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ADDRESSING WILDLIFE MORTALITY ON HIGHWAYS IN WASHINGTON

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Abstract: Deer and elk vehicle collisions are a major safety concern for highways. While there are a number of methods which can be used to reduce collisions, the selection of the appropriate method is complicated by the fact that Washington is home to four subspecies of deer, in addition to elk and moose. Differences between the life history of the species and the types of habitat they occupy can lead to differences in what methods may be suitable for reducing vehicle-ungulate collisions. The Washington State Department of Transportation (WSDOT) maintains a deer kill database which contains information on where dead ungulates are removed from the state highways. This information is used along with site-specific information to determine what type of mitigation method may work the best to reduce the ungulate vehicle collisions.

Introduction

Washington State, with its diversity of habitats supports a diverse wildlife assemblage, including four subspecies of deer, two subspecies of elk, moose, woodland caribou, mountain goats and big horn sheep. Of seven ungulate species found in Washington, the deer and elk are the ones most likely to be involved in deer/vehicle collisions. Approximately 2,450 to 3,000 dead deer and elk are removed each year from the state highways by WSDOT maintenance workers. This number does not include the number of animals which die outside the right of way, animals removed by non-WSDOT personnel, and animals hit on county or city roads. While this number does not approach the magnitude of the deer/vehicle collision problems encountered in other states such as Michigan where between 18,000 and 44,374 animals may be killed in a year (Romin and Bissonette 1996), it still has a significant effect on the safety of the traveling public, and may have an effect on local deer and elk populations.

Deer Kill Database

Numerous methods to reduce deer vehicle collisions have been reported in the literature (Feldhamer, et. al. 1986; Romin and Bissonette 1996; Schafer and Pendland 1985; Ward 1982). Selection of the appropriate method must take into account: the species, time of year there is a problem, the terrain, and the specific situation. There will be no one perfect solution. WSDOT maintains a deer kill database, which contains information on deer and elk removed by maintenance personnel. The database can be used to analyze the location of ungulate vehicle collisions, by species, sex, and date. The database shows clear differences between species. Black-tailed deer, which inhabit the western portion of Washington State are non-migratory. See Figure 1.

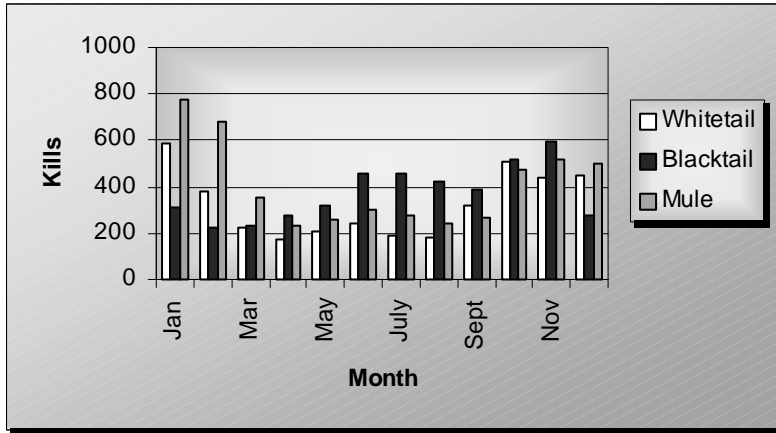


Fig. 1. Deer Kills by Species

Black-tailed Deer

There are two peak collision periods for black-tailed deer, one in June and July, when the does have their fawns and are hiding them, and the second in October and November, during the rut. During both of these times, the deer are more active and may encounter the highways more often. See Figure 1. There are five problem areas on the west side of the state. With the exception of Whidby Island, where there is very low hunting pressure and a high deer population, most of the problem areas are in the Cascade Mountains or their foothills. See Figure 2.

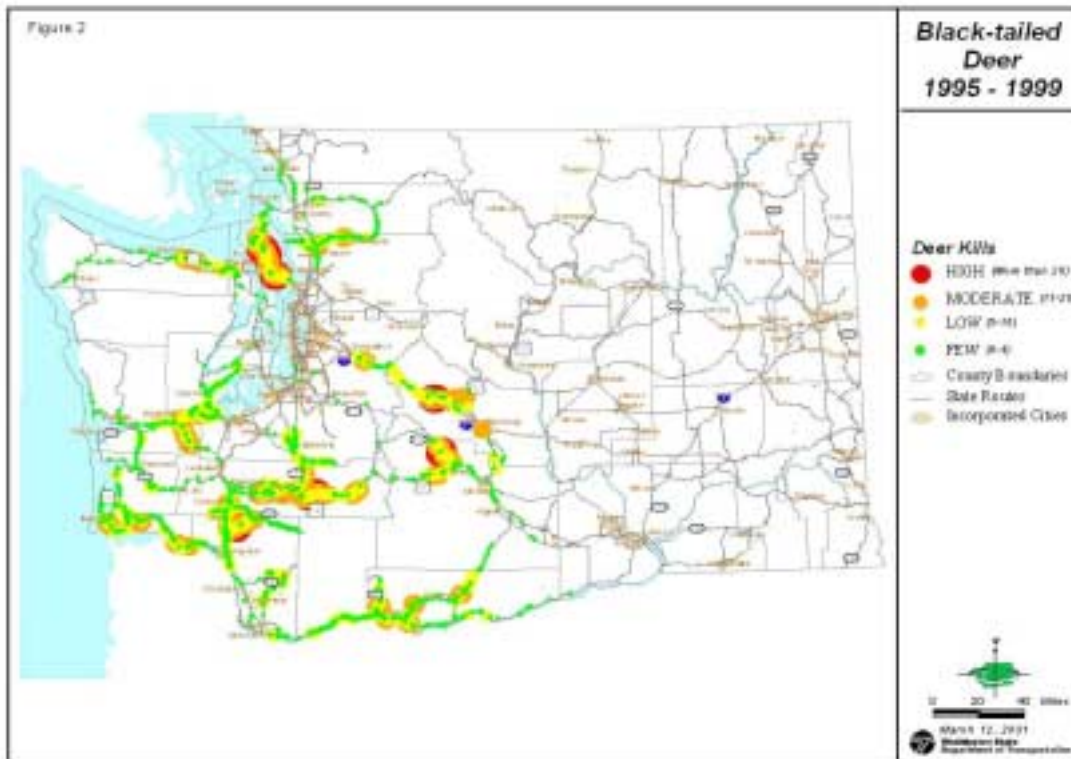


Fig. 2. Black-tailed Deer (1995 – 1999)

Elk

Elk occur in nine ranges throughout Washington State, including a herd on the Hanford Nuclear Range (WDFW 1996). They may be resident in lower elevation habitats and may exhibit seasonal movements in higher elevation habitats as they move between higher elevation summer grounds, and lower elevation wintering

grounds. The peak collision period is July. See Figure 3. There are four main problem areas; all associated with passes in the Cascade Mountains. See Figure 4.

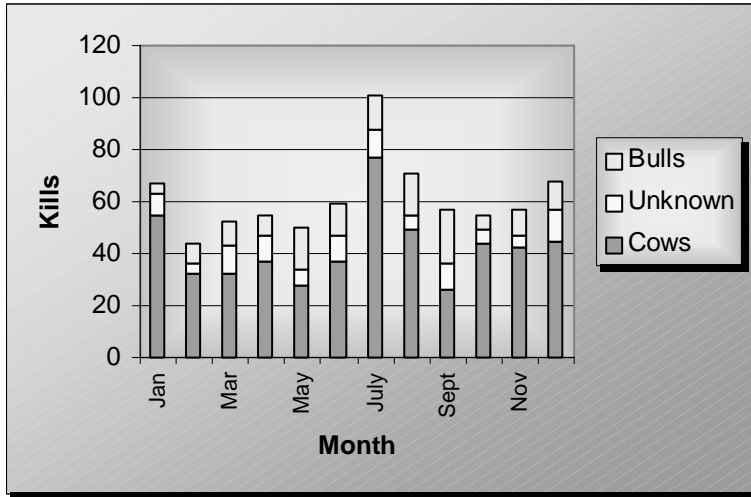


Fig. 3. Elk Killed by Month (1990-1999)

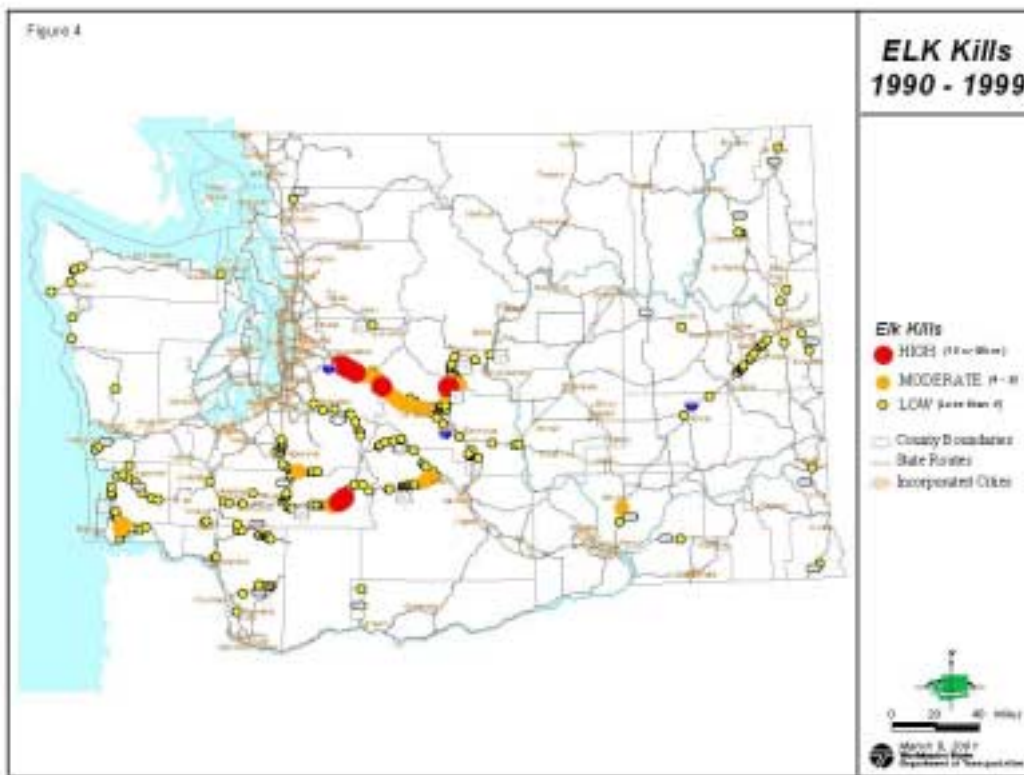


Fig. 4. Elk Kills (1990 – 1999)

White-tailed and Mule Deer

Both white-tailed and mule deer occur in eastern Washington. Both species may exhibit seasonal movements between summer and wintering grounds. Peak collision periods for both species occur in the fall, during the migration and rut, and during the winter, when they congregate on wintering grounds, some of which are near state highways. Wintering ground impacts can be significant. See Figure 1. There are 16 problem areas on

the east side of the state. Of these, nine areas involved both species and seven areas involved only one species. Problem areas for mule deer include four major passes in the Cascade Mountains, while the main problem areas for white-tailed deer include three highways outside the city of Spokane. Problem areas for both species include wintering grounds near highways in the Okanogan area, the Selkirk Mountains, and agricultural lands in the southeastern corner of the state. See Figure 5 and 6.

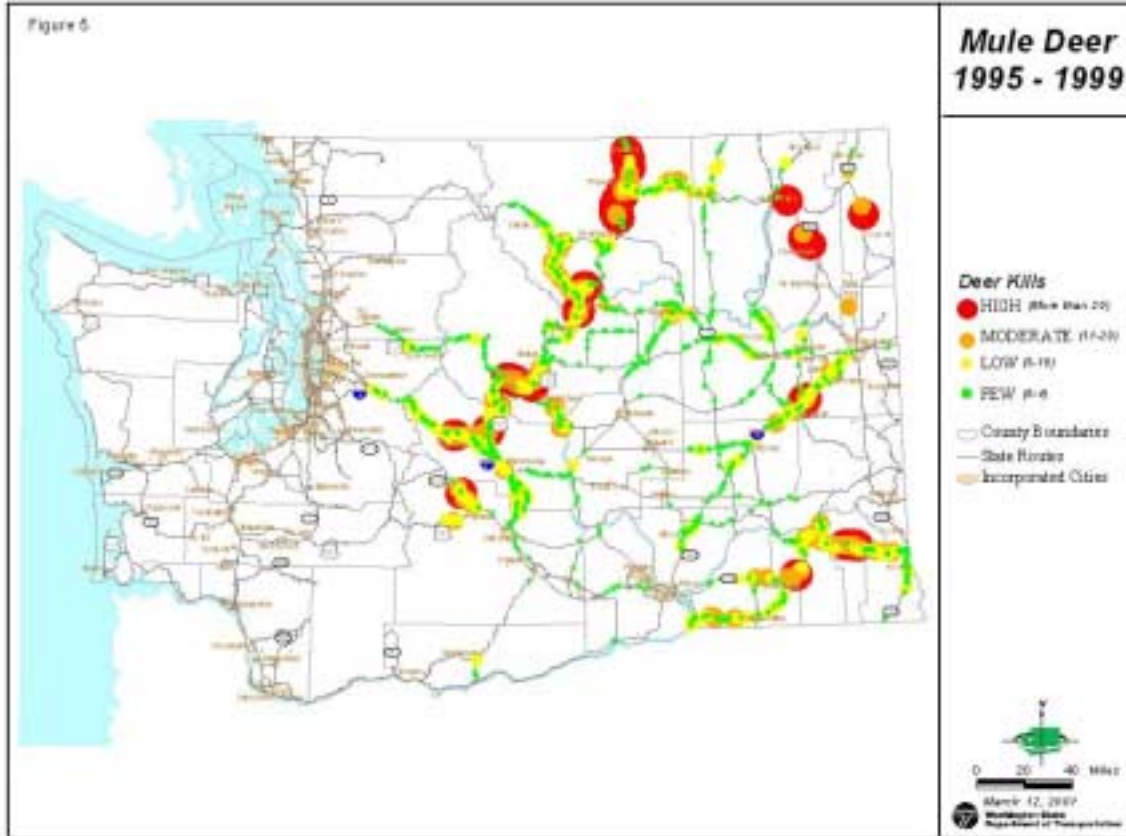


Fig. 5. Mule Deer (1995- 1999)

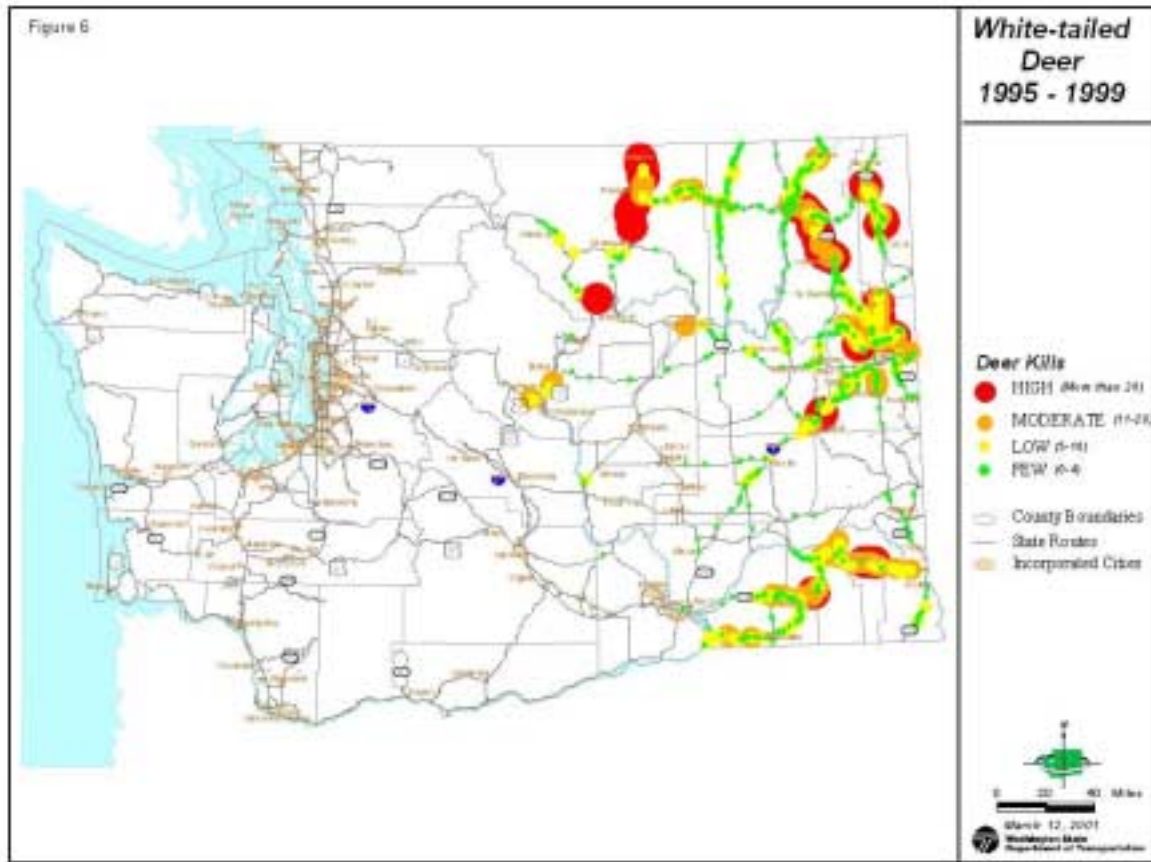


Fig. 6. White-tailed Deer (1995 - 1999)

Mitigation Methods

By using the database to determine where and when animals are being killed and combining that information with site-specific information on terrain and other special circumstances, the correct mitigation method can be selected. Examples of some of the different methods that are being used are provided below.

Radio Collar Activated Crossing Signs

Radio collar activated crossing signs are being used with elk in the Olympic Peninsula where there is a herd of 50 resident elk which readily move from forest land in the foothills of the Olympics, across SR 101 to farm pastures just outside of the city of Sequim. To alleviate an elk-vehicle collision problem on this highway, the Washington State Department of Fish and Wildlife in partnership with WSDOT, the tribes, and the Rocky Mountain Elk foundation, put sign activating radio collars on six members of this herd. These collars trigger the flashers on the elk crossing signs when the collared elk are within a quarter of a mile of the signs. The signs have helped reduce the number of elk vehicle collisions, but one problem with the system is that it often flashes when no elk are visible, but they are somewhere within the quarter mile of the sign. Since this technique is dependent on motorists slowing down in response to the flashing lights, false positives will not help maintain the desired response. This technique may prove useful for resident elk herds but will not be useful for deer.

Special Signs

These signs focus on slowing down traffic in the high kill areas. They range from informing motorists on the number of deer which have been killed that year to date on that specific stretch of roadway, to reduced nighttime speed limit signs, to signs identifying high kill zones. These methods are being used in north-central Washington. We have not conducted any studies to determine the effectiveness of these signs.

Reflectors

Reflectors have been installed along miles of highway in eastern Washington. Our studies on reflectors have indicated that there may be some effectiveness in Eastern Washington, but not in Western Washington (Schafer and Penland 1985; and Ossinger 1992). Reflectors are not effective during the day, during snowstorms, when covered with snow from a snow-plowed road, and when out of alignment or dirty.

Crossing Structures

Crossing structures (underpasses) have been installed for deer and elk on several highways. Structures are planned for a major up-grade on Interstate 90, where it crosses the Cascades Mountains on primarily U.S. Forest Service managed land. Crossing structures are most suitable in areas where there is suitable habitat and an assurance that the habitat will be available to the animals in the future.

Deer Detectors

WSDOT is developing a detector system that will detect the presence of large mammals such as deer along selected roadways. Once the animal breaks the beam, an animal crossing sign will flash, warning motorists that the animal has entered the right of way. WSDOT is planning on using these systems at migratory routes and wintering areas. We hope to keep these systems fairly inexpensive and mobile so that they can be moved from place to place as the need arises. Major changes in vegetation (as in the aftermath of a fire) can cause changes in deer and elk movement, which require some warning to motorists. This technology is still in the development phase. We hope to conduct field tests in 2002.

Summary

The WSDOT maintains its deer kill database to analyze where ungulate vehicle accident problem areas exist statewide. The data includes information on location to the nearest 0.10 mile, setting, fencing, date, sex, age and species information. This data is used along with on-site specific information to select the most appropriate method for reducing the ungulate vehicle encounters. Several methods are currently being used, tested or developed in the state, including an experimental radio collar triggered flashing sign system with elk, and the development of a laser beam detector system.

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