	85.4369
10.8	0	6174.7	380.2	1200.70	47.80	7.71	0.4999	0	86.0915
10.9	0	6324.4	393.8	1202.39	47.80	8.00	0.4999	0	85.9960
11	1	6479.8	369.5	1201.73	47.80	8.11	0.4999	0	83.3132
11.1	2	6635.5	328.5	1198.46	51.50	8.23	0.4999	0	82.3616
11.2	0	6791.5	283.3	1193.95	51.50	8.50	0.4999	0	79.7423
11.3	0	6930.1	244.7	1188.92	51.50	8.86	0.4999	0	79.0381
11.4	0	7086.7	210.4	1184.12	51.50	9.02	0.4999	0	78.1825
11.5	0	7250.9	176.3	1179.79	51.50	8.90	0.4999	0	73.8435
11.6	0	7407.9	150.3	1175.79	51.50	8.49	0.4999	0	69.7319
11.7	0	7538.0	126.3	1171.50	51.50	8.10	0.0053	0	66.5029
11.8	0	7630.7	107.9	1165.82	48.83	7.73	0	0	60.8958
11.9	1	7707.1	99.1	1159.36	48.83	7.28	0	0	54.2660
12	0	7737.9	98.7	1152.46	48.83	6.66	0	0	45.4582
12.1	0	7723.8	99.5	1145.04	48.83	5.95	0	0	35.3041
12.2	0	7679.3	105.7	1137.86	48.83	5.01	0	0	27.2925
12.3	0	7588.9	118.2	1130.35	48.83	4.16	0	0	18.5662
12.4	1	7481.1	138.2	1124.88	84.95	3.80	0	0	11.9804
12.5	1	7349.9	151.7	1119.77	84.95	3.68	0	0	8.0425
12.6	2	7202.6	164.7	1114.50	84.95	3.51	0	0	5.1327
12.7	0	7013.5	184.7	1109.36	84.95	3.37	0	0	3.4703
12.8	0	6863.3	215.8	1103.19	84.95	3.25	0	0	2.2038
12.9	0	5124.1	354.7	1097.17	84.95	2.46	0	0	2.5481
13	0	6713.2	240.1	1032.86	64.20	3.22	0	0	2.2494
13.1	0	6535.5	270.5	1090.32	80.62	3.24	0	0	1.4063
13.2	1	6385.8	314.6	1083.48	80.62	3.25	0	0	2.4605
13.3	1	6236.2	349.6	1076.59	80.62	3.56	0	0	4.0419
13.4	0	6071.2	388.1	1070.67	80.62	3.73	0	0	5.1888
13.5	0	5934.4	424.6	1065.77	80.62	3.80	0	0	4.7184
13.6	1	5810.9	441.7	1061.10	80.62	3.68	0	0	3.6608
13.7	2	5648.8	457.5	1056.61	80.62	3.54	0	0	2.9408
13.8	0	5528.0	437.5	1051.77	64.20	3.33	0	0	2.0463
13.9	1	5394.9	420.5	1046.80	64.20	2.98	0	0	1.0623
14	1	5277.0	396.8	1041.85	64.20	2.62	0	0	0.4729
14.1	0	5135.0	370.9	1037.83	64.20	2.49	0	0	0.1674
14.2	0	5021.2	336.0	1033.77	64.20	2.35	0	0	0.1666
14.3	0	4925.6	312.0	1029.95	64.20	2.25	0	0	0.1666
14.4	0	4816.8	301.5	1026.32	75.97	2.13	0	0	0.1666
14.5	0	4686.0	301.1	1022.82	75.97	2.02	0	0	0.2916
14.6	0	4582.7	320.3	1019.28	75.97	1.95	0	0	0.3333
14.7	0	4482.2	345.0	1015.99	75.97	1.87	0	0	0.3333
14.8	0	4384.8	371.0	1012.83	75.97	1.85	0	0	0.3333
14.9	1	4290.6	392.5	1009.41	75.97	1.82	0	0	0.3333
15	1	4178.0	403.7	1006.15	205.92	1.75	0	0	0.3333
15.1	1	4091.6	394.9	1003.06	205.92	1.70	0	0	0.8057
15.2	0	4009.2	366.8	1000.18	205.92	1.64	0	0	1.4410
15.3	0	3886.3	346.8	997.33	148.75	1.54	0	0	1.3311
15.4	1	3743.0	328.2	993.95	205.92	1.42	0	0	1.4744
15.5	0	3594.2	321.4	990.63	205.92	1.29	0	0	1.4538

Table A.2a. Half-Mile Level Raw Data (continued).

MM	DVC	City	Water	Elev	Density	Slope	LIR	Bare	Pine
15.6	0	3426.0	304.7	987.55	205.92	1.17	0	0	1.5334
15.7	0	3254.9	293.4	985.00	205.92	1.03	0	0	1.5403
15.8	0	3106.5	288.9	982.74	252.23	0.94	0	0	1.5823
15.9	0	2938.6	294.3	980.90	252.23	0.92	0	0	1.5247
16	0	2790.5	300.1	979.05	252.23	0.92	0	0	1.4997
16.1	0	2623.0	309.1	977.28	252.23	0.90	0	0	1.2177
16.2	0	2475.2	327.6	975.36	252.23	0.85	0	0	0.3333
16.3	0	2305.9	341.5	973.65	169.80	0.85	0	0	0.3990
16.4	0	2139.1	352.8	971.90	169.80	0.87	0	0	0.2323
16.5	0	1992.6	374.5	970.21	169.80	0.89	0	0	0.2688
16.6	1	1846.7	389.9	968.28	169.80	0.90	0	0	0.3333
16.7	0	1681.6	404.6	966.40	169.80	0.91	0	0	0.3333
16.8	0	1537.3	415.7	964.33	182.61	0.90	0	0	0.3333
16.9	0	1373.9	417.6	962.41	182.61	0.90	0	0	0.3309
17	0	1213.2	416.2	960.39	182.61	0.93	0	0	0.1666
17.1	0	1075.6	399.6	958.36	496.27	1.01	0	0	0
17.2	0	942.8	366.0	956.15	496.27	1.08	0.3333	0	0.1137
17.3	1	786.1	333.2	953.99	496.27	1.34	0.3333	0	0.1666
17.4	0	685.7	300.9	951.85	496.27	1.72	0.3333	0	0.1666
17.5	0	597.2	273.5	950.06	496.27	2.16	0.3333	0	0.1666
17.6	0	545.5	259.9	948.35	496.27	2.31	0.3333	0	0.3172
17.7	0	522.0	258.1	946.27	493.46	2.06	0.3333	0	1.0604
17.8	0	530.1	258.1	943.90	493.46	2.11	0.3333	0	3.2501
17.9	0	562.1	257.1	941.51	493.46	2.15	0.3333	0	4.9144
18	1	637.4	251.7	939.00	611.78	2.18	0.3333	0	5.4859
18.1	0	729.3	243.6	936.22	611.78	2.19	0.3333	0	6.8378
18.2	0	863.4	233.2	933.77	611.78	2.15	0	0	6.9479
18.3	0	993.7	225.4	931.21	611.78	2.16	0	0	7.5781
18.4	0	1153.6	214.7	929.00	611.78	2.34	0	0	8.4068
18.5	0	1294.2	197.1	927.08	334.14	2.54	0	0	8.8637
18.6	1	1460.9	170.3	925.63	334.14	2.83	0	0	8.4591
18.7	0	1605.3	150.9	924.37	334.14	3.27	0	0	7.1688
18.8	0	1758.9	139.3	923.86	334.14	3.81	0	0	7.3773
18.9	1	1929.5	138.1	924.19	334.14	4.33	0	0	7.9762
19	1	2060.3	136.5	925.25	334.14	4.79	0	0	7.5259
19.1	0	2201.3	128.0	925.21	334.14	4.96	0	0	6.6293
19.2	2	2369.6	118.4	924.03	101.06	4.73	0	0	7.3387
19.3	0	2539.8	112.2	921.88	101.06	4.44	0	0	6.8921
19.4	0	2671.9	110.3	919.60	101.06	4.22	0	0	7.0571
19.5	1	2845.3	115.8	917.29	101.06	3.98	0	0	7.5195
19.6	0	3007.6	118.0	915.04	101.06	3.53	0	0	8.1653
19.7	0	3156.0	119.0	912.72	101.06	2.87	0	0	8.6006
19.8	1	3321.0	122.0	909.77	65.96	2.21	0	0	8.0121
19.9	0	3470.5	127.1	906.96	65.96	1.73	0	0	7.2843
20	3	3609.7	134.4	904.26	65.96	1.48	0	0	6.3416
20.1	0	3759.9	137.2	902.22	65.96	1.49	0	0	4.5524
20.2	0	3928.5	143.8	900.42	65.96	1.51	0	0	2.1886
20.3	0	4079.3	147.9	898.80	65.96	1.50	0	0	0.1583
20.4	1	4230.3	150.4	897.30	48.49	1.45	0	0	0
20.5	0	4390.9	155.1	895.70	48.49	1.42	0	0	0
20.6	1	4561.4	169.5	893.90	48.49	1.38	0	0	0.2398
20.7	0	4714.3	195.9	891.99	48.49	1.17	0	0	0.3333
20.8	0	4857.7	213.8	890.55	48.49	1.07	0	0	0.4740

Table A.2a. Half-Mile Level Raw Data (continued).

MM	DVC	City	Water	Elev	Density	Slope	LIR	Bare	Pine
20.9	0	5001.5	227.8	889.36	48.49	1.03	0	0	0.9048
21	0	5129.0	246.7	888.24	48.49	1.04	0	0	1.1159
21.1	0	5273.7	261.5	887.10	48.49	1.10	0	0	1.5952
21.2	0	5458.0	278.0	885.82	30.12	1.13	0	0	1.8667
21.3	1	5603.3	287.2	884.38	35.61	1.11	0	0	2.0008
21.4	0	5761.1	290.5	883.02	35.61	1.13	0	0	1.9749
21.5	0	5907.1	281.9	881.63	35.61	1.24	0	0	1.9696
21.6	0	6053.3	269.3	880.40	35.61	1.36	0	0	1.9919
21.7	0	6212.4	260.4	879.33	35.61	1.32	0	0	2.6132
21.8	1	6359.1	250.1	878.13	35.61	1.32	0	0	3.9176
21.9	0	6519.0	233.2	876.94	35.61	1.46	0	0	4.9642
22	1	6665.7	212.9	875.85	15.78	1.60	0	0	5.6520
22.1	0	6835.3	193.3	874.67	15.78	1.62	0	0	6.4367
22.2	0	6940.7	183.2	873.69	15.78	1.79	0	0	7.1320
22.3	1	7021.5	175.5	872.79	33.88	2.14	0	0	6.7512
22.4	1	7060.6	172.5	872.00	33.88	2.43	0	0	5.8890
22.5	1	7063.6	166.0	871.32	33.88	2.81	0	0	4.3919
22.6	0	7029.1	156.8	870.85	33.88	2.87	0	0	2.7014
22.7	0	6954.2	145.3	870.47	33.88	2.94	0	0	2.4379
22.8	0	6830.5	135.6	869.91	16.91	3.07	0	0	2.6657
22.9	0	6687.7	128.4	869.50	16.91	3.21	0	0	2.5679
23	1	6542.8	127.6	869.29	16.91	3.49	0	0	3.0415
23.1	0	6385.8	126.0	869.59	16.91	3.77	0	0	2.7992
23.2	2	6240.7	122.5	870.22	21.92	3.96	0	0	4.4947
23.3	1	6095.9	120.2	871.02	21.92	4.26	0	0	6.2563
23.4	0	5940.4	118.5	871.61	21.92	4.90	0	0	7.2696
23.5	1	5796.3	120.5	871.95	21.92	5.40	0	0	7.9945
23.6	0	5642.1	120.3	873.07	16.70	5.90	0	0	8.2253
23.7	1	5498.9	114.3	873.98	16.70	6.28	0	0	6.6163
23.8	2	5346.2	108.9	873.59	16.70	6.72	0	0	4.6857
23.9	0	5175.6	114.1	873.93	16.70	7.06	0	0	3.9935
24	2	5033.8	128.6	873.92	16.70	7.51	0	0	3.8929
24.1	2	4883.5	136.8	875.26	16.70	7.91	0	0	4.9605
24.2	1	4743.0	136.7	876.58	18.79	8.60	0	0	7.4438
24.3	0	4603.1	129.3	878.17	18.79	9.10	0	0	8.4307
24.4	0	4427.1	125.1	878.54	14.53	9.98	0	0	8.6332
24.5	2	4288.9	126.5	879.59	14.53	10.44	0	0	10.5520
24.6	0	4144.6	126.5	880.12	14.53	11.15	0	0	11.6953
24.7	0	4008.5	125.9	881.09	14.53	11.88	0	0	12.5735
24.8	0	3844.2	128.1	881.81	14.53	13.01	0	0	12.8336
24.9	1	3686.3	138.5	885.97	14.53	14.07	0	0	14.5324
25	1	3534.2	156.5	893.80	14.53	15.31	0	0	16.2896
25.1	0	3376.8	176.2	904.35	14.53	16.75	0	0	18.2241
25.2	1	3224.9	198.5	913.80	12.46	18.05	0	0	19.7147
25.3	1	3043.9	223.2	921.78	12.46	19.14	0	0	21.1125
25.4	0	2892.3	255.2	928.97	12.46	20.01	0	0	22.6439
25.5	0	2740.9	272.2	934.79	12.46	20.61	0	0	25.1613
25.6	1	2606.8	265.9	939.11	12.46	20.98	0	0	30.7101
25.7	0	2512.1	249.0	940.64	12.46	20.95	0	0	33.9168
25.8	0	2432.0	239.7	937.66	32.15	20.56	0	0	34.2742
25.9	0	2350.5	238.3	939.31	32.15	20.78	0	0	37.5132
26	2	2237.0	235.6	943.22	32.15	20.94	0	0	38.8516
26.1	1	2090.6	208.2	943.40	32.15	21.17	0	0	32.8133

Table A.2a. Half-Mile Level Raw Data (continued).

MM	DVC	City	Water	Elev	Density	Slope	LIR	Bare	Pine
26.2	1	1932.6	174.1	931.23	32.15	21.05	0	0	27.0152
26.3	0	1750.7	163.5	919.45	32.15	20.66	0	0	24.2899
26.4	0	1609.2	166.4	911.73	32.15	20.11	0	0	25.5357
26.5	0	1469.5	176.9	910.24	32.15	20.18	0	0	26.8950
26.6	0	1332.1	195.2	909.92	49.79	20.28	0	0	28.5160
26.7	0	1171.3	210.0	909.08	49.11	20.05	0	0	27.9108
26.8	0	1023.2	233.5	906.10	49.11	19.23	0	0	25.7958
26.9	2	864.9	263.7	901.02	49.11	17.99	0	0	21.9371
27	0	740.0	300.0	896.52	49.11	17.04	0	0	17.6047
27.1	0	644.6	349.3	892.56	49.11	16.44	0	0	12.8801
27.2	0	571.2	362.7	890.05	47.99	15.94	0	0	7.8820
27.3	0	534.7	366.0	888.89	47.99	15.19	0	0	6.7738
27.4	0	522.0	348.0	886.27	47.99	14.84	0	0	6.4227
28.5	0	1416.0	237.1	948.66	37.52	13.07	0	0	0
29.2	0	2356.8	528.9	967.19	20.59	5.63	0	0	0.5022
29.8	0	3182.0	728.0	950.66	22.80	4.93	0	0	0
30	0	3526.5	587.7	943.26	11.87	5.12	0	0	0.0128
30.7	0	3639.2	199.4	920.38	21.40	5.04	0	0	6.4489
31	1	3270.7	217.7	914.21	27.68	4.72	0	0	4.7147
31.4	0	2632.2	297.6	905.14	27.68	3.77	0.0003	0	0.1666
31.8	4	2032.8	227.6	886.33	655.94	1.50	2.6068	0	3.9306
32.2	0	1466.8	236.3	880.02	644.59	1.16	6.5193	0	11.0002
32.3	2	1337.9	247.1	879.30	1332.72	1.20	7.5866	0	10.6052
32.4	4	1211.4	262.9	879.49	1332.72	1.30	9.7491	0	9.8559
32.5	6	1096.6	265.5	880.01	1332.72	1.39	10.3565	0	8.2569
32.6	1	994.7	250.8	880.83	1332.72	1.46	10.5309	0	5.8639
32.7	0	906.4	227.8	881.63	1332.72	1.49	9.3521	0	4.1146
33.6	5	1541.1	113.9	886.66	22.98	1.44	0	0	0.1666
34	0	2144.0	145.5	881.66	22.98	1.53	0	0	0
34.1	1	2320.5	162.0	880.03	22.98	1.52	0	0	0
34.2	3	2468.0	165.7	878.40	23.37	1.48	0	0	0.1666
34.3	2	2613.9	166.3	876.71	23.37	1.45	0	0	0.1666
34.4	1	2791.6	173.8	875.04	23.37	1.34	0	0	0.1666
34.5	1	2940.0	183.8	873.65	23.37	1.28	0	0	0.1666
34.6	2	3087.2	186.3	872.24	23.37	1.26	0	0	0.1666
35.4	0	4367.9	144.8	860.62	39.16	1.48	0	0	0.1666
36.2	1	5653.6	187.2	853.34	37.62	1.16	0	0	0
36.7	0	6432.1	115.6	846.14	48.95	1.13	0	0	0
37.5	3	7721.3	105.3	837.10	69.74	0.90	0	0	2.7668
37.6	1	7901.1	107.2	836.73	69.74	0.94	0	0	2.2510
37.7	3	8050.8	111.7	836.68	69.74	0.96	0	0	2.1306
37.8	10	8201.3	113.5	836.93	69.74	0.95	0	0	2.0193
37.9	3	8381.0	124.7	837.71	69.74	0.95	0	0	1.9586
38	2	8530.8	143.0	838.77	69.82	0.96	0	0	1.6084
38.5	0	9371.2	166.7	850.11	69.82	1.63	0	0	0
39.1	0	10391.7	166.1	878.78	34.06	2.66	0	0	0.3103
39.4	0	10871.5	161.6	895.84	25.71	2.27	0	0	2.6453
39.9	1	11256.5	156.3	917.29	24.45	0.90	0	0	6.4908
40.3	0	10903.4	158.3	921.35	24.45	0.50	0	0	5.6084
41	0	9974.1	139.4	919.85	6.55	0.49	0	0	7.1966
41.3	2	9493.8	108.9	920.37	0.00	0.62	0	0	5.3371
42.2	0	7843.4	659.2	930.74	12.47	0.62	0	0	1.8331
43.1	0	6403.7	911.7	927.28	21.83	0.45	0	0	0.3622

Table A.2a. Half-Mile Level Raw Data (continued).

MM	DVC	City	Water	Elev	Density	Slope	LIR	Bare	Pine
44.1	1	4786.3	185.0	922.50	59.60	0.53	0	0	2.8373
44.7	0	3830.0	164.8	922.14	59.60	0.41	0	0	0.8332
45	1	3353.0	148.9	922.78	59.60	0.47	0	0	0.1666
45.5	4	2551.9	146.3	924.54	69.38	0.44	0	0	6.6541
45.8	10	2110.3	151.1	926.01	69.38	0.51	0	0	7.1531
46.1	1	1645.1	143.6	928.06	971.52	0.55	4.1873	0	0.4295
46.4	0	1161.7	149.0	930.17	971.52	0.61	15.9327	0.1249	0.1666
46.7	1	760.6	147.5	931.48	2815.88	0.66	21.0559	1.6427	0.3333
47.6	0	890.5	238.9	931.87	963.05	0.49	2.3336	1.0595	0
47.8	0	1100.2	272.2	932.33	963.05	0.45	0.9511	0.3934	0
48.1	1	1487.7	272.5	933.31	79.96	0.84	0	0	0
48.4	1	1923.7	191.8	931.87	79.96	1.19	0	0	0
49.4	1	3410.3	312.4	929.24	97.40	1.44	0	0	0.4999
49.7	0	3712.1	403.0	928.58	97.40	1.29	0	0	0.4992
50	3	3662.8	585.3	927.87	91.32	1.11	0	0	0.1598
50.2	2	3437.8	637.6	928.40	91.32	1.08	0	0	0
50.6	1	2823.1	477.1	929.10	90.31	1.24	0	0	0
51.3	1	1717.8	358.4	930.05	525.36	0.69	0.0486	0	4.9825
51.7	0	1083.5	621.6	932.43	525.36	0.54	4.1232	0.1667	7.3503
52.2	0	610.6	991.6	938.08	2355.82	0.65	5.6100	0.1667	14.2790
52.7	0	906.4	1112.5	943.26	1710.17	0.68	0.2659	0.3343	27.1477
53.6	0	2068.1	1175.2	950.89	766.16	0.87	0	0.2502	16.8732
53.9	1	2449.7	1012.9	953.52	129.70	1.07	0	0	16.9256
54.5	0	3366.7	445.3	960.05	46.49	1.19	0	0.1667	5.9532
55.1	0	4319.7	487.5	966.64	39.70	0.85	0	0.5000	0.3333
56.8	1	5022.2	196.0	991.27	82.89	2.57	0	1.1666	1.4430
57.1	0	4951.7	212.9	998.87	99.90	4.87	0	1.1666	2.2334
57.6	2	4744.8	257.1	977.25	99.90	6.70	0	1.3460	1.6665
58.1	1	4070.6	288.3	958.01	103.23	6.15	0	0.5000	2.3183

Table A.2b. Half-Mile Level Raw Data

Table of raw data for the deer vehicle collision study at the half-mile level. Abbreviations for landcover variables: MM, mile marker; Shrub, shrub land; and Grass, grassland. All variables continuous and measured in proportion per buffered layer.Shrub, shrub land; and Grass, grassland. All variables continuous and measured in proportion per buffered layer.

MM	Shrub	Grass	Past	Ag	Wtlnd	H_wetland	Build
7	5.0515	7.5251	18.3315	33.0404	0	0	16.0901
7.8	18.4035	7.3580	4.6431	17.6229	1.3331	4.4337	15.1886
8	28.4164	13.7671	9.6647	32.0222	3.0057	7.6651	12.5068
8.1	11.8258	6.4719	4.9126	17.1201	1.6663	3.8326	11.4465
8.2	10.7323	6.6373	5.1680	17.5829	1.3370	3.8326	10.5413
8.3	11.5821	5.7941	4.9846	19.9893	1.1868	3.6659	9.9722
8.4	11.9344	7.0227	5.4428	21.3743	1.5800	3.5263	9.5365
8.5	10.5644	8.1031	4.5693	19.9004	2.7330	2.7291	9.0915
8.6	10.8044	8.9777	4.0445	17.9616	3.3027	2.1662	8.9123
8.7	10.5220	9.3126	3.5700	16.8367	4.3411	0.9710	8.8986
8.8	10.6471	9.8428	2.2504	13.9947	4.7736	0.0020	8.8553
8.9	10.7322	10.2376	1.2490	10.2319	6.0089	0	9.3116

Table A.2b. Half-Mile Level Raw Data (continued).

MM	Shrub	Grass	Past	Ag	Wtlnd	H_wetland	Build
9	10.5776	11.8025	0.8332	6.5908	6.1644	0	10.2900
9.1	8.8814	12.6888	0.4955	2.5560	5.9988	0	11.8406
9.2	7.7462	14.5308	0.0816	0.3332	6.1058	0	13.1674
9.3	7.3599	16.9527	0	0	6.1654	0	15.0453
9.4	7.2771	19.2164	0	0	5.8209	0	16.5691
9.5	7.8463	19.2444	0	0	4.7814	0	17.7911
9.6	7.7819	19.9520	0	0	3.9081	0	18.6148
9.7	8.0640	20.1863	0	0	2.9510	0	18.8444
9.8	9.5657	19.0003	0	0	1.9996	0	18.3555
9.9	12.5894	17.5632	0	0	1.1652	0	16.8166
10	13.8342	15.9210	0	0	0.3416	0	14.6478
10.1	15.3017	13.1304	0	0	0.3333	0	12.0764
10.2	15.9252	10.3497	0	0	0.0235	0	9.1876
10.3	16.1175	5.9295	0	0	0	0	6.6478
10.4	15.6246	3.3203	0	0	0.1666	0	4.7421
10.5	14.2921	2.4342	0	0	0.1666	0	3.7770
10.6	12.9760	0.7546	0	0	0.1666	0	3.6096
10.7	12.2626	0.1666	0	0	0.1666	0	4.7959
10.8	11.1648	0.1666	0	0	0.1666	0	6.7916
10.9	10.3146	0.2925	0	0	0.1666	0	9.7600
11	11.8562	0.6665	0	0	0.1666	0	12.5629
11.1	12.7882	0.6665	0	0	0.1666	0	15.1579
11.2	14.4129	1.6646	0	0	0.1666	0	17.0024
11.3	14.9612	2.3424	0	0	0.1666	0	18.4290
11.4	15.6271	2.6644	0.1226	0	0.0708	0	18.9104
11.5	16.4381	3.0995	2.4531	0.6665	0.1666	0	19.1084
11.6	15.4128	3.2454	6.9048	0.6665	0.7059	0	18.7247
11.7	14.2627	4.0468	9.5702	1.2068	1.8237	0	17.5988
11.8	14.2642	4.9412	9.6647	3.4086	4.7149	0	16.4715
11.9	14.5096	6.3511	9.6657	6.7765	7.1159	0	15.3366
12	16.2104	8.1730	10.1649	11.8821	7.5993	0	13.8986
12.1	18.0670	9.8674	11.3826	16.7641	8.2383	0	12.7388
12.2	18.7256	10.7014	12.8393	22.4589	7.9823	0	11.7812
12.3	18.4810	11.1668	14.2265	29.8603	7.6992	0	11.3102
12.4	17.3220	11.5560	13.6751	38.1759	7.2907	0	10.7845
12.5	15.8111	11.2578	12.1331	46.4728	6.2827	0	10.3093
12.6	14.8328	11.1437	11.1402	52.4752	5.2755	0	9.9632
12.7	12.7464	10.3149	11.8978	56.8678	4.7027	0	9.6285
12.8	8.5342	9.4307	15.3821	60.7279	3.7212	0	9.1400
12.9	5.6689	13.1292	37.5309	130.5000	10.6229	0	7.2324
13	2.9208	5.5449	17.5531	67.4280	4.3038	0	8.6568
13.1	2.3742	5.5341	16.4138	69.6170	4.6546	0	8.0754
13.2	3.3007	7.1978	14.0731	67.6183	5.3496	0	7.3795
13.3	3.9369	7.8074	12.4222	66.8008	4.9907	0	6.6879
13.4	3.7079	6.7974	11.8938	66.4066	6.0056	0	6.1193
13.5	3.5320	6.6238	11.5434	67.1580	6.4244	0	5.8279
13.6	2.8166	6.4785	14.1016	65.6358	7.3067	0	5.8256
13.7	1.9281	6.5256	15.9768	65.1950	7.4337	0	5.9378
13.8	1.5836	6.0815	16.5915	65.2684	8.4287	0	6.3861
13.9	1.2215	6.0363	18.4319	64.7068	8.5412	0	6.7322
14	0.9086	5.1560	20.1553	65.2974	8.0097	0	7.0938
14.1	0.4999	3.1617	22.2446	67.9422	5.9841	0	7.2155
14.2	0.3122	1.0301	23.6553	70.2968	4.5390	0	7.1570

Table A.2b. Half-Mile Level Raw Data (continued).

MM	Shrub	Grass	Past	Ag	Wtlnd	H_wetland	Build
14.3	0.3333	0.6665	23.3858	71.4085	4.0393	0	6.9406
14.4	0.3333	0.6665	22.2200	73.4839	3.1296	0	6.5130
14.5	0.3333	0.6005	20.7255	75.4049	2.6443	0	6.2518
14.6	0.3622	0.3866	22.9067	73.7725	2.2387	0	5.9472
14.7	0.8216	1.1339	26.0336	69.7810	1.8966	0	5.7379
14.8	0.8332	1.4997	28.1805	67.4182	1.7352	0	5.5332
14.9	0.8332	1.6409	26.9230	68.6033	1.6663	0	5.4243
15	0.8332	2.2286	24.8981	70.2072	1.4997	0	5.6181
15.1	0.8559	4.2025	25.3238	67.3771	1.3331	0.0922	6.0915
15.2	1.2800	8.0628	26.2416	60.9315	1.3331	0.1666	6.6374
15.3	1.5636	13.6351	26.4898	53.9338	1.2866	0.1666	7.1933
15.4	1.9996	16.9181	25.6734	50.7047	1.3968	0.1666	8.0919
15.5	1.9692	17.4861	25.4200	50.3959	1.4420	0.1666	9.0608
15.6	1.3331	17.7188	24.0388	52.3764	1.1665	0.1666	10.4182
15.7	1.3331	17.8529	23.3421	53.2425	0.8561	0.1666	11.6280
15.8	1.2421	17.7485	21.7395	55.6437	0.2109	0.1666	12.9208
15.9	1.1664	19.5131	20.1054	55.8575	0	0.1666	14.4540
16	1.1664	18.7875	21.2547	55.4587	0	0.1666	15.5417
16.1	0.9998	15.1559	22.4392	58.2896	0.0869	0.1446	16.3413
16.2	0.6538	10.6412	23.7436	63.3822	0.1859	0	17.0075
16.3	0.2346	6.1496	24.4159	68.5830	0.1387	0	17.2400
16.4	0	4.6721	21.8397	73.2481	0.0078	0	17.4936
16.5	0	3.8944	20.3573	75.4795	0	0	17.5073
16.6	0	2.9354	18.1342	78.5971	0	0	17.2603
16.7	0.0441	1.7519	22.0497	75.7987	0.0224	0	16.9962
16.8	0.2237	0.9501	28.8872	69.4039	0.2018	0	17.1424
16.9	0.9161	0.6665	38.8739	58.9058	0.3067	0	17.6950
17	1.6835	1.4221	46.9589	49.5276	0.2413	0	20.2485
17.1	2.1184	3.7031	52.5774	40.9430	0.4914	0	25.0141
17.2	3.0152	6.9055	54.1262	33.5269	1.4997	0	31.4399
17.3	3.3310	12.3002	55.9451	25.1716	1.9413	0	41.0255
17.4	3.8374	17.5761	55.7974	18.9566	2.1662	0	50.3970
17.5	5.0271	20.6537	54.8043	15.6823	2.1662	0	59.7407
17.6	6.4780	20.3344	56.0036	13.3887	1.9783	0	69.4946
17.7	7.2510	21.8101	55.0047	12.0648	1.2649	0.0443	77.1839
17.8	8.4474	23.4789	50.8744	11.1812	0.7831	0.1666	81.8048
17.9	8.2209	25.3504	47.3199	11.5602	0.5806	0.1666	82.4177
18	8.1579	27.2354	44.1806	10.8467	1.5918	0.1666	79.7185
18.1	7.7261	27.6581	41.6361	11.0919	2.4177	0.1666	73.8147
18.2	8.0139	26.7138	41.2429	11.0258	4.0179	0.1666	63.9538
18.3	7.3942	25.3263	42.0218	10.8034	4.8280	0.1666	55.6176
18.4	6.5429	25.1588	42.5181	10.3150	4.9990	0.1666	45.0971
18.5	6.1914	29.0275	38.6305	10.3876	4.9990	0.0871	36.9180
18.6	6.4091	31.2336	36.6811	10.6265	4.9242	0	29.1004
18.7	5.8908	35.8692	33.3683	10.6030	4.8233	0	23.8934
18.8	4.6463	40.2241	31.1930	10.0624	3.9349	0	19.7426
18.9	6.1534	41.8270	28.8334	10.0544	2.8169	0	17.5497
19	7.8097	42.9287	27.5319	10.2075	1.9927	0	15.1876
19.1	8.2873	43.4148	28.1691	10.0674	1.4325	0	13.2654
19.2	8.7152	43.2332	29.7492	8.1324	0.8332	0	12.0570
19.3	9.7606	41.7199	30.9045	9.0135	0.2096	0	11.2786
19.4	10.0653	37.1617	33.7943	10.8702	0	0	10.2258
19.5	10.0677	32.1006	38.3538	10.6253	0.3333	0	9.4319

Table A.2b. Half-Mile Level Raw Data (continued).

MM	Shrub	Grass	Past	Ag	Wtlnd	H_wetland	Build
19.6	9.0825	24.0149	45.8454	11.6136	0.3333	0	8.7190
19.7	8.4806	15.5570	54.5775	12.1950	0.3333	0	8.4319
19.8	6.8232	10.2871	62.1740	12.2313	0.3333	0.1391	8.1796
19.9	4.8872	8.2955	66.5021	12.2851	0.3871	0.3587	8.5804
20	3.5461	6.5488	68.1483	14.0306	0.8848	0.4999	8.8633
20.1	3.3308	5.0191	71.2323	14.3936	0.9720	0.4999	9.0721
20.2	2.1951	6.3753	73.8754	13.8633	1.0023	0.4999	9.0712
20.3	2.5146	7.5521	74.5728	13.5104	1.1919	0.4999	8.4917
20.4	2.3573	7.7081	74.2543	13.1811	1.9994	0.4999	7.7313
20.5	2.9837	8.4143	73.8881	11.8731	2.3408	0.4999	6.7289
20.6	3.1193	8.6462	75.3364	10.1023	2.5560	0	5.5941
20.7	2.5545	7.9273	79.9942	7.0244	2.1663	0	4.7473
20.8	2.6662	7.3701	81.3535	5.9700	2.1663	0	4.1372
20.9	2.5588	6.8467	80.3548	7.1688	2.1663	0	3.7204
21	2.7132	4.9872	80.0419	8.9756	2.1663	0	3.5186
21.1	1.8880	3.9703	78.9467	11.6394	1.9604	0	3.5120
21.2	0.9589	4.3885	77.0745	14.8212	0.8902	0	3.7341
21.3	0.5052	4.2490	76.7908	16.2007	0.2536	0	3.9760
21.4	0.5010	4.4867	74.7659	18.2715	0	0	4.3159
21.5	0.6701	5.4670	71.9028	19.9549	0.0345	0	4.6256
21.6	1.2207	6.0227	66.9382	23.3312	0.4420	0	4.7850
21.7	1.5030	6.3351	62.9081	26.1073	0.4999	0	4.7242
21.8	1.7091	6.3062	59.5652	27.6975	0.8045	0	4.4955
21.9	1.8284	6.6706	57.0082	28.5287	0.9998	0	4.1462
22	1.4942	7.8117	56.6743	27.1551	1.2127	0	3.6478
22.1	1.4787	9.0677	55.6273	25.8900	1.4997	0	3.2381
22.2	1.4569	11.1364	53.8224	24.8481	1.4554	0	2.9033
22.3	1.7251	12.6843	53.6540	24.1469	0.8718	0	2.5898
22.4	1.3892	13.8543	54.0027	23.8649	0.8332	0	2.4281
22.5	1.5745	13.6247	56.5722	22.5895	1.0805	0	2.3998
22.6	2.0860	13.8024	58.2112	22.0507	0.9817	0	2.4870
22.7	2.6210	14.5678	58.8385	20.7876	0.6207	0	2.7765
22.8	2.7513	15.9141	59.2309	19.1048	0.3333	0	3.1179
22.9	5.0286	15.6982	57.2415	19.0395	0.2578	0	3.3451
23	8.1970	15.9755	54.0068	18.6098	0.0027	0	3.4894
23.1	12.1020	17.7259	48.9879	18.2094	0.0090	0	3.6709
23.2	14.4239	19.4794	42.7517	18.1837	0.3333	0	3.7115
23.3	17.5157	22.3996	36.4264	16.7307	0.3333	0	3.7350
23.4	20.5992	26.2442	29.6409	15.4129	0.3333	0	3.6733
23.5	21.1635	30.0688	26.8020	12.9714	0.4999	0	3.6374
23.6	20.6686	33.2248	26.0700	10.8115	0.4999	0	3.4762
23.7	22.1722	34.1500	26.1026	9.9633	0.6624	0	3.2768
23.8	20.0932	38.0706	25.2720	10.0358	1.5094	0	3.0764
23.9	18.2673	42.1281	24.0165	9.6319	1.5821	0	2.9118
24	15.8970	45.4270	22.3972	9.3545	2.3648	0	2.7525
24.1	15.4084	45.7259	21.5302	8.6856	2.9994	0	2.6785
24.2	16.0413	44.6094	20.1935	7.3865	3.1406	0	2.6874
24.3	18.5233	46.0186	16.5036	6.0246	3.1661	0	2.7713
24.4	18.9447	48.9094	13.4468	4.7575	3.4602	0	2.8963
24.5	20.1626	49.6171	10.3021	3.8296	3.3704	0	3.0377
24.6	19.5938	53.6201	7.4445	2.6282	2.6627	0	3.1876
24.7	19.7638	55.6979	4.3331	2.0793	2.4995	0	3.2862
24.8	20.8569	56.8624	3.1657	0.8111	2.1376	0	3.3588

Table A.2b. Half-Mile Level Raw Data (continued).

MM	Shrub	Grass	Past	Ag	Wtlnd	H_wetland	Build
24.9	21.8410	57.0639	1.7566	0	1.5268	0	3.2984
25	21.4521	57.5239	0.5685	0	0.9998	0	3.1386
25.1	22.6366	55.2809	0.0628	0	0.7557	0	2.8449
25.2	21.5483	55.3387	0	0	0.6664	0	2.5050
25.3	19.9985	55.9935	0	0	0.3333	0	2.1532
25.4	17.4795	57.6633	0	0	0.1666	0	1.7619
25.5	17.4654	55.3737	0	0	0.1666	0	1.4352
25.6	19.0729	48.2906	0	0	0.1666	0	1.2480
25.7	20.1719	44.1224	0	0	0.1666	0	1.1924
25.8	19.4550	44.9088	0	0	0.1666	0	1.1612
25.9	17.7410	43.2460	0	0	0.1666	0	1.1749
26	17.1660	42.1896	0	0	0.1666	0	1.3607
26.1	19.1676	46.0194	0	0	0.1666	0	2.0820
26.2	22.1838	48.5307	0.0460	0	0.1666	0	3.4583
26.3	25.2446	47.4545	0.5114	0	0.1666	0	5.0971
26.4	25.1715	45.6339	0.9998	0.0025	0	0	7.6851
26.5	25.4522	43.0183	1.6350	0.1666	0	0	10.5502
26.6	25.6702	39.7736	3.0407	0.1666	0	0	13.5314
26.7	25.0162	38.8404	5.3558	0.1666	0	0	17.2522
26.8	22.4015	41.4622	7.5857	0.2989	0	0.1666	20.6341
26.9	20.6960	44.8033	9.7308	0.6665	0	0.1666	23.6803
27	19.0944	48.9825	11.6578	0.6665	0	0.1666	25.9774
27.1	18.1545	52.5095	13.6109	1.3446	0	0.1666	27.3008
27.2	17.6732	54.8289	15.1619	3.1858	0	0.1666	27.3413
27.3	17.1075	54.3413	15.3995	5.0416	0	0.1666	26.0835
27.4	16.7777	52.8549	15.5915	6.9801	0	0.1666	23.9976
28.5	9.2030	78.2368	9.1021	0.6156	0	0	0.7355
29.2	1.6011	62.6250	14.3454	17.7415	0	0	0.5266
29.8	3.1973	78.8326	4.9689	11.4301	0	0	0.2999
30	4.8579	67.1369	8.8740	17.7664	0.1666	0	0.5776
30.7	7.5221	53.0324	9.8009	21.8625	0.1666	0	1.4668
31	5.8434	43.4203	16.0393	29.0484	0	0	2.3456
31.4	3.0436	11.8434	34.2214	49.9618	0.7628	0	6.5304
31.8	4.2520	12.6978	31.9125	39.7115	0.8474	0	26.0717
32.2	3.7488	17.5287	27.1131	25.6556	0	0	59.0669
32.3	3.5271	18.6377	27.8102	21.5747	0.1230	0	67.0811
32.4	3.4905	18.5418	27.0170	20.5858	0.1666	0	75.3003
32.5	3.4637	18.5147	26.8325	22.2990	0.1666	0	85.3461
32.6	3.1662	18.3138	28.5933	24.5177	0.1662	0	91.5233
32.7	2.4514	14.8505	32.0363	28.7484	0.0031	0	97.8604
33.6	1.6218	1.7873	58.7348	37.6894	0	0	15.0005
34	2.6528	0.8448	31.6779	64.6219	0.2025	0	3.8435
34.1	2.5174	0.8332	26.0311	69.9517	0.6666	0	4.0061
34.2	1.2461	0.8332	22.2912	74.7964	0.6666	0	4.3909
34.3	0.8332	0.8332	20.8553	76.6451	0.6666	0	4.7836
34.4	0.8332	0.8332	19.4566	78.0438	0.6666	0	5.1678
34.5	0.2043	0.6666	23.2946	75.0014	0.6666	0	5.6167
34.6	0.3333	0.6666	22.9432	75.2237	0.6666	0	6.0712
35.4	0	0.1667	61.5342	38.0573	0.0751	0	6.3960
36.2	0	0.7926	74.1192	24.5882	0.4999	0	6.5026
36.7	0.1666	2.1663	76.7667	20.9003	0	0	6.4498
37.5	1.7590	3.9428	37.4703	54.0611	0	0	17.7992
37.6	1.2859	4.2907	36.7486	55.4239	0	0	16.7511

Table A.2b. Half-Mile Level Raw Data (continued).

MM	Shrub	Grass	Past	Ag	Wtlnd	H_wetland	Build
37.7	1.0023	4.4743	37.2572	55.1357	0	0	14.9863
37.8	0.8332	6.1818	36.5046	54.4611	0	0	13.4290
37.9	0.6666	6.8903	37.0554	53.4053	0.0238	0	11.6011
38	0.3133	6.5339	39.1523	52.3824	0.0097	0	9.8204
38.5	0	2.1116	45.4622	52.4262	0	0	4.7657
39.1	0.1666	1.1665	28.0190	70.1709	0	0	2.6737
39.4	0.8332	2.5007	39.0097	54.6244	0	0	3.8708
39.9	1.7850	18.1563	57.7805	11.2668	0	0.6666	4.7977
40.3	1.8127	34.7408	51.1620	0	0	0.6666	2.3984
41	1.5746	27.1294	55.2141	0	0	0	1.0160
41.3	0.5199	10.1240	78.7014	0	0	0	0.9524
42.2	0.3333	3.7792	92.6604	0	0	0.0608	6.9642
43.1	0	1.7248	92.4364	4.8100	0	0	0.4719
44.1	0.3443	6.0420	57.8778	28.0628	0.1666	0.6666	4.4154
44.7	0.1666	0.9806	73.3063	24.7132	0	0	3.6233
45	0	1.1787	75.0763	23.5540	0.0243	0	3.0429
45.5	0.4999	4.5253	51.1675	36.3641	0.7891	0	7.4889
45.8	0.5044	5.0985	44.9998	40.0778	1.6665	0	11.7789
46.1	0	7.1857	37.9230	46.2385	0.7115	0	26.2612
46.4	0.2487	14.1715	19.6351	37.5943	0.3333	0	95.3310
46.7	0.8332	19.8574	11.9083	21.3425	0.3333	0	201.7789
47.6	0.5313	12.1457	17.9884	60.6984	0.1833	0	80.8916
47.8	0.4999	16.2555	16.7757	62.6237	0.1666	0	49.4375
48.1	0.7598	23.2143	15.1095	60.9164	0	0	21.7195
48.4	0.7534	18.2945	19.6912	61.2609	0	0	4.1391
49.4	0.1666	3.0554	61.7579	34.5201	0	0	4.9689
49.7	0.1273	3.0175	56.7701	39.5859	0	0	8.4785
50	0.1666	2.9730	54.9024	41.7982	0	0	10.5625
50.2	0	1.0591	53.7290	45.2119	0	0	9.7327
50.6	0.1085	0.9565	54.7165	44.0519	0.1666	0	6.2678
51.3	2.6494	11.9822	41.8579	37.1328	0.1666	0	11.7063
51.7	4.0609	31.4176	22.7214	20.7621	0	0	70.2565
52.2	6.4380	34.4417	15.5752	11.2841	0	0	146.6558
52.7	12.7074	39.1687	10.9317	6.5401	0	0	95.7058
53.6	10.8894	24.3594	28.9546	16.1733	0	0	20.6624
53.9	7.5183	15.8153	28.4408	28.8003	0	0	14.4917
54.5	7.2639	11.4843	7.6661	66.8969	0	0	7.8086
55.1	4.9978	12.9989	15.9789	65.1911	0	0	2.9849
56.8	1.4702	13.5307	63.1096	18.4466	0	0	9.7265
57.1	5.8249	33.3796	42.9830	12.7460	0	0	15.9340
57.6	7.1988	33.9109	31.9796	21.0970	0	0	15.5139
58.1	6.5963	30.5394	41.8307	16.1812	0	0	17.7412

Table A.2c. Half-Mile Level Raw Data

Table of additional raw data for the deer vehicle collision study at the half-mile level. Abbreviations for landcover variables: MM, mile marker; HIR, high intensity residential development; Comrcial, commercial use; Trans, transitional; Decid, deciduous forest; urb_veg, urban/recreational vegetation; and water, water source. All variables continuous and measured in proportion per buffered layer.

MM	HIR	Commercial	Trans	Deciduous	Urb_veg	Water
7	0	0.4999	0	0	0	0
7.8	0	0.6665	0	0	0	0.3333
8	0	1.2477	0	0	0	0.6665
8.1	0	0.8332	0	0	0	0.3333
8.2	0	0.9998	0	0	0	0.3333
8.3	0	1.3331	0	0	0	0.3333
8.4	0	1.1027	0	0	0	0.3333
8.5	0	1.0219	0	0	0	0.3333
8.6	0	1.1744	0	0	0	0.1802
8.7	0	1.4997	0	0	0	0
8.8	0	1.4997	0	0	0	0
8.9	0	1.4997	0	0	0	0
9	0	1.2002	0	0	0	0
9.1	0	1.2495	0	0	0	0
9.2	0	1.4417	0.0622	0	0	0
9.3	0	1.4569	0.1666	0	0	0
9.4	0	1.4997	0.1666	0	0	0
9.5	0	1.5724	0.1666	0	0	0
9.6	0	1.7969	0.1666	0	0	0
9.7	0	1.6833	0	0	0	0
9.8	0	1.6663	0	0	0	0
9.9	0	1.6663	0	0	0	0
10	0	1.6663	0	0	0	0
10.1	0	1.6149	0	0	0	0
10.2	0	1.5980	0	0	0	0
10.3	0	1.7212	0	0	0	0
10.4	0	1.8330	0	0	0	0
10.5	0	1.7737	0	0	0	0
10.6	0	1.3891	0	0	0	0
10.7	0	1.4673	0	0	0	0
10.8	0	1.9106	0	0	0	0
10.9	0	2.7272	0	0	0.0032	0
11	0	2.9994	0	0	0.4981	0
11.1	0	3.0173	0	0	0.4999	0
11.2	0	3.0137	0	0	0.4999	0
11.3	0	2.4919	0	0	0.4999	0
11.4	0	2.3329	0	0	0.4999	0
11.5	0	2.3329	0	0	0.4999	0
11.6	0	2.3329	0	0	0.4999	0
11.7	0	2.0817	0	0	0.4999	0
11.8	0	1.6108	0	0	0.4999	0
11.9	0	0.8154	0	0	0.4999	0
12	0	0.4999	0	0	0.0124	0
12.1	0	0.3766	0	0	0	0
12.2	0	0	0	0	0	0

Table A.2c. Half-Mile Level Raw Data (continued).

MM	HIR	Commercial	Trans	Deciduous	Urb_veg	Water
12.3	0	0	0	0	0	0
12.4	0	0	0	0	0	0
12.5	0	0	0	0	0	0
12.6	0	0	0	0	0	0
12.7	0	0	0	0	0	0
12.8	0	0	0	0	0	0
12.9	0	0	0	0	0	0
13	0	0	0	0	0	0
13.1	0	0	0	0	0	0
13.2	0	0	0	0	0	0
13.3	0	0	0	0	0	0
13.4	0	0	0	0	0	0
13.5	0	0	0	0	0	0
13.6	0	0	0	0	0	0
13.7	0	0	0	0	0	0
13.8	0	0	0	0	0	0
13.9	0	0	0	0	0	0
14	0	0	0	0	0	0
14.1	0	0	0	0	0	0
14.2	0	0	0	0	0	0
14.3	0	0	0	0	0	0
14.4	0	0	0	0	0	0
14.5	0	0	0	0	0	0
14.6	0	0	0	0	0	0
14.7	0	0	0	0	0	0
14.8	0	0	0	0	0	0
14.9	0	0	0	0	0	0
15	0	0	0	0	0	0
15.1	0	0	0	0	0	0.0098
15.2	0	0	0	0	0	0.5434
15.3	0	0.2603	0	0	0	1.3331
15.4	0	0.3333	0	0	0	1.3331
15.5	0	0.3333	0	0	0	1.3331
15.6	0	0.3333	0	0	0	1.3331
15.7	0	0.3333	0	0	0	1.3331
15.8	0	0.3333	0	0	0	1.3331
15.9	0	0.3333	0	0	0	1.3331
16	0	0.3333	0	0	0	1.3331
16.1	0	0.3333	0	0	0	1.3331
16.2	0	0.3333	0	0	0	0.7269
16.3	0	0.0791	0	0	0	0
16.4	0	0	0	0	0	0
16.5	0	0	0	0	0	0
16.6	0	0	0	0	0	0
16.7	0	0	0	0	0	0
16.8	0	0	0	0	0	0
16.9	0	0	0	0	0	0
17	0	0	0	0	0	0
17.1	0	0.1666	0	0	0	0
17.2	0	0.4795	0	0	0	0
17.3	0	0.8109	0	0	0	0
17.4	0	1.1664	0	0	0	0
17.5	0	1.1664	0	0	0	0

Table A.2c. Half-Mile Level Raw Data (continued).

MM	HIR	Commercial	Trans	Deciduous	Urb_veg	Water
17.6	0	1.1664	0	0	0	0
17.7	0	1.1664	0	0	0	0
17.8	0	1.1664	0	0.3186	0	0
17.9	0	1.1664	0	0.3872	0	0
18	0	1.1664	0	0.8354	0	0
18.1	0	0.9998	0	1.1324	0	0
18.2	0	0.7116	0	1.1597	0	0
18.3	0	0.3819	0	1.4997	0	0
18.4	0	0.0807	0	1.8121	0	0
18.5	0	0.1666	0	1.6466	0	0
18.6	0	0.1666	0	1.4997	0	0
18.7	0	0.7770	0	1.4997	0	0
18.8	0	1.1664	0	1.3956	0	0
18.9	0	1.1664	0	1.1723	0	0
19	0	1.1664	0	0.8372	0	0
19.1	0	1.1664	0	0.8332	0	0
19.2	0	1.1664	0	0.8318	0	0
19.3	0	1.1664	0	0.3333	0	0
19.4	0	1.0481	0	0.0034	0	0
19.5	0	0.9998	0	0	0	0
19.6	0	0.9451	0	0	0	0
19.7	0	0.2561	0	0	0	0
19.8	0	0	0	0	0	0
19.9	0	0	0	0	0	0
20	0	0	0	0	0	0
20.1	0	0	0	0	0	0
20.2	0	0	0	0	0	0
20.3	0	0	0	0	0	0
20.4	0	0	0	0	0	0
20.5	0	0	0	0	0	0
20.6	0	0	0	0	0	0
20.7	0	0	0	0	0	0
20.8	0	0	0	0	0	0
20.9	0	0	0	0	0	0
21	0	0	0	0	0	0
21.1	0	0	0	0	0	0
21.2	0	0	0	0	0	0
21.3	0	0	0	0	0	0
21.4	0	0	0	0	0	0
21.5	0	0	0	0	0	0.0011
21.6	0	0	0	0	0	0.0533
21.7	0	0	0	0	0	0.0334
21.8	0	0	0	0	0	0
21.9	0	0	0	0	0	0
22	0	0	0	0	0	0
22.1	0	0	0	0	0	0
22.2	0	0	0	0	0	0.1486
22.3	0	0	0	0	0	0.1666
22.4	0	0	0	0	0	0.1666
22.5	0	0	0	0	0	0.1666
22.6	0	0	0	0	0	0.1666
22.7	0	0	0	0	0	0.1265
22.8	0	0	0	0	0	0

Table A.2c. Half-Mile Level Raw Data (continued).

MM	HIR	Commercial	Trans	Deciduous	Urb_veg	Water
22.9	0	0	0	0.1666	0	0
23	0	0	0	0.1666	0	0
23.1	0	0	0	0.1666	0	0
23.2	0	0	0	0.3333	0	0
23.3	0	0	0	0.3380	0	0
23.4	0	0	0	0.4999	0	0
23.5	0	0	0	0.4999	0	0
23.6	0	0	0	0.4999	0	0
23.7	0	0	0	0.3333	0	0
23.8	0	0	0	0.3333	0	0
23.9	0	0.0475	0	0.3333	0	0
24	0	0.3333	0	0.3333	0	0
24.1	0	0.6900	0	0	0	0
24.2	0	1.1849	0	0	0	0
24.3	0	1.3331	0	0	0	0
24.4	0	1.3332	0	0	0	0.5150
24.5	0	1.4997	0	0	0	0.6665
24.6	0	1.6888	0	0	0	0.6665
24.7	0	2.2196	0	0	0	0.8332
24.8	0	2.3329	0	0	0	0.9998
24.9	0	2.2796	0	0	0	0.9998
25	0	2.1663	0	0	0	0.9998
25.1	0	2.0401	0	0	0	0.9998
25.2	0	1.7320	0	0	0	0.9998
25.3	0	1.6664	0	0	0	0.8958
25.4	0	1.6664	0	0	0	0.3803
25.5	0	1.4997	0	0	0	0.3333
25.6	0	1.4265	0	0	0	0.3333
25.7	0	1.4557	0	0	0	0.1666
25.8	0	1.1954	0	0	0	0
25.9	0	1.3331	0	0	0	0
26	0	1.4595	0	0.1666	0	0
26.1	0	1.6664	0	0.1666	0	0
26.2	0	1.7747	0	0.1666	0	0.1162
26.3	0	1.8330	0	0.1666	0	0.3333
26.4	0	2.1566	0	0.1666	0	0.3333
26.5	0	2.3329	0	0.1666	0	0.3333
26.6	0	2.3329	0	0.1666	0	0.3333
26.7	0	2.2102	0	0.1666	0	0.3333
26.8	0	1.9561	0	0	0	0.3333
26.9	0	1.6664	0	0	0	0.3333
27	0	1.4941	0	0	0	0.3333
27.1	0	1.1665	0	0	0	0.1674
27.2	0	1.1015	0	0	0	0
27.3	0	1.1696	0	0	0	0
27.4	0	1.2064	0	0	0	0
28.5	0	2.8425	0	0	0	0
29.2	0	3.1847	0	0	0	0
29.8	0	1.5710	0	0	0	0
30	0	1.1854	0	0	0	0
30.7	0	1.1665	0	0	0	0
31	0	0.9340	0	0	0	0
31.4	0	0	0	0	0	0

Table A.2c. Half-Mile Level Raw Data (continued).

MM	HIR	Commercial	Trans	Deciduous	Urb_veg	Water
31.8	0	3.8747	0	0	0	0.1666
32.2	0	7.9345	0	0	0	0.4999
32.3	0	9.6355	0	0	0	0.4999
32.4	0	10.0934	0	0	0	0.4999
32.5	0	9.6101	0	0	0	0.4999
32.6	0	8.5148	0	0	0	0.3333
32.7	0	8.1102	0	0	0	0.3333
33.6	0	0	0	0	0	0
34	0	0	0	0	0	0
34.1	0	0	0	0	0	0
34.2	0	0	0	0	0	0
34.3	0	0	0	0	0	0
34.4	0	0	0	0	0	0
34.5	0	0	0	0	0	0
34.6	0	0	0	0	0	0
35.4	0	0	0	0	0	0
36.2	0	0	0	0	0	0
36.7	0	0	0	0	0	0
37.5	0	0	0	0	0	0
37.6	0	0	0	0	0	0
37.7	0	0	0	0	0	0
37.8	0	0	0	0	0	0
37.9	0	0	0	0	0	0
38	0	0	0	0	0	0
38.5	0	0	0	0	0	0
39.1	0	0	0	0	0	0.16664
39.4	0	0	0	0	0	0.38660
39.9	0	0	0	0	0	3.85399
40.3	0	0.1666	0	0	0	5.84287
41	0	0.1666	0	0	0	8.71859
41.3	0	0	0	0	0	5.31758
42.2	0	0	0	0	0	1.33314
43.1	0	0	0	0	0	0.66657
44.1	0	0.1666	0	0	0	3.83602
44.7	0	0	0	0	0	0
45	0	0	0	0	0	0
45.5	0	0	0	0	0	0
45.8	0	0.4999	0	0	0	0
46.1	0	3.3244	0	0	0	0
46.4	0	11.7929	0	0	0	0
46.7	0.1666	22.5267	0	0	0	0
47.6	0	4.8931	0	0.1666	0	0
47.8	0	2.3339	0	0	0	0
48.1	0	0	0	0	0	0
48.4	0	0	0	0	0	0
49.4	0	0	0	0	0	0
49.7	0	0	0	0	0	0
50	0	0	0	0	0	0
50.2	0	0	0	0	0	0
50.6	0	0	0	0	0	0
51.3	0	1.0134	0	0	0.1667	0
51.7	0.5000	7.4811	0	0	1.2502	0.1667
52.2	0.5000	8.8722	0	0	2.6664	0.1667

Table A.2c. Half-Mile Level Raw Data (continued).

MM	HIR	Commercial	Trans	Deciduous	Urb_veg	Water
52.7	0	2.4042	0	0	0.5000	0
53.6	0	2.4998	0	0	0	0
53.9	0	2.4998	0	0	0	0
54.5	0	0.5690	0	0	0	0
55.1	0	0	0	0	0	0
56.8	0	0.8333	0	0	0	0
57.1	0	1.6665	0	0	0	0
57.6	0	2.8012	0	0	0	0
58.1	0	2.0341	0	0	0	0

Table A.3a. One-Mile Level Raw Data

Table of raw data for the deer vehicle collision study at the one-mile level. Abbreviations for landcover variables: MM, mile marker; DVC, 1998-2003 DVC data; City, distance to nearest city; Water, distance to nearest water; Elev, elevation; Density, population density; Slope, slope; LIR, low intensity residential development; and Bare, barren. All variables continuous and measured in proportion per buffered layer.

MM	DVC	City	Water	Elev	Density	Slope	LIR	Bare
7	2	1122.47	593.36	1251.96	75.6249	8.3778	0	0
7.8	1	1901.02	294.03	1243.52	84.3691	6.0809	0	0
8	0	2174.89	252.60	1244.86	84.3691	6.1428	0	0
8.1	0	2322.82	242.60	1244.49	84.3691	6.0258	0	0
8.2	1	2472.78	238.18	1243.37	84.3691	5.8541	0	0
8.3	0	2611.49	234.58	1242.36	84.3691	5.6634	0	0
8.4	1	2764.35	230.44	1241.26	55.2563	5.5035	0	0
8.5	0	2918.25	224.04	1240.08	55.2563	5.3379	0	0
8.6	0	3086.73	221.07	1238.83	55.2563	5.2964	0	0
8.7	1	3242.40	221.45	1237.64	55.2563	5.2667	0	0
8.8	1	3398.67	222.38	1236.26	55.2563	5.2046	0.0417	0.0277
8.9	0	3543.42	224.70	1235.06	66.4602	5.3315	0.0417	0.1414
9	1	3700.65	228.76	1234.18	66.4602	5.5169	0.0417	0.2083
9.1	1	3858.27	233.98	1234.34	108.057	5.7772	0.0417	0.2083
9.2	0	4016.21	244.32	1234.61	108.057	5.9763	0.0417	0.2083
9.3	0	4174.44	260.83	1233.85	108.057	6.0766	0.0417	0.2083
9.4	0	4317.96	276.28	1232.46	108.057	6.1054	0.0417	0.2083
9.5	1	4486.84	290.54	1230.42	108.057	6.1509	0.0417	0.2083
9.6	1	4617.96	295.52	1227.73	108.057	6.1212	0.0417	0.2083
9.7	0	4737.49	300.05	1224.92	108.057	6.1202	0.0417	0.2083
9.8	0	4859.46	306.04	1222.37	108.057	6.0630	0.0417	0.2083
9.9	0	4983.68	311.46	1220.19	90.0751	6.0304	0.0417	0.2083
10	1	5109.99	315.42	1218.31	98.7338	6.0930	0.0417	0.2083
10.1	0	5238.24	319.61	1217.17	98.7338	6.2059	0.1540	0.2083
10.2	1	5368.29	325.24	1217.00	98.7338	6.2937	0.1666	0.2083
10.3	3	5500.01	331.73	1218.09	98.7338	6.4920	0.1666	0.2083
10.4	1	5633.29	339.95	1220.29	98.7338	6.8097	0.1666	0.2083
10.5	3	5768.02	338.46	1223.18	98.7338	7.1609	0.1666	0.2083
10.6	1	5904.09	332.84	1227.53	53.6131	7.5451	0.1666	0.2083
10.7	0	6046.93	329.29	1230.85	53.6131	7.9047	0.1666	0.2083

Table A.3a. One-Mile Level Raw Data (continued).

MM	DVC	City	Water	Elev	Density	Slope	LIR	Bare
10.8	0	6213.69	323.70	1232.91	53.6131	8.1807	0.1666	0.2083
10.9	0	6362.45	322.73	1232.10	53.6131	8.3925	0.1250	0.1666
11	1	6516.94	321.97	1228.23	53.6131	8.5039	0.1250	0.0231
11.1	2	6671.62	321.78	1222.76	38.8872	8.4882	0.1250	0
11.2	0	6822.56	321.77	1216.42	38.8872	8.4058	0.1250	0
11.3	0	6948.08	312.56	1210.26	38.8872	8.2568	0.1250	0
11.4	0	7080.47	299.91	1204.37	38.8872	8.0534	0.1250	0
11.5	0	7200.03	286.66	1199.32	38.8872	7.8903	0.1250	0
11.6	0	7304.09	265.61	1194.15	38.8872	7.7856	0.1250	0
11.7	0	7377.70	246.29	1188.19	38.8872	7.6479	0.1250	0
11.8	0	7421.28	234.48	1181.80	48.0978	7.4782	0.1250	0
11.9	1	7454.35	223.67	1174.30	48.0978	7.2803	0.1250	0
12	0	7465.47	213.04	1165.92	48.0978	7.0625	0.1250	0
12.1	0	7447.49	209.52	1157.61	48.0978	6.8238	0.1250	0
12.2	0	7414.99	207.41	1148.52	48.0978	6.5143	0.0482	0
12.3	0	7359.42	206.53	1140.46	48.0978	6.1846	0	0
12.4	1	7294.98	206.84	1132.17	65.4104	5.9188	0	0
12.5	1	7216.39	210.94	1124.06	65.4104	5.6612	0	0
12.6	2	7124.11	216.04	1116.60	65.4104	5.4334	0	0
12.7	0	6986.77	224.96	1109.01	65.4104	5.1441	0	0
12.8	0	6867.14	241.04	1102.51	65.4104	4.7662	0	0
12.9	0	5171.25	390.60	1039.83	65.4104	3.3436	0	0
13	0	6736.77	258.58	1096.75	67.0131	4.4855	0	0
13.1	0	6570.74	277.31	1091.95	67.8328	4.3932	0	0
13.2	1	6423.47	296.65	1087.27	67.8328	4.4192	0	0
13.3	1	6274.79	310.83	1082.75	67.8328	4.4836	0	0
13.4	0	6110.88	322.60	1078.27	67.8328	4.5448	0	0
13.5	0	5975.00	331.51	1073.64	67.8328	4.5685	0	0
13.6	1	5852.35	338.23	1068.84	67.8328	4.5183	0	0
13.7	2	5691.46	346.87	1063.69	67.8328	4.4358	0	0
13.8	0	5571.62	359.14	1058.24	67.0131	4.2637	0	0
13.9	1	5439.64	369.54	1052.52	67.0131	4.0397	0	0
14	1	5322.76	379.47	1047.01	67.0131	3.7791	0	0
14.1	0	5182.03	388.03	1041.20	67.0131	3.4454	0	0
14.2	0	5069.33	394.13	1035.81	67.0131	3.0884	0	0
14.3	0	4974.64	393.30	1030.90	67.0131	2.7515	0	0
14.4	0	4866.95	386.62	1026.51	99.4748	2.4490	0	0
14.5	0	4737.59	373.61	1022.18	99.4748	2.1485	0	0
14.6	0	4635.46	349.85	1018.55	99.4748	1.9712	0	0
14.7	0	4536.19	327.68	1015.30	99.4748	1.8914	0	0
14.8	0	4439.98	308.16	1011.99	99.4748	1.8075	0	0
14.9	1	4347.03	293.31	1009.05	99.4748	1.7292	0	0
15	1	4236.04	287.13	1006.42	157.425	1.6659	0	0
15.1	1	4150.89	291.68	1004.06	157.425	1.5974	0	0
15.2	0	4069.71	303.38	1001.81	157.425	1.5216	0	0
15.3	0	3948.80	312.55	998.99	134.332	1.4372	0	0
15.4	1	3807.94	321.51	995.99	157.425	1.3720	0	0
15.5	0	3661.94	323.90	992.99	157.425	1.3132	0	0
15.6	0	3497.20	329.38	990.28	157.425	1.2496	0	0
15.7	0	3330.03	333.82	987.56	157.425	1.2011	0	0
15.8	0	3185.38	335.45	985.07	173.978	1.1679	0	0
15.9	0	3022.21	333.45	982.53	173.978	1.1414	0	0
16	0	2878.78	329.03	980.12	173.978	1.1606	0	0

Table A.3a. One-Mile Level Raw Data (continued).

MM	DVC	City	Water	Elev	Density	Slope	LIR	Bare
16.1	0	2717.25	323.24	977.62	173.978	1.1635	0	0
16.2	0	2575.58	314.61	975.28	173.978	1.1773	0	0
16.3	0	2414.25	307.71	972.87	166.866	1.1974	0	0
16.4	0	2256.84	300.04	970.55	166.866	1.2348	0	0
16.5	0	2120.11	288.97	968.20	166.866	1.3340	0	0
16.6	1	1985.87	281.74	966.13	166.866	1.4990	0	0
16.7	0	1837.31	276.67	964.32	166.866	1.7052	0.0833	0
16.8	0	1712.06	271.43	962.91	209.057	1.9606	0.0833	0
16.9	0	1578.56	267.45	961.81	209.057	2.3097	0.0833	0
17	0	1457.97	263.37	960.94	209.057	2.7337	0.0833	0
17.1	0	1364.08	263.45	960.64	364.889	3.1646	0.0833	0
17.2	0	1282.07	267.11	960.81	364.889	3.5856	0.0833	0
17.3	1	1194.94	268.25	961.61	364.889	4.0036	0.0833	0
17.4	0	1142.35	271.19	962.36	364.889	4.3643	0.0833	0
17.5	0	1097.47	274.05	963.18	364.889	4.6968	0.0833	0
17.6	0	1071.79	273.94	963.39	364.889	4.9754	0.0833	0
17.7	0	1060.19	270.36	962.25	359.626	5.1335	0.0833	0
17.8	0	1064.15	264.70	960.98	359.626	5.3111	0.0833	0
17.9	0	1079.98	257.03	959.74	359.626	5.4057	0.0833	0
18	1	1117.70	242.08	958.12	421.148	5.4907	0.0833	0
18.1	0	1164.94	230.29	956.30	421.148	5.5542	0.0833	0
18.2	0	1236.89	217.58	953.75	421.148	5.5800	0.0833	0
18.3	0	1312.53	210.05	951.18	421.148	5.6213	0.0833	0
18.4	0	1416.17	203.80	948.83	421.148	5.6387	0.0833	0
18.5	0	1517.37	200.26	946.85	258.059	5.6906	0.0833	0
18.6	1	1648.40	194.61	944.10	258.059	5.6226	0.0833	0
18.7	0	1770.35	192.38	942.17	258.059	5.5303	0	0
18.8	0	1906.32	191.50	940.09	258.059	5.3456	0	0
18.9	1	2061.81	191.98	938.63	258.059	5.2191	0	0
19	1	2183.05	191.73	936.73	258.059	5.0150	0	0
19.1	0	2315.32	189.65	934.95	258.059	4.8026	0	0
19.2	2	2474.76	187.18	932.30	87.7405	4.5211	0	0
19.3	0	2637.42	186.64	929.59	87.7405	4.3424	0	0
19.4	0	2764.35	188.53	926.70	87.7405	4.2310	0	0
19.5	1	2931.75	194.57	923.93	87.7405	4.1238	0	0
19.6	0	3089.20	198.63	920.91	87.7405	3.9323	0	0
19.7	0	3233.53	204.00	918.15	87.7405	3.7355	0	0
19.8	1	3394.57	206.86	915.55	66.6659	3.5185	0	0
19.9	0	3540.75	208.59	913.03	66.6659	3.3650	0	0
20	3	3677.13	210.10	910.72	66.6659	3.2809	0	0
20.1	0	3824.56	210.33	908.53	66.6659	3.1995	0	0
20.2	0	3990.26	207.49	906.17	66.6659	3.0153	0	0
20.3	0	4138.74	204.97	903.96	66.6659	2.7995	0	0
20.4	1	4287.54	204.24	902.17	48.1059	2.6734	0	0
20.5	0	4446.06	205.50	900.77	48.1059	2.6844	0	0
20.6	1	4614.45	203.34	899.95	48.1059	2.9207	0	0
20.7	0	4765.61	199.37	899.51	48.1059	3.1169	0	0
20.8	0	4907.45	194.41	898.95	48.1059	3.2644	0	0
20.9	0	5049.77	191.32	898.31	48.1059	3.3211	0	0
21	0	5176.03	188.54	897.67	48.1059	3.3932	0	0
21.1	0	5319.46	187.33	896.49	48.1059	3.4185	0	0
21.2	0	5502.14	186.95	895.25	33.7447	3.4162	0	0
21.3	1	5646.38	186.45	893.97	33.2857	3.4210	0	0

Table A.3a. One-Mile Level Raw Data (continued).

MM	DVC	City	Water	Elev	Density	Slope	LIR	Bare
21.4	0	5802.94	185.65	892.64	33.2857	3.4204	0	0
21.5	0	5947.23	183.23	891.26	33.2857	3.3878	0	0
21.6	0	6086.40	180.93	889.74	33.2857	3.3615	0	0
21.7	0	6227.40	180.37	888.32	33.2857	3.3460	0	0
21.8	1	6345.54	181.58	887.05	33.2857	3.3116	0	0
21.9	0	6459.34	182.89	885.94	33.2857	3.3045	0	0
22	1	6549.13	181.89	884.90	23.9160	3.2528	0	0
22.1	0	6641.39	177.89	884.17	23.9160	3.2249	0	0
22.2	0	6695.71	171.93	883.65	23.9160	3.3168	0	0
22.3	1	6736.34	165.28	883.13	25.6049	3.3715	0	0
22.4	1	6755.67	161.59	882.70	25.6049	3.3192	0	0
22.5	1	6757.81	160.11	882.82	25.6049	3.4884	0	0
22.6	0	6741.38	158.37	883.04	25.6049	3.7016	0	0
22.7	0	6705.03	160.18	883.08	25.6049	3.8395	0	0
22.8	0	6641.69	161.73	883.24	17.5210	3.9990	0	0
22.9	0	6565.28	168.38	883.56	17.5210	4.3056	0	0
23	1	6478.34	171.14	884.52	17.5210	4.6670	0	0
23.1	0	6368.81	172.34	885.10	17.5210	5.0465	0	0
23.2	2	6253.45	168.79	886.01	20.0489	5.5076	0	0
23.3	1	6126.67	168.65	887.43	20.0489	5.9150	0	0
23.4	0	5980.01	169.04	889.39	20.0489	6.3445	0	0
23.5	1	5837.88	171.32	891.70	20.0489	6.7273	0	0
23.6	0	5684.81	171.26	893.99	13.1704	7.1224	0	0
23.7	1	5542.71	170.28	895.71	13.1704	7.5523	0	0
23.8	2	5391.29	167.64	898.07	13.1704	8.1241	0	0
23.9	0	5222.24	161.77	900.01	13.1704	8.6735	0	0
24	2	5081.74	155.33	902.64	13.1704	9.2757	0	0
24.1	2	4932.96	153.87	905.20	13.1704	9.7627	0	0
24.2	1	4793.94	152.69	908.30	16.2279	10.1598	0	0
24.3	0	4655.60	152.53	910.79	16.2279	10.5875	0	0
24.4	0	4481.83	156.35	913.77	12.1580	11.1462	0	0
24.5	2	4345.37	161.41	916.12	12.1580	11.5396	0	0
24.6	0	4203.11	168.34	918.84	12.1580	12.0188	0	0
24.7	0	4069.05	176.01	921.10	12.1580	12.4543	0	0
24.8	0	3907.37	188.52	924.64	12.1580	12.9064	0	0
24.9	1	3752.29	203.11	929.56	12.1580	13.4097	0	0
25	1	3603.17	222.42	935.59	12.1580	13.9997	0	0
25.1	0	3449.07	242.14	942.17	12.1580	14.7173	0	0
25.2	1	3300.76	261.85	948.50	14.5467	15.4685	0	0
25.3	1	3124.47	279.66	955.98	14.5467	16.3377	0	0
25.4	0	2977.33	303.23	964.07	14.5467	17.1566	0	0
25.5	0	2830.87	316.37	971.08	14.5467	17.8783	0	0
25.6	1	2701.71	318.64	976.94	15.2763	18.5644	0	0
25.7	0	2610.81	313.35	982.50	14.5467	19.1603	0	0
25.8	0	2534.24	300.78	989.85	26.8677	19.7342	0	0
25.9	0	2456.63	298.89	997.77	26.8677	20.1941	0	0
26	2	2348.99	301.88	1005.27	26.8677	20.5504	0	0
26.1	1	2211.39	317.48	1007.77	26.8677	20.7644	0	0
26.2	1	2064.59	342.99	1006.60	26.8677	20.8812	0	0
26.3	0	1898.94	367.51	1002.69	26.8677	20.9176	0	0
26.4	0	1773.72	392.15	998.04	26.8677	20.9553	0	0
26.5	0	1655.43	410.68	993.13	26.8677	20.9002	0	0
26.6	0	1546.13	429.08	989.40	42.6385	20.7929	0	0

Table A.3a. One-Mile Level Raw Data (continued).

MM	DVC	City	Water	Elev	Density	Slope	LIR	Bare
26.7	0	1428.38	436.85	986.92	39.9328	20.4785	0	0
26.8	0	1330.68	442.60	983.51	39.9328	20.1271	0	0
26.9	2	1237.71	441.92	978.84	39.9328	19.6383	0	0
27	0	1170.51	441.59	973.83	39.9328	19.2500	0	0
27.1	0	1121.35	431.09	967.78	39.9328	18.8662	0	0
27.2	0	1084.50	427.82	961.87	40.3220	18.5235	0	0
27.3	0	1066.42	422.60	955.39	40.3220	18.1185	0	0
27.4	0	1060.19	419.26	949.93	40.3220	17.6829	0	0
28.5	0	1611.97	461.20	981.99	27.2472	13.3941	0	0
29.2	0	2462.63	505.99	987.03	18.2025	9.4618	0	0
29.8	0	3186.36	476.80	959.28	20.4514	6.2147	0	0
30	0	3385.27	438.74	948.64	16.0862	5.8778	0	0
30.7	0	3442.00	303.12	920.95	20.7514	4.5169	0	0
31	1	3241.32	245.72	913.74	147.624	4.1170	0.1250	0
31.4	0	2725.62	228.98	904.77	147.624	3.6731	1.0677	0
31.8	4	2157.45	246.08	894.30	481.974	2.9841	2.7223	0
32.2	0	1653.20	230.38	884.33	535.036	1.8913	4.1243	0
32.3	2	1550.54	218.21	883.50	1142.23	1.6418	4.1243	0
32.4	4	1456.67	208.13	883.22	1142.2	1.4640	4.1243	0
32.5	6	1377.77	201.37	883.49	1142.23	1.4001	4.1243	0
32.6	1	1313.08	195.02	883.93	1142.23	1.3458	4.1243	0
32.7	0	1261.04	192.04	884.62	1142.23	1.3149	4.1243	0
33.6	5	1715.27	147.29	884.44	277.640	1.4429	1.4812	0
34	0	2261.40	135.18	879.68	277.640	1.4466	0.0742	0
34.1	1	2428.11	134.08	878.36	277.640	1.4386	0	0
34.2	3	2568.64	135.98	876.99	28.0272	1.4364	0	0
34.3	2	2708.51	138.63	875.59	28.0272	1.4368	0	0
34.4	1	2879.89	139.50	874.10	28.0272	1.4541	0	0
34.5	1	3023.55	141.03	872.50	28.0272	1.4741	0	0
34.6	2	3166.59	142.84	870.93	28.0272	1.4748	0	0
35.4	0	4423.34	152.55	860.56	33.8086	1.2192	0	0
36.2	1	5696.20	134.44	851.06	37.9840	1.1369	0	0.0769
36.7	0	6469.54	144.99	845.70	49.2682	1.1029	0	0
37.5	3	7752.44	143.76	841.35	62.4343	1.0478	0	0
37.6	1	7931.47	146.24	841.70	62.4343	1.0484	0	0
37.7	3	8080.69	146.05	842.26	62.4343	1.0797	0	0
37.8	10	8230.55	144.62	843.23	62.4343	1.1440	0	0
37.9	3	8409.67	145.58	844.45	62.4343	1.2408	0	0
38	2	8558.97	149.44	846.23	52.5901	1.3461	0	0
38.5	0	9396.81	155.58	860.52	52.5901	1.7410	0	0
39.1	0	10393.16	177.47	885.04	37.0820	1.8211	0	0
39.4	0	10736.97	179.86	896.77	28.1504	1.7688	0	0
39.9	1	10938.23	162.66	912.67	23.9558	1.3803	0	0
40.3	0	10754.96	133.68	919.13	23.9558	0.9393	0	0
41	0	9998.19	118.93	922.22	13.0091	0.6209	0	0
41.3	2	9519.04	157.80	923.24	4.6617	0.6178	0	0
42.2	0	7874.02	475.15	928.98	15.9341	0.6739	0	0
43.1	0	6441.24	638.48	927.60	19.1741	0.6453	0	0
44.1	1	4836.82	287.19	923.70	47.9933	0.5229	0	0
44.7	0	3893.42	189.33	923.75	47.9933	0.4577	0	0
45	1	3425.81	181.67	924.25	56.6437	0.4488	0.0377	0
45.5	4	2648.96	155.99	925.94	251.595	0.4940	0.5493	0
45.8	10	2229.87	138.69	927.31	251.595	0.5320	3.6263	0

Table A.3a. One-Mile Level Raw Data (continued).

MM	DVC	City	Water	Elev	Density	Slope	LIR	Bare
46.1	1	1805.17	139.59	928.80	966.142	0.5572	5.4393	0.3102
46.4	0	1421.76	144.72	930.24	966.142	0.5876	6.1659	0.5833
46.7	1	1181.35	154.81	931.71	1632.44	0.6163	6.2075	0.5833
47.6	0	1251.99	219.71	933.46	1159.59	0.8481	5.1213	0.5833
47.8	0	1380.18	228.66	932.59	1159.59	0.8441	3.3378	0.5833
48.1	1	1670.49	243.32	931.12	369.584	0.9230	1.2251	0.4582
48.4	1	2056.42	269.39	929.78	369.584	1.1125	0.1845	0.0417
49.4	1	3303.28	344.13	929.02	70.5869	1.0267	0.0833	0
49.7	0	3449.49	420.68	929.22	70.5869	0.9598	0.0833	0
50	3	3423.51	460.73	929.41	76.0123	0.9588	0.0833	0
50.2	2	3308.69	483.85	929.53	76.0123	0.9307	0.0833	0
50.6	1	2892.99	556.37	930.19	168.988	0.8766	0.0401	0
51.3	1	1869.52	568.86	932.67	714.281	0.8727	1.4582	0.0417
51.7	0	1369.18	583.04	935.35	714.281	0.8988	1.4998	0.0417
52.2	0	1104.22	681.03	940.10	1459.93	0.8594	1.4998	0.2495
52.7	0	1261.03	870.21	945.02	1347.76	0.8620	1.4998	0.2916
53.6	0	2190.39	912.07	953.69	675.027	1.0924	0	0.2500
53.9	1	2551.15	866.69	956.63	218.033	1.1577	0	0.2916
54.5	0	3439.16	697.04	963.82	60.4215	1.1380	0	0.1250
55.1	0	4374.16	574.11	970.85	40.8044	1.0230	0	0.1250
56.8	1	5032.85	425.14	990.18	83.7259	3.7750	0	0.2916
57.1	0	4997.13	374.26	983.76	94.9235	4.4096	0	0.4166
57.6	2	4795.72	312.65	967.34	94.9235	4.6346	0	0.4166
58.1	1	4130.15	269.70	959.01	106.803	4.6196	0	0.5000

Table A.3b. One-Mile Level Raw Data

Table of raw data for the deer vehicle collision study at the one-mile level. Abbreviations for landcover variables: MM, mile marker; Pine, pine forest; Shrb, shrub land; and Grass, grassland; Past, pasture land; Ag, agriculture; Wtlnd, woody wetland; H_Wland, herbaceous wetland; and Build, buildings. All variables continuous and measured in proportions per buffered layer.

MM	Pine	Shrub	Grass	Past	Ag	Wtlnd	H_wland	Build
7	57.2341	12.0579	6.9688	7.4522	14.7874	0.9942	0.2949	10.198
7.8	58.7677	12.2611	5.3790	5.5381	15.5832	0.7213	1.1248	8.8251
8	129.9870	23.5709	10.1559	6.7111	24.5154	1.6339	2.2495	8.2694
8.1	66.9813	11.6614	4.5558	2.8146	11.1217	1.1123	1.1248	7.9925
8.2	67.9892	11.6046	4.7181	2.2957	10.1020	1.4575	1.1248	7.7006
8.3	68.9759	11.5326	4.9927	2.1246	8.9612	1.5801	1.1248	7.4638
8.4	70.0911	10.9620	5.1381	2.0842	8.1048	1.8888	1.0699	7.4175
8.5	70.9936	10.3988	5.7654	2.0412	7.3017	1.9163	0.9581	7.6002
8.6	72.3909	9.2908	6.0908	1.9628	6.6786	1.9163	0.9581	7.9103
8.7	73.7816	7.9512	6.7765	1.7835	6.0116	1.8732	0.9581	8.3418
8.8	74.5068	7.3482	7.0800	1.5645	5.6819	1.8746	0.9581	8.8163
8.9	74.7527	7.0791	7.3463	1.4827	5.5028	1.8746	0.9165	9.3324
9	75.6701	6.7636	7.5189	1.2556	5.0570	1.8746	0.7350	9.6926
9.1	76.5892	6.5672	7.7587	1.0882	4.5596	1.7384	0.5416	9.7945
9.2	76.8191	6.8495	7.9546	0.9998	4.3901	1.6663	0.2375	9.6775

Table A.3b. One-Mile Level Raw Data (continued).

MM	Pine	Shrub	Grass	Past	Ag	Wtlnd	H_wland	Build
9.3	76.8356	7.8808	7.7930	0.9244	3.8165	1.6663	0.0003	9.3622
9.4	77.0549	8.8426	7.5828	0.6697	3.1006	1.6663	0	9.0459
9.5	77.3189	9.7167	7.5616	0.3757	2.3800	1.6247	0	8.6493
9.6	78.0301	10.2390	7.2700	0.2104	1.6770	1.5830	0	8.2564
9.7	78.3120	10.5813	7.2050	0.1294	1.1403	1.5830	0	7.8352
9.8	78.2267	11.3652	7.0607	0.1225	0.5489	1.5572	0	7.4419
9.9	78.9499	11.2968	6.9095	0.0004	0.1356	1.5830	0	7.1166
10	79.1757	11.6530	6.5409	0	0	1.5056	0	6.9063
10.1	78.9861	12.2863	6.2886	0	0	1.2342	0	6.8592
10.2	78.8549	12.9841	5.9028	0	0	0.9655	0	6.9738
10.3	78.9698	13.5522	5.4725	0	0	0.5849	0	7.1938
10.4	79.5179	13.4160	5.0212	0	0	0.4348	0	7.4056
10.5	79.9045	13.4660	4.7985	0	0	0.1647	0	7.5230
10.6	80.2525	13.6945	4.2244	0	0	0.1250	0	7.4735
10.7	81.0071	13.5421	3.7306	0	0	0.0592	0	7.1349
10.8	82.1560	13.6081	2.6229	0	0	0.0417	0	6.7361
10.9	82.4935	13.9659	1.9329	0.0409	0.0044	0.1043	0	6.4182
11	81.8532	14.0207	1.5742	0.7191	0.1666	0.3516	0	6.3771
11.1	80.6050	13.9129	1.4100	1.9289	0.1966	0.7284	0	6.5069
11.2	78.9244	13.8524	1.4815	2.8292	0.7583	1.0176	0	6.7708
11.3	76.8736	13.8807	1.5031	3.2577	1.6394	1.7207	0	7.0930
11.4	74.9719	13.4895	2.0473	3.6763	2.7325	1.9578	0	7.4457
11.5	72.5169	13.3046	3.1051	4.2319	3.7337	1.9831	0	7.7621
11.6	69.8955	13.6640	3.6883	4.6916	4.8341	2.1246	0	8.0024
11.7	66.4563	14.4377	4.4735	5.1205	6.3695	2.1246	0	8.2667
11.8	62.4386	14.8119	5.4582	5.8290	8.3644	2.2122	0	8.5098
11.9	58.3375	14.8425	6.0523	6.7557	10.6766	2.5022	0	8.7555
12	54.1182	14.3956	6.3808	8.3650	13.3244	2.5828	0	8.9671
12.1	49.3222	14.4380	7.0540	9.9863	15.6810	2.6853	0	9.0302
12.2	43.9552	14.5617	7.7111	12.0138	18.3312	2.7078	0	8.8986
12.3	38.8431	14.1280	8.3022	14.0648	21.3274	2.7779	0	8.6505
12.4	33.9673	13.3820	8.8527	15.3092	25.0145	3.0816	0	8.2323
12.5	29.8271	12.5090	9.1065	16.7827	28.2463	3.3414	0	7.7902
12.6	25.1405	12.1098	9.7874	18.4068	30.9774	3.4329	0	7.3823
12.7	21.3176	11.7066	10.0367	19.7529	33.4807	3.6639	0	7.0574
12.8	18.0299	11.0184	9.9346	20.5174	36.5627	3.8954	0	6.8861
12.9	22.2992	12.6819	13.3948	39.9637	101.738	9.8799	0	5.7329
13	12.9148	9.7186	9.3180	21.1671	42.6425	4.1974	0	6.8205
13.1	12.4069	8.9970	8.5935	20.7105	45.1325	4.1180	0	6.7354
13.2	12.8254	7.6597	7.7607	20.2842	47.2301	4.1982	0	6.6757
13.3	13.0970	5.8739	7.3825	20.2204	48.9670	4.4175	0	6.6163
13.4	13.2765	4.8328	6.6533	19.9011	50.9166	4.3781	0	6.5485
13.5	13.1464	3.9630	5.6850	19.8839	52.5886	4.6914	0	6.4314
13.6	12.3885	3.3693	5.2040	19.6308	54.5175	4.8482	0	6.2899
13.7	11.9457	2.9148	4.7120	19.0402	56.1951	5.1505	0	6.1523
13.8	10.9473	2.6921	4.6016	18.4275	58.1641	5.1257	0	5.9486
13.9	9.7329	2.4498	4.3039	18.1001	60.2605	5.1527	0	5.8143
14	8.0827	2.2780	3.6927	18.8054	61.5886	5.5527	0	5.7604
14.1	6.4137	1.9415	3.4090	20.1505	62.3933	5.6921	0	5.7342
14.2	4.5452	1.7856	3.5311	21.3175	62.9170	5.9036	0	5.7383
14.3	2.8863	1.6249	3.6987	22.3124	63.5674	5.9104	0	5.7976
14.4	1.4410	1.4933	3.9114	22.3238	64.7951	6.0130	0.0224	5.9161
14.5	1.1745	1.2914	4.4409	21.5710	65.2256	6.0834	0.0417	6.1001

Table A.3b. One-Mile Level Raw Data (continued).

MM	Pine	Shrub	Grass	Past	Ag	Wtlnd	H_wland	Build
14.6	1.0492	1.5005	5.2038	21.1622	64.7112	5.9955	0.0417	6.3787
14.7	1.0476	1.4853	6.0136	21.0421	64.2425	5.7107	0.0417	6.6055
14.8	1.2954	1.3862	7.3221	21.1098	63.2972	5.1310	0.0417	6.8316
14.9	1.3747	1.2931	8.6384	21.4453	62.3332	4.4570	0.0417	7.0430
15	1.2912	1.2081	9.4614	22.1100	61.8209	3.6501	0.0417	7.2773
15.1	1.0903	1.1665	10.6191	22.2777	61.3854	3.0028	0.0417	7.4988
15.2	1.0831	1.1161	11.4325	22.5265	60.8145	2.5690	0.0417	7.7058
15.3	1.0831	1.1565	12.5106	22.2527	59.9473	2.5915	0.0417	7.9443
15.4	1.1675	1.1170	13.1917	22.1670	58.7633	3.1353	0.0417	8.3101
15.5	1.0498	1.0996	13.1350	22.6816	58.3731	3.2027	0.0417	8.6939
15.6	0.7977	1.0042	12.4643	22.7052	59.4261	3.1443	0.0417	9.1575
15.7	0.7761	0.9109	11.6660	23.1969	59.9548	3.0372	0.0417	9.5295
15.8	0.9282	0.9554	10.9358	23.5659	60.1634	2.9931	0.0417	9.8763
15.9	1.0023	0.8825	10.2724	23.6075	60.8361	2.9409	0.0417	10.213
16	1.2154	0.8668	10.0385	23.8549	60.7261	2.8401	0.0417	10.521
16.1	1.4961	0.7560	9.8163	23.9470	60.8082	2.7175	0.0417	10.893
16.2	1.9342	0.9644	9.6470	24.8017	59.7123	2.4228	0.0417	11.315
16.3	2.5210	1.1084	9.5354	26.4485	57.8245	1.9516	0.0417	11.692
16.4	3.1263	1.3290	9.6963	29.0884	54.5652	1.5283	0.0417	12.237
16.5	3.5718	1.5716	9.8459	31.9981	51.0277	1.3104	0.0417	13.279
16.6	3.8786	1.8239	9.8667	34.6276	47.7016	1.3521	0.0416	14.618
16.7	4.2064	1.9577	10.4427	36.1526	45.3757	1.0958	0	16.688
16.8	4.6663	2.0166	11.8012	37.4573	42.3453	1.1652	0	19.327
16.9	5.1428	2.4971	13.9013	37.5663	39.2474	1.0752	0	21.820
17	5.3967	3.2170	15.7820	37.4596	36.5718	1.0548	0	24.575
17.1	6.0593	3.7642	17.8097	37.0474	33.8334	0.9315	0.0130	26.582
17.2	6.7734	4.4355	19.9725	36.3747	30.9026	0.9165	0.0417	27.728
17.3	7.4990	5.2634	21.8875	35.8381	27.8915	0.9539	0.0417	28.596
17.4	7.6313	5.9393	23.8990	35.4141	25.3793	1.0287	0.0417	29.035
17.5	7.8313	6.1754	25.7617	35.6928	22.3846	1.3627	0.0417	29.343
17.6	8.1575	6.5677	26.8295	36.3437	19.5883	1.6801	0.0417	29.571
17.7	8.2689	6.8567	28.2930	35.9867	17.9358	1.8544	0.0417	29.684
17.8	8.5585	6.6773	29.4111	35.8063	16.7140	1.9163	0.0417	29.431
17.9	8.6637	6.6850	30.3562	35.5100	15.8022	1.9579	0.0417	29.161
18	8.7293	6.7681	31.5456	34.4433	15.5561	1.9579	0.0417	29.001
18.1	8.7395	6.7813	32.6164	33.8486	15.0981	1.9579	0.0417	28.874
18.2	8.5285	6.6733	34.4115	32.1115	15.2280	1.9206	0.0417	28.763
18.3	7.7373	6.5711	37.1588	30.0191	15.5874	1.7183	0.0417	28.551
18.4	7.3045	7.0897	38.4039	28.3766	16.0342	1.5830	0.0417	27.823
18.5	6.8842	7.3839	39.6758	27.1102	16.2111	1.5267	0.0417	26.530
18.6	6.3892	7.4760	41.2232	26.1357	16.2402	1.3692	0.0417	24.268
18.7	6.8472	7.3929	41.4766	25.8543	16.1221	1.2914	0.0417	21.738
18.8	7.2994	7.4640	40.7259	26.3499	15.9545	1.2696	0.0417	18.580
18.9	7.6405	7.3496	39.6839	27.2229	16.0203	1.2497	0.0417	16.345
19	8.1376	7.7191	38.1120	27.9058	16.0009	1.3331	0.0417	13.991
19.1	8.5776	7.7835	36.2078	29.4187	15.9074	1.3331	0.0221	11.968
19.2	8.2772	7.3842	34.4583	31.5528	16.2533	1.4077	0	10.377
19.3	8.2813	6.9706	31.9243	34.1586	16.4600	1.4697	0.0690	9.4686
19.4	8.4731	7.0436	29.1869	36.1575	16.9699	1.4174	0.1250	8.5362
19.5	8.4941	6.9966	26.9631	37.5270	18.0262	1.3266	0.1250	7.8828
19.6	8.3246	6.4744	25.1877	40.0407	18.1672	1.1806	0.1250	7.4669
19.7	8.2602	6.2838	23.9187	41.6482	18.2907	0.9736	0.1250	7.2525
19.8	7.8456	6.1753	23.2350	43.3732	17.9591	0.8929	0.1439	7.0234

Table A.3b. One-Mile Level Raw Data (continued).

MM	Pine	Shrub	Grass	Past	Ag	Wtlnd	H_wland	Build
19.9	7.1528	6.0748	21.2955	46.5759	17.3283	1.1223	0.2004	6.7431
20	6.7540	6.0788	19.3110	50.1583	15.9381	1.3016	0.2083	6.4339
20.1	6.9371	5.6049	16.6135	54.1491	14.9159	1.3331	0.2083	6.1400
20.2	6.9462	5.5366	13.5802	58.0305	14.2975	1.3331	0.2083	5.7706
20.3	6.8130	5.2557	12.0354	60.3125	14.0419	1.3331	0.2083	5.4775
20.4	7.1520	4.8983	11.2903	62.2099	12.8664	1.3747	0.2083	5.2996
20.5	7.6496	4.6762	11.4479	63.0246	11.6187	1.3747	0.2083	5.1859
20.6	8.0190	4.6538	11.9060	62.1680	11.6701	1.3747	0.2083	5.0115
20.7	8.0634	4.6053	12.0740	61.5545	12.1528	1.3416	0.2083	4.8500
20.8	8.2469	4.3192	12.4772	61.5684	11.8054	1.3331	0.2083	4.6491
20.9	8.4492	4.1675	12.8422	60.7470	12.1704	1.3738	0.2083	4.3563
21	8.0819	3.7889	14.2640	59.6994	12.5163	1.3995	0.2083	4.1185
21.1	8.1906	3.6342	15.4857	57.8533	13.3845	1.2925	0.1176	3.8981
21.2	8.0635	3.4608	16.6671	56.6971	13.9278	1.0588	0.0833	3.6273
21.3	8.2852	3.1352	17.5556	55.5174	14.3517	1.0300	0.0833	3.4434
21.4	8.5047	3.0385	18.3990	54.5467	14.3810	1.0052	0.0833	3.2871
21.5	8.3668	3.0775	18.6842	54.1756	14.5294	1.0415	0.0833	3.1785
21.6	8.3862	2.9772	18.9463	53.2920	15.2637	1.0097	0.0417	3.1148
21.7	8.2435	2.7071	19.4464	52.2424	16.3223	0.9133	0.0417	3.1088
21.8	7.9342	2.4192	19.4246	52.1263	17.4133	0.5992	0	3.1799
21.9	7.3473	2.1796	18.7802	52.8366	18.2306	0.5424	0	3.2369
22	6.5056	2.0912	17.8878	53.9248	18.9860	0.5212	0	3.2898
22.1	6.0946	2.0821	18.6573	53.4426	19.1400	0.4999	0	3.3022
22.2	5.7874	2.0893	19.2867	53.5420	18.7114	0.4999	0	3.2852
22.3	5.1297	2.3215	19.2330	54.0562	18.6388	0.4999	0	3.2183
22.4	4.7565	3.1622	19.0670	53.6687	18.7208	0.4999	0	3.1142
22.5	4.0985	4.5880	19.2369	53.2873	18.1948	0.4999	0	2.9713
22.6	3.9570	6.0885	19.6683	52.3772	17.2841	0.5416	0	2.8177
22.7	4.3650	6.9728	20.6668	50.5914	16.7375	0.5416	0	2.6484
22.8	4.4462	8.0306	21.4051	49.6236	15.8112	0.5167	0	2.5063
22.9	4.0944	8.9257	22.9699	48.3759	15.0509	0.4166	0	2.3961
23	4.1106	9.5389	25.3420	46.5912	13.8341	0.4166	0	2.2840
23.1	3.7823	10.2819	27.9394	44.9153	12.4979	0.4166	0	2.2131
23.2	3.3219	11.5324	29.8683	43.1030	11.4074	0.6003	0	2.1647
23.3	3.5073	12.2082	32.1474	40.9335	10.5372	0.4999	0	2.1487
23.4	3.7269	13.2501	34.4449	37.8133	10.0321	0.5927	0	2.1372
23.5	4.0737	14.3142	35.9382	34.9426	9.7142	0.8088	0	2.1190
23.6	4.5133	14.6230	38.2778	31.9685	9.4370	0.8778	0	2.0871
23.7	5.0706	15.6888	39.7824	29.5078	8.6512	0.8747	0	2.0692
23.8	5.6734	16.7352	42.6488	26.1443	7.4653	0.8748	0	2.0489
23.9	6.0259	17.6859	45.9197	22.2814	6.4874	1.0192	0	2.0337
24	6.4161	18.3512	49.2870	18.5732	5.6228	1.0831	0	1.9972
24.1	6.9208	18.5341	52.4592	15.2373	5.0370	1.0831	0	1.9633
24.2	7.2506	18.3447	55.3315	13.0362	4.0816	1.0831	0	1.9303
24.3	7.0850	18.0091	58.0306	11.4055	3.4702	1.0831	0	1.8934
24.4	7.5762	16.7103	60.2686	10.3298	3.1419	1.0566	0	1.8299
24.5	8.4435	16.0253	61.2935	9.3023	2.9599	0.9998	0	1.7497
24.6	9.3463	15.5174	62.2631	8.2321	2.6060	0.9998	0	1.6636
24.7	10.3075	15.2851	63.2547	7.0785	2.0392	1.0352	0	1.5838
24.8	11.3792	15.3293	64.0466	5.6166	1.5870	1.0415	0	1.4997
24.9	12.1791	14.9830	65.3767	4.1160	1.3039	1.0415	0	1.4249
25	13.0713	15.5032	65.6129	2.8332	1.0534	0.9262	0	1.3830
25.1	13.9435	15.4879	66.0037	2.0614	0.7138	0.7132	0	1.3627

Table A.3b. One-Mile Level Raw Data (continued).

MM	Pine	Shrub	Grass	Past	Ag	Wtlnd	H_wland	Build
25.2	14.7483	15.3659	66.2715	1.2131	0.5682	0.6665	0	1.3571
25.3	16.1863	16.0861	64.8164	0.8708	0.2726	0.5839	0	1.3423
25.4	19.0272	15.8502	62.8283	0.5249	0	0.4463	0	1.3722
25.5	21.0366	16.5305	60.5802	0.1743	0	0.2916	0	1.6615
25.6	22.8734	17.5513	57.7165	0.1454	0	0.2830	0	2.0251
25.7	24.9062	18.3748	55.0116	0.0980	0	0.2083	0	2.3187
25.8	27.0617	18.8504	52.4592	0.1904	0	0.1669	0	2.4828
25.9	28.6842	18.3443	51.3818	0.2500	0.0058	0.0433	0	2.8431
26	30.8922	17.3169	50.0966	0.4138	0.0417	0.0417	0	3.2636
26.1	31.9851	17.2634	48.7054	0.7964	0.0417	0.0417	0	3.9905
26.2	32.7572	17.8349	46.8007	1.3991	0.0417	0.0417	0	4.8840
26.3	32.7133	18.3294	45.8436	1.9344	0.0849	0.0417	0.0417	5.6202
26.4	31.7074	18.6056	46.0774	2.4848	0.1666	0.0417	0.0417	6.4159
26.5	29.9747	18.6261	47.2470	3.0274	0.1666	0.0417	0.0417	7.0601
26.6	27.7416	19.1782	47.9888	3.6311	0.5022	0.0417	0.0417	7.5474
26.7	26.4770	19.8830	47.5143	4.1154	1.0262	0.0417	0.0417	7.9890
26.8	24.8647	20.4722	47.4754	4.4257	1.7622	0.0417	0.0417	8.2467
26.9	24.0396	20.6456	47.4916	4.6422	2.2229	0	0.0417	8.3572
27	23.6394	20.2895	47.6648	4.9203	2.5278	0	0.0417	8.3868
27.1	23.1679	19.5265	48.3130	5.2642	2.6899	0	0.0417	8.3975
27.2	22.2759	18.8229	49.3316	5.5886	2.8579	0.0469	0.0417	8.3975
27.3	21.5369	18.2360	50.2075	5.8755	2.9578	0.1060	0.0417	8.3847
27.4	20.2329	16.8544	52.5979	6.1982	3.0334	0.1250	0.0417	8.3605
28.5	0.9221	8.4941	79.2194	4.7614	5.3116	0	0	3.3398
29.2	1.4269	9.1494	76.9719	4.5241	6.5947	0	0	0.2349
29.8	1.8133	7.9935	66.8708	8.2965	13.8308	0.0417	0	0.4850
30	1.9543	6.5920	68.4594	8.4756	13.5986	0.0417	0	0.5223
30.7	1.7080	4.5420	49.2885	19.6764	23.9717	0.2718	0	1.5640
31	2.0349	5.0643	38.0879	25.0292	28.5589	0.4210	0	3.3650
31.4	6.5598	7.3785	30.2803	24.0704	28.2447	0.6503	0	12.127
31.8	7.8684	6.2696	19.3024	28.8375	30.8588	0.7499	0	27.446
32.2	7.4613	4.3599	10.8686	30.7774	37.4896	0.7947	0	48.933
32.3	7.3691	4.1238	10.1924	31.0682	38.2406	0.7574	0	53.271
32.4	7.2516	3.8905	10.0873	32.0112	37.8214	0.6928	0	56.272
32.5	7.1345	3.4273	9.8705	33.2462	37.5636	0.5018	0	57.932
32.6	6.5859	2.6284	9.3531	34.2187	38.6254	0.2982	0	58.485
32.7	6.0073	2.2962	9.6709	34.7134	38.7720	0.2083	0	58.520
33.6	0.0417	0.7499	3.5785	38.9372	54.4272	0.2500	0	25.604
34	0.0833	0.7499	0.9998	37.5109	60.4152	0.1666	0	8.5412
34.1	0.0833	0.7499	0.9998	38.4109	59.5886	0.1675	0	6.4541
34.2	0.0833	0.7082	1.0240	37.9774	59.9988	0.2083	0	4.7941
34.3	0.1050	0.8294	1.2410	36.6349	60.9814	0.2083	0	4.1074
34.4	0.1250	0.8748	1.1134	35.7783	61.9002	0.2083	0	3.8528
34.5	0.1036	0.8748	0.7929	34.7696	63.2507	0.2083	0	3.7937
34.6	0.0833	0.8748	0.6888	35.3059	62.8389	0.2083	0	3.8643
35.4	0.0833	0.2083	0.6240	43.7258	55.0856	0.2729	0	4.8719
36.2	0.0417	0.0873	2.0232	56.2170	41.4290	0.1250	0	5.1519
36.7	0.7541	1.2681	1.7649	55.8879	40.2000	0.1250	0	7.9792
37.5	1.9963	1.2928	3.8947	45.3342	47.1809	0.2422	0	9.0381
37.6	1.9908	1.2007	4.0621	42.6500	49.7632	0.2500	0	9.1531
37.7	2.1780	1.0832	4.1048	40.2243	52.0200	0.2500	0	9.1530
37.8	2.4752	0.9768	4.0365	39.0018	53.0543	0.2500	0	9.0635
37.9	2.8004	0.8808	3.9993	37.6697	54.0734	0.2500	0	8.8222

Table A.3b. One-Mile Level Raw Data (continued).

MM	Pine	Shrub	Grass	Past	Ag	Wtlnd	H_wland	Build
38	3.2050	0.7377	3.9121	35.7092	55.6743	0.2500	0	8.3125
38.5	3.8394	0.8215	3.7659	32.6812	57.6917	0.2500	0	5.2604
39.1	2.3155	0.6083	2.6220	41.3390	51.7608	0	0.1250	4.4021
39.4	2.3748	1.1086	7.0895	42.5359	45.1411	0	0.1666	4.1376
39.9	4.2184	1.7269	14.8059	43.6694	27.4208	0	0.2083	3.5943
40.3	4.9467	1.9899	17.0109	50.5451	12.1168	0	0.2083	3.0468
41	4.2933	1.5750	16.9081	59.0314	1.0553	0	0.1927	1.3065
41.3	3.7828	1.4101	15.2974	65.1344	0	0	0.0417	1.1358
42.2	1.5323	0.8749	4.3887	83.8665	0.8379	0	0.1250	2.4004
43.1	1.6804	0.5017	3.4154	80.7963	11.0012	0.0833	0.2083	1.6945
44.1	1.9829	0.3119	4.0693	67.3695	23.7963	0.6786	0.2500	2.3418
44.7	3.6563	0.8810	4.8324	59.7930	28.8329	0.6069	0.2445	3.3067
45	4.6203	1.1229	4.6509	58.7206	29.4402	0.8657	0	4.7248
45.5	6.2166	1.2613	5.9091	51.7290	32.2024	1.0576	0	8.8737
45.8	7.0840	1.1575	8.2171	42.2575	33.0262	1.2082	0	25.256
46.1	6.3020	0.8123	9.7714	34.2185	35.0304	0.9683	0	56.429
46.4	4.6999	0.6468	11.5229	31.0859	36.1325	0.9581	0	83.283
46.7	0.7373	0.3750	11.3158	30.3665	40.9506	0.7846	0	96.860
47.6	0.1666	0.6249	18.2341	22.9573	44.6368	0.2083	0.0833	86.785
47.8	0.1666	0.6249	17.1935	23.0596	48.5067	0.2500	0.0833	72.811
48.1	0.0679	0.5052	16.3640	26.5715	51.3518	0.1666	0	46.638
48.4	0.2678	0.4166	13.5216	34.8663	50.0357	0.1125	0	22.375
49.4	3.8003	1.1462	8.1790	45.8614	40.4683	0.1698	0	5.1165
49.7	3.6338	1.3348	9.2241	47.6750	37.6761	0.0417	0	6.2135
50	2.8190	1.1179	8.7245	48.5386	38.3015	0.0833	0	6.7807
50.2	2.6142	0.9285	7.1025	48.7166	40.2646	0.0833	0	6.8499
50.6	2.2527	1.1665	6.7938	47.3686	42.1274	0.0833	0	6.7812
51.3	5.5084	1.9946	11.6029	38.3651	37.9731	0.1175	0	30.644
51.7	10.5838	2.9586	16.5646	29.0828	35.4774	0.1666	0	54.309
52.2	17.8173	5.4867	24.1149	21.8988	25.2531	0.1250	0	65.938
52.7	20.5534	6.5738	24.0063	22.2757	21.3403	0.0402	0	66.125
53.6	18.8520	7.2006	18.2631	25.8502	28.8550	0	0	25.338
53.9	13.7520	7.5091	16.4545	25.0258	36.3003	0	0	17.443
54.5	6.1954	4.5967	9.5314	23.4231	55.5034	0	0	6.7026
55.1	1.1536	2.1419	5.7556	13.3433	77.2992	0	0	3.5255
56.8	3.4406	2.6813	17.3322	34.8465	40.6929	0	0	7.8864
57.1	4.9058	2.9716	20.0859	36.6951	34.1791	0	0	9.6441
57.6	1.4671	3.0481	20.0251	39.1951	34.9313	0	0	13.414
58.1	0.8070	3.3099	26.4505	39.9951	27.6217	0.3993	0	16.689

Table A.3c. One-Mile Level Raw Data
Additional raw data for the deer vehicle collision study at the one-mile level. Abbreviations for landcover variables: MM, mile marker; HIR, high intensity residential development; Cmrcl, commercial use; Trans, transitional; Deciduous, deciduous forest; urb_veg, urban/recreational vegetation; and water, water source. All variables continuous and measured in proportions per buffered layer.

MM	HIR	Comrcl	Trans	Deciduous	Urb_veg	Water
7	0	0.2083	0	0	0.0023	0
7.8	0	0.4582	0.0833	0	0	0
8	0	0.8430	0.1666	0	0	0
8.1	0	0.4615	0.0833	0	0	0
8.2	0	0.5416	0.0833	0	0	0
8.3	0	0.5416	0.0833	0	0	0
8.4	0	0.4945	0.0833	0	0	0
8.5	0	0.4582	0.0833	0	0	0
8.6	0	0.5450	0.0833	0	0	0
8.7	0	0.6559	0.1250	0	0	0
8.8	0	0.7082	0.1250	0	0	0
8.9	0	0.6539	0.1250	0	0	0
9	0	0.7061	0.0858	0	0	0
9.1	0	0.7900	0.0417	0	0	0
9.2	0	0.7915	0.0417	0	0	0
9.3	0	0.7915	0.0417	0	0	0
9.4	0	0.7915	0.0417	0	0	0
9.5	0	0.7309	0.0417	0	0	0
9.6	0	0.6989	0.0417	0	0	0
9.7	0	0.7574	0.0417	0	0	0
9.8	0	0.8272	0.0417	0	0	0
9.9	0	0.8332	0.0417	0	0	0
10	0	0.8332	0.0417	0	0	0
10.1	0	0.8008	0.0417	0	0	0
10.2	0	0.8762	0.0417	0	0	0
10.3	0	1.0457	0	0	0	0
10.4	0	1.1508	0	0	0	0.0844
10.5	0	1.1664	0	0	0	0.1250
10.6	0	1.2038	0	0	0	0.1250
10.7	0	1.1612	0	0	0	0.1250
10.8	0	1.0714	0	0	0	0.1250
10.9	0	1.0415	0	0	0	0.1250
11	0	1.0415	0	0	0	0.1250
11.1	0	0.9683	0	0	0	0.1250
11.2	0	0.8867	0	0	0	0.1250
11.3	0	0.8748	0	0	0	0.1250
11.4	0	0.8748	0	0	0	0.1250
11.5	0	0.8748	0	0	0	0.1250
11.6	0	0.8519	0	0	0	0.1250
11.7	0	0.7679	0	0	0	0.1250

Table A.3c. One-Mile Level Raw Data (continued).

MM	HIR	Commercial	Trans	Deciduous	Urb_veg	Water
11.8	0	0.6357	0	0	0	0.1250
11.9	0	0.5832	0	0	0	0.1250
12	0	0.5832	0	0	0	0.1250
12.1	0	0.5832	0	0	0	0.1250
12.2	0	0.5460	0	0	0	0.1250
12.3	0	0.4296	0	0.0020	0	0.1250
12.4	0	0.2262	0	0.0417	0	0.1250
12.5	0	0.1250	0	0.0417	0	0.0204
12.6	0	0.1035	0	0.0417	0	0
12.7	0	0	0	0.0417	0	0
12.8	0	0	0	0.0417	0	0
12.9	0	0	0	0.0417	0	0
13	0	0	0	0.0417	0	0
13.1	0	0	0	0.0417	0	0
13.2	0	0	0	0.0417	0	0
13.3	0	0	0	0.0417	0	0
13.4	0	0	0	0.0417	0	0
13.5	0	0	0	0.0417	0	0
13.6	0	0	0	0.0417	0	0
13.7	0	0	0	0.0417	0	0
13.8	0	0	0	0.0417	0	0
13.9	0	0	0	0	0	0
14	0	0	0	0	0	0
14.1	0	0	0	0	0	0
14.2	0	0	0	0	0	0
14.3	0	0	0	0	0	0
14.4	0	0	0	0	0	0
14.5	0	0	0	0	0	0
14.6	0	0.0026	0	0	0	0
14.7	0	0.0833	0	0	0	0
14.8	0	0.0833	0	0	0	0
14.9	0	0.0833	0	0	0	0
15	0	0.0833	0	0	0	0
15.1	0	0.0833	0	0	0	0
15.2	0	0.0833	0	0	0	0
15.3	0	0.0833	0	0	0	0
15.4	0	0.0833	0	0	0	0
15.5	0	0.0833	0	0	0	0
15.6	0	0.0833	0	0	0	0
15.7	0	0.0833	0	0	0	0
15.8	0	0.0833	0	0	0	0
15.9	0	0.0833	0	0	0	0
16	0	0.0833	0	0	0	0
16.1	0	0.0833	0	0.0006	0	0
16.2	0	0.0833	0	0.0593	0	0
16.3	0	0.0833	0	0.1524	0	0
16.4	0	0.0833	0	0.2083	0	0

Table A.3c. One-Mile Level Raw Data (continued).

MM	HIR	Commercial	Trans	Deciduous	Urb_veg	Water
16.5	0	0.0833	0	0.2163	0	0
16.6	0	0.1250	0	0.2496	0	0
16.7	0	0.2013	0	0.2720	0	0
16.8	0	0.2421	0	0.2228	0	0
16.9	0	0.2916	0	0.1950	0	0
17	0	0.2916	0	0.1431	0	0
17.1	0	0.2916	0	0.1666	0	0
17.2	0	0.2916	0	0.2083	0	0
17.3	0	0.2916	0	0.2499	0	0
17.4	0	0.2916	0	0.2916	0	0
17.5	0	0.2916	0	0.3749	0	0
17.6	0	0.2916	0	0.4166	0	0
17.7	0	0.2916	0	0.3879	0	0
17.8	0	0.2916	0	0.4999	0	0
17.9	0	0.3167	0	0.5832	0	0
18	0	0.3333	0	0.5416	0	0
18.1	0	0.3333	0	0.4999	0	0
18.2	0	0.5017	0	0.4999	0	0
18.3	0	0.5832	0	0.4999	0	0
18.4	0	0.5832	0	0.4999	0	0
18.5	0	0.5832	0	0.4999	0	0
18.6	0	0.5416	0	0.4999	0	0
18.7	0	0.4738	0	0.4999	0	0
18.8	0	0.3953	0	0.4999	0	0
18.9	0	0.2916	0	0.4999	0	0
19	0	0.2916	0	0.4582	0	0
19.1	0	0.2916	0	0.4582	0	0
19.2	0	0.2916	0	0.3749	0	0
19.3	0	0.2916	0	0.3749	0	0
19.4	0	0.2916	0	0.3351	0	0
19.5	0	0.2916	0	0.2499	0	0
19.6	0	0.2916	0	0.2083	0	0
19.7	0	0.2916	0	0.2083	0	0
19.8	0	0.2916	0	0.0833	0	0
19.9	0	0.2501	0	0	0	0
20	0	0.2500	0	0	0	0
20.1	0	0.2382	0	0	0	0
20.2	0	0.0676	0	0	0	0
20.3	0	0	0	0	0	0
20.4	0	0	0	0	0	0
20.5	0	0	0	0	0	0
20.6	0	0	0	0	0	0
20.7	0	0	0	0	0	0
20.8	0	0	0	0	0	0
20.9	0	0	0	0	0	0
21	0	0	0	0	0	0
21.1	0	0	0	0	0	0

Table A.3c. One-Mile Level Raw Data (continued).

MM	HIR	Commercial	Trans	Deciduous	Urb_veg	Water
21.2	0	0	0	0	0	0
21.3	0	0	0	0	0	0
21.4	0	0	0	0	0	0
21.5	0	0	0	0	0	0
21.6	0	0	0	0	0	0
21.7	0	0	0	0	0	0
21.8	0	0	0	0	0	0
21.9	0	0	0	0	0	0
22	0	0	0	0	0	0
22.1	0	0	0	0	0	0
22.2	0	0	0	0	0	0
22.3	0	0	0	0.0376	0	0
22.4	0	0	0	0.0417	0	0
22.5	0	0	0	0.0417	0	0
22.6	0	0	0	0.0418	0	0
22.7	0	0	0	0.0833	0	0
22.8	0	0	0	0.1250	0	0
22.9	0	0	0	0.1250	0	0
23	0	0	0	0.1250	0	0
23.1	0	0	0	0.1250	0	0
23.2	0	0	0	0.1250	0	0
23.3	0	0	0	0.1250	0	0
23.4	0	0.0150	0	0.1250	0	0
23.5	0	0.0833	0	0.1250	0	0
23.6	0	0.1776	0	0.1250	0	0
23.7	0	0.2997	0	0.1250	0	0
23.8	0	0.3333	0	0.1250	0	0
23.9	0	0.3333	0	0.1250	0	0
24	0	0.3749	0	0.1250	0	0
24.1	0	0.4355	0	0.1250	0	0
24.2	0	0.5715	0	0.0925	0	0
24.3	0	0.5832	0	0.0833	0	0
24.4	0	0.5832	0	0.0833	0	0
24.5	0	0.6424	0	0.0833	0	0
24.6	0	0.7473	0	0.0381	0	0
24.7	0	0.7499	0	0	0	0
24.8	0	0.7499	0	0	0	0
24.9	0	0.7499	0	0	0	0
25	0	0.7499	0	0	0	0
25.1	0	0.8265	0	0	0	0
25.2	0	0.9165	0	0	0	0
25.3	0	0.9340	0	0	0	0
25.4	0	1.0415	0	0.0195	0	0
25.5	0	1.0120	0	0.0417	0	0
25.6	0	1.0555	0	0.0417	0	0
25.7	0	1.0262	0	0.0417	0	0
25.8	0	0.8963	0	0.0417	0	0

Table A.3c. One-Mile Level Raw Data (continued).

MM	HIR	Commercial	Trans	Deciduous	Urb_veg	Water
25.9	0	0.9811	0	0.0417	0	0
26	0	0.9890	0	0.0417	0	0
26.1	0	0.9582	0	0.0417	0	0
26.2	0	0.9165	0	0.0417	0	0
26.3	0	0.8444	0	0.0417	0	0
26.4	0	0.7499	0	0.0417	0	0
26.5	0	0.7499	0	0.0417	0	0
26.6	0	0.7499	0	0.0417	0	0
26.7	0	0.7757	0	0.0417	0	0
26.8	0	0.7915	0	0.0417	0	0
26.9	0	0.7915	0	0.0417	0	0
27	0	0.7915	0	0.0417	0	0
27.1	0	0.8719	0	0.0417	0	0
27.2	0	0.9096	0	0.0417	0	0
27.3	0	0.9136	0	0.0417	0	0
27.4	0	0.8332	0	0	0	0
28.5	0	1.2914	0	0	0	0
29.2	0	1.3331	0	0	0	0
29.8	0	1.1535	0	0	0	0
30	0	0.8786	0	0	0	0
30.7	0	0.5416	0	0	0	0
31	0	0.5538	0	0.1250	0	0
31.4	0	1.5400	0	0.1666	0	0
31.8	0	3.0395	0	0.2266	0	0
32.2	0	3.7910	0	0.2083	0	0
32.3	0	3.7910	0	0.2083	0	0
32.4	0	3.8612	0	0.1346	0	0
32.5	0	3.9652	0	0.0417	0	0
32.6	0	3.9993	0	0.0417	0	0
32.7	0	4.0410	0	0.0417	0	0
33.6	0	0.4510	0	0	0	0
34	0	0	0	0	0	0
34.1	0	0	0	0	0	0
34.2	0	0	0	0	0	0
34.3	0	0	0	0	0	0
34.4	0	0	0	0	0	0
34.5	0	0	0	0	0	0
34.6	0	0	0	0	0	0
35.4	0	0	0	0	0	0
36.2	0	0	0	0	0	0
36.7	0	0	0	0	0	0
37.5	0	0	0	0.0588	0	0
37.6	0	0	0	0.0833	0	0
37.7	0	0	0	0.1397	0	0
37.8	0	0	0	0.2056	0	0
37.9	0	0	0	0.3264	0	0
38	0	0	0	0.5118	0	0

Table A.3c. One-Mile Level Raw Data (continued).

MM	HIR	Commercial	Trans	Deciduous	Urb_veg	Water
38.5	0	0	0	0.8560	0	0
39.1	0	0	0	0	0	0
39.4	0	0	0	0	0	0
39.9	0	0.0417	0	0	0	0
40.3	0	0.0417	0	0	0	0
41	0	0.0417	0	0	0	0
41.3	0	0.0417	0	0	0	0
42.2	0	0	0	0	0	0
43.1	0	0.0417	0	0	0	0
44.1	0	0.0417	0	0	0	0
44.7	0	0.0231	0	0	0	0
45	0	0	0	0	0	0
45.5	0	0.4080	0	0	0	0
45.8	0	2.3977	0	0	0	0
46.1	0.0417	5.9046	0	0	0	0
46.4	0.0417	7.5086	0	0	0	0
46.7	0.0417	7.9748	0	0.0417	0	0
47.6	0.0417	7.3007	0	0.0417	0	0
47.8	0.0417	6.1110	0	0.0417	0	0
48.1	0.0417	3.2063	0	0.0417	0	0
48.4	0	0.5316	0	0	0	0
49.4	0	0.0417	0	0.2500	0	0
49.7	0	0.0417	0	0.2896	0	0
50	0	0.0417	0	0.2902	0	0
50.2	0	0.0417	0	0.1654	0	0
50.6	0	0.0417	0	0.1250	0	0
51.3	0.1250	2.1069	0	0.0417	0	0.5402
51.7	0.1250	2.6247	0	0.0417	0	0.7083
52.2	0.1250	2.6247	0	0	0	0.7083
52.7	0.1250	2.5622	0	0.0234	0	0.6666
53.6	0	0.6875	0	0.0417	0	0
53.9	0	0.6249	0	0.0417	0	0
54.5	0	0.6249	0	0	0	0
55.1	0	0.1816	0	0	0	0
56.8	0	0.7148	0	0	0	0
57.1	0	0.7459	0	0	0	0
57.6	0	0.9166	0	0	0	0
58.1	0	0.9166	0	0	0	0

Table A.4a. Two-Mile Level Raw Data

Table of raw data for the deer vehicle collision study at the two-mile level. Abbreviations for landcover variables: MM, mile marker; DVC, 1998-2003 DVC data; City, distance to nearest city; Water, distance to nearest water; Density, population density; Slope, slope; LIR, low intensity residential development; Bare, barren; Elev, elevation; All variables continuous and measured in proportions per buffered layer.

MM	DVC	City	Water	Density	Slope	LIR	Bare	Elev
7	2	2171.06	670.16	35.054	11.520	0	0	1319.663
7.8	1	2585.88	454.79	42.936	9.477	0.0104	0.0105	1294.093
8	0	2755.11	424.54	42.936	9.291	0.0104	0.0521	1291.815
8.1	0	2853.92	408.59	42.936	9.294	0.0104	0.0521	1291.841
8.2	1	2959.30	398.49	42.936	9.218	0.0104	0.0521	1291.377
8.3	0	3061.33	385.32	42.936	9.109	0.0104	0.0521	1291.430
8.4	1	3178.59	373.42	52.126	9.035	0.0104	0.0521	1291.942
8.5	0	3301.48	365.68	52.126	8.987	0.0104	0.0521	1292.915
8.6	0	3441.12	355.60	52.126	9.039	0.0104	0.0521	1294.089
8.7	1	3574.39	346.73	52.126	9.122	0.0104	0.0521	1294.911
8.8	1	3711.54	338.99	52.126	9.203	0.0104	0.0521	1295.293
8.9	0	3840.80	334.40	49.937	9.271	0.0104	0.0521	1295.223
9	1	3983.08	329.87	49.937	9.384	0.0157	0.0521	1294.685
9.1	1	4127.30	327.90	45.100	9.480	0.0417	0.0521	1293.459
9.2	0	4273.15	327.99	45.100	9.593	0.0417	0.0521	1291.663
9.3	0	4420.39	328.64	45.100	9.659	0.0417	0.0521	1289.400
9.4	0	4554.77	329.39	45.100	9.680	0.0417	0.0521	1286.318
9.5	1	4712.98	330.12	45.100	9.697	0.0417	0.0521	1282.752
9.6	1	4835.04	330.02	45.100	9.680	0.0417	0.0521	1279.437
9.7	0	4946.10	329.24	45.100	9.646	0.0417	0.0521	1277.330
9.8	0	5058.91	327.91	45.100	9.650	0.0417	0.0521	1276.493
9.9	0	5173.20	326.14	42.274	9.663	0.0417	0.0521	1276.336
10	1	5288.75	323.68	43.866	9.700	0.0417	0.0521	1276.641
10.1	0	5405.34	321.51	43.866	9.782	0.0417	0.0521	1278.013
10.2	1	5522.78	320.22	43.866	9.887	0.0417	0.0521	1280.399
10.3	3	5640.92	320.12	43.866	10.016	0.0417	0.0521	1283.734
10.4	1	5759.59	320.53	43.866	10.154	0.0417	0.0521	1287.767
10.5	3	5878.66	321.47	43.866	10.320	0.0417	0.0521	1292.608
10.6	1	5998.01	321.89	41.775	10.579	0.0417	0.0521	1297.745
10.7	0	6117.19	320.77	41.775	10.883	0.0417	0.0521	1303.764
10.8	0	6250.10	319.37	41.775	11.123	0.0417	0.0521	1307.523
10.9	0	6361.82	315.95	41.775	11.303	0.0417	0.0521	1309.335
11	1	6465.83	313.43	41.775	11.327	0.0417	0.0521	1307.366
11.1	2	6563.35	311.99	45.518	11.230	0.0417	0.0521	1301.954
11.2	0	6654.17	311.69	45.518	11.076	0.0417	0.0521	1294.924
11.3	0	6721.78	312.87	45.518	10.887	0.0417	0.0521	1287.147
11.4	0	6798.85	314.99	45.518	10.665	0.0417	0.0521	1279.346
11.5	0	6859.57	317.54	45.518	10.476	0.0417	0.0521	1271.557
11.6	0	6920.99	319.99	45.518	10.309	0.0417	0.0521	1264.391
11.7	0	6959.44	323.06	45.518	10.106	0.0417	0.0521	1256.435
11.8	0	6975.38	326.65	40.109	9.863	0.0417	0.0521	1247.115
11.9	1	6985.56	330.89	40.109	9.612	0.0417	0.0521	1237.263
12	0	6986.51	335.92	40.109	9.312	0.0342	0.0521	1226.390
12.1	0	6965.87	339.47	40.109	8.959	0.0312	0.0499	1214.752
12.2	0	6938.72	340.89	40.109	8.628	0.0312	0.0348	1203.664

Table A.4a. Two-Mile Level Raw Data (continued).

MM	DVC	City	Water	Density	Slope	LIR	Bare	Elev
12.3	0	6900.30	340.79	40.109	8.300	0.0312	0	1192.414
12.4	1	6858.62	338.96	38.107	8.002	0.0312	0	1182.691
12.5	1	6810.31	337.82	38.107	7.695	0.0312	0	1172.854
12.6	2	6755.36	334.48	38.107	7.390	0.0312	0	1163.503
12.7	0	6670.16	330.87	38.107	7.084	0.0312	0	1155.274
12.8	0	6600.87	327.16	38.107	6.827	0.0312	0	1146.999
12.9	0	5365.17	303.78	38.107	6.586	0.0312	0	1139.349
13	0	6525.09	325.13	66.699	4.361	0.0312	0	1063.894
13.1	0	6428.25	324.31	49.163	6.358	0.0312	0	1131.590
13.2	1	6338.55	323.63	49.163	6.197	0.0269	0	1124.925
13.3	1	6242.76	322.54	49.163	6.055	0	0	1118.186
13.4	0	6135.04	319.87	49.163	5.924	0	0	1111.771
13.5	0	6039.10	315.60	49.163	5.804	0	0	1105.629
13.6	1	5950.67	311.15	49.163	5.680	0	0	1099.617
13.7	2	5822.94	306.31	49.163	5.521	0	0	1093.642
13.8	0	5724.90	302.64	66.699	5.346	0	0	1087.581
13.9	1	5609.99	300.93	66.699	5.129	0	0	1081.528
14	1	5505.60	301.13	66.699	4.875	0	0	1075.635
14.1	0	5375.13	302.89	66.699	4.622	0	0	1070.444
14.2	0	5268.00	304.76	66.699	4.411	0	0	1065.183
14.3	0	5177.40	305.95	66.699	4.221	0	0	1060.043
14.4	0	5074.57	306.12	81.872	4.019	0	0	1054.960
14.5	0	4951.37	306.41	81.872	3.834	0	0	1050.234
14.6	0	4854.40	305.92	81.872	3.638	0	0	1045.370
14.7	0	4760.40	304.69	81.872	3.505	0	0	1040.680
14.8	0	4669.55	303.06	81.872	3.399	0	0	1036.267
14.9	1	4582.04	300.75	81.872	3.309	0	0	1031.703
15	1	4477.94	296.56	108.517	3.184	0	0	1027.382
15.1	1	4398.37	293.37	108.517	3.060	0	0	1023.510
15.2	0	4322.77	290.62	108.517	2.921	0	0	1019.839
15.3	0	4210.71	289.76	94.908	2.764	0	0	1016.102
15.4	1	4081.06	286.88	108.517	2.660	0	0	1012.037
15.5	0	3947.85	283.66	108.517	2.606	0	0	1008.187
15.6	0	3799.29	277.62	108.517	2.608	0	0	1004.895
15.7	0	3650.89	273.20	108.517	2.650	0.0208	0	1002.029
15.8	0	3525.10	269.11	126.305	2.739	0.0208	0	999.383
15.9	0	3387.01	263.90	126.305	2.826	0.0208	0	997.070
16	0	3269.49	260.27	126.305	2.934	0.0208	0	995.055
16.1	0	3141.91	257.16	126.305	3.026	0.0208	0	993.350
16.2	0	3034.49	253.91	126.305	3.137	0.0208	0	991.890
16.3	0	2917.54	252.12	156.798	3.236	0.0208	0	990.475
16.4	0	2809.19	250.87	156.798	3.350	0.0208	0	989.136
16.5	0	2719.82	250.56	156.798	3.441	0.0208	0	987.820
16.6	1	2636.40	251.75	156.798	3.547	0.0208	0	986.701
16.7	0	2548.94	253.41	156.798	3.651	0.0208	0	985.763
16.8	0	2478.67	254.46	172.658	3.763	0.0208	0	985.053
16.9	0	2406.17	252.49	172.658	3.848	0.0208	0	984.388
17	0	2342.34	247.70	172.658	3.933	0.0208	0	983.945
17.1	0	2293.55	243.53	162.316	4.032	0.0208	0	983.289
17.2	0	2251.51	239.71	162.316	4.150	0.0208	0	982.955
17.3	1	2207.38	236.57	162.316	4.237	0.0208	0	982.669
17.4	0	2180.99	234.79	162.316	4.357	0.0208	0	982.802
17.5	0	2158.61	233.24	162.316	4.476	0.0208	0	983.009

Table A.4a. Two-Mile Level Raw Data (continued).

MM	DVC	City	Water	Density	Slope	LIR	Bare	Elev
17.6	0	2145.86	231.99	162.316	4.600	0.0208	0	983.365
17.7	0	2140.11	231.27	164.672	4.691	0.0208	0	983.333
17.8	0	2142.08	230.98	164.672	4.751	0.0208	0	982.516
17.9	0	2149.92	230.75	164.672	4.820	0.0208	0	981.857
18	1	2168.68	230.01	146.221	4.911	0.0208	0	981.481
18.1	0	2192.30	229.28	146.221	5.039	0.0208	0	981.296
18.2	0	2228.56	228.30	146.221	5.182	0.0208	0	981.362
18.3	0	2267.07	227.36	146.221	5.347	0.0208	0	981.486
18.4	0	2320.53	226.66	146.221	5.498	0.0208	0	981.728
18.5	0	2373.61	227.18	138.985	5.704	0.0208	0	982.393
18.6	1	2443.85	228.73	138.985	5.914	0.0208	0	983.589
18.7	0	2511.07	231.65	138.985	6.070	0.0208	0	984.473
18.8	0	2588.98	236.44	138.985	6.234	0.0208	0	985.932
18.9	1	2683.08	240.23	138.985	6.371	0.0208	0	986.741
19	1	2760.42	243.70	138.985	6.491	0.0208	0	987.260
19.1	0	2848.78	244.48	138.985	6.553	0.0208	0	986.337
19.2	2	2960.73	244.30	97.970	6.602	0.0208	0	984.982
19.3	0	3080.87	244.70	97.970	6.579	0.0208	0	982.295
19.4	0	3178.59	245.28	97.970	6.556	0.0208	0	979.129
19.5	1	3312.48	243.85	97.970	6.568	0.0208	0	975.631
19.6	0	3443.21	243.13	97.970	6.604	0.0208	0	972.621
19.7	0	3566.69	238.91	97.970	6.646	0.0104	0	969.694
19.8	1	3707.92	235.62	57.851	6.702	0	0	967.118
19.9	0	3838.42	233.52	57.851	6.733	0	0	964.813
20	3	3961.71	230.57	57.851	6.763	0	0	962.857
20.1	0	4096.36	228.82	57.851	6.792	0	0	961.303
20.2	0	4249.13	225.46	57.851	6.843	0	0	960.150
20.3	0	4387.10	223.86	57.851	6.901	0	0	959.247
20.4	1	4526.25	221.93	40.676	6.989	0	0	958.361
20.5	0	4674.49	220.52	40.676	7.033	0	0	957.575
20.6	1	4829.23	220.15	40.676	7.081	0	0	956.660
20.7	0	4964.04	219.54	40.676	7.066	0	0	955.043
20.8	0	5086.49	217.50	40.676	7.022	0	0	953.354
20.9	0	5204.71	216.62	40.676	7.014	0	0	951.569
21	0	5304.68	216.32	40.676	7.007	0	0	949.714
21.1	0	5413.63	216.09	40.676	6.976	0	0	947.859
21.2	0	5543.69	215.08	31.314	6.962	0	0	945.937
21.3	1	5639.27	213.53	25.893	6.891	0	0	943.797
21.4	0	5735.10	211.69	25.893	6.815	0	0	941.750
21.5	0	5817.04	209.62	25.893	6.725	0	0	939.491
21.6	0	5892.01	206.14	25.893	6.662	0	0	937.586
21.7	0	5964.99	203.23	25.893	6.634	0	0	935.967
21.8	1	6024.81	201.64	25.893	6.598	0	0	934.286
21.9	0	6081.17	200.48	25.893	6.587	0	0	932.982
22	1	6125.11	198.09	21.791	6.610	0	0	931.953
22.1	0	6169.73	194.74	21.791	6.662	0	0	931.094
22.2	0	6195.80	190.74	21.791	6.742	0	0	930.528
22.3	1	6215.45	186.46	18.032	6.825	0	0	930.174
22.4	1	6224.87	184.06	18.032	6.912	0	0	930.216
22.5	1	6226.59	182.76	18.032	6.968	0	0	930.504
22.6	0	6219.27	181.11	18.032	7.051	0	0	931.426
22.7	0	6203.08	180.24	18.032	7.159	0	0	932.260
22.8	0	6173.10	178.37	14.091	7.305	0	0	932.964

Table A.4a. Two-Mile Level Raw Data (continued).

MM	DVC	City	Water	Density	Slope	LIR	Bare	Elev
22.9	0	6137.54	177.47	14.091	7.499	0	0	933.867
23	1	6095.77	177.11	14.091	7.658	0	0	934.875
23.1	0	6043.03	178.79	14.091	7.815	0	0	936.307
23.2	2	5985.47	180.05	13.137	7.926	0	0	937.251
23.3	1	5920.53	181.74	13.137	8.017	0	0	938.714
23.4	0	5843.64	183.40	13.137	8.142	0	0	940.428
23.5	1	5764.12	184.89	13.137	8.356	0	0	942.397
23.6	0	5672.30	186.24	10.749	8.557	0	0	944.102
23.7	1	5579.29	188.68	10.749	8.817	0	0	945.591
23.8	2	5473.92	193.58	10.749	9.076	0	0	946.713
23.9	0	5346.73	199.81	10.749	9.348	0	0	948.621
24	2	5235.35	208.90	10.749	9.610	0	0	950.547
24.1	2	5112.22	218.15	10.749	9.917	0	0	953.314
24.2	1	4991.93	226.40	12.356	10.205	0	0	956.067
24.3	0	4868.25	234.15	12.356	10.559	0	0	959.483
24.4	0	4708.41	243.50	12.444	10.892	0	0	962.547
24.5	2	4580.56	249.64	12.444	11.273	0	0	966.082
24.6	0	4447.22	255.55	12.444	11.603	0	0	968.921
24.7	0	4322.25	262.26	12.444	11.961	0	0	972.063
24.8	0	4172.57	271.84	12.444	12.279	0	0	975.211
24.9	1	4030.23	281.59	12.444	12.638	0	0	979.433
25	1	3894.73	292.27	12.444	13.051	0	0	984.159
25.1	0	3756.41	303.21	12.444	13.448	0	0	989.352
25.2	1	3625.34	314.69	15.303	13.819	0	0	994.402
25.3	1	3473.15	326.20	15.303	14.144	0	0	998.753
25.4	0	3349.93	341.20	15.303	14.507	0	0	1003.480
25.5	0	3231.19	352.17	15.303	14.848	0	0	1008.542
25.6	1	3129.98	360.92	15.824	15.122	0	0	1013.117
25.7	0	3060.85	366.82	15.303	15.446	0	0	1018.079
25.8	0	3004.00	369.79	18.808	15.680	0	0	1022.863
25.9	0	2947.72	378.39	18.808	15.834	0	0	1027.314
26	2	2871.95	387.75	18.808	15.991	0	0	1031.356
26.1	1	2779.02	397.56	18.808	16.172	0	0	1034.795
26.2	1	2684.83	406.71	18.808	16.278	0	0	1036.136
26.3	0	2584.66	413.67	18.808	16.326	0	0	1035.921
26.4	0	2512.98	422.88	18.808	16.447	0	0	1034.100
26.5	0	2447.68	431.28	18.808	16.617	0	0	1032.572
26.6	0	2388.88	440.24	21.940	16.783	0	0	1030.864
26.7	0	2326.88	449.25	20.412	16.925	0	0	1029.368
26.8	0	2276.36	457.27	20.412	17.073	0	0	1028.404
26.9	2	2228.98	464.13	20.412	17.200	0	0	1028.401
27	0	2195.10	470.06	20.412	17.248	0	0	1028.592
27.1	0	2170.50	474.50	20.412	17.213	0	0	1028.867
27.2	0	2152.17	475.58	21.523	17.277	0	0	1028.937
27.3	0	2143.20	475.41	21.523	17.353	0	0	1028.948
27.4	0	2140.11	475.34	21.523	17.499	0	0	1028.923
28.5	0	2422.27	392.98	19.747	15.822	0	0	1019.115
29.2	0	2799.04	368.38	17.167	13.014	0	0	1005.515
29.8	0	3030.37	374.05	19.147	10.598	0	0	996.777
30	0	3098.64	365.21	62.819	9.770	0.0312	0	992.343
30.7	0	3119.51	339.93	155.373	6.740	0.5901	0	960.735
31	1	3044.42	328.84	204.972	5.799	0.9939	0	946.935
31.4	0	2861.36	293.18	204.972	4.807	1.0311	0	929.276

Table A.4a. Two-Mile Level Raw Data (continued).

MM	DVC	City	Water	Density	Slope	LIR	Bare	Elev
31.8	4	2649.78	248.94	305.826	3.847	1.0311	0	912.595
32.2	0	2435.62	203.73	316.642	2.918	1.0311	0	900.955
32.3	2	2387.26	195.90	313.867	2.714	1.0311	0	898.993
32.4	4	2341.13	189.79	313.867	2.556	1.0311	0	897.576
32.5	6	2300.61	185.33	313.867	2.406	1.0311	0	896.262
32.6	1	2267.34	180.98	313.867	2.285	1.0311	0	895.373
32.7	0	2240.81	178.80	313.867	2.185	1.0311	0	894.494
33.6	5	2480.45	160.60	264.730	1.425	1.0311	0	885.119
34	0	2812.28	154.25	264.730	1.345	1.0031	0	880.030
34.1	1	2927.40	152.06	264.730	1.328	0.8260	0	878.771
34.2	3	3029.40	149.05	165.330	1.322	0.6801	0.0208	877.607
34.3	2	3135.24	146.61	165.330	1.316	0.6050	0.0208	876.430
34.4	1	3270.49	144.65	165.330	1.309	0.5442	0.0208	875.254
34.5	1	3388.26	143.13	165.330	1.303	0.4651	0.0208	874.092
34.6	2	3509.13	142.49	165.330	1.297	0.3822	0.0208	872.928
35.4	0	4653.96	144.57	74.713	1.320	0	0.0208	863.709
36.2	1	5871.67	145.64	38.070	1.352	0	0.0208	855.318
36.7	0	6623.03	144.06	40.239	1.356	0	0.0208	852.619
37.5	3	7879.67	158.76	39.358	1.496	0	0.0208	855.380
37.6	1	8055.75	161.35	39.358	1.500	0	0.0208	856.361
37.7	3	8202.61	162.99	39.358	1.508	0	0.0060	857.453
37.8	10	8350.19	163.96	39.358	1.520	0	0	858.578
37.9	3	8526.70	164.59	39.358	1.537	0	0	859.948
38	2	8673.29	164.39	39.224	1.544	0	0	861.256
38.5	0	9423.92	161.65	39.224	1.604	0	0	869.890
39.1	0	10068.50	157.93	35.913	1.610	0	0	882.655
39.4	0	10245.75	154.23	31.440	1.584	0	0	889.023
39.9	1	10345.27	150.51	25.281	1.515	0	0	900.138
40.3	0	10254.74	154.14	25.281	1.437	0	0	907.929
41	0	9846.38	182.02	21.968	1.260	0	0	917.839
41.3	2	9518.76	216.65	19.694	1.115	0	0	921.588
42.2	0	7999.23	297.49	25.820	0.648	0	0	926.668
43.1	0	6595.43	333.85	28.608	0.641	0	0	927.343
44.1	1	5045.91	335.49	81.500	0.621	0.0729	0	927.121
44.7	0	4159.75	281.15	81.500	0.644	0.7321	0	926.729
45	1	3735.76	230.93	217.525	0.647	1.3572	0.0577	926.865
45.5	4	3089.67	179.61	410.618	0.634	1.6376	0.1458	927.892
45.8	10	2791.24	179.74	410.618	0.643	1.6446	0.1458	928.979
46.1	1	2530.65	185.99	500.714	0.737	1.6390	0.1458	930.119
46.4	0	2323.43	189.86	500.714	0.851	1.6352	0.1458	931.253
46.7	1	2200.54	186.17	494.574	0.958	1.6352	0.1458	932.339
47.6	0	2236.21	208.99	479.754	1.134	1.5623	0.1458	934.895
47.8	0	2300.34	215.02	479.754	1.116	1.5519	0.1458	934.093
48.1	1	2434.01	234.48	417.582	1.081	1.5727	0.1458	932.202
48.4	1	2603.88	255.59	417.582	1.054	1.5727	0.1458	930.289
49.4	1	3046.46	333.00	127.126	1.045	0.1018	0.0229	929.804
49.7	0	3093.99	355.36	127.126	1.008	0.0208	0	930.315
50	3	3081.70	368.87	170.526	0.960	0.1313	0	931.018
50.2	2	3036.76	378.01	170.526	0.950	0.3229	0.0104	931.714
50.6	1	2887.51	408.15	321.023	0.915	0.3958	0.0104	933.507
51.3	1	2514.67	466.86	411.295	0.880	0.3958	0.0729	937.258
51.7	0	2295.26	531.37	411.295	0.886	0.3750	0.0729	939.956
52.2	0	2161.97	584.26	438.787	0.943	0.3750	0.0729	943.784

Table A.4a. Two-Mile Level Raw Data (continued).

MM	DVC	City	Water	Density	Slope	LIR	Bare	Elev
52.7	0	2240.80	604.34	452.078	1.015	0.3750	0.0833	948.234
53.6	0	2765.23	650.79	429.116	0.950	0.3750	0.1042	956.752
53.9	1	3016.45	668.61	312.582	0.951	0.3699	0.1042	959.447
54.5	0	3696.61	667.14	161.831	1.020	0.0104	0.0937	966.148
55.1	0	4306.00	633.37	77.898	1.365	0	0.1404	973.932
56.8	1	4814.60	440.95	108.505	3.055	0.0314	0.1562	976.204
57.1	0	4899.43	422.97	164.704	3.274	0.0729	0.1458	972.464
57.6	2	4903.63	371.88	164.704	3.575	0.4481	0.1250	962.530
58.1	1	4371.18	314.20	246.338	3.551	1.6834	0.1250	949.624

Table A.4b. Two-Mile Level Raw Data

Table of raw data for the deer vehicle collision study at the two-mile level. Abbreviations for landcover variables: MM, mile marker; Pine, pine forest; Mix, mixed forest; Shrub, shrub land; and Grass, grassland. All variables continuous and measured in proportions per buffered layer.

MM	Pine	Mix	Shrub	Grass	Past	Ag	Wtlnd
7	73.4310	0.0104	11.3897	5.8182	2.3224	5.7800	0.6333
7.8	76.3979	0.0208	8.4835	5.2769	2.3224	5.7800	0.8436
8	77.3251	0.0208	7.8105	4.9451	2.3224	5.7800	0.8436
8.1	77.7529	0.0208	7.5323	4.8284	2.2997	5.7800	0.8436
8.2	78.0947	0.0208	7.4509	4.6693	2.2600	5.7339	0.8436
8.3	78.0379	0.0208	7.6650	4.6384	2.2012	5.6463	0.8435
8.4	78.2999	0.0193	7.7185	4.5691	2.1324	5.4739	0.8208
8.5	78.8360	0.0127	7.7063	4.5344	1.9979	5.1242	0.8031
8.6	79.5955	0.0104	7.5845	4.4410	1.8338	4.7033	0.8019
8.7	80.0153	0.0104	7.7610	4.3656	1.6887	4.3092	0.7918
8.8	80.5743	0.0104	7.8970	4.2271	1.4766	3.9957	0.7669
8.9	81.3385	0.0104	8.0495	4.1187	1.1632	3.6500	0.6283
9	82.2210	0.0104	8.1469	3.8106	0.8776	3.2638	0.6230
9.1	83.0240	0.0104	8.2792	3.4817	0.7311	2.8293	0.5511
9.2	83.7474	0.0104	8.1852	3.2622	0.5736	2.5662	0.5231
9.3	83.9580	0	8.1039	3.4150	0.5311	2.2866	0.5103
9.4	84.0499	0	8.0960	3.5360	0.5235	2.0783	0.5103
9.5	83.8212	0	8.0862	3.8224	0.5913	1.9123	0.5664
9.6	83.5335	0	7.9963	4.0852	0.7359	1.7872	0.6720
9.7	83.4363	0	7.8444	4.1751	0.8815	1.7693	0.7062
9.8	83.3260	0	7.6813	4.1427	1.1731	1.8121	0.7081
9.9	83.1444	0	7.4448	4.1067	1.5939	1.8669	0.7290
10	82.8720	0	7.3359	4.0770	1.8608	2.0669	0.7290
10.1	82.6788	0	7.3293	4.0780	2.0079	2.1435	0.8219
10.2	82.3608	0	7.3833	4.1384	2.1402	2.1854	0.9478
10.3	82.1317	0	7.4432	4.1411	2.2854	2.2731	0.9591
10.4	81.7974	0	7.5315	4.1526	2.4825	2.4609	0.9581
10.5	81.3291	0	7.6865	4.2319	2.5952	2.6314	0.9636
10.6	80.9599	0	7.8791	4.1949	2.7062	2.7231	0.9848
10.7	80.5819	0	7.8850	4.2884	2.9181	2.7976	1.0028
10.8	79.9183	0	7.9508	4.4731	3.2059	2.9082	1.0314
10.9	78.9643	0	8.0915	4.5999	3.5538	3.2515	1.0496

Table A.4b. Two-Mile Level Raw Data (continued).

MM	Pine	Mix	Shrub	Grass	Past	Ag	Wtlnd
11	77.6862	0	8.1315	4.7127	4.1044	3.8032	1.0725
11.1	76.1270	0	8.2458	4.9543	4.6197	4.4871	1.0664
11.2	74.5045	0	8.3355	5.2357	5.1653	5.2463	1.0232
11.3	72.9387	0	8.4686	5.2525	5.6894	6.1915	0.9869
11.4	71.6340	0	8.4536	5.2245	5.9129	7.3457	0.9606
11.5	70.2074	0	8.4212	5.1941	6.1995	8.5417	0.9688
11.6	68.5800	0	8.6177	5.2259	6.3972	9.8060	0.9149
11.7	67.0175	0	8.7186	5.2445	6.5193	11.0941	0.9477
11.8	65.4001	0	8.7557	5.1581	6.5790	12.6343	1.0262
11.9	63.7703	0	8.7968	5.0551	6.7807	14.0418	1.1284
12	62.1547	0	8.8324	4.9369	7.1410	15.3676	1.1685
12.1	60.5406	0	8.7964	4.9005	7.4380	16.6359	1.3054
12.2	58.8310	0	8.7696	4.9035	7.7849	17.9070	1.4359
12.3	57.0529	0	8.8121	4.9368	8.2308	19.0945	1.5577
12.4	55.1672	0	8.8401	5.0485	8.8198	20.2362	1.5960
12.5	53.1942	0	8.8566	5.1065	9.4677	21.3814	1.7021
12.6	51.2821	0	8.7718	5.1482	9.8924	22.8024	1.8079
12.7	49.4084	0	8.6295	5.2582	10.1987	24.3161	1.8965
12.8	47.6016	0	8.3765	5.3809	10.3667	26.0405	1.9729
12.9	66.1118	0	12.7352	12.8416	26.8602	76.4312	4.6659
13	43.3278	0	7.9978	5.5253	10.8746	29.7914	2.2539
13.1	41.3035	0	7.6388	5.7524	11.4015	31.2792	2.3955
13.2	38.9491	0	7.5056	5.9928	11.9580	32.8618	2.5107
13.3	36.6311	0	7.2352	6.2075	12.6125	34.5843	2.5662
13.4	34.3427	0	6.8679	6.4951	12.9422	36.6394	2.5832
13.5	32.2919	0	6.2428	6.7955	13.2580	38.6525	2.6169
13.6	30.1952	0	5.7366	7.0196	13.7303	40.4995	2.6667
13.7	27.7921	0	5.4353	7.2540	14.2721	42.4450	2.6765
13.8	25.4869	0	5.1140	7.4351	14.8490	44.3135	2.6765
13.9	23.1613	0	4.8793	7.4247	15.6051	46.1280	2.6765
14	21.1218	0	4.6699	7.3161	16.2045	47.9529	2.6097
14.1	19.1540	0	4.5381	7.3475	16.4957	49.8568	2.4830
14.2	17.2023	0	4.3643	7.3505	16.9848	51.5986	2.3746
14.3	15.3510	0	4.0556	7.3445	17.4726	53.3762	2.2752
14.4	13.7991	0	3.8047	7.1322	18.1628	54.7503	2.2260
14.5	12.7909	0	3.4050	6.8497	18.7643	55.8453	2.2081
14.6	11.9844	0	2.9361	6.7678	19.0028	56.9612	2.1734
14.7	11.2718	0	2.5455	6.6486	19.4227	57.7523	2.1713
14.8	10.5000	0	2.2864	6.6192	20.2670	57.9878	2.1227
14.9	9.7521	0	2.2555	6.5469	21.3297	57.8328	2.0586
15	8.9789	0	2.1503	6.3964	22.6226	57.5814	2.0308
15.1	8.0516	0	2.0375	6.3439	23.9396	57.3769	2.0110
15.2	7.4968	0	1.9903	6.1499	24.7377	57.3848	1.9905
15.3	7.2413	0	2.0293	6.1302	25.6676	56.6973	1.9771
15.4	7.5001	0	2.0982	6.4565	26.5638	55.1726	1.9447
15.5	7.8743	0	2.1118	6.9497	27.3308	53.4708	1.9919
15.6	8.2385	0	2.1528	7.7292	27.7699	51.8079	2.0204
15.7	8.6705	0	2.4023	8.4568	27.8926	50.2327	2.0231
15.8	9.0801	0	2.5626	9.3076	27.4483	49.1657	2.0811
15.9	9.3207	0	2.9074	10.0534	27.1079	48.1866	2.0594
16	9.5910	0	3.1610	10.7770	26.9975	47.0756	2.0298
16.1	10.0106	0	3.4894	11.4970	26.8512	45.8027	1.9632
16.2	10.4597	0	3.8131	12.1257	26.7823	44.5367	1.8868

Table A.4b. Two-Mile Level Raw Data (continued).

MM	Pine	Mix	Shrub	Grass	Past	Ag	Wtlnd
16.3	10.8882	0	4.0849	12.8021	26.8524	43.0828	1.8860
16.4	11.2187	0	4.2973	13.5992	26.9720	41.5884	1.8998
16.5	11.6011	0	4.6252	14.3149	27.0349	40.1414	1.8451
16.6	12.0126	0	4.7620	14.9530	26.6643	39.3648	1.8059
16.7	12.4126	0	4.8469	15.6671	26.0888	38.8239	1.7114
16.8	12.9312	0	5.0613	16.1744	25.4952	38.1783	1.7109
16.9	13.3646	0	5.2915	16.7117	24.9001	37.6111	1.6519
17	13.6265	0	5.4606	17.4545	24.1427	37.2673	1.5799
17.1	14.0003	0	5.6560	18.2346	23.4878	36.6720	1.4873
17.2	14.6375	0	5.8205	19.1899	22.8048	35.6597	1.3998
17.3	15.3098	0	6.1398	19.8420	22.3015	34.5908	1.3161
17.4	16.0240	0	6.4171	20.3948	21.9701	33.5177	1.1764
17.5	16.1892	0	6.7024	20.9646	22.3284	32.2436	1.0718
17.6	15.9897	0	6.8806	21.4658	22.8269	31.4234	0.9137
17.7	15.7812	0	7.0837	21.8160	23.2965	30.7138	0.8430
17.8	15.4808	0	7.2403	22.4344	23.6952	30.0409	0.7120
17.9	15.3299	0	7.4014	23.0516	24.1038	29.0275	0.7012
18	15.1098	0	7.6247	23.7012	24.5491	27.9490	0.6912
18.1	14.9367	0	7.8485	24.4043	24.8872	26.9210	0.6274
18.2	14.8571	0	8.0130	25.1614	25.1712	25.7726	0.6323
18.3	14.7117	0	8.1537	25.8636	25.4676	24.7385	0.6587
18.4	14.4998	0	8.3990	26.5231	25.6239	23.8544	0.7039
18.5	14.4227	0	8.6344	27.1482	25.7491	22.9296	0.7307
18.6	14.5332	0	8.7872	27.6894	26.1428	21.7316	0.7376
18.7	14.6165	0	8.9138	28.2309	26.3872	20.7213	0.7517
18.8	14.5429	0	9.0775	28.5241	26.7400	19.9790	0.7511
18.9	14.4034	0	9.1878	28.5821	27.4044	19.2397	0.7973
19	14.1093	0	9.3289	28.2698	28.2901	18.7682	0.8484
19.1	13.5748	0	9.3166	28.1031	29.4596	18.2946	0.8748
19.2	12.9317	0	9.2066	27.9500	30.7589	17.9171	0.8607
19.3	12.1071	0	9.0948	28.1859	31.6134	17.8242	0.7997
19.4	11.2272	0	9.0982	28.3074	32.4671	17.7753	0.7603
19.5	10.6208	0	8.8318	28.4586	33.1771	17.8012	0.7462
19.6	9.9452	0	8.8517	28.4410	34.0686	17.6105	0.7290
19.7	9.2913	0	8.9469	28.3578	34.7705	17.5727	0.7290
19.8	8.9566	0	9.1647	28.1401	35.2874	17.4023	0.7462
19.9	8.5568	0	9.3195	28.3277	35.6436	17.1247	0.7560
20	8.0738	0	9.4953	28.7190	35.8513	16.8534	0.7364
20.1	7.6911	0	9.6867	28.9518	36.1362	16.5361	0.7290
20.2	7.4487	0	9.9172	28.8682	36.4288	16.3529	0.7290
20.3	7.2887	0	10.0550	28.6918	36.7387	16.2477	0.7440
20.4	7.3691	0	10.0090	28.5790	36.9680	16.0855	0.7602
20.5	7.5484	0	10.1305	28.4301	37.1524	15.8261	0.6855
20.6	7.7423	0	10.3590	28.3614	37.2780	15.4454	0.6098
20.7	7.8721	0	10.5695	28.5475	37.3806	14.9092	0.5233
20.8	7.8915	0	10.5715	28.8026	37.5382	14.5019	0.5009
20.9	7.8747	0	10.5250	29.1600	37.9709	13.8272	0.4755
21	7.7663	0	10.4684	29.5503	38.5393	13.0718	0.4687
21.1	7.6419	0	10.3893	29.7665	39.4886	12.1096	0.4687
21.2	7.5049	0	10.2822	29.8194	40.2789	11.5145	0.4687
21.3	7.3966	0	10.3863	29.7288	40.8294	11.0902	0.4687
21.4	7.3054	0	10.4605	30.0573	40.9810	10.6438	0.4687
21.5	7.0718	0	10.7413	30.7517	40.8602	10.0230	0.4687

Table A.4b. Two-Mile Level Raw Data (continued).

MM	Pine	Mix	Shrub	Grass	Past	Ag	Wtlnd
21.6	6.9103	0	10.8812	31.4769	40.5248	9.6332	0.4895
21.7	6.6892	0	11.0422	32.2172	39.9594	9.5087	0.4895
21.8	6.4496	0	11.3174	32.9509	39.3166	9.3724	0.4890
21.9	6.2049	0	11.4962	33.9352	38.5511	9.2295	0.4791
22	5.8703	0	11.5717	35.1059	37.8062	9.0626	0.4791
22.1	5.5311	0	11.4193	36.4210	37.1073	8.9611	0.4726
22.2	5.2517	0	11.2813	37.6833	36.5225	8.6735	0.5149
22.3	5.0026	0	10.9685	39.2298	35.7717	8.4816	0.4729
22.4	4.7360	0	10.6134	40.9449	34.8796	8.2936	0.4567
22.5	4.6695	0	10.3875	42.1371	34.1125	8.1089	0.4908
22.6	4.8485	0	10.2640	42.9648	33.3347	7.9879	0.4840
22.7	4.9794	0	10.4907	43.6400	32.2824	7.9817	0.4802
22.8	5.0952	0	10.7043	44.4474	31.2166	7.9776	0.4092
22.9	5.1041	0	10.7714	45.3047	30.2617	7.9567	0.4111
23	5.0292	0	10.8091	46.1698	29.3999	7.9567	0.4166
23.1	4.9412	0	10.8998	46.9081	28.6524	7.9366	0.4209
23.2	4.9292	0	10.9395	47.5383	28.1383	7.7450	0.4270
23.3	5.1705	0	11.1364	47.8803	27.8046	7.2897	0.4270
23.4	5.6926	0	11.1038	48.1524	27.5211	6.8063	0.4270
23.5	6.0633	0	11.1330	48.4656	27.2291	6.3487	0.4270
23.6	6.4147	0	11.1924	49.0082	26.7181	5.9077	0.4361
23.7	6.4103	0	11.4938	49.7950	25.8594	5.6917	0.4270
23.8	6.5287	0	11.7948	50.4703	24.9852	5.4712	0.4270
23.9	6.6679	0	12.2040	51.1837	24.0170	5.2084	0.3962
24	7.0116	0	12.5003	52.0202	23.0506	4.6896	0.3868
24.1	7.4033	0	12.7397	52.9065	22.0252	4.1816	0.3853
24.2	8.1299	0	12.9988	53.5027	20.9354	3.6834	0.3853
24.3	9.1593	0	13.3260	53.9121	19.5272	3.3461	0.3333
24.4	10.0372	0	13.7461	54.3255	18.2324	2.9170	0.3333
24.5	10.6186	0	14.2333	54.8501	16.9273	2.6000	0.3333
24.6	11.3652	0	14.4445	55.3128	15.6145	2.4715	0.3333
24.7	12.2534	0	14.7330	55.6807	14.2312	2.3152	0.3124
24.8	13.0814	0	15.1554	56.1289	12.7346	2.0978	0.3124
24.9	14.1182	0	15.5576	56.4974	11.1761	1.8489	0.3124
25	14.9931	0	15.6634	57.1112	9.8061	1.6138	0.3124
25.1	15.4716	0	15.8889	57.9773	8.4924	1.3574	0.3124
25.2	15.7822	0	15.9896	59.1601	7.1152	1.1435	0.3124
25.3	16.2476	0	15.9980	60.0056	5.9781	0.9687	0.3124
25.4	16.8787	0	15.7375	60.3533	5.2337	0.9922	0.3123
25.5	17.3308	0	15.8285	60.1207	4.7881	1.1245	0.2952
25.6	17.4642	0	16.1388	59.9034	4.4926	1.1918	0.2759
25.7	17.5232	0	16.2388	60.0166	4.1603	1.2592	0.2708
25.8	17.5070	0	16.4253	60.1431	3.8768	1.2782	0.2697
25.9	17.6663	0	16.3574	60.1277	3.7082	1.3744	0.2604
26	17.9349	0	16.1749	59.9303	3.5896	1.5732	0.2604
26.1	18.4318	0	16.0087	59.4696	3.5784	1.6933	0.2655
26.2	19.0411	0	15.7324	59.0610	3.5373	1.8297	0.2329
26.3	19.4581	0	15.3954	58.9366	3.3727	1.9905	0.2186
26.4	19.7106	0	15.1613	58.9210	3.1770	2.1063	0.2187
26.5	19.9616	0	14.8419	59.0157	3.0707	2.1890	0.1921
26.6	20.0351	0	14.6138	59.1229	2.9980	2.3476	0.1536
26.7	20.0693	0	14.2794	59.3481	2.9123	2.5352	0.1250
26.8	19.9180	0	13.7655	59.8893	2.9031	2.6890	0.1134

Table A.4b. Two-Mile Level Raw Data (continued).

MM	Pine	Mix	Shrub	Grass	Past	Ag	Wtlnd
26.9	19.6887	0	13.6435	60.0972	2.9952	2.7824	0.1041
27	19.5121	0	13.6130	60.1737	3.1486	2.8017	0.0730
27.1	19.4357	0	13.4231	60.3320	3.2713	2.8276	0.0625
27.2	19.4395	0	13.3029	60.3034	3.4301	2.8367	0.0625
27.3	19.6571	0	13.2730	60.0453	3.5393	2.8084	0.0625
27.4	19.9612	0	13.0108	59.9170	3.6338	2.8357	0.0625
28.5	11.4894	0	11.1087	68.8155	3.7222	4.2196	0.0614
29.2	6.6600	0	8.4101	72.8449	5.2462	6.2157	0.0363
29.8	5.0629	0	7.6108	65.6583	10.3336	10.6757	0.1579
30	4.3380	0	7.5734	62.4674	12.1864	12.6334	0.2395
30.7	4.9056	0	6.2208	47.3653	17.7104	21.8115	0.2500
31	5.2257	0	5.8893	41.7338	19.3274	25.2812	0.2708
31.4	5.2175	0	4.8318	33.4956	23.4067	30.4535	0.3124
31.8	4.2497	0	4.1324	24.8919	27.7706	36.2478	0.3588
32.2	3.5008	0	3.3727	16.5821	32.0924	41.7472	0.3584
32.3	3.5103	0	3.2490	15.0812	32.2293	43.2160	0.3513
32.4	3.5193	0	3.1602	13.8489	31.8126	44.9199	0.3579
32.5	3.5057	0	3.0530	12.6867	31.7107	46.3036	0.3553
32.6	3.4441	0	2.9475	11.4433	31.6165	47.8412	0.3440
32.7	3.2293	0	2.7251	10.1479	31.4731	49.7173	0.3437
33.6	2.2288	0	1.8226	4.0362	35.3035	54.0886	0.3437
34	1.9859	0	1.3748	3.5266	35.0777	55.7559	0.2537
34.1	1.9127	0	1.2066	3.3508	35.3452	56.2540	0.2255
34.2	1.7543	0	1.0252	3.3561	35.8842	56.3256	0.1770
34.3	1.5993	0	0.8341	3.3614	36.5216	56.1978	0.1666
34.4	1.2692	0	0.6447	3.3646	37.2708	56.1748	0.1502
34.5	0.8361	0	0.4239	3.1790	38.2208	56.2957	0.1452
34.6	0.3652	0	0.3114	2.9056	39.2402	56.4465	0.1354
35.4	0.4241	0	0.8398	2.1955	40.5041	55.8594	0.1250
36.2	0.7560	0	0.8080	2.7606	41.6532	53.8313	0.1389
36.7	1.1404	0	0.8124	2.8495	43.2781	51.5899	0.1146
37.5	1.5655	0	0.9373	2.4912	41.2103	53.3576	0.1146
37.6	1.6201	0	0.9397	2.3992	41.0404	53.5002	0.1243
37.7	1.7453	0	0.9292	2.3231	40.9724	53.4798	0.1250
37.8	1.7701	0	0.9492	2.2688	41.4173	52.9924	0.1250
37.9	1.9168	0	0.9307	2.1335	41.8268	52.5987	0.0937
38	2.0353	0	0.9276	2.2593	42.2579	51.8520	0.0937
38.5	2.4096	0	1.0218	4.3400	41.1323	49.6809	0.0937
39.1	4.0465	0	1.2646	6.6320	38.8125	43.8772	0.0937
39.4	4.4985	0	1.3936	7.7848	40.0459	39.0076	0.1250
39.9	4.7963	0	1.5246	8.9107	45.1135	29.7010	0.0835
40.3	4.5966	0	1.7745	10.0500	47.2082	24.4822	0.0625
41	4.1748	0	1.8854	11.9121	52.5136	14.7875	0.0417
41.3	4.2104	0	1.9283	12.5500	55.3530	10.2480	0.0373
42.2	3.2858	0	1.1817	10.4103	61.9071	7.8902	0.1262
43.1	4.9089	0	1.0436	7.4523	66.5868	12.3938	0.7825
44.1	9.5172	0	1.3827	6.0800	61.6029	17.6515	1.1834
44.7	10.9776	0	1.4419	5.8883	56.0224	22.3364	1.2721
45	11.9095	0	1.4212	6.5595	51.0617	24.0803	1.4060
45.5	12.3081	0	1.4186	7.7695	44.6181	27.8235	1.5149
45.8	11.5980	0	1.3993	8.3738	42.2241	30.5788	1.4795
46.1	10.6043	0	1.3785	9.7257	41.2413	31.7257	1.1570
46.4	9.6477	0	1.4214	9.9350	38.8375	34.9822	1.0101

Table A.4b. Two-Mile Level Raw Data (continued).

MM	Pine	Mix	Shrub	Grass	Past	Ag	Wtlnd
46.7	9.3291	0	1.4071	9.7579	37.4933	36.8831	0.9627
47.6	4.8018	0	0.6634	8.3786	38.3665	43.2306	0.5991
47.8	3.4957	0	0.6042	8.0561	39.3787	43.9382	0.5636
48.1	2.4036	0	0.5857	8.7306	38.3444	45.5994	0.2772
48.4	2.7028	0	0.7000	8.8636	38.0097	45.5369	0.1666
49.4	2.9104	0	0.8067	7.0621	42.1013	46.5592	0.1137
49.7	3.3223	0	0.8746	6.8764	41.4150	47.1665	0.0916
50	4.0676	0	1.0262	6.9822	41.0063	46.1354	0.0843
50.2	4.4340	0	1.1356	7.0789	40.7355	45.4162	0.1042
50.6	5.8160	0	1.3442	8.5215	40.3422	42.4242	0.0937
51.3	8.4149	0	2.1345	10.4710	36.9371	40.3949	0.1274
51.7	8.8366	0	2.3815	11.0993	36.3787	39.6213	0.1431
52.2	10.1555	0	2.7387	11.2833	36.3627	37.7413	0.1354
52.7	10.2413	0	3.2559	11.7489	32.0871	40.0327	0.1278
53.6	8.3945	0	3.2345	11.8949	25.9126	44.6071	0.1042
53.9	7.2806	0	3.1664	10.9842	24.8833	46.8579	0.0625
54.5	6.0588	0	2.8619	8.7572	25.2259	49.4704	0.0242
55.1	5.5955	0	2.7324	7.5140	26.2892	50.4564	0.0000
56.8	7.2204	0	2.3200	17.1152	27.1629	45.3149	0.1034
57.1	8.3807	0	2.3434	16.1954	29.1936	42.9170	0.1122
57.6	8.0646	0	3.1631	18.6635	29.3907	37.9848	0.1287
58.1	4.3013	0	2.7419	21.7916	27.0371	33.7588	0.1458

Table A.4c. Two-Mile Level Raw Data

Table of raw data for the deer vehicle collision study at the two-mile level. Abbreviations for landcover variables: MM, mile marker; H_Wetland, herbaceous wetland; Build, buildings; HIR, high intensity residential development; Commercial, commercial use; Trans, transitional; Deciduous, deciduous forest; urb_veg, urban/recreational vegetation; and water, water source. All variables continuous and measured in proportions per buffered.

MM	H_wetland	Build	Water	HIR	Commercial	Trans	Deciduous	Crop	Urb_veg
7	0.3020	3.9327	0.0208	0	0.2079	0.0323	0.0312	0.0208	0
7.8	0.3020	5.2418	0.0208	0	0.2291	0.2395	0.0417	0.0208	0
8	0.3020	5.4971	0.0208	0	0.2594	0.2660	0.0208	0.0208	0
8.1	0.3018	5.4890	0.0208	0	0.2499	0.2812	0.0208	0.0052	0
8.2	0.2916	5.4228	0.0208	0	0.2499	0.2812	0.0208	0	0
8.3	0.2916	5.3226	0.0208	0	0.2499	0.3011	0.0208	0	0
8.4	0.2916	5.2024	0.0208	0	0.2510	0.3228	0.0173	0	0
8.5	0.2916	5.0803	0.0208	0	0.2706	0.3285	0.0112	0	0
8.6	0.2916	4.9265	0.0208	0	0.2914	0.3537	0.0095	0	0
8.7	0.2916	4.7675	0.0208	0	0.3184	0.3645	0	0	0
8.8	0.2812	4.6283	0.0208	0	0.3228	0.3645	0	0	0
8.9	0.2812	4.5087	0.0208	0	0.3124	0.3645	0	0	0
9	0.2812	4.4228	0.0208	0	0.3124	0.3645	0	0	0
9.1	0.2812	4.3585	0.0208	0	0.3330	0.3645	0	0	0
9.2	0.2812	4.3167	0.0208	0	0.3716	0.3645	0	0	0
9.3	0.2812	4.3226	0.0208	0	0.4166	0.3645	0	0	0.0183

Table A.4c. Two-Mile Level Raw Data (continued).

MM	H_wetland	Build	Water	HIR	Commercial	Trans	Deciduous	Crop	Urb_veg
9.4	0.2787	4.3440	0.0208	0	0.4169	0.3645	0	0	0.0312
9.5	0.2547	4.3729	0.0208	0	0.4329	0.3668	0	0	0.0312
9.6	0.2395	4.4069	0.0208	0	0.4374	0.3672	0	0	0.0312
9.7	0.2395	4.4312	0.0208	0	0.4374	0.3645	0	0	0.0312
9.8	0.2395	4.4568	0.0208	0	0.4374	0.3340	0	0	0.0312
9.9	0.2395	4.4925	0.0208	0	0.4374	0.2916	0	0	0.0312
10	0.2395	4.5333	0.0208	0	0.4323	0.2408	0	0	0.0312
10.1	0.2304	4.5676	0.0208	0	0.4166	0.1477	0	0	0.0312
10.2	0.2106	4.5898	0.0208	0	0.4166	0.0711	0	0	0.0312
10.3	0.1520	4.5873	0.0208	0	0.4166	0.0521	0	0	0.0312
10.4	0.0520	4.5608	0.0004	0	0.4166	0.0230	0	0	0.0312
10.5	0	4.5260	0	0	0.4166	0.0208	0	0	0.0312
10.6	0	4.4648	0	0	0.4166	0.0104	0	0	0.0312
10.7	0	4.3878	0	0	0.3908	0.0104	0	0	0.0312
10.8	0	4.3273	0	0	0.3768	0.0104	0	0	0.0312
10.9	0	4.3075	0	0	0.3541	0.0104	0	0	0.0312
11	0	4.3141	0	0	0.3541	0.0104	0	0	0.0312
11.1	0	4.3235	0	0	0.3541	0.0104	0.0104	0	0.0312
11.2	0	4.3432	0	0	0.3437	0.0104	0.0104	0	0.0312
11.3	0	4.3462	0	0	0.3266	0.0104	0.0104	0	0.0312
11.4	0	4.3373	0	0	0.3228	0.0104	0.0104	0	0.0312
11.5	0	4.2982	0	0	0.3228	0.0091	0.0104	0	0.0312
11.6	0	4.2534	0	0	0.3228	0	0.0104	0	0.0312
11.7	0	4.1697	0	0	0.3228	0	0.0104	0	0.0312
11.8	0	4.0901	0	0	0.3113	0	0.0104	0	0.0312
11.9	0	4.0416	0	0	0.2915	0	0.0104	0	0.0312
12	0	4.0311	0	0	0.2710	0	0.0104	0	0.0312
12.1	0	4.0423	0	0	0.2604	0	0.0104	0	0.0312
12.2	0	4.0681	0	0	0.2604	0	0.0104	0	0.0312
12.3	0	4.1104	0	0	0.2423	0	0.0104	0	0.0312
12.4	0	4.1745	0	0	0.2193	0	0.0104	0	0.0312
12.5	0	4.2489	0	0	0.2187	0	0.0104	0	0.0312
12.6	0	4.3354	0	0	0.2187	0.0036	0.0104	0	0.0312
12.7	0	4.4285	0	0	0.2094	0.0102	0.0104	0	0.0312
12.8	0	4.5448	0	0	0.1777	0.0104	0.0104	0	0.0312
12.9	0.0104	5.7372	0.0833	0	0.1666	0.0104	0.0208	0	0.0312
13	0	4.6439	0	0	0.1458	0.0104	0.0104	0	0.0312
13.1	0	4.7151	0	0	0.1458	0.0104	0.0104	0	0.0312
13.2	0	4.7560	0	0	0.1428	0.0104	0.0104	0	0.0312
13.3	0	4.7489	0	0	0.1111	0.0104	0.0104	0	0.0312
13.4	0.0104	4.7497	0.0081	0	0.0589	0.0104	0.0104	0	0.0312
13.5	0.0104	4.7796	0.0833	0	0.0312	0.0004	0.0104	0	0.0067
13.6	0.0104	4.8228	0.0833	0	0.0480	0	0.0104	0	0
13.7	0.0104	4.9094	0.0833	0	0.0208	0	0.0104	0	0
13.8	0.0104	5.0576	0.0833	0	0.0208	0	0.0104	0	0
13.9	0.0104	5.2567	0.0833	0	0.0208	0	0.0104	0	0
14	0.0104	5.4768	0.0833	0	0.0208	0	0.0104	0	0
14.1	0.0104	5.6729	0.0833	0	0.0208	0	0.0104	0	0
14.2	0.0104	5.8771	0.0833	0	0.0208	0	0.0104	0	0
14.3	0.0104	6.0398	0.0833	0	0.0208	0	0.0104	0	0
14.4	0.0104	6.1846	0.0833	0	0.0208	0	0.0104	0	0
14.5	0.0104	6.3084	0.0833	0	0.0208	0	0.0222	0	0
14.6	0.0104	6.4452	0.0833	0	0.0208	0	0.0596	0	0

Table A.4c. Two-Mile Level Raw Data (continued).

MM	H_wetland	Build	Water	HIR	Commercial	Trans	Deciduous	Crop	Urb_veg
14.7	0.0104	6.5464	0.0833	0	0.0208	0	0.0733	0	0
14.8	0.0104	6.6335	0.0833	0	0.0208	0	0.1023	0	0
14.9	0.0104	6.7297	0.0833	0	0.0208	0	0.1099	0	0
15	0.0104	6.8514	0.0833	0	0.0208	0	0.1250	0	0
15.1	0.0104	6.9885	0.0833	0	0.0208	0	0.1250	0	0
15.2	0.0104	7.1535	0.0833	0	0.0208	0	0.1354	0	0
15.3	0.0104	7.3082	0.0833	0	0.0208	0	0.1426	0	0
15.4	0.0104	7.5346	0.0833	0	0.0208	0	0.1495	0	0
15.5	0.0104	7.8121	0.0833	0	0.0208	0	0.1562	0	0
15.6	0.0104	8.2738	0.0833	0	0.0312	0	0.1562	0	0
15.7	0.0104	8.7864	0.0833	0	0.0512	0	0.1562	0	0
15.8	0.0104	9.3830	0.0833	0	0.0838	0	0.1562	0	0
15.9	0.0104	10.0818	0.0833	0	0.0937	0	0.1562	0	0
16	0.0104	10.6147	0.0833	0	0.0937	0	0.1597	0	0
16.1	0.0208	11.0461	0.0833	0	0.0937	0	0.1672	0	0
16.2	0.0208	11.3272	0.0833	0	0.0937	0	0.1770	0	0
16.3	0.0208	11.4730	0.0833	0	0.0937	0	0.1850	0	0
16.4	0.0208	11.5807	0.0833	0	0.0937	0	0.2060	0	0
16.5	0.0208	11.6721	0.0833	0	0.0937	0	0.2187	0	0
16.6	0.0208	11.6849	0.0833	0	0.0937	0	0.2187	0	0
16.7	0.0208	11.6591	0.0833	0	0.0937	0	0.2307	0	0
16.8	0.0208	11.6509	0.0833	0	0.0937	0	0.2300	0	0
16.9	0.0208	11.6554	0.0833	0	0.1041	0	0.2401	0	0
17	0.0208	11.7057	0.0833	0	0.1041	0	0.2395	0	0
17.1	0.0208	11.7557	0.0833	0	0.1108	0	0.2264	0	0
17.2	0.0208	11.8089	0.0833	0	0.1546	0	0.2083	0	0
17.3	0.0208	11.8542	0.0833	0	0.1666	0	0.2083	0	0
17.4	0.0208	11.8314	0.0833	0	0.1666	0	0.2083	0	0
17.5	0.0208	11.7645	0.0833	0	0.1666	0	0.2083	0	0
17.6	0.0208	11.6792	0.0833	0	0.1666	0	0.2083	0	0
17.7	0.0104	11.6080	0.0596	0	0.1666	0	0.2083	0	0
17.8	0.0104	11.5099	0	0	0.1568	0	0.2083	0	0
17.9	0.0104	11.4117	0	0	0.1458	0	0.2075	0	0
18	0.0104	11.3189	0	0	0.1458	0	0.1979	0	0
18.1	0.0104	11.2298	0	0	0.1458	0	0.1979	0	0
18.2	0.0278	11.1337	0	0	0.1458	0	0.1979	0	0
18.3	0.0417	11.0635	0	0	0.1458	0	0.1979	0	0
18.4	0.0417	10.9503	0	0	0.1458	0	0.1877	0	0
18.5	0.0417	10.8298	0	0	0.1458	0	0.1770	0	0
18.6	0.0450	10.6995	0	0	0.1458	0	0.1666	0	0
18.7	0.0558	10.5507	0	0	0.1458	0	0.1562	0	0
18.8	0.0625	10.3792	0	0	0.1458	0	0.1562	0	0
18.9	0.0625	10.2573	0	0	0.1458	0	0.1562	0	0
19	0.0625	10.1069	0	0	0.1458	0	0.1562	0	0
19.1	0.0625	9.9346	0	0	0.1458	0	0.1472	0	0
19.2	0.0625	9.7592	0	0	0.1458	0	0.1458	0	0
19.3	0.0625	9.6151	0	0	0.1458	0	0.1457	0	0
19.4	0.0625	9.3500	0	0	0.1458	0	0.1354	0	0
19.5	0.0625	9.0008	0.0103	0	0.1458	0	0.1250	0	0
19.6	0.0625	8.5404	0.0104	0	0.1354	0	0.1250	0	0
19.7	0.0625	7.8909	0.0104	0	0.1236	0	0.1250	0	0
19.8	0.0625	7.2394	0.0104	0	0.1049	0	0.1250	0	0
19.9	0.0625	6.5250	0.0104	0	0.0739	0	0.1250	0	0

Table A.4c. Two-Mile Level Raw Data (continued).

MM	H_wetland	Build	Water	HIR	Commercial	Trans	Deciduous	Crop	Urb_veg
20	0.0625	5.8915	0.0104	0	0.0729	0	0.1250	0	0
20.1	0.0625	5.3248	0.0104	0	0.0729	0	0.1233	0	0
20.2	0.0573	4.7326	0.0104	0	0.0729	0	0.1146	0	0
20.3	0.0521	4.3192	0.0104	0	0.0729	0	0.0987	0	0
20.4	0.0521	3.9831	0.0104	0	0.0729	0	0.0937	0	0
20.5	0.0521	3.6630	0.0204	0	0.0729	0	0.0818	0	0
20.6	0.0521	3.4274	0.0208	0	0.0729	0	0.0582	0	0
20.7	0.0521	3.2837	0.0208	0	0.0729	0	0.0521	0	0
20.8	0.0521	3.1896	0.0208	0	0.0729	0	0.0476	0	0
20.9	0.0521	3.0983	0.0208	0	0.0729	0	0.0208	0	0
21	0.0521	2.9919	0.0208	0	0.0625	0	0	0	0
21.1	0.0521	2.8723	0.0208	0	0.0625	0	0	0	0
21.2	0.0521	2.7196	0.0208	0	0.0585	0	0	0	0
21.3	0.0521	2.6087	0.0208	0	0.0168	0	0.0104	0	0
21.4	0.0521	2.5086	0.0208	0	0	0	0.0104	0	0
21.5	0.0521	2.4388	0.0208	0	0	0	0.0104	0	0
21.6	0.0521	2.3783	0.0208	0	0	0	0.0111	0	0
21.7	0.0521	2.3155	0.0208	0	0	0	0.0209	0	0
21.8	0.0521	2.2290	0.0208	0	0	0	0.0312	0	0
21.9	0.0521	2.1359	0.0208	0	0	0	0.0312	0	0
22	0.0521	2.0214	0.0208	0	0	0	0.0312	0	0
22.1	0.0356	1.9217	0.0208	0	0	0	0.0312	0	0
22.2	0.0208	1.8272	0.0208	0	0	0	0.0312	0	0
22.3	0.0208	1.7202	0.0208	0	0	0	0.0312	0	0
22.4	0.0208	1.6461	0.0208	0	0.0030	0	0.0312	0	0
22.5	0.0208	1.5975	0.0208	0	0.0208	0	0.0312	0	0
22.6	0.0208	1.5666	0.0208	0	0.0433	0	0.0312	0	0
22.7	0.0170	1.5536	0.0208	0	0.0765	0	0.0312	0	0
22.8	0.0104	1.5567	0.0208	0	0.0833	0	0.0352	0	0
22.9	0.0118	1.5674	0.0531	0	0.0837	0	0.0417	0	0
23	0.0208	1.5818	0.0625	0	0.0937	0	0.0417	0	0
23.1	0.0208	1.6034	0.0651	0	0.1135	0	0.0417	0	0
23.2	0.0208	1.6112	0.0744	0	0.1458	0	0.0417	0	0
23.3	0.0208	1.6091	0.0833	0	0.1458	0	0.0417	0	0
23.4	0.0208	1.5865	0.0833	0	0.1510	0	0.0417	0	0
23.5	0.0208	1.5450	0.0833	0	0.1875	0	0.0417	0	0
23.6	0.0208	1.4911	0.0729	0	0.1875	0	0.0417	0	0
23.7	0.0208	1.4253	0.0729	0	0.1875	0	0.0417	0	0
23.8	0.0208	1.3605	0.0729	0	0.1875	0	0.0417	0	0
23.9	0.0208	1.3018	0.0729	0	0.1875	0	0.0417	0	0
24	0.0208	1.2472	0.0729	0	0.2054	0	0.0417	0	0
24.1	0.0208	1.2206	0.0729	0	0.2230	0	0.0417	0	0
24.2	0.0208	1.2040	0.0729	0	0.2291	0	0.0417	0	0
24.3	0.0208	1.2069	0.0729	0	0.2501	0	0.0521	0	0
24.4	0.0208	1.2506	0.0752	0	0.2604	0	0.0521	0	0
24.5	0.0208	1.3276	0.0833	0	0.2812	0	0.0521	0	0
24.6	0.0208	1.4114	0.0833	0	0.3020	0	0.0521	0	0
24.7	0.0208	1.5066	0.0833	0	0.3179	0	0.0521	0	0
24.8	0.0208	1.6348	0.0833	0	0.3333	0	0.0521	0	0
24.9	0.0208	1.7967	0.0833	0	0.3333	0	0.0521	0	0
25	0.0312	1.9581	0.0833	0	0.3333	0	0.0521	0	0
25.1	0.0312	2.0979	0.0833	0	0.3333	0	0.0521	0	0
25.2	0.0312	2.2196	0.0833	0	0.3333	0	0.0490	0	0

Table A.4c. Two-Mile Level Raw Data (continued).

MM	H_wetland	Build	Water	HIR	Commercial	Trans	Deciduous	Crop	Urb_veg
25.3	0.0312	2.3262	0.0833	0	0.3333	0	0.0417	0	0
25.4	0.0312	2.4087	0.0833	0	0.3333	0	0.0444	0	0
25.5	0.0312	2.4830	0.0833	0	0.3456	0	0.0521	0	0
25.6	0.0305	2.5063	0.0833	0	0.3673	0	0.0521	0	0
25.7	0.0104	2.5060	0.0833	0	0.3853	0	0.0521	0	0
25.8	0.0104	2.4992	0.0833	0	0.3853	0	0.0208	0	0
25.9	0.0104	2.4840	0.0833	0	0.3911	0	0.0208	0	0
26	0.0104	2.4679	0.0833	0	0.4221	0	0.0208	0	0
26.1	0.0104	2.4580	0.0833	0	0.4382	0	0.0208	0	0
26.2	0.0104	2.4522	0.0833	0	0.4509	0	0.0208	0	0
26.3	0.0104	2.4447	0.0833	0	0.5135	0	0.0208	0	0
26.4	0.0104	2.4318	0.0833	0	0.5906	0	0.0208	0	0
26.5	0.0104	2.4142	0.0833	0	0.6145	0	0.0208	0	0
26.6	0.0104	2.3951	0.0833	0	0.6145	0	0.0208	0	0
26.7	0.0104	2.3742	0.0833	0	0.6161	0	0.0208	0	0
26.8	0.0104	2.3562	0.0833	0	0.6071	0	0.0208	0	0
26.9	0.0104	2.3355	0.0833	0	0.5744	0	0.0208	0	0
27	0.0104	2.3134	0.0740	0	0.5728	0	0.0208	0	0
27.1	0.0104	2.2814	0.0439	0	0.5728	0	0.0208	0	0
27.2	0.0104	2.2643	0.0417	0	0.5624	0	0.0104	0	0
27.3	0.0104	2.2483	0.0417	0	0.5520	0	0.0104	0	0
27.4	0.0104	2.2473	0.0312	0	0.5268	0	0.0104	0	0
28.5	0.0104	2.2068	0.0208	0	0.5416	0	0.0104	0	0
29.2	0.0104	2.1549	0	0	0.5452	0	0.0312	0	0
29.8	0	1.4684	0	0	0.4439	0	0.0569	0	0
30	0	1.6770	0	0	0.4577	0	0.0729	0	0
30.7	0	7.3216	0.0312	0	1.0421	0	0.0729	0	0
31	0	11.1785	0.0312	0	1.1737	0	0.0729	0	0
31.4	0	15.3058	0.0312	0	1.1288	0	0.0914	0	0
31.8	0	16.0836	0.0312	0	1.1647	0	0.1217	0	0
32.2	0	16.4727	0.0312	0	1.1144	0	0.1696	0	0
32.3	0	16.5807	0.0312	0	1.1144	0	0.1862	0	0
32.4	0	16.6740	0.0312	0	1.1144	0	0.2044	0	0
32.5	0	16.7386	0.0312	0	1.1026	0	0.2201	0	0
32.6	0	16.7922	0.0312	0	1.0727	0	0.2284	0	0
32.7	0	16.8386	0.0312	0	1.0688	0	0.2325	0	0
33.6	0	17.0651	0.0312	0	1.0415	0	0.0729	0	0
34	0	16.1230	0.0312	0	0.9633	0	0.0277	0	0
34.1	0	15.3271	0.0312	0	0.8271	0	0.0208	0	0
34.2	0	14.2190	0.0299	0	0.7364	0	0.0104	0	0
34.3	0	13.1464	0.0402	0	0.6427	0	0.0104	0	0
34.4	0	11.8419	0.0417	0	0.5085	0	0.0104	0	0
34.5	0	10.1927	0.0417	0	0.3613	0	0.0104	0	0
34.6	0	8.9157	0.0417	0	0.1407	0	0.0104	0	0
35.4	0	3.7110	0.0208	0	0	0	0.0104	0	0
36.2	0	4.7069	0.0208	0	0	0	0.0104	0	0
36.7	0	4.8366	0.0208	0	0	0	0.1734	0	0
37.5	0	4.9023	0.0838	0	0	0	0.2187	0	0
37.6	0	4.9554	0.1366	0	0	0	0.2187	0	0
37.7	0	5.0103	0.2005	0	0	0	0.2187	0	0
37.8	0	5.0478	0.2481	0	0	0	0.2291	0	0
37.9	0	5.0588	0.2708	0	0	0	0.2291	0	0
38	0.0232	5.0712	0.3211	0	0	0	0.2299	0	0

Table A.4c. Two-Mile Level Raw Data (continued).

MM	H_wetland	Build	Water	HIR	Commercial	Trans	Deciduous	Crop	Urb_veg
38.5	0.0417	5.0933	0.8454	0	0	0	0.4347	0	0
39.1	0.0542	4.5531	4.6881	0	0.0104	0	0.5207	0	0
39.4	0.0625	3.9925	6.5404	0	0.0104	0	0.5312	0	0
39.9	0.0937	3.2961	9.2022	0	0.0104	0	0.5641	0	0
40.3	0.1179	3.2301	11.3641	0	0.0104	0	0.3336	0	0
41	0.1458	3.2674	14.4790	0	0.0104	0	0.0498	0	0
41.3	0.1458	3.1022	15.5063	0	0.0104	0	0.0104	0	0
42.2	0.1289	2.3478	15.0485	0	0.0208	0	0.0005	0	0
43.1	0.1250	2.5812	6.6967	0	0.0104	0	0.0000	0	0
44.1	0.1100	3.5255	2.3880	0	0.0114	0	0.0000	0	0
44.7	0.0937	7.3661	0.7751	0	0.4604	0	0.0000	0	0
45	0.0937	15.4599	0.7135	0.0104	1.3293	0	0.0000	0	0
45.5	0.0833	27.6185	0.6285	0.0104	2.0310	0	0.0104	0	0
45.8	0.0384	30.3899	0.4764	0.0104	2.0206	0	0.0104	0	0
46.1	0.0080	31.1123	0.3333	0.0104	2.0206	0	0.0104	0	0
46.4	0.0208	31.3664	0.3229	0.0104	2.0206	0	0.0104	0	0
46.7	0.0209	31.3804	0.3233	0.0104	2.0206	0	0.0104	0	0
47.6	0.0230	30.7197	0.1867	0.0104	2.0206	0	0.0111	0	0
47.8	0.0417	30.2546	0.1666	0.0104	2.0206	0	0.0266	0	0
48.1	0.0417	29.6711	0.1666	0.0104	2.0310	0	0.0909	0	0
48.4	0.0417	28.6527	0.1458	0.0104	1.9997	0	0.1042	0	0
49.4	0.0208	9.7344	0.0104	0	0.1761	0	0.1146	0	0
49.7	0.0208	5.7684	0.0369	0	0.0500	0	0.1146	0	0.0104
50	0	6.4100	0.0702	0	0.3305	0	0.1146	0	0.0512
50.2	0	9.2345	0.0729	0.0312	0.4598	0	0.1146	0	0.0839
50.6	0	15.1543	0.0729	0.0312	0.6666	0	0.1042	0	0.1771
51.3	0.0621	19.9798	0.0312	0.0312	0.6666	0	0.0833	0	0.1771
51.7	0.0625	21.2802	0.0312	0.0312	0.7376	0	0.0521	0	0.1771
52.2	0.0625	21.4051	0.0312	0.0312	0.8124	0	0.0208	0	0.1771
52.7	0.0625	21.5471	0.9441	0.0312	0.8124	0	0.0208	0	0.1771
53.6	0.0937	20.8162	4.2481	0.0312	0.8124	0	0.0104	0	0.1771
53.9	0.0312	19.7004	5.2993	0.0312	0.7521	0	0.0104	0	0.1666
54.5	0.0312	10.7352	7.1441	0	0.2804	0	0.0104	0	0.0312
55.1	0.0312	5.9131	7.0017	0	0.2288	0	0.0104	0	0
56.8	0	9.2001	0.2500	0	0.2884	0	0.0162	0	0.0208
57.1	0	11.2681	0.3035	0.0104	0.2834	0	0.0208	0	0.0208
57.6	0.0521	15.3650	0.9244	0.0235	0.3961	0	0.0417	0	0.5937
58.1	0.0625	26.8406	7.1796	0.0625	0.4544	0	0.0520	0	0.6041

APPENDIX B

OBSERVED CROSSING AREA DATA SET

Table B.1a. Local Level Raw Data
Table of raw data for the observed crossing area study at the local level. Abbreviations for landcover variables: MM, mile marker; Bed, sand tracking bed; Cross, number of deer crossing counted on tracking bed medium between 2003 and 2004; For, forest; Grass, grassland; Build, buildings; Rd Sight, road sight; Rd, auxiliary road; and Rd width, road width. Road sight, road width, and side sight are continuous variables all measured in meters. Speed limit is measured in miles per hour. All other variables categorical with 1 describing the variable as present and 0 describing the variable as not present.

MM	Bed	Cross	For	Grass	Build	Rd Sight	Slope	Rd	Rd Width	Side Sight	Speed limit
7.7	EV 2	72	1	0	1	100	1	1	24	10	65
8.7	EV 7	46	1	1	1	500	0	0	24	20	65
8.8	EV 8	63	1	1	1	500	1	1	24	30	65
9.3	EV 10	54	1	0	1	200	1	1	24	25	65
9.4	EV 11	73	1	0	1	200	1	1	24	25	65
9.6	EV 12	120	1	1	0	250	1	0	24	10	65
10	EV 13	64	1	1	0	500	0	1	36	10	65
10	EV 15	76	1	1	0	500	0	1	36	10	65
10.1	EV 14	64	1	1	0	500	0	1	36	10	65
10.1	EV 16	76	1	1	0	500	0	1	36	10	65
10.6	EV 18	117	1	0	0	100	0	1	24	5	65
10.7	PILOT W	44	1	0	0	150	1	1	36	8	65
10.7	PILOT E	70	1	0	0	150	1	1	36	8	65
23.1	RC 1	55	0	1	0	150	1	0	24	10	65
23.7	RC 2	54	0	1	0	50	1	0	24	30	65
24	RC 3	45	0	1	1	100	0	0	24	5	65
24.1	RC 4	95	0	1	0	100	1	0	24	15	65
24.8	RC 8	175	0	1	0	200	1	0	24	3	65
24.9	RC 9	175	0	1	0	200	1	0	24	3	65
25.2	RC 11	109	0	1	0	150	1	0	24	30	65
25.3	RC 12	109	0	1	0	150	1	0	24	30	65
25.4	RC 13	27	1	1	0	40	0	0	24	25	65
25.5	RC 14	16	1	1	0	40	0	0	24	25	65
25.8	RC 15	27	1	0	0	50	1	0	24	10	65
26	RC 16	26	0	1	0	50	0	0	24	5	65
26	RC 6a	39	0	1	0	50	0	0	24	5	65
26.1	RC 17	39	0	1	0	50	0	0	24	5	65
26.2	RC 18	31	0	1	0	150	1	0	24	25	65
26.3	RC 7a	18	0	1	0	100	1	0	24	5	65
26.4	RC 20	16	0	1	0	100	1	0	24	5	65
27.7	RH 1	61	0	1	0	50	0	1	36	5	65
27.8	RH 2	62	1	1	0	70	1	0	36	2	65
28.3	RH 9a	31	0	1	0	100	1	0	36	5	65
28.4	RH 5	14	0	1	0	250	1	0	36	3	65
28.6	RH 6	73	0	1	0	150	1	0	36	5	65
37.9	RH 3	62	1	1	0	70	1	0	36	2	65

Table B.1b. Local Level Raw Data
Additional raw data for the observed crossing area study at the local level._Abbreviations for landcover variables: Water, open water source; Ripar/wland, riparian or wetland area; Guard, guard rail;_Res/Urban, residential urban area; Grass ROW, grass in the right-of-way; Lights, streetlights; and Rail, railroad. All variables categorical with 1 describing the variable as present and 0 describing the variable as not present.

MM	Bed	Water	Ripar/ Wland	Guard	Gully	Ridge	Res/Urban	Grass ROW	Lights	Rail	Edge
7.7	EV 2	0	0	0	0	1	0	1	0	0	0
8.7	EV 7	0	0	0	1	0	0	1	0	0	0
8.8	EV 8	0	0	0	0	0	0	1	0	0	0
9.3	EV 10	1	1	1	0	1	0	1	0	0	1
9.4	EV 11	1	1	1	0	1	0	1	0	0	1
9.6	EV 12	0	0	0	1	0	0	1	0	0	0
10	EV 13	0	0	1	1	0	0	1	1	1	0
10	EV 15	0	0	1	1	0	0	1	1	1	0
10.1	EV 14	0	0	1	1	0	0	1	1	1	0
10.1	EV 16	0	0	1	1	0	0	1	1	1	0
10.6	EV 18	0	0	1	1	0	0	1	0	1	0
10.7	PILOT W	0	0	1	0	0	0	1	0	1	0
10.7	PILOT E	0	0	1	0	0	0	1	0	1	0
23.1	RC 1	1	1	1	0	0	0	1	0	1	0
23.7	RC 2	1	0	0	0	0	0	1	0	1	0
24	RC 3	1	1	0	0	1	0	1	0	1	0
24.1	RC 4	1	0	0	0	1	0	1	0	1	0
24.8	RC 8	0	1	0	0	0	0	1	0	1	0
24.9	RC 9	0	1	0	0	0	0	1	0	1	0
25.2	RC 11	1	1	0	0	1	0	1	0	0	0
25.3	RC 12	1	1	0	0	1	0	1	0	0	0
25.4	RC 13	1	1	0	0	1	0	1	0	1	0
25.5	RC 14	1	1	0	0	1	0	1	0	1	0
25.8	RC 15	1	1	1	0	0	0	1	0	1	0
26	RC 16	1	1	0	1	1	0	1	0	1	0
26	RC 6a	1	1	0	1	1	0	1	0	1	0
26.1	RC 17	1	1	0	1	1	0	1	0	1	0
26.2	RC 18	1	1	0	0	0	0	1	0	1	0
26.3	RC 7a	1	1	0	1	0	0	1	0	0	0
26.4	RC 20	1	1	0	1	0	0	1	0	0	0
27.7	RH 1	0	0	0	0	1	0	1	0	0	0
27.8	RH 2	0	0	0	1	1	0	1	0	0	0
28.3	RH 9a	0	1	1	1	0	0	1	0	0	0
28.4	RH 5	0	0	0	1	1	0	1	0	0	0
28.6	RH 6	0	0	0	0	1	0	1	0	0	0
37.9	RH 3	0	0	0	1	1	0	1	0	0	0

Table B.2a. Half-Mile Level Raw Data. Table of raw data for the observed crossing area study at the half-mile level. Abbreviations for landcover variables: MM, mile marker; Bed, sand tracking bed; Cross, number of deer crossings counted on tracking bed medium between 2003 and 2004; City, distance to nearest city; D_Water, distance to nearest water; Density, population density; LIR, low intensity residential development; Pine, pine forest; Shrub, shrub land; Grass, grassland; and Ag, agriculture. All variables continuous and measured in proportions per buffered layer.

MM	Bed	Cross	City	D_Water	Elev	Density	LIR	Pine	Shrub	Grass	Ag
7.7	EV 2	72	1573.65	197.82	1222.33	115.12	0	43.58	17.46	7.12	21.06
8.7	EV 7	46	3165.09	165.12	1219.37	51.77	0	52.94	10.52	9.31	16.83
8.8	EV 8	63	3325.23	170.93	1218.40	51.77	0	56.98	10.64	9.84	13.99
9.3	EV 10	54	4115.51	177.92	1209.57	157.11	0	67.89	7.35	16.95	0
9.4	EV 11	73	4261.09	179.62	1207.26	157.11	0.131	65.72	7.27	19.21	0
9.6	EV 12	120	4564.96	158.07	1202.90	157.11	0.166	65.39	7.78	19.95	0
10	EV 13	64	5062.29	121.37	1194.45	136.52	0.166	67.23	13.83	15.92	0
10	EV 15	76	5062.29	121.37	1194.45	136.52	0.166	67.23	13.83	15.92	0
10.1	EV 14	64	5191.75	125.18	1193.20	136.52	0.166	68.61	15.30	13.13	0
10.1	EV 16	76	5191.75	125.18	1193.20	136.52	0.166	68.61	15.30	13.13	0
10.6	EV 18	117	5862.99	278.78	1196.41	47.80	0	84.71	12.97	0.75	0
10.7	PiLOTW	44	6006.82	327.72	1198.87	47.80	0.499	85.43	12.26	0.16	0
10.7	PILOTE	70	6006.82	327.72	1198.87	47.80	0.499	85.43	12.26	0.16	0
23.1	RC 1	55	6385.77	126.02	869.58	16.90	0	2.79	12.10	17.72	18.20
23.7	RC 2	54	5498.85	114.32	873.97	16.70	0	6.61	22.17	34.15	9.96
24	RC 3	45	5033.76	128.63	873.92	16.70	0	3.89	15.89	45.42	9.35
24.1	RC 4	95	4883.48	136.78	875.26	16.70	0	4.96	15.40	45.72	8.68
24.8	RC 8	175	3844.16	128.13	881.80	14.52	0	12.83	20.85	56.86	0.81
24.9	RC 9	175	3686.29	138.48	885.96	14.52	0	14.53	21.84	57.06	0
25.2	RC 11	109	3224.94	198.53	913.79	12.45	0	19.71	21.54	55.33	0
25.3	RC 12	109	3043.92	223.22	921.77	12.45	0	21.11	19.99	55.99	0
25.4	RC 13	27	2892.33	255.16	928.97	12.45	0	22.64	17.47	57.66	0
25.5	RC 14	16	2740.90	272.15	934.79	12.45	0	25.16	17.46	55.37	0
25.8	RC 15	27	2431.97	239.71	937.65	32.14	0	34.27	19.45	44.90	0
26	RC 16	26	2236.96	235.60	943.21	32.14	0	38.85	17.16	42.18	0
26	RC 6a	39	2236.96	235.60	943.21	32.14	0	38.85	17.16	42.18	0
26.1	RC 17	39	2090.63	208.18	943.39	32.14	0	32.81	19.16	46.01	0
26.2	RC 18	31	1932.57	174.09	931.23	32.14	0	27.01	22.18	48.53	0
26.3	RC 7a	18	1750.71	163.53	919.44	32.14	0	24.28	25.24	47.45	0
26.4	RC 20	16	1609.22	166.35	911.73	32.14	0	25.53	25.17	45.63	0
27.7	RH 1	61	670.94	312.01	870.94	47.99	0	3.31	12.01	61.83	9.07
27.8	RH 2	62	754.21	319.23	871.18	47.99	0	1.32	11.71	68.76	7.93
28.3	RH 9a	31	1144.65	280.55	932.86	37.51	0	0.01	14.83	79.71	0
28.4	RH 5	14	1278.59	251.88	943.68	37.51	0	0	12.67	78.45	0.01
28.6	RH 6	73	1567.65	245.32	951.75	42.80	0	0.16	6.23	77.59	1.57
37.9	RH 3	62	8381.01	124.69	837.71	69.74	0	1.95	0.66	6.89	53.40

Table B.2b. Half-Mile Level Raw Data. Additional raw data for the observed crossing area study at the half-mile level. Abbreviations for landcover variables: Slope, slope in degrees; Water, water in the area; Comrcl, commercial property; Bare, bare land; and Trans, transitional land use. All variables continuous and measured in proportions per buffered layer.

MM	Bed	Slope	Water	Comrcl	Bare	Trans
7.7	EV 2	4.8204	0.3097	0.6665	0	0
8.7	EV 7	5.3771	0	1.4997	0	0
8.8	EV 8	5.2391	0	1.4997	0	0
9.3	EV 10	4.0937	0	1.4569	0.0008	0.1666
9.4	EV 11	4.0885	0	1.4997	0.1672	0.1666
9.6	EV 12	4.2915	0	1.7969	0.8332	0.1666
10	EV 13	4.8470	0	1.6663	0.8332	0
10	EV 15	4.8470	0	1.6663	0.8332	0
10.1	EV 14	4.9001	0	1.6149	0.8332	0
10.1	EV 16	4.9001	0	1.6149	0.8332	0
10.6	EV 18	7.0074	0	1.3891	0	0
10.7	PiLOTW	7.4039	0	1.4673	0	0
10.7	PILOTE	7.4039	0	1.4673	0	0
23.1	RC 1	3.7655	0	0	0	0
23.7	RC 2	6.2769	0	0	0	0
24	RC 3	7.5123	0	0.3333	0	0
24.1	RC 4	7.9071	0	0.6900	0	0
24.8	RC 8	13.0095	0.9998	2.3329	0	0
24.9	RC 9	14.0739	0.9998	2.2796	0	0
25.2	RC 11	18.0482	0.9998	1.7320	0	0
25.3	RC 12	19.1408	0.8958	1.6664	0	0
25.4	RC 13	20.0081	0.3803	1.6664	0	0
25.5	RC 14	20.6134	0.3333	1.4997	0	0
25.8	RC 15	20.5590	0	1.1954	0	0
26	RC 16	20.9416	0	1.4595	0	0
26	RC 6a	20.9416	0	1.4595	0	0
26.1	RC 17	21.1698	0	1.6664	0	0
26.2	RC 18	21.0453	0.1162	1.7747	0	0
26.3	RC 7a	20.6614	0.3333	1.8330	0	0
26.4	RC 20	20.1085	0.3333	2.1566	0	0
27.7	RH 1	13.8577	0	0.8332	0	0
27.8	RH 2	14.1684	0	0.8332	0	0
28.3	RH 9a	15.0590	0	2.0381	0	0
28.4	RH 5	13.9589	0	2.4007	0	0
28.6	RH 6	12.0273	0	3.3443	0	0
37.9	RH 3	0.9537	0	0	0	0

Table B.2c. Half-Mile Level Raw Data. Additional raw data for the observed crossing area study at the half-mile level. Abbreviations for landcover variables: Decid, deciduous forest; Past, pasture land;; W_wland, woody wetland; H_wland, herbaceous wetland; Urban, urban/recreational vegetation; Build, buildings; and HIR, high intensity residential. All variables continuous and measured in proportions per buffered layer.

MM	Decid	Past	W_ wland	H_ wland	Urban	Build	HIR
7.7	0	5.0439	1.3331	3.4150	0	16.3819	0
8.7	0	3.5700	4.3411	0.9710	0	8.8986	0
8.8	0	2.2504	4.7736	0.0020	0	8.8553	0
9.3	0	0	6.1654	0	0	15.0453	0
9.4	0	0	5.8209	0	0	16.5691	0
9.6	0	0	3.9081	0	0	18.6148	0
10	0	0	0.3416	0	0	14.6478	0
10	0	0	0.3416	0	0	14.6478	0
10.1	0	0	0.3333	0	0	12.0764	0
10.1	0	0	0.3333	0	0	12.0764	0
10.6	0	0	0.1666	0	0	3.6096	0
10.7	0	0	0.1666	0	0	4.7959	0
10.7	0	0	0.1666	0	0	4.7959	0
23.1	0.1666	48.9879	0.0090	0	0	3.6709	0
23.7	0.3333	26.1026	0.6624	0	0	3.2768	0
24	0.3333	22.3972	2.3648	0	0	2.7525	0
24.1	0	21.5302	2.9994	0	0	2.6785	0
24.8	0	3.1657	2.1376	0	0	3.3588	0
24.9	0	1.7566	1.5268	0	0	3.2984	0
25.2	0	0	0.6664	0	0	2.5050	0
25.3	0	0	0.3333	0	0	2.1532	0
25.4	0	0	0.1666	0	0	1.7619	0
25.5	0	0	0.1666	0	0	1.4352	0
25.8	0	0	0.1666	0	0	1.1612	0
26	0.1666	0	0.1666	0	0	1.3607	0
26	0.1666	0	0.1666	0	0	1.3607	0
26.1	0.1666	0	0.1666	0	0	2.0820	0
26.2	0.1666	0.0460	0.1666	0	0	3.4583	0
26.3	0.1666	0.5114	0.1666	0	0	5.0971	0
26.4	0.1666	0.9998	0	0	0	7.6851	0
27.7	0	12.8622	0	0.0654	0	14.1089	0
27.8	0	9.4151	0	0	0	10.5186	0
28.3	0	3.3969	0	0	0	2.4908	0
28.4	0	6.4456	0	0	0	1.2673	0
28.6	0	11.0806	0	0	0	0.5596	0
37.9	0	37.0554	0.0238	0	0	11.6011	0

Table B.3a. One-Mile Level Raw Data. Table of raw data for the observed crossing area study at the one-mile level. Abbreviations for landcover variables: MM, mile marker; Bed, sand tracking bed; Cross, number of deer crossings counted on tracking bed medium between 2003 and 2004; City, distance to nearest city; D_Water, distance to nearest water; and Elev, elevation. All variables continuous and measured in proportions per buffered layer.

MM	Bed	Cross	City	D_Water	Elev
7.7	EV 2	72	1743.0267	329.6254	1242.8158
8.7	EV 7	46	3242.4043	221.4461	1237.6417
8.8	EV 8	63	3398.6726	222.3786	1236.2646
9.3	EV 10	54	4174.4434	260.8332	1233.8511
9.4	EV 11	73	4317.9604	276.2798	1232.4602
9.6	EV 12	120	4617.9590	295.5191	1227.7262
10	EV 13	64	5109.9893	315.4237	1218.3079
10	EV 15	76	5109.9893	315.4237	1218.3079
10.1	EV 14	64	5238.2402	319.6058	1217.1736
10.1	EV 16	76	5238.2402	319.6058	1217.1736
10.6	EV 18	117	5904.0908	332.8372	1227.5278
10.7	PiLOTW	44	6046.9292	329.2861	1230.8538
10.7	PILOTE	70	6046.9292	329.2861	1230.8538
23.1	RC 1	55	6368.8062	172.3425	885.1040
23.7	RC 2	54	5542.7139	170.2767	895.7104
24	RC 3	45	5081.7397	155.3345	902.6404
24.1	RC 4	95	4932.9609	153.8679	905.2020
24.8	RC 8	175	3907.3667	188.5159	924.6406
24.9	RC 9	175	3752.2883	203.1118	929.5590
25.2	RC 11	109	3300.7642	261.8548	948.4984
25.3	RC 12	109	3124.4697	279.6570	955.9802
25.4	RC 13	27	2977.3267	303.2288	964.0734
25.5	RC 14	16	2830.8723	316.3670	971.0802
25.8	RC 15	27	2534.2427	300.7813	989.8544
26	RC 16	26	2348.9939	301.8802	1005.2667
26	RC 6a	39	2348.9939	301.8802	1005.2667
26.1	RC 17	39	2211.3896	317.4821	1007.7679
26.2	RC 18	31	2064.5859	342.9853	1006.5988
26.3	RC 7a	18	1898.9369	367.5109	1002.6863
26.4	RC 20	16	1773.7224	392.1517	998.0424
27.7	RH 1	61	1134.7966	397.0024	936.4268
27.8	RH 2	62	1178.0143	385.8046	934.9921
28.3	RH 9a	31	1410.0562	431.2793	965.6713
28.4	RH 5	14	1505.6591	450.3605	974.2211
28.6	RH 6	73	1737.8662	467.0874	988.3387
37.9	RH 3	62	8409.6719	145.5837	844.4450

Table B.3b. One-Mile Level Raw Data. Table of raw data for the observed crossing area study at the one-mile level. Abbreviations for landcover variables: MM, mile marker; Density, population density; LIR, low intensity residential development; Pine, pine forest; Shrub, shrub land; Grass, grassland; Ag, agriculture; and Urban, urban/recreational vegetation. All variables continuous and measured in proportions per buffered layer.

MM	Density	LIR	Pine	Shrub	Grass	Ag	Urban
7.7	84.3691	0	57.1773	12.3059	5.9059	15.7728	0
8.7	55.2563	0	73.7816	7.9512	6.7765	6.0116	0
8.8	55.2563	0.0417	74.5068	7.3482	7.0800	5.6819	0
9.3	108.0575	0.0417	76.8356	7.8808	7.7930	3.8165	0
9.4	108.0575	0.0417	77.0549	8.8426	7.5828	3.1006	0
9.6	108.0575	0.0417	78.0301	10.2390	7.2700	1.6770	0
10	98.7338	0.0417	79.1757	11.6530	6.5409	0	0
10	98.7338	0.0417	79.1757	11.6530	6.5409	0	0
10.1	98.7338	0.1540	78.9861	12.2863	6.2886	0	0
10.1	98.7338	0.1540	78.9861	12.2863	6.2886	0	0
10.6	53.6131	0.1666	80.2525	13.6945	4.2244	0	0.1250
10.7	53.6131	0.1666	81.0071	13.5421	3.7306	0	0.1250
10.7	53.6131	0.1666	81.0071	13.5421	3.7306	0	0.1250
23.1	17.5210	0	3.7823	10.2819	27.9394	12.4979	0
23.7	13.1704	0	5.0706	15.6888	39.7824	8.6512	0
24	13.1704	0	6.4161	18.3512	49.2870	5.6228	0
24.1	13.1704	0	6.9208	18.5341	52.4592	5.0370	0
24.8	12.1580	0	11.3792	15.3293	64.0466	1.5870	0
24.9	12.1580	0	12.1791	14.9830	65.3767	1.3039	0
25.2	14.5467	0	14.7483	15.3659	66.2715	0.5682	0
25.3	14.5467	0	16.1863	16.0861	64.8164	0.2726	0
25.4	14.5467	0	19.0272	15.8502	62.8283	0	0
25.5	14.5467	0	21.0366	16.5305	60.5802	0	0
25.8	26.8677	0	27.0617	18.8504	52.4592	0	0
26	26.8677	0	30.8922	17.3169	50.0966	0.0417	0
26	26.8677	0	30.8922	17.3169	50.0966	0.0417	0
26.1	26.8677	0	31.9851	17.2634	48.7054	0.0417	0
26.2	26.8677	0	32.7572	17.8349	46.8007	0.0417	0
26.3	26.8677	0	32.7133	18.3294	45.8436	0.0849	0
26.4	26.8677	0	31.7074	18.6056	46.0774	0.1666	0
27.7	40.3220	0	15.3664	11.9575	61.4618	3.3384	0
27.8	40.3220	0	11.5835	11.6944	64.9864	3.2161	0
28.3	27.2472	0	2.5763	9.6976	73.2192	6.2993	0
28.4	27.2472	0	1.4564	9.0448	76.1089	5.9848	0
28.6	37.3007	0	0.9165	7.9117	81.1711	4.5952	0
37.9	62.4343	0	2.8004	0.8808	3.9993	54.0734	0

Table B.3c. One-Mile Level Raw Data. Additional raw data for the observed crossing area study at the one-mile level. Abbreviations for landcover variables: Slope, slope in degrees; Water, water in the area; Commercial, commercial property; Bare, bare land; Trans, transitional land use. All variables continuous and measured in proportions per buffered layer.

MM	Bed	Slope	Water	Commercial	Bare	Trans
7.7	EV 2	5.9795	0.0833	0.3749	0	0.0074
8.7	EV 7	5.2667	0.0833	0.6559	0	0.1250
8.8	EV 8	5.2046	0.0833	0.7082	0.0277	0.1250
9.3	EV 10	6.0766	0	0.7915	0.2083	0.0417
9.4	EV 11	6.1054	0	0.7915	0.2083	0.0417
9.6	EV 12	6.1212	0	0.6989	0.2083	0.0417
10	EV 13	6.0930	0	0.8332	0.2083	0.0417
10	EV 15	6.0930	0	0.8332	0.2083	0.0417
10.1	EV 14	6.2059	0	0.8008	0.2083	0.0417
10.1	EV 16	6.2059	0	0.8008	0.2083	0.0417
10.6	EV 18	7.5451	0	1.2038	0.2083	0
10.7	PiLOTW	7.9047	0	1.1612	0.2083	0
10.7	PILOTE	7.9047	0	1.1612	0.2083	0
23.1	RC 1	5.0465	0.0417	0	0	0
23.7	RC 2	7.5523	0	0.2997	0	0
24	RC 3	9.2757	0.1666	0.3749	0	0
24.1	RC 4	9.7627	0.1681	0.4355	0	0
24.8	RC 8	12.9064	0.2500	0.7499	0	0
24.9	RC 9	13.4097	0.2500	0.7499	0	0
25.2	RC 11	15.4685	0.2500	0.9165	0	0
25.3	RC 12	16.3377	0.2500	0.9340	0	0
25.4	RC 13	17.1566	0.2621	1.0415	0	0
25.5	RC 14	17.8783	0.3333	1.0120	0	0
25.8	RC 15	19.7342	0.3333	0.8963	0	0
26	RC 16	20.5504	0.1666	0.9890	0	0
26	RC 6a	20.5504	0.1666	0.9890	0	0
26.1	RC 17	20.7644	0.1666	0.9582	0	0
26.2	RC 18	20.8812	0.1666	0.9165	0	0
26.3	RC 7a	20.9176	0.1250	0.8444	0	0
26.4	RC 20	20.9553	0.0833	0.7499	0	0
27.7	RH 1	17.0405	0.0072	0.7569	0	0
27.8	RH 2	16.6151	0	0.8122	0	0
28.3	RH 9a	14.1421	0	1.1596	0	0
28.4	RH 5	13.7330	0	1.2540	0	0
28.6	RH 6	13.0585	0	1.2914	0	0
37.9	RH 3	1.2408	0	0	0	0

Table B.3d. One-Mile Level Raw Data. Additional raw data for the observed crossing area study at the one-mile level. Abbreviations for landcover variables: Slope, slope in degrees; Water, water in the area; Commercial, commercial property; Bare, bare land; Trans, transitional land use; Deciduous, deciduous forest; Past, pasture land; W_wland, woody wetland; H_wland, herbaceous wetland; Build, buildings; and HIR, high intensity residential. All variables continuous and measured in proportions per buffered layer.

MM	Deciduous	Past	W_wland	H_wland	Build	HIR
7.7	0	6.3143	0.9334	1.1248	9.0202	0
8.7	0	1.7835	1.8732	0.9581	8.3418	0
8.8	0	1.5645	1.8746	0.9581	8.8163	0
9.3	0	0.9244	1.6663	0.0003	9.3622	0
9.4	0	0.6697	1.6663	0	9.0459	0
9.6	0	0.2104	1.5830	0	8.2564	0
10	0	0	1.5056	0	6.9063	0
10	0	0	1.5056	0	6.9063	0
10.1	0	0	1.2342	0	6.8592	0
10.1	0	0	1.2342	0	6.8592	0
10.6	0	0	0.1250	0	7.4735	0
10.7	0	0	0.0592	0	7.1349	0
10.7	0	0	0.0592	0	7.1349	0
23.1	0.1250	44.9153	0.4166	0	2.2131	0
23.7	0.1250	29.5078	0.8747	0	2.0692	0
24	0.1250	18.5732	1.0831	0	1.9972	0
24.1	0.1250	15.2373	1.0831	0	1.9633	0
24.8	0	5.6166	1.0415	0	1.4997	0
24.9	0	4.1160	1.0415	0	1.4249	0
25.2	0	1.2131	0.6665	0	1.3571	0
25.3	0	0.8708	0.5839	0	1.3423	0
25.4	0.0195	0.5249	0.4463	0	1.3722	0
25.5	0.0417	0.1743	0.2916	0	1.6615	0
25.8	0.0417	0.1904	0.1669	0	2.4828	0
26	0.0417	0.4138	0.0417	0	3.2636	0
26	0.0417	0.4138	0.0417	0	3.2636	0
26.1	0.0417	0.7964	0.0417	0	3.9905	0
26.2	0.0417	1.3991	0.0417	0	4.8840	0
26.3	0.0417	1.9344	0.0417	0.0417	5.6202	0
26.4	0.0417	2.4848	0.0417	0.0417	6.4159	0
27.7	0	6.8617	0.2083	0.0417	7.7101	0
27.8	0	7.4606	0.2051	0.0417	7.1563	0
28.3	0	7.0274	0	0.0208	5.3006	0
28.4	0	6.1511	0	0	4.3422	0
28.6	0	4.1140	0	0	2.3758	0
37.9	0.3264	37.6697	0.2500	0	8.8222	0

Table B.4a. Two-Mile Level Raw Data. Table of raw data for the observed crossing area study at the two-mile level. Abbreviations for landcover variables: MM, mile marker; Bed, sand tracking bed; Cross, number of deer crossings counted on tracking bed medium between 2003 and 2004; City, distance to nearest city; D_Water, distance to nearest water; and Density, population density. All variables continuous and measured in proportions per buffered layer.

MM	Bed	Cross	City	D_Water	Elevation	Density
7.7	EV 2	72	2495.8354	474.1563	1296.0720	42.9362
8.7	EV 7	46	3574.3857	346.7293	1294.9113	52.1255
8.8	EV 8	63	3711.5371	338.9945	1295.2930	52.1255
9.3	EV 10	54	4420.3926	328.6391	1289.4001	45.1000
9.4	EV 11	73	4554.7681	329.3904	1286.3182	45.1000
9.6	EV 12	120	4835.0449	330.0246	1279.4368	45.1000
10	EV 13	64	5288.7451	323.6846	1276.6410	43.8656
10	EV 15	76	5288.7451	323.6846	1276.6410	43.8656
10.1	EV 14	64	5405.3369	321.5110	1278.0126	43.8656
10.1	EV 16	76	5405.3369	321.5110	1278.0126	43.8656
10.6	EV 18	117	5998.0107	321.8854	1297.7445	41.7747
10.7	PiLOTW	44	6117.1943	320.7692	1303.7642	41.7747
10.7	PILOTE	70	6117.1943	320.7692	1303.7642	41.7747
23.1	RC 1	55	6043.0347	178.7926	936.3075	14.0910
23.7	RC 2	54	5579.2852	188.6846	945.5908	10.7495
24	RC 3	45	5235.3550	208.8999	950.5471	10.7495
24.1	RC 4	95	5112.2236	218.1452	953.3143	10.7495
24.8	RC 8	175	4172.5679	271.8443	975.2111	12.4436
24.9	RC 9	175	4030.2346	281.5876	979.4330	12.4436
25.2	RC 11	109	3625.3396	314.6873	994.4023	15.3035
25.3	RC 12	109	3473.1504	326.2018	998.7525	15.3035
25.4	RC 13	27	3349.9270	341.2049	1003.4796	15.3035
25.5	RC 14	16	3231.1904	352.1691	1008.5421	15.3035
25.8	RC 15	27	3004.0049	369.7882	1022.8629	18.8075
26	RC 16	26	2871.9453	387.7534	1031.3560	18.8075
26	RC 6a	39	2871.9453	387.7534	1031.3560	18.8075
26.1	RC 17	39	2779.0151	397.5581	1034.7950	18.8075
26.2	RC 18	31	2684.8279	406.7115	1036.1361	18.8075
26.3	RC 7a	18	2584.6643	413.6671	1035.9214	18.8075
26.4	RC 20	16	2512.9814	422.8776	1034.0997	18.8075
27.7	RH 1	61	2177.2153	469.2228	1028.5763	21.5232
27.8	RH 2	62	2198.8662	463.1574	1029.0037	21.5232
28.3	RH 9a	31	2317.3489	413.7785	1023.1008	19.7473
28.4	RH 5	14	2367.2725	402.4628	1020.9948	19.7473
28.6	RH 6	73	2485.5381	382.6275	1017.1251	21.2037
37.9	RH 3	62	8526.6973	164.5868	859.9479	39.3582

Table B.4b. Two-Mile Level Raw Data. Table of raw data for the observed crossing area study at the two-mile level. Abbreviations for landcover variables: MM, mile marker; LIR, low intensity residential development; Pine, pine forest; Shrub, shrub land; Grass, grassland; Ag, agriculture; Urban, urban/recreational vegetation; and Build, buildings. All variables continuous and measured in proportions per buffered layer.

MM	LIR	Pine	Shrub	Grass	Ag	Urban	Build
7.7	0.0104	76.2751	8.5901	5.3598	5.7800	0	5.0211
8.7	0.0104	80.0153	7.7610	4.3656	4.3092	0	4.7675
8.8	0.0104	80.5743	7.8970	4.2271	3.9957	0	4.6283
9.3	0.0417	83.9580	8.1039	3.4150	2.2866	0.0183	4.3226
9.4	0.0417	84.0499	8.0960	3.5360	2.0783	0.0312	4.3440
9.6	0.0417	83.5335	7.9963	4.0852	1.7872	0.0312	4.4069
10	0.0417	82.8720	7.3359	4.0770	2.0669	0.0312	4.5333
10	0.0417	82.8720	7.3359	4.0770	2.0669	0.0312	4.5333
10.1	0.0417	82.6788	7.3293	4.0780	2.1435	0.0312	4.5676
10.1	0.0417	82.6788	7.3293	4.0780	2.1435	0.0312	4.5676
10.6	0.0417	80.9599	7.8791	4.1949	2.7231	0.0312	4.4648
10.7	0.0417	80.5819	7.8850	4.2884	2.7976	0.0312	4.3878
10.7	0.0417	80.5819	7.8850	4.2884	2.7976	0.0312	4.3878
23.1	0	4.9412	10.8998	46.9081	7.9366	0	1.6034
23.7	0	6.4103	11.4938	49.7950	5.6917	0	1.4253
24	0	7.0116	12.5003	52.0202	4.6896	0	1.2472
24.1	0	7.4033	12.7397	52.9065	4.1816	0	1.2206
24.8	0	13.0814	15.1554	56.1289	2.0978	0	1.6348
24.9	0	14.1182	15.5576	56.4974	1.8489	0	1.7967
25.2	0	15.7822	15.9896	59.1601	1.1435	0	2.2196
25.3	0	16.2476	15.9980	60.0056	0.9687	0	2.3262
25.4	0	16.8787	15.7375	60.3533	0.9922	0	2.4087
25.5	0	17.3308	15.8285	60.1207	1.1245	0	2.4830
25.8	0	17.5070	16.4253	60.1431	1.2782	0	2.4992
26	0	17.9349	16.1749	59.9303	1.5732	0	2.4679
26	0	17.9349	16.1749	59.9303	1.5732	0	2.4679
26.1	0	18.4318	16.0087	59.4696	1.6933	0	2.4580
26.2	0	19.0411	15.7324	59.0610	1.8297	0	2.4522
26.3	0	19.4581	15.3954	58.9366	1.9905	0	2.4447
26.4	0	19.7106	15.1613	58.9210	2.1063	0	2.4318
27.7	0	18.4816	12.5712	61.5407	3.0426	0	2.3067
27.8	0	17.7949	12.6931	62.0581	3.0794	0	2.3120
28.3	0	13.8897	11.6553	66.2255	4.2993	0	2.1989
28.4	0	12.6852	11.3840	67.5255	4.3403	0	2.2055
28.6	0	10.3694	10.6251	70.1971	4.3870	0	2.2091
37.9	0	1.9168	0.9307	2.1335	52.5987	0	5.0588

Table B.4c. Two-Mile Level Raw Data. Additional raw data for the observed crossing area study at the two-mile level._Abbreviations for landcover variables: Slope, slope in degrees; Water, water in the area; Commercial, commercial property; Bare, bare land; and Trans, transitional land use. All variables continuous.

MM	Bed	Slope	Water	Commercial	Bare	Trans
7.7	EV 2	9.6252	0.0208	0.2188	0	0.2029
8.7	EV 7	9.1217	0.0208	0.3184	0.0521	0.3645
8.8	EV 8	9.2033	0.0208	0.3228	0.0521	0.3645
9.3	EV 10	9.6593	0.0208	0.4166	0.0521	0.3645
9.4	EV 11	9.6796	0.0208	0.4169	0.0521	0.3645
9.6	EV 12	9.6800	0.0208	0.4374	0.0521	0.3672
10	EV 13	9.7001	0.0208	0.4323	0.0521	0.2408
10	EV 15	9.7001	0.0208	0.4323	0.0521	0.2408
10.1	EV 14	9.7817	0.0208	0.4166	0.0521	0.1477
10.1	EV 16	9.7817	0.0208	0.4166	0.0521	0.1477
10.6	EV 18	10.5788	0	0.4166	0.0521	0.0104
10.7	PiLOTW	10.8833	0	0.3908	0.0521	0.0104
10.7	PILOTE	10.8833	0	0.3908	0.0521	0.0104
23.1	RC 1	7.8145	0.0651	0.1135	0	0
23.7	RC 2	8.8170	0.0729	0.1875	0	0
24	RC 3	9.6101	0.0729	0.2054	0	0
24.1	RC 4	9.9172	0.0729	0.2230	0	0
24.8	RC 8	12.2790	0.0833	0.3333	0	0
24.9	RC 9	12.6379	0.0833	0.3333	0	0
25.2	RC 11	13.8192	0.0833	0.3333	0	0
25.3	RC 12	14.1444	0.0833	0.3333	0	0
25.4	RC 13	14.5070	0.0833	0.3333	0	0
25.5	RC 14	14.8482	0.0833	0.3456	0	0
25.8	RC 15	15.6804	0.0833	0.3853	0	0
26	RC 16	15.9907	0.0833	0.4221	0	0
26	RC 6a	15.9907	0.0833	0.4221	0	0
26.1	RC 17	16.1724	0.0833	0.4382	0	0
26.2	RC 18	16.2778	0.0833	0.4509	0	0
26.3	RC 7a	16.3255	0.0833	0.5135	0	0
26.4	RC 20	16.4469	0.0833	0.5906	0	0
27.7	RH 1	17.8168	0.0208	0.5095	0	0
27.8	RH 2	17.8636	0.0208	0.5157	0	0
28.3	RH 9a	16.5886	0.0208	0.5312	0	0
28.4	RH 5	16.1633	0.0208	0.5312	0	0
28.6	RH 6	15.4713	0.0208	0.5687	0	0
37.9	RH 3	1.5371	0.2708	0	0	0

Table B.4d. Two-Mile Level Raw Data. Additional raw data for the observed crossing area study at the two-mile level._Abbreviations for landcover variables: Decid, deciduous forest; Past, pasture land;; W_wland, woody wetland; H_wland, herbaceous wetland; HIR, high intensity residential; and Mixed, mixed forest. All variables continuous.

MM	Decid	Past	W_wland	H_wland	HIR	Mixed
7.7	0.0415	2.3224	0.8344	0.3020	0	0.0208
8.7	0	1.6887	0.7918	0.2916	0	0.0104
8.8	0	1.4766	0.7669	0.2812	0	0.0104
9.3	0	0.5311	0.5103	0.2812	0	0
9.4	0	0.5235	0.5103	0.2787	0	0
9.6	0	0.7359	0.6720	0.2395	0	0
10	0	1.8608	0.7290	0.2395	0	0
10	0	1.8608	0.7290	0.2395	0	0
10.1	0	2.0079	0.8219	0.2304	0	0
10.1	0	2.0079	0.8219	0.2304	0	0
10.6	0	2.7062	0.9848	0	0	0
10.7	0	2.9181	1.0028	0	0	0
10.7	0	2.9181	1.0028	0	0	0
23.1	0.0417	28.6524	0.4209	0.0208	0	0
23.7	0.0417	25.8594	0.4270	0.0208	0	0
24	0.0417	23.0506	0.3868	0.0208	0	0
24.1	0.0417	22.0252	0.3853	0.0208	0	0
24.8	0.0521	12.7346	0.3124	0.0208	0	0
24.9	0.0521	11.1761	0.3124	0.0208	0	0
25.2	0.0490	7.1152	0.3124	0.0312	0	0
25.3	0.0417	5.9781	0.3124	0.0312	0	0
25.4	0.0444	5.2337	0.3123	0.0312	0	0
25.5	0.0521	4.7881	0.2952	0.0312	0	0
25.8	0.0208	3.8768	0.2697	0.0104	0	0
26	0.0208	3.5896	0.2604	0.0104	0	0
26	0.0208	3.5896	0.2604	0.0104	0	0
26.1	0.0208	3.5784	0.2655	0.0104	0	0
26.2	0.0208	3.5373	0.2329	0.0104	0	0
26.3	0.0208	3.3727	0.2186	0.0104	0	0
26.4	0.0208	3.1770	0.2187	0.0104	0	0
27.7	0.0104	3.7503	0.0625	0.0104	0	0
27.8	0.0104	3.7548	0.0625	0.0104	0	0
28.3	0.0104	3.3054	0.0521	0.0104	0	0
28.4	0.0104	3.4401	0.0521	0.0104	0	0
28.6	0.0115	3.7475	0.0625	0.0104	0	0
37.9	0.2291	41.8268	0.0937	0	0	0

APPENDIX C

STATISTICAL OUTPUT OF DEER VEHICLE COLLISION A PRIORI MODELS

Table C. Description and associated statistics for a priori models concerning the effects of road and landscape characteristics affecting deer vehicle collisions at three spatial scales at each 160.9 meters study point along US Highway 93. Binary logistic regression output: N=266.

	Local Level										
	Model	Coefficient	Std Error	P-Value	Likelihood	AIC_c	W_i	Goodness of Fit			
1)	β_0	-0.57725	0.240110	0.016	- 169.438	349.11	0.0001				
	β_1 (edge)	-1.45019	0.472622	0.002				Method	Chi^2	DF	P
	β_2 (road)	0.21225	0.275054	0.44				Pearson	7.64227	4	0.106
	β_3 (water)	0.81884	0.291739	0.005				Deviance	7.19787	4	0.126
2)	β_0	-0.66105	0.270584	0.015	- 170.841	354.01	0.0000				
	β_1 (forest)	0.6152	0.273291	0.024				Method	Chi^2	DF	P
	β_2 (edge)	-1.65093	0.478671	0.001				Pearson	19.1968	10	0.038
	β_3 (building)	0.18883	0.267090	0.480				Deviance	15.9614	10	0.101
	β_4 (slope)	0.03283	0.285367	0.908							
3)	β_0	-0.56786	0.403442	0.103	- 170.841	356.12	0.0000				
	β_1 (forest)	0.61501	0.273872	0.025				Method	Chi^2	DF	P
	β_2 (edge)	-1.65066	0.479334	0.001				Pearson	113.356	84	0.018
	β_3 (building)	0.18913	0.268508	0.481				Deviance	127.978	84	0.001
	β_4 (road sight)	-0.000009	0.000864	0.991							
	β_5 (slope)	0.03196	0.296740	0.914							
4)	β_0	-0.5916	0.372253	0.036	- 169.287	353.01	0.0000				
	β_1 (edge)	-1.46066	0.474075	0.002				Method	Chi^2	DF	P
	β_2 (road)	0.16184	0.306972	0.598				Pearson	22.1712	22	0.450
	β_3 (water)	0.87492	0.315979	0.006				Deviance	22.8101	22	0.413
	β_4 (slope)	0.12622	0.303034	0.677							
	β_5 (buildings)	0.09090	0.30	0.761							
5)	β_0	-4.26012	1.53248	0.005	-167.411	351.38	0.0000				
	β_1 (forest)	0.62082	0.27661	0.025				Method	Chi^2	DF	P
	β_2 (edge)	-1.72402	0.483632	0.000				Pearson	141.809	106	0.012
	β_3 (building)	0.35239	0.277585	0.204				Deviance	159.835	105	0.001
	β_4 (road sight)	-0.00003	0.0008749	0.968							
	β_5 (slope)	0.10985	0.301969	0.716							
	β_6 (speed limit)	0.05579	0.022754	0.014							

Table C. Local Level DVC a priori output (continued).

	Model	Coefficients	Std Error	P-Value	Likelihood	AIC_c	W_i
6)	β_0	-0.79335	0.423781	0.061	- 164.107	346.92	0.0004
	β_1 (forest)	0.61255	0.279496	0.028			
	β_2 (edge)	-1.73453	0.487215	0.000			
	β_3 (building)	0.28374	0.304786	0.352			
	β_4 (road sight)	-0.00016	0.0008942	0.855			
	β_5 (slope)	0.20132	0.308494	0.514			
	β_6 (res/urban)	-1.72959	0.537658	0.001			
	β_7 (road)	0.37939	0.312567	0.225			
7)	β_0	-1.38276	0.473219	0.003	- 154.511	332.06	0.7471
	β_1 (forest)	0.75451	0.301488	0.012			
	β_2 (edge)	-1.86934	0.510843	0.000			
	β_3 (building)	0.23299	0.318998	0.465			
	β_4 (road sight)	0.00081	0.0009661	0.401			
	β_5 (slope)	-0.47068	0.363099	0.195			
	β_6 (res/urban)	-1.62437	0.554109	0.003			
	β_7 (road)	0.47472	0.330172	0.150			
	β_8 (water)	0.7231	0.339540	0.033			
	β_9 (ridge)	1.94976	0.590641	0.001			
8)	β_0	-1.69678	2.15594	0.431	- 154.500	334.23	0.2522
	β_1 (forest)	0.75557	0.301543	0.012			
	β_2 (edge)	-1.87274	0.511530	0.000			
	β_3 (building)	0.23725	0.320285	0.459			
	β_4 (road sight)	0.0008	0.0009667	0.404			
	β_5 (slope)	-0.47174	0.363083	0.194			
	β_6 (res/urban)	-1.55153	0.736165	0.035			
	β_7 (road)	0.47364	0.330263	0.152			
	β_8 (water)	0.72531	0.339754	0.033			
	β_9 (ridge)	1.94595	0.591139	0.001			
	β_{10} (speed limit)	0.00489	0.032767	0.881			

Goodness of Fit

Model	Method	Chi^2	DF	P
6)	Pearson	151.920	122	0.034
6)	Deviance	169.359	122	0.003
7)	Pearson	177.973	148	0.047
7)	Deviance	186.806	148	0.017
8)	Pearson	193.583	156	0.022
8)	Deviance	203.616	156	0.006

Table C. Half-Mile Level DVC a priori output (continued).

	Model	Coefficient	Std Error	P-Value	Likelihd	AIC_c	W_i	Goodness of Fit			
1)	β_0	0.04228	1.07464	0.969	-175.77	366.28	0.1620				
	β_1 (nearest city)	0.00005	0.00005	0.330				Method	Chi^2	DF	P
	β_2 (elevation)	-0.00065	0.0011	0.553				Pearson	266.026	263	0.436
								Deviance	358.127	263	0.000
2)	β_0	-0.30072	0.17679	0.089	-177.86	365.95	0.1907				
	β_1 (pop density)	-0.00099	0.00071	0.162				Method	Chi^2	DF	P
	β_2 (resident:low)	0.18899	0.10898	0.083				Pearson	254.163	248	0.380
	β_3 (pine)	0.00031	0.00517	0.952				Deviance	339.087	248	0.000
3)	β_0	2.31734	1.85335	0.211	-179.06	366.61	0.1369				
	β_1 (elevation)	-0.00280	0.00197	0.155				Method	Chi^2	DF	P
	β_2 (slope)	-0.03960	0.02835	0.162				Pearson	266.370	262	0.412
	β_3 (pine)	0.01431	0.00995	0.151				Deviance	356.385	262	0.000
4)	β_0	1.68211	1.81530	0.354	-178.19	369.05	0.0406				
	β_1 (nearest city)	0.00004	0.00005	0.422				Method	Chi^2	DF	P
	β_2 (elevation)	-0.00234	0.00191	0.220				Pearson	266.179	261	0.400
	β_3 (shrub)	-0.01856	0.02164	0.391				Deviance	356.721	261	0.000
	β_4 (pine)	0.01187	0.01031	0.250							
5)	β_0	-0.15578	0.38406	0.685	-176.2	367.68	0.0805				
	β_1 (grass)	-0.01092	0.00899	0.224				Method	Chi^2	DF	P
	β_2 (pasture)	-0.00334	0.00572	0.559				Pearson	265.854	259	0.372
	β_3 (agriculture)	0.00089	0.00572	0.876				Deviance	355.353	259	0.000
	β_4 (bare)	0.641965	0.54205	0.236							
6)	β_0	-0.16334	0.23737	0.491	-177.68	371.29	0.0132				
	β_1 (shrubs)	0.01748	0.02996	0.560				Method	Chi^2	DF	P
	β_2 (grass)	-0.0149	0.01098	0.175				Pearson	265.707	259	0.374
	β_3 (pine)	-0.00232	0.00707	0.743				Deviance	356.855	259	0.000
	β_4 (wetland)	-0.03332	0.05944	0.575							
	β_5 (pop density)	0.00004	0.00038	0.921							

Table C. Half-Mile Level DVC a priori output (continued).

	Model	Coefficient	Std Error	P-Value	Likelihood	AIC_c	W_i	Goodness of Fit			
7)	β_0	0.12851	0.40220	0.749	-178.12	368.56	0.0517	Method	Chi^2	DF	P
	β_1 (pine)	-0.00585	0.00797	0.463				Pearson	265.613	261	0.409
	β_2 (shrub)	0.01104	0.02900	0.703				Deviance	356.238	261	0.000
	β_3 (grass)	-0.01632	0.01090	0.134							
	β_4 (pasture)	-0.00719	0.00740	0.331							
8)	β_0	0.27024	0.32951	0.412	-178.36	365.98	0.1879				
	β_1 (pine)	0.00208	0.00559	0.709				Method	Chi^2	DF	P
	β_2 (resident:low)	0.05671	0.06269	0.366				Pearson	267.567	260	0.360
	β_3 (slope)	-0.02899	0.02692	0.282				Deviance	351.548	260	0.000
	β_4 (wetland)	-0.03376	0.06108	0.580							
	β_5 (nearest water)	-0.00213	0.00096	0.027							
9)	β_0	-0.15753	0.42399	0.710	-169.63	366.84	0.1225				
	β_1 (nearest city)	0.000001	0.00006	0.988				Method	Chi^2	DF	P
	β_2 (pop density)	-0.00110	0.00082	0.181				Pearson	265.909	260	0.387
	β_3 (resident:low)	0.18369	0.11426	0.108				Deviance	352.403	260	0.000
	β_4 (grass)	-0.00947	0.00794	0.233							
	β_5 (bare)	0.71299	0.56469	0.207							
10)	β_0	17.0406	13.2627	0.199	-178.43	371.18	0.0140				
	β_1 (nearest city)	-0.00006	0.00007	0.415				Method	Chi^2	DF	P
	β_2 (nearest water)	-0.00118	0.00115	0.302				Pearson	263.372	252	0.299
	β3 (pop density)	-0.00137	0.00102	0.179				Deviance	339.261	252	0.000
	β_4 (elevation)	-0.00817	0.00349	0.019							
	β_5 (slope)	-0.06837	0.05729	0.233							
	β_6 (resident:low)	-0.0169	0.23624	0.43							
	β_7 (bare)	1.02779	0.63917	0.108							
	β_8 (pine)	-0.06440	0.11820	0.586							
	β_9 (shrub)	-0.05939	0.12032	0.622							
	β_{10} (grass)	-0.10998	0.12522	0.380							
	β_{11} (pasture)	-0.10072	0.11877	0.396							
	β_{12} (ag)	-0.07905	0.1169	0.499							
	β_{13} (wetland)	0.01519	0.12191	0.901							

Table C. One-Mile Level DVC a priori output (continued).

	Model	Coefficient	Std Error	P-Value	Likelihood	AIC_c	W_i	Goodness of Fit			
1)	β_0	0.19836	1.07894	0.854	- 179.06	366.20	0.0366				
	β_1 (nearest city)	0.00005	0.00005	0.367				Method	Chi^2	DF	P
	β_2 (elevation)	-0.00797	0.00107	0.459				Pearson	266.072	263	0.435
								Deviance	358.047	263	0.000
2)	β_0	-0.27787	0.18990	0.143	- 177.86	364.55	0.0835				
	β_1 (pop density)	-0.00155	0.00097	0.112				Method	Chi^2	DF	P
	β_2 (resident:low)	0.52080	0.25283	0.039				Pearson	265.950	262	0.420
	β_3 (pine)	-0.00062	0.00484	0.898				Deviance	354.323	262	0.000
3)	β_0	3.39231	2.31502	0.143	- 178.19	365.17	0.0613				
	β_1 (elevation)	-0.00391	0.00250	0.118				Method	Chi^2	DF	P
	β_2 (slope)	-0.04367	0.02746	0.112				Pearson	266.247	262	0.415
	β_3 (pine)	0.01793	0.01157	0.121				Deviance	354.938	262	0.000
4)	β_0	3.25609	2.36728	0.169	- 329.528	367.29	0.0212				
	β_1 (nearest city)	0.00003	0.00005	0.538				Method	Chi^2	DF	P
	β_2 (elevation)	-0.00393	0.00252	0.119				Pearson	266.116	261	0.401
	β_3 (shrub)	-0.03576	0.02604	0.170				Deviance	354.965	261	0.000
	β_4 (pine)	0.01934	0.01230	0.116							
5)	β_0	-0.30656	0.36741	0.404	- 326.840	368.32	0.0127				
	β_1 (grass)	-0.00958	0.00824	0.245				Method	Chi^2	DF	P
	β_2 (pasture)	0.00285	0.00692	0.681				Pearson	266.175	261	0.400
	β_3 (agriculture)	-0.00002	0.00670	0.997				Deviance	355.993	261	0.000
	β_4 (bare)	0.95676	1.17644	0.416							
6)	β_0	0.41354	0.31636	0.191	- 325.975	363.14	0.1695				
	β_1 (shrubs)	0.03234	0.04573	0.479				Method	Chi^2	DF	P
	β_2 (grass)	-0.02607	0.01348	0.053				Pearson	266.254	260	0.382
	β_3 (pine)	-0.00822	0.00866	0.343				Deviance	348.702	260	0.000
	β_4 (wetland)	-0.23217	0.09969	0.008							
	β_5 (pop density)	-0.00011	0.00050	0.823							
7)	β_0	-0.04261	0.51283	0.934	- 327.047	368.69	0.0106				
	β_1 (pine)	-0.00526	0.00972	0.588				Method	Chi^2	DF	P
	β_2 (shrub)	0.01469	0.04386	0.738				Pearson	266.007	261	0.402
	β_3 (grass)	-0.01583	0.01297	0.222				Deviance	356.364	261	0.000
	β_4 (pasture)	-0.00122	0.01015	0.904							

Table C. One-Mile Level DVC a priori output (continued).

	Model	Coefficients	Std Error	P-Value	Likelihood	AIC$_c$	W$_i$	Goodness of Fit			
8)	β_0	0.61709	0.37347	0.098	- 320.339	360.74	0.5627				
	β_1 (pine)	0.00386	0.00506	0.446				Method	Chi^2	DF	P
	β_2 (resident:low)	0.09242	0.13347	0.489				Pearson	267.080	260	0.368
	β_3 (slope)	-0.03811	0.02893	0.188				Deviance	346.301	260	0.000
	β_4 (wetland)	-0.20562	0.10274	0.045							
	β_5 (nearest water)	-0.00234	0.00112	0.037							
9)	β_0	-0.12682	0.47851	0.791	- 326.213	366.37	0.0337				
	β_1 (nearest city)	0.000004	0.00007	0.948				Method	Chi^2	DF	P
	β_2 (pop density)	-0.00160	0.00110	0.146				Pearson	266.174	260	0.383
	β_3 (resident:low)	0.48929	0.26158	0.061				Deviance	351.933	260	0.000
	β_4 (grass)	-0.00970	0.00781	0.214							
	β_5 (bare)	0.59613	1.31823	0.651							
10)	β_0	3.65495	7.22717	0.613	- 316.904	369.19	0.0082				
	β_1 (nearest city)	-0.00004	0.00008	0.638				Method	Chi^2	DF	P
	β_2 (nearest water)	-0.00296	0.00149	0.047				Pearson	262.753	252	0.308
	β3 (pop density)	-0.00136	0.00128	0.288				Deviance	337.275	252	0.000
	β_4 (elevation)	0.00029	0.00545	0.957							
	β_5 (slope)	-0.04810	0.07097	0.498							
	β_6 (resident:low)	0.19938	0.29794	0.503							
	β_7 (bare)	0.67493	1.57943	0.669							
	β_8 (pine)	-0.03282	0.03291	0.319							
	β_9 (shrub)	0.03942	0.06254	0.528							
	β_{10} (grass)	-0.04484	0.03910	0.252							
	β_{11} (pasture)	-0.03901	0.03794	0.316							
	β_{12} (ag)	-0.01028	0.03392	0.762							
	β_{13} (wetland)	-0.37168	0.17375	0.032							

Two-Mile Level DVC

	Model	Coefficients	Std Error	P-Value	Likelihood	AIC$_c$	W$_i$	Goodness of Fit			
1)	β_0	0.31660	1.02362	0.757	- 178.9	366.0	0.0007				
	β_1 (nearest city)	0.00005	0.00006	0.391				Method	Chi^2	DF	P
	β_2 (elevation)	-0.00092	0.00097	0.342				Pearson	266.163	263	0.434
								Deviance	357.800	263	0.000
2)	β_0	-0.30249	0.24076	0.209	- 171.313	352.9	0.5107				
	β_1 (pop density)	-0.00474	0.00230	0.039				Method	Chi^2	DF	P
	β_2 (resident:low)	2.33202	0.67285	0.001				Pearson	264.589	262	0.444
	β_3 (pine)	0.00118	0.00491	0.810				Deviance	342.626	262	0.001

Table C. Two-Mile Level DVC a priori output (continued).

	Model	Coefficients	Std Error	P-Value	Likelihood	AIC_c	W_i	Goodness of Fit			
3)	β_0	11.2481	4.15963	0.007	- 173.863	358.0	0.0399				
	β_1 (elevation)	-0.01251	0.00460	0.007				Method	Chi^2	DF	P
	β_2 (slope)	-0.03113	0.03469	0.370				Pearson	266.421	262	0.412
	β_3 (pine)	0.06151	0.02189	0.005				Deviance	347.725	262	0.000
4)	β_0	11.2976	4.14025	0.006	- 173.477	359.3	0.0206				
	β_1 (nearest city)	0.000008	0.00069	0.903				Method	Chi^2	DF	P
	β_2 (elevation)	-0.01250	0.00449	0.005				Pearson	266.564	261	0.393
	β_3 (shrub)	-0.03912	0.03068	0.214				Deviance	346.954	261	0.00
	β_4 (pine)	0.06039	0.02196	0.006							
5)	β_0	-0.53118	0.388127	0.171	- 176.529	365.4	0.0010				
	β_1 (grass)	-0.00774	0.008540	0.365				Method	Chi^2	DF	P
	β_2 (pasture)	0.01291	0.00966	0.182				Pearson	265.982	261	0.403
	β_3 (agriculture)	-0.00329	0.00880	0.708				Deviance	353.059	261	0.000
	β_4 (bare)	4.90820	3.70387	0.185							
6)	β_0	0.375518	0.45418	0.408	- 174.537	363.5	0.0025				
	β_1 (shrubs)	0.02155	0.08421	0.798				Method	Chi^2	DF	P
	β_2 (grass)	-0.02269	0.01989	0.254				Pearson	266.245	260	0.382
	β_3 (pine)	-0.00364	0.00876	0.677				Deviance	349.074	260	0.000
	β_4 (wetland)	-0.50201	0.20925	0.016							
	β_5 (pop density)	0.00061	0.00144	0.668							
7)	β_0	-0.67648	0.74644	0.365	- 176.867	368.2	0.0002				
	β_1 (pine)	0.00678	0.01341	0.613				Method	Chi^2	DF	P
	β_2 (mixed)	33.9789	40.1059	0.397				Pearson	266.652	260	0.375
	β_3 (shrub)	-0.05016	0.07602	0.509				Deviance	353.735	260	0.000
	β_4 (grass)	0.00429	0.01983	0.829							
	β_5 (pasture)	0.01649	0.01666	0.322							
8)	β_0	0.42162	0.48252	0.382	- 170.494	355.4	0.1416				
	β_1 (pine)	0.01026	0.00578	0.076				Method	Chi^2	DF	P
	β_2 (resident:low)	0.95558	0.40771	0.019				Pearson	267.068	260	0.368
	β_3 (slope)	-0.03784	0.03845	0.325				Deviance	340.988	260	0.001
	β_4 (wetland)	-0.37995	0.20482	0.064							
	β_5 (nearest water)	-0.00220	0.00144	1.00							

Table C. Two-Mile Level DVC a priori output (continued).

	Model	Coefficients	Std Error	P-Value	Likelihood	AIC_c	W_i
9)	β_0	-0.08278	0.71327	0.908	- 169.805	354.0	0.2821
	β_1 (nearest city)	0.00002	0.00009	0.793			
	β_2 (pop density)	-0.00556	0.00298	0.062			
	β_3 (resident:low)	2.46542	0.73800	0.001			
	β_4 (grass)	-0.01097	0.00847	0.196			
	β_5 (bare)	-0.54676	4.50426	0.903			
10)	β_0	8.62108	9.30491	0.354	- 165.906	366.0	0.0007
	β_1 (nearest city)	-0.00001	0.00013	0.923			
	β_2 (nearest water)	0.00005	0.00207	0.978			
	β3 (pop density)	-0.00657	0.00841	0.435			
	β_4 (elevation)	-0.00772	0.00431	0.073			
	β_5 (slope)	-0.11820	0.15518	0.446			
	β_6 (resident:low)	2.52624	0.89031	0.005			
	β_7 (bare)	0.73653	6.16355	0.905			
	β_8 (pine)	0.00767	0.03672	0.834			
	β_9 (mixed)	26.1003	47.6071	0.583			
	β_{10} (shrub)	0.10989	0.10975	0.317			
	β_{11} (grass)	-0.03758	0.04088	0.358			
	β_{12} (pasture)	-0.03850	0.03780	0.308			
	β_{13} (ag)	-0.00361	0.03111	0.907			
	β_{14} (wetland)	-0.37197	0.37857	0.326			

Goodness of Fit

9)

Method	Chi^2	DF	P
Pearson	264.653	260	0.408
Deviance	339.610	260	0.001

10)

Method	Chi^2	DF	P
Pearson	263.760	251	0.278
Deviance	331.812	251	0.000

APPENDIX D

STATISTICAL OUTPUT OF OBSERVED CROSSING AREA A PRIORI MODELS

Table D. Description and associated statistics for a priori models concerning the effects of road and landscape characteristics influencing observed crossing areas along US Highway 93 at three spatial scales. Multiple linear regression output: N=36.

Local Level

	Model	Coeff	Std Error	P-Value	AIC_c	ΔAIC_c	W_i
1)	β_0	7.4066	0.9605	0.000	32.28	0.0	0.4589
	β_1 (grassland)	-0.555	1.006	0.585			
	β_2 (road sight)	0.0037	0.002605	0.162			
2)	β_0	8.7457	0.7904	0.000	32.89	0.8	0.3380
	β_1 (forest)	-0.8774	0.9470	0.361			
	β_2 (road)	0.652	1.026	0.530			
	β_3 (water)	-1.8711	0.85	0.035			
3)	β_0	7.678	1.072	0.000	37.23	5.3	0.0385
	β_1 (forest)	-0.1251	0.9696	0.898			
	β_2 (building)	0.013	1.150	0.991			
	β_3 (slope)	0.8841	0.8543	0.309			
	β_4 (riparian/wetland)	-1.0845	0.9102	0.243			
4)	β_0	6.1342	0.9399	0.000	36.63	4.7	0.0519
	β_1 (forest)	-0.0823	0.8948	0.927			
	β_2 (building)	-0.497	1.128	0.662			
	β_3 (road sight)	1.1865	0.8533	0.174			
	β_4 (slope)	0.0047	0.002918	0.111			
5)	β_0	7.6618	0.9365	0.000	35.32	3.4	0.1004
	β_1 (road)	0.4637	0.9860	0.641			
	β_2 (water)	-1.6175	0.8612	0.070			
	β_3 (slope)	-0.171	1.098	0.877			
	β_4 (buildings)	0.9653	0.8133	0.244			
6)	β_0	7.264	1.137	0.000	39.54	7.8	0.0122
	β_1 (forest)	-0.559	1.048	0.597			
	β_2 (building)	-0.314	1.186	0.793			
	β_3 (slope)	1.0397	0.8644	0.238			
	β_4 (road)	1.238	1.151	0.291			
	β_5 (riparian/wetland)	-0.7360	0.9640	0.451			
7)	β_0	7.877	2.678	0.007	47.54	16.6	0.0002
	β_1 (forest)	-0.875	1.219	0.479			
	β_2 (grassland)	-0.446	1.973	0.823			
	β_3 (building)	-0.268	1.242	0.831			
	β_4 (road sight)	0.0025	0.0043	0.525			
	β_5 (slope)	0.901	1.001	0.376			
	β_6 (road)	0.572	1.600	0.724			
	β_7 (water)	-1.952	1.234	0.125			
	β_8 (riparian/wetland)	0.606	1.239	0.629			

Table D continued.

Half-Mile Level							
	Model	Coeffi	Std Error	P-Value	AIC_c	ΔAIC_c	W_i
1)	β_0	6.112	3	0.050	35.84	0.0	0.4198
	β_1 (nearest city)	0.00036	0.0002381	0.137			
	β_2 (elevation)	0.00124	0.002758	0.655			
	β_3 (nearest water)	-0.00520	0.006330	0.417			
2)	β_0	9.979	1.420	0.000	37.032	4.1	0.2313
	β_1 (grassland)	-0.01395	0.01767	0.436			
	β_2 (ag)	-0.01639	0.04156	0.696			
	β_3 (nearest water)	-0.00881	0.006281	0.170			
3)	β_0	8.232	1.803	0.000	40.706	4.9	0.0368
	β_1 (resid:low)	0.485	4.466	0.914			
	β_2 (population density)	0.00626	0.01116	0.579			
	β_3 (pine)	-0.00897	0.02879	0.758			
	β_4 (grassland)	-0.01814	0.02761	0.516			
4)	β_0	6.637	6.689	0.329	39.814	4.0	0.0576
	β_1 (elevation)	0.003030	0.007937	0.705			
	β_2 (nearest water)	-0.009824	0.006572	0.145			
	β_3 (pine)	0.00083	0.03451	0.981			
	β_4 (population density)	-0.00261	0.01394	0.853			
5)	β_0	-2.118	5.980	0.726	37.922	2.1	0.1483
	β_1 (nearest city)	0.0007181	0.0002801	0.015			
	β_2 (elevation)	0.009318	0.006820	0.182			
	β_3 (agriculture)	-0.06420	0.05028	0.211			
	β_4 (pine)	-0.05688	0.04010	0.166			
6)	β_0	11.093	2.592	0.000	39.454	6.8	0.0689
	β_1 (pine)	0.0165	0.01957	0.406			
	β_2 (shrub)	-0.08353	0.08954	0.358			
	β_3 (population density)	-0.00693	0.01388	0.621			
	β_4 (nearest water)	-0.0119	0.006925	0.096			
7)	β_0	10.167	5.172	0.059	42.314	3.4	0.0165
	β_1 (population density)	-0.01115	0.01584	0.487			
	β_2 (shrub)	-0.1266	0.1166	0.286			
	β_3 (agriculture)	-0.04082	0.05491	0.463			
	β_4 (elevation)	0.003013	0.004439	0.503			
	β_5 (nearest water)	-0.014307	0.007854	0.079			
8)	β_0	6.559	2.575	0.016	41.848	6.0	0.0208
	β_1 (nearest city)	0.000433	0.0003076	0.169			
	β_2 (population density)	0.00384	0.01168	0.744			
	β_3 (residential:low)	-1.269	5.117	0.806			
	β_4 (nearest water)	-0.003143	0.00847	0.713			
	β_5 (pine)	0.00031	0.02296	0.989			

Table D. Half-Mile Level continued.

	Model	Coeff	Std Error	P-Value	AIC_c	ΔAIC_c	W_i
9)	β_0	13.18	15.29	0.397	55.07	4.3	0
	β_1 (nearest city)	0.0011077	0.0005713	0.063			
	β_2 (elevation)	0.012069	0.009789	0.229			
	β_3 (nearest water)	-0.0003	0.01277	0.981			
	β_4 (residential:low)	-3.537	5.650	0.537			
	β_5 (pine)	0.00300	0.07622	0.969			
	β_6 (grassland)	0.08887	0.08680	0.315			
	β_7 (population density)	0.00087	0.01786	0.961			
	β_8 (agriculture)	0.0384	0.1207	0.753			
	β_9 (shrub)	0.0845	0.1612	0.604			
One-Mile Level							
1)	β_0	7.109	3.170	0.032	35.032	0.0	0.2164
	β_1 (nearest city)		0.0002952	0.587			
	β_2 (elevation)	0.0001618	0.003018	0.376			
	β_3 (nearest water)	0.002708	0.006321	0.129			
		-0.009837					
2)	β_0	12.227	1.889	0	35.4	0.4	0.18
	β_1 (shrub)	-0.0973	0.1006	0.341			
	β_2 (grassland)	0.00194	0.01606	0.904			
	β_3 (nearest water)	-0.011364	0.004757	0.023			
3)	β_0	11.670	1.601	0	35.479	0.5	0.173
	β_1 (grassland)	-0.00637	0.01470	0.668			
	β_2 (nearest water)	-0.012252	0.005015	0.020			
	β_3 (agriculture)	-0.03865	0.04408	0.387			
4)	β_0	12.352	3.689	0.002	37.472	2.5	0.0639
	β_1 (residential:low)	15.9	13.75	0.256			
	β_2 (nearest city)	-	0.0004335	0.691			
	β_3 (pine)	0.0001737	0.01769	0.803			
	β_4 (nearest water)	-0.00444	0.007983	0.074			
		-0.014740					
5)	β_0	-3.85	11.13	0.732	37.405	2.4	0.0661
	β_1 (elevation)	0.01502	0.01237	0.234			
	β_2 (nearest water)	-0.010573	0.006356	0.106			
	β_3 (pine)	-0.05760	0.05609	0.312			
	β_4 (nearest city)	0.000268	0.0003125	0.398			
6)	β_0	9.213	2.604	0.001	37.702	2.7	0.0569
	β_1 (nearest city)	0.000318	0.0003402	0.357			
	β_2 (nearest water)	-0.008886	0.006278	0.167			
	β_3 (agriculture)	-0.04635	0.04983	0.359			
	β_4 (pine)	0.00221	0.01537	0.887			
7)	β_0	10.603	1.879	0	35.544	0.5	0.1675
	β_1 (pine)	0.06965	0.02851	0.020			
	β_2 (shrub)	-0.2057	0.1036	0.056			
	β_3 (grassland)	0.08368	0.03665	0.029			
	β_4 (nearest water)	-0.20169	0.005708	0.001			

Table D. One-Mile Level continued.

	Model	Coeff	Std Error	P-Value	AIC_c	ΔAIC_c	W_i
8)	β_0	5.212	3.586	0.156	37.136	2.1	0.0756
	β_1 (shrubs)	-0.2009	0.1004	0.007			
	β_2 (pine)	0.08329	0.0287	0.054			
	β_3 (grassland)	0.11809	0.04061	0.007			
	β_4 (nearest water)	-0.015539	0.006132	0.017			
	β_5 (nearest city)	0.005871	0.0003364	0.091			
9)	β_0	-5.03	16.75	0.766	46.999	12.0	0.0005
	β_1 (nearest city)	.0003852	0.00058	0.513			
	β_2 (elevation)	0.01187	0.01387	0.400			
	β_3 (nearest water)	-0.020622	0.00827	0.019			
	β_4 (residential:low)	11.93	14.73	0.425			
	β_5 (pine)	0.03513	0.08008	0.664			
	β_6 (grassland)	0.12941	0.07079	0.079			
	β_7 (agriculture)	0.0453	0.1113	0.688			
	β_8 (shrub)	-0.1360	0.1584	0.398			
Two-Mile Level							
1)	β_0	3.968	2.953	0.188	33.506	0.0	0.3147
	β_1 (nearest city)	0.0005385	0.0002575	0.044			
	β_2 (elevation)	0.001344	0.002672	0.618			
2)	β_0	6.134	1.263	0	35.276	1.8	0.1299
	β_1 (nearest city)		0.00027	0.034			
	β_2 (population density)	0.0005985	0.07093	0.187			
	β_3 (pine)	-0.09554	0.02952	0.144			
		0.04418					
3)	β_0	53.70	15.79	0.002	33.821	0.3	0.2689
	β_1 (elevation)	-0.04832	0.01658	0.006			
	β_2 (pine)	0.27121	0.08486	0.003			
	β_3 (population density)	-0.11658	0.06874	0.100			
4)	β_0	10.845	1.752	0	35.092	1.6	0.1424
	β_1 (slope)	0.0674	0.2329	0.774			
	β_2 (pine)	0.02167	0.01714	0.215			
	β_3 (nearest water)	-0.01441	0.01001	0.160			
5)	β_0	10.188	2.101	0	37.812	4.3	0.0366
	β_1 (residential:low)	-3.83	53.89	0.944			
	β_2 (grassland)	0.02858	0.04351	0.516			
	β_3 (pine)	0.04177	0.04862	0.397			
	β_4 (nearest water)	-0.015337	0.007667	0.054			
6)	β_0	4.567	4.788	0.348	38.42	4.9	0.027
	β_1 (nearest city)	0.00075	0.000359	0.043			
	β_2 (agriculture)	-0.06316	0.09462	0.509			
	β_3 (shrub)	0.0147	0.2667	0.956			
	β_4 (pine)	0.00213	0.02663	0.937			

Table D. Two-Mile Level continued.

	Model	Coeff	Std Error	P-Value	AIC_c	ΔAIC_c	W_i
7)	β_0	0.998	5.804	0.865	36.443	2.9	0.0725
	β_1 (deciduous)	44.71	26.52	0.102			
	β_2 (pine)	0.1662	0.08222	0.052			
	β_3 (grassland)	0.16210	0.08945	0.080			
	β_4 (nearest water)	-0.020727	0.007448	0.009			
8)	β_0	13.81	10.79	0.210	40.845	7.3	0.008
	β_1 (agriculture)	-0.0596	0.1822	0.746			
	β_2 (nearest city)	-0.00009	0.0008163	0.904			
	β_3 (nearest water)	-0.01335	0.01574	0.403			
	β_4 (pine)	-0.0017	0.1241	0.989			
	β_5 (grassland)	-0.0249	0.1527	0.871			
9)	β_0	34.51	41.58	0.415	61.361	27.9	0
	β_1 (nearest city)	-0.00071	0.00259	0.787			
	β_2 (nearest water)	-0.01672	0.04834	0.732			
	β_3 (population density)	0.5284	0.6059	0.392			
	β_4 (elevation)	0.0072	0.05803	0.902			
	β_5 (slope)	1.029	1.583	0.522			
	β_6 (residential:low)	118	206.5	0.573			
	β_7 (pine)	-0.6033	0.8672	0.493			
	β_8 (deciduous)	184.3	111.5	0.112			
	β_9 (agriculture)	-1.626	1.204	0.189			
	β_{10} (shrub)	-1.1688	0.7653	0.140			
	β_{11} (grassland)	-0.4316	0.5885	0.470			

Coeff = coefficient; Std Error = Standard Error.

APPENDIX E

STATISTICAL OUTPUT OF DEER VEHICLE COLLISION EXPLORATORY MODELS

Table E. Description and associated statistics for exploratory models concerning the effects of road and landscape characteristics predicting deer vehicle collisions locations at three spatial scales. Binary logistic regression output: N=266. Model names in the multi-scale section include numbers, 0.5, 1, and 2, referring to the mile buffer level in which they belong, half mile, one mile, and two mile, respectively. Ripar/wland, riparian or wetland area; Wwetland refers to woody wetland vegetation cover; nearest water refers to distance to nearest water; pop density refers to population density; resid:low refers to low intensity residential development; and near(est) city refers to distance to nearest city; urban veg refers to urban vegetation.

Local Level												
	Model	Coefficient	Std Error	P-Value	Likelihood	AIC_c	ΔAIC_c	W_i	Goodness of Fit			
1)	β_0	-0.991074	0.3029	0.001	-160.231	337.02	0.0	0.9853				
	β_1 (forest)	0.740494	0.2936	0.012					Method	Chi^2	DF	P
	β_2 (road)	0.397364	0.2926	0.175					Pearson	43.92	29	0.037
	β_3 (water)	0.645680	0.3328	0.052					Deviance	44.18	29	0.035
	β_4 (edge)	-1.74737	0.4992	0.000								
	β_5 (slope)	-0.727578	0.3501	0.038								
	β_6 (ridge)	2.00097	0.5621	0.000								
2)	β_0	-0.657397	0.2026	0.001	-168.187	346.60	9.6	0.0081				
	β_1 (forest)	0.477616	0.2721	0.079					Method	Chi^2	DF	P
	β_2 (water)	0.717020	0.2985	0.016					Pearson	7.886	4	0.096
	β_3 (edge)	-1.60484	0.4803	0.001					Deviance	6.657	4	0.155
3)	β_0	-0.437388	0.1555	0.005	-169.738	347.62	10.6	0.0049				
	β_1 (water)	0.821408	0.2916	0.005					Method	Chi^2	DF	P
	β_2 (edge)	-1.44770	0.4712	0.002					Pearson	0.094	1	0.759
									Deviance	0.095	1	0.757
4)	β_0	-0534388	0.1939	0.006	-171.092	350.33	13.3	0.0012				
	β_1 (forest)	0.606785	0.2646	0.022					Method	Chi^2	DF	P
	β_2 (edge)	-1.63233	0.4765	0.001					Pearson	4.027	1	0.045
									Deviance	2.933	1	0.087
5)	β_0	-0.570819	0.2880	0.048	-172.879	358.08	21.1	0.00002				
	β_1 (grass/ag)	0.485356	0.3374	0.150					Method	Chi^2	DF	P
	β_2 (ripar/wland)	0.765109	0.3119	0.014					Pearson	7.180	8	0.517
	β_3 (railroad)	-0.464318	0.2792	0.096					Deviance	7.511	8	0.483
	β_4 (arable)	-0.524198	0.2858	0.067								

Table E. Local Level (continued).

	Model	Coefficient	Std Error	P-Value	Likelihood	AIC_c	ΔAIC_c	W_i	Goodness of Fit			
6)	β_0	-0.273672	0.1959	0.163	-173.932	358.09	21.1	0.000				
	β_1 (ripar/wland)	0.485356	0.3106	0.011					Method	Chi^2	DF	P
	β_2 (railroad)	-0.381495	0.2726	0.162					Pearson	7.268	4	0.122
	β_3 (arable)	-0.398383	0.2717	0.143					Deviance	7.679	4	0.107
Half-Mile												
1)	β_0	-0.295058	0.1500	0.049	-177.863	363.87	2.9	0.1554				
	β_1 (resid:low)	0.189369	0.1089	0.082					Method	Chi^2	DF	P
	β_2 (pop density)	-0.0010045	0.0007	0.158					Pearson	103.745	93	0.210
									Deviance	129.685	93	0.007
2)	β_0	-0.245115	0.1828	0.180	-177.877	363.90	3.0	0.1533				
	β_1 (grassland)	-0.010105	0.0073	0.171					Method	Chi^2	DF	P
	β_2 (barren)	0.681499	0.5288	0.198					Pearson	265.94	256	0.322
									Deviance	355.74	256	0.000
3)	β_0	2.65403	1.8661	0.155	-179.371	360.89	0	0.6912				
	β_1 (slope)	-0.045560	0.0285	0.110					Method	Chi^2	DF	P
	β_2 (pine)	0.0192725	0.0104	0.066					Pearson	265.02	261	0.419
	β_3 (elevation)	-0.003153	0.0019	0.113					Deviance	352.74	261	0.000
	β_4 (urban veg)	-1.92341	1.3191	0.145								
One-Mile Level												
1)	β_0	0.913118	0.3828	0.017	- 172.211	354.65	1.0	0.2855				
	β_1 (wetland)	-0.245728	0.1028	0.017					Method	Chi^2	DF	P
	β_2 (nearest water)	-0.002460	0.0011	0.029					Pearson	265.856	262	0.422
	β_3 (grassland)	-0.016099	0.0075	0.032					Deviance	344.422	262	0.000
2)	β_0	0.702044	0.3565	0.049	- 173.670	357.57	3.9	0.0663				
	β_1 (wetland)	-0.209179	0.0996	0.036					Method	Chi^2	DF	P
	β_2 (slope)	-0.036133	0.0266	0.175					Pearson	266.801	262	0.406
	β_3 (nearest water)	-0.002304	0.0011	0.039					Deviance	347.341	262	0.000

Table E. One-Mile Level (continued).

	Model	Coefficient	Std Error	P-Value	Likelihood	AIC_c	ΔAIC_c	W_i	Goodness of Fit: Method	Chi^2	DF	P
3)	β_0	0.551252	0.3425	0.108	- 174.614	357.38	3.7	0.0729				
	β_1 (wetland)	-0.182874	0.0976	0.061					Pearson	266.247	262	0.415
	β_2 (nearest water)	-0.002605	0.0011	0.022					Deviance	354.938	262	0.000
4)	β_0	0.273279	0.2488	0.272	- 174.843	357.83	4.2	0.0580				
	β_1 (grassland)	-0.016874	0.0074	0.023					Pearson	266.471	263	0.429
	β_2 (wetland)	-0.248268	0.0987	0.012					Deviance	349.686	263	0.000
5)	β_0	-2.68381	0.9017	0.003	- 169.605	353.64	0.0	0.4728				
	β_1 (nearest water)	-0.003286	0.0012	0.009					Pearson	266.175	261	0.400
	β_2 (pine)	-0.017011	0.0087	0.052					Deviance	355.993	261	0.000
	β_3 (grassland)	-0.031751	0.0104	0.002								
	β_4 (pasture)	-0.028483	0.0129	0.028								
	β_5 (wetland)	-0.362318	0.1176	0.002								
6)	β_0	0.550404	0.3584	0.125	- 175.392	358.93	5.3	0.0335				
	β_1 (nearest water)	-0.002708	0.0011	0.022					Pearson	266.25	260	0.382
	β_2 (grassland)	-0.010679	0.0071	0.136					Deviance	348.70	260	0.000
7)	β_0	-0.432008	0.1302	0.001	- 178.591	363.27	9.6	0.0038				
	β_1 (resid:low)	0.182434	0.1275	0.153					Pearson	266.254	260	0.382
									Deviance	348.702	260	0.000
8)	β_0	3.49615	2.3461	0.136	- 177.672	365.57	11.9	0.0012				
	β_1 (elevation)	-0.114027	0.0025	0.112								
	β_2 (shrubs)	-0.038135	0.0257	0.139					Pearson	266.406	262	0.413
	β_3 (pine)	-0.020344	0.0122	0.097					Deviance	355.344	262	0.000
9)	β_0	-0.291894	0.1556	0.061	- 177.170	362.49	8.8	0.0056				
	β_1 (pop density)	-0.001537	0.0009	0.113								
	β_2 (resid:low)	0.519327	0.2522	0.039					Pearson	104.758	96	0.254
									Deviance	131.326	96	0.010

Table E. Two-Mile Level (continued).

	Model	Coefficient	Std Error	P-Value	Likelihood	AIC_c	ΔAIC_c	W_i	Goodness of Fit			
1)	β_0	-0.266665	0.1888	0.158	- 171.342	350.83	2.4	0.1192				
	β_1 (resid:low)	2.33572	0.6731	0.001					Method	Chi^2	DF	P
	β_2 (pop density)	-0.004835	0.0022	0.033					Pearson	106.742	103	0.381
									Deviance	129.759	103	0.038
2)	β_0	0.522493	0.3616	0.149	- 168.047	348.41	0.0	0.3998				
	β_1 (resid:low)	2.27218	0.6825	0.001					Method	Chi^2	DF	P
	β_2 (pop density)	-0.005763	0.0023	0.015					Pearson	264.19	261	0.433
	β_3 (grassland)	-0.017916	0.0076	0.019					Deviance	336.09	261	0.001
	β_4 (wetland)	-0.384056	0.2075	0.064								
3)	β_0	0.418935	0.2876	0.145	-174.795	357.74	9.3	0.0037				
	β_1 (grassland)	-0.018269	0.0071	0.011					Method	Chi^2	DF	P
	β_2 (wetland)	-0.509564	0.2006	0.011					Pearson	266.309	263	0.43
									Deviance	349.589	263	0.00
4)	β_0	0.716747	0.3910	0.067	- 167.109	348.65	0.2	0.3557				
	β_1 (pop density)	-0.005960	0.0023	0.012					Method	Chi^2	DF	P
	β_2 (resid:low)	2.26275	0.6769	0.001					Pearson	264.539	260	0.410
	β_3 (grassland)	-0.020718	0.0079	0.009					Deviance	334.218	260	0.001
	β_4 (wetland)	-4.70984	0.2201	0.032								
	β_5 (nearest water)	-0.091064	0.0695	0.190								

APPENDIX F

STATISTICAL OUTPUT OF OBSERVED CROSSING AREA EXPLORATORY MODELS

Table F. Description and associated statistics for exploratory models concerning the effects of road and landscape characteristics predicting successful crossing areas at three spatial scales. Multiple linear regression output: N=36

	Model	Coefficient	Std Error	P-Value	AIC_c	ΔAIC_c	W_i
Local Level							
1)	β_0	8.4885	0.5090	0.000	30.778	0	0.6113
	β_1 (water)	-1.7952	0.7408	0.021			
2)	β_0	6.1053	0.8712	0.000	34.042	3.3	0.1195
	β_1 (road sight)	0.004352	0.002582	0.101			
	β_2 (slope)	1.1601	0.8218	0.167			
3)	β_0	6.9992	0.6069	0.000	32.418	1.6	0.26 1
	β_1 (road sight)	0.003515	0.002549	0.177			
Half-Mile Level							
1)	β_0	5.9634	0.8145	0.000	30.981	0.5	0.3533
	β_1 (nearest city)	0.0004691	0.0002026	0.027			
2)	β_0	9.521	1.221	0.000	32.102	1.6	0.2017
	β_1 (nearest water)	-0.009463	0.005829	0.114			
3)	β_0	9.2425	0.726	0.000	30.52	0	0.4449
	β_1 (slope)	-0.13897	0.05434	0.015			
One-Mile Level							
1)	β_0	5.8329	0.8617	0.000	30.961	0.7	0.174
	β_1 (nearest city)	0.0004909	0.000211	0.026			
2)	β_0	10.959	1.383	0.000	30.650	0.4	0.203
	β_1 (nearest water)	1.383	0.004494	0.018			
3)	β_0	11.178	1.330	0.000	33.452	3.2	0.050
	β_1 (slope)	-0.21822	0.09473	0.028			
	β_2 (grassland)	0.02875	0.01992	0.159			
	β_3 (nearest water)	-0.006782	0.004766	0.164			
4)	β_0	9.6473	0.7936	0.000	31.701	1.4	0.120
	β_1 (slope)	-0.26753	0.08952	0.005			
	β_2 (grassland)	0.03162	0.02013	0.126			
5)	β_0	11.267	1.350	0.000	31.728	1.4	0.118
	β_1 (slope)	-0.11865	0.06597	0.081			
	β_2 (nearest water)	-0.007476	0.004819	0.130			
6)	β_0	9.5716	0.8091	0.000	30.288	0.0	0.243
	β_1 (slope)	-0.16253	0.06082	0.011			
7)	β_0	12.505	1.723	0.000	32.211	1.9	0.093
	β_1 (pasture)	-0.05935	0.04064	0.154			

	β_2 (nearest water)	-0.015242	0.005219	0.006			

Table F. continued

Two-Mile Level

1)	β_0	10.966	1.677	0.000	32.4231	1.7	0.134987
	β_1 (nearest water)	-0.011884	0.004803	0.019			
	β_2 (pine)	0.01795	0.0112	0.118			
2)	β_0	8.5486	0.6547	0.000	31.98986	1.5	0.167636
	β_1 (grassland)	-0.02414	0.01418	0.098			
3)	β_0	4.819	1.143	0.000	32.81765	1.1	0.11082
	β_1 (nearest city)	0.0007648	0.00029	0.013			
	β_2 (agriculture)	-0.06892	0.05209	0.195			
4)	β_0	10.654	1.327	0.000	30.88933	1.9	0.290633
	β_1 (slope)	-0.2438	0.1031	0.024			
5)	β_0	6.134	1.263	0.000	35.27642	0.0	0.032412
	β_1 (nearest city)	0.0005985	0.0002705	0.034			
	β_2 (pop density)	-0.09554	0.07093	0.187			
	β_3 (pine)	0.04418	0.02952	0.144			
6)	β_0	5.347	1.083	0.000	31.08526	4.4	0.263512
	β_1 (nearest city)	0.0005639	0.0002498	0.031			