

Jackson Hole Wildlife Foundation's

Teton County Wildlife-Vehicle Collision Database Summary Report 2017/2018

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JACKSON HOLE



Summary:

2017-2018 Data Update

Wildlife-vehicle collisions (WVC) are most prevalent during the winter months (December – February; Figure 3). In order to delineate an annual duration that captures the increase in WVCs during the winter months, an annual unit is defined as May 1 – April 30 (e.g. May 1, 2017 – April 30, 2018 = 2017-2018). This provides a more accurate representation of the seasonal trends associated with WVCs in Teton County, WY.

There were a total of 181 WVCs from May 1, 2017 – April 30, 2018 (Table 1). Data for the 2017-2018 update was acquired from the following data sources: Wyoming Department of Transportation - Carcass (n=49), Wyoming Department of Transportation – Crash (n=72), Wyoming Game and Fish Wildlife Observation System (n=29) and Nature Mapping Jackson Hole (n=31) (Table 2). In total, Jackson Hole Wildlife Foundation's (JHWF) WVC database contains 45 total species with mule deer, elk and moose being the most prominent species involved in WVCs (Table 4). The total number of WVCs decreased in 2017-2018 compared to the previous year, likely due to very mild winter conditions and perhaps a lower mule deer population following the severe winter of 2016/2017 when a high number of deer-vehicle collisions occurred. The number of WVCs decreased on all roads in Teton County in 2017-2018, except for a slight increase on Highway 390 (Figure 4). This increase was due to an uptick in deer collisions on that roadway (Figure 5). Moose-vehicle collisions decreased or stayed the same on all roads except for Highway 22 where they increased from 8 in 2016-2017 to 14 in 2017-2018 (Figure 6).

Methods

The WVC database is updated annually using an automated process. This process stores all wildlife-vehicle collisions in a SQL database where it can be accessed in ArcMap, via an SDE connection, and in Program R, via a remote database connection. The SQL database allows all raw data to be stored in one place. Then, with saved queries, the data is formatted and combined into one large database. This database is then run through an iterative loop in R that eliminates duplicates based on distance (<0.25mi) from other observations entered on the same day of the same species. Additional observations are easily added to the SQL database and queried to eliminate duplicates.

WYDOT maintains spatial datasets for all major travel routes in Wyoming. These spatial datasets use linear-referenced system (LRS) geometry that contain route and measure attributes. Before raw WVC data is queried in a SQL database, a field locating each observation to the nearest LRS WYDOT route is added and populated with a value using the "Locate Feature Along Route" tool in ArcMap. This value is used to when identifying duplicates.

When duplicates are identified in the R script, optimal observations are selected based on the data source. The following table indicates the ranking of the data sources included in the JHWF WVC database (observations with a lower source rank are selected over a higher source rank). If duplicate observations are found in multiple data sources, the record from the source with the highest rank (lowest number) will be retained. The rankings are based on relative spatial accuracy and species sex/age identification.

| DATASOURCE | Source Rank |
|---|-------------|
| Jackson Hole Wildlife Foundation Nature Mapping Observations (2010-2018) | 1 |
| JHWF Roadkill Hotline (2012) | 2 |
| Wyoming Game and Fish Department Wildlife Observation System (2014-2018) | 2 |
| Wyoming Department of Transportation Crash Data (1994-2018) | 3 |
| Wyoming Department of Transportation Carcass Pick-Up Data (1999-2018) | 4 |
| Jackson Hole Wildlife Foundation Roadkill Hotline, Other Data Sources (1990-2009) | 5 |
| Wyoming Game and Fish Department Wildlife Observation System (1976-2013) | 6 |

Important Caveats of the Database

- No records included within Grand Teton National Park at the park's request. The park maintains its own database.
- Mix of data collected in different ways with different accuracies; may want to consider dissolving data to the nearest mile marker, depending on your goal. Some observers are trained biologists while others are not.
- Large effort to remove potential duplicates among different sources.
- Date/time usually does not record actual time of death, but rather when the dead animal was observed (often a day or two later).
- Heavily biased by ungulates, especially mule deer. These are the animals that WYDOT picks up and that cause crashes large enough to call Police. Also easier to observe by citizen scientists.
- This database is likely a significant underestimate of road kill occurrences in Teton County, even for ungulates. Many road kill events go unreported or animals are hit and die out of sight from roads.
- Probably biased by larger roads (more observers).
- Biased by year; WYDOT has been collecting data since 1990, but other groups started later. WYDOT has also improved their documentation in recent years.
- Road kill numbers are influenced by winter conditions, with high numbers occurring during more severe winters when ungulates are concentrated close to roads.

Suggested Citation:

Jackson Hole Wildlife Foundation, Jackson, WY, Wildlife-Vehicle Collision Database, 2/28/2019

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Table 1. Wildlife-Vehicle Collisions by year (1990-2018).

| YEAR | Total |
|--------------------|-------------|
| 1990 | 29 |
| 1990-1991 | 67 |
| 1991-1992 | 107 |
| 1992-1993 | 77 |
| 1993-1994 | 61 |
| 1994-1995 | 123 |
| 1995-1996 | 64 |
| 1996-1997 | 237 |
| 1997-1998 | 101 |
| 1998-1999 | 124 |
| 1999-2000 | 155 |
| 2000-2001 | 170 |
| 2001-2002 | 166 |
| 2002-2003 | 129 |
| 2003-2004 | 251 |
| 2004-2005 | 146 |
| 2005-2006 | 264 |
| 2006-2007 | 197 |
| 2007-2008 | 220 |
| 2008-2009 | 179 |
| 2009-2010 | 136 |
| 2010-2011 | 371 |
| 2011-2012 | 206 |
| 2012-2013 | 171 |
| 2013-2014 | 213 |
| 2014-2015 | 277 |
| 2015-2016 | 284 |
| 2016-2017 | 358 |
| 2017-2018 | 181 |
| Grand Total | 5064 |

Table 2. Data sources included in the database by year (1990-2018).

| Data Source | Count |
|--------------------------------------|-------------|
| tblJHWF_1990_2002 | 1032 |
| tblJHWF_2003_2009 | 440 |
| tblJHWF_NATURE_MAPPING_2010_2012 | 150 |
| tblJHWF_NATURE_MAPPING_2013 | 41 |
| tblJHWF_NATURE_MAPPING_2014 | 44 |
| tblJHWF_NATURE_MAPPING_2015 | 39 |
| tblJHWF_NATURE_MAPPING_2016_20170430 | 99 |
| tblJHWF_NATURE_MAPPING_2017_2018 | 31 |
| tblJHWF_ROADKILLHOTLINE_2012 | 22 |
| tblWGFD_WOS_1976_2012 | 205 |
| tblWGFD_WOS_2013 | 5 |
| tblWGFD_WOS_2014 | 17 |
| tblWGFD_WOS_2015 | 33 |
| tblWGFD_WOS_2016_20170430 | 71 |
| tblWGFD_WOS_2017_2018 | 29 |
| tblWYDOT_TETON_CARCASS_1999_2005 | 211 |
| tblWYDOT_TETON_CARCASS_2006_2012 | 660 |
| tblWYDOT_TETON_CARCASS_2013 | 93 |
| tblWYDOT_TETON_CARCASS_2014 | 110 |
| tblWYDOT_TETON_CARCASS_2015 | 118 |
| TBLWYDOT_TETON_CARCASS_2016_20170430 | 196 |
| TBLWYDOT_TETON_CARCASS_2017_2018 | 49 |
| tblWYDOT_TETON_CRASH_1994_2012 | 1004 |
| tblWYDOT_TETON_CRASH_2013 | 55 |
| tblWYDOT_TETON_CRASH_2014 | 93 |
| tblWYDOT_TETON_CRASH_2015 | 70 |
| TBLWYDOT_TETON_CRASH_2016_20170430 | 108 |
| TBLWYDOT_TETON_CRASH_2017-2018 | 72 |
| Grand Total | 5064 |

Table 3. Wildlife-Vehicle Collisions for all years by road name (2010-2018).

| ROADNAME | 2010-2011 | 2011-2012 | 2012-2013 | 2013-2014 | 2014-2015 | 2015-2016 | 2016-2017 | 2017-2018 | Grand Total |
|---------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------------|
| BATCH PLANT RD | | 2 | | 1 | | | | | 3 |
| BOYLES HILL RD | 1 | | | | | | | | 1 |
| BUFFALO VALLEY RD | | | | | | 1 | 2 | | 3 |
| CASHE ST | 1 | | | | | | | | 1 |
| DELONEY AVE | 1 | | | | | | | | 1 |
| E BROADWAY AVE | | | | 1 | | | | | 1 |
| FALL CREEK RD | 3 | 1 | 2 | 2 | 2 | 1 | 5 | 2 | 18 |
| FISH CREEK RD | 12 | | | | 1 | 6 | | | 19 |
| GAME CREEK RD | | | | | | 1 | 1 | | 2 |
| HENRY'S RD | | 2 | | 1 | | 1 | | | 4 |
| HIDDEN RANCH LN | 1 | | | | | | | | 1 |
| HIGH SCHOOL RD | | | | | | | 1 | | 1 |
| JACKSON AVE | | | | | 1 | | | | 1 |
| KELLY AVE | | | | | 1 | | | | 1 |
| MALLARD RD | 1 | | | | | | | | 1 |
| NATIONAL ELK REFUGE | 1 | | | | | | | 1 | 2 |
| PARK LOOP RD | 6 | | | | | | 2 | 1 | 9 |
| PARK RANCH RD SO FORK | | | | 1 | | | | | 1 |
| REDMOND ST | | | | | 1 | | | | 1 |
| SKI HILL RD | | | 1 | | 2 | 1 | | | 4 |
| SNOW KING AVE | | 1 | | | | | 1 | | 2 |
| SOUTH PARK LOOP | | | 1 | | 1 | | | | 2 |
| SPRING GULCH RD | 1 | 1 | 1 | 3 | 6 | 2 | 2 | | 16 |
| UPPER CACHE CREEK DR | | | | | 1 | | | | 1 |
| US 189 | | 1 | | | | | | | 1 |
| US 189/US 191 | 28 | 18 | 14 | 16 | 18 | 18 | 27 | 27 | 166 |
| US 189/US 191/US 26/US 89 | 139 | 58 | 38 | 57 | 94 | 94 | 149 | 40 | 669 |
| US 191/US 26/US 89 | 54 | 38 | 31 | 27 | 37 | 29 | 30 | 21 | 267 |
| US 26/US 287 | 10 | 5 | 7 | 1 | 15 | 17 | 10 | 8 | 73 |
| US 26/US 89 | 40 | 22 | 21 | 34 | 34 | 38 | 42 | 27 | 258 |
| VIRGINIAN LN | | 1 | | | | | | | 1 |
| WY 22 | 54 | 36 | 41 | 48 | 51 | 65 | 70 | 37 | 402 |
| WY 390 | 18 | 20 | 14 | 21 | 12 | 10 | 16 | 17 | 128 |
| Grand Total | 371 | 206 | 171 | 213 | 277 | 284 | 358 | 181 | 2061 |

Table 4. Species count in the Wildlife-Vehicle Collision database.

| SPECIES | 2010-2011 | 2011-2012 | 2012-2013 | 2013-2014 | 2014-2015 | 2015-2016 | 2016-2017 | 2017-2018 | Grand Total |
|------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------------|
| American Marten | 1 | 1 | | | | | | | 2 |
| American Mink | | 1 | | | | | | | 1 |
| American Robin | 1 | | | | | 1 | | | 2 |
| Barrows Goldeneye | 1 | | | | | | | | 1 |
| Bighorn Sheep | | | | | | | 4 | | 4 |
| Bison | 1 | | | | | | | | 1 |
| Black Bear | | | 1 | 1 | | 1 | 2 | | 5 |
| Black Rosy-Finch | 1 | | | | | | | | 1 |
| Black-billed Magpie | | | 1 | 1 | | | | | 2 |
| Boreal Toad | | | | | | | 1 | | 1 |
| Brewers Blackbird | 1 | | | | | | | | 1 |
| Common Gartersnake | 2 | | | | | | | | 2 |
| Common Raven | | 1 | | | 1 | | | | 2 |
| Coyote | | 1 | 1 | 1 | | 3 | 2 | | 8 |
| Deer Mouse | 1 | | | | | | | | 1 |
| Elk | 59 | 37 | 36 | 46 | 29 | 25 | 46 | 49 | 327 |
| Gray Wolf | | | 1 | | 1 | | | | 2 |
| Great Horned Owl | 1 | 1 | | 1 | | 4 | | | 7 |
| Grizzly Bear | | | | | | 1 | 1 | | 2 |
| Least Chipmunk | | | | | | 2 | | | 2 |
| Long-tailed Weasel | | | | | | | 1 | | 1 |
| Moose | 33 | 14 | 18 | 15 | 13 | 12 | 18 | 20 | 143 |
| Mountain Bluebird | | | | | 1 | | | | 1 |
| Mountain Lion | | 1 | | | | | | 1 | 2 |
| Mule Deer | 247 | 137 | 99 | 134 | 217 | 223 | 265 | 105 | 1427 |
| North American Porcupine | 1 | 4 | 5 | 4 | 2 | 4 | 4 | | 24 |
| Northern Goshawk | | | | 1 | | | | | 1 |
| Northern Raccoon | 4 | 5 | 3 | 4 | 6 | 4 | 1 | 1 | 28 |
| Pronghorn | 1 | | | 1 | | | | 1 | 3 |
| Red Fox | 2 | 1 | 1 | 1 | 1 | | 2 | 2 | 10 |
| Red Squirrel | 2 | | | | | 1 | | | 3 |
| Rough-legged Hawk | | | | 1 | | | | | 1 |
| Ruffed Grouse | | | | | 1 | | | | 1 |
| Short-tailed Weasel (Ermine) | 3 | | 1 | | | | | | 4 |
| Snowshoe Hare | | | 1 | | | | | | 1 |
| Striped Skunk | | | 1 | | 4 | | 6 | | 11 |
| Wandering Gartersnake | | | | | | 1 | | 1 | 2 |
| Weasel | | | | | | 1 | | | 1 |
| Western Tanager | 1 | | | | | | | | 1 |
| White-tailed Deer | 5 | 2 | 2 | 2 | | 1 | 4 | 1 | 17 |

| | | | | | | | | | |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|
| Wilsons Warbler | 1 | | | | | | | | 1 |
| Yellow Warbler | 2 | | | | | | | | 2 |
| Yellow-bellied Marmot | | | | | 1 | | 1 | | 2 |
| Grand Total | 371 | 206 | 171 | 213 | 277 | 284 | 358 | 181 | 2061 |

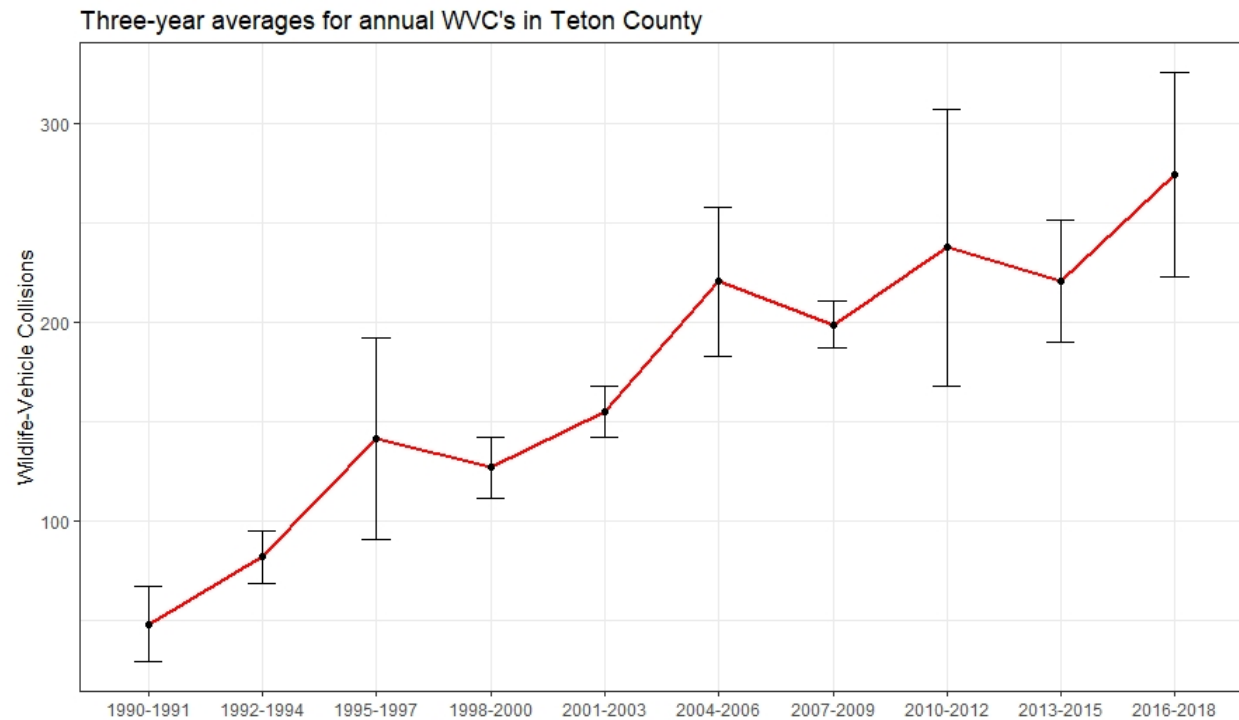


Figure 1. Three year averages and standard error of wildlife-vehicle collisions in Teton County, WY (1990-2018).

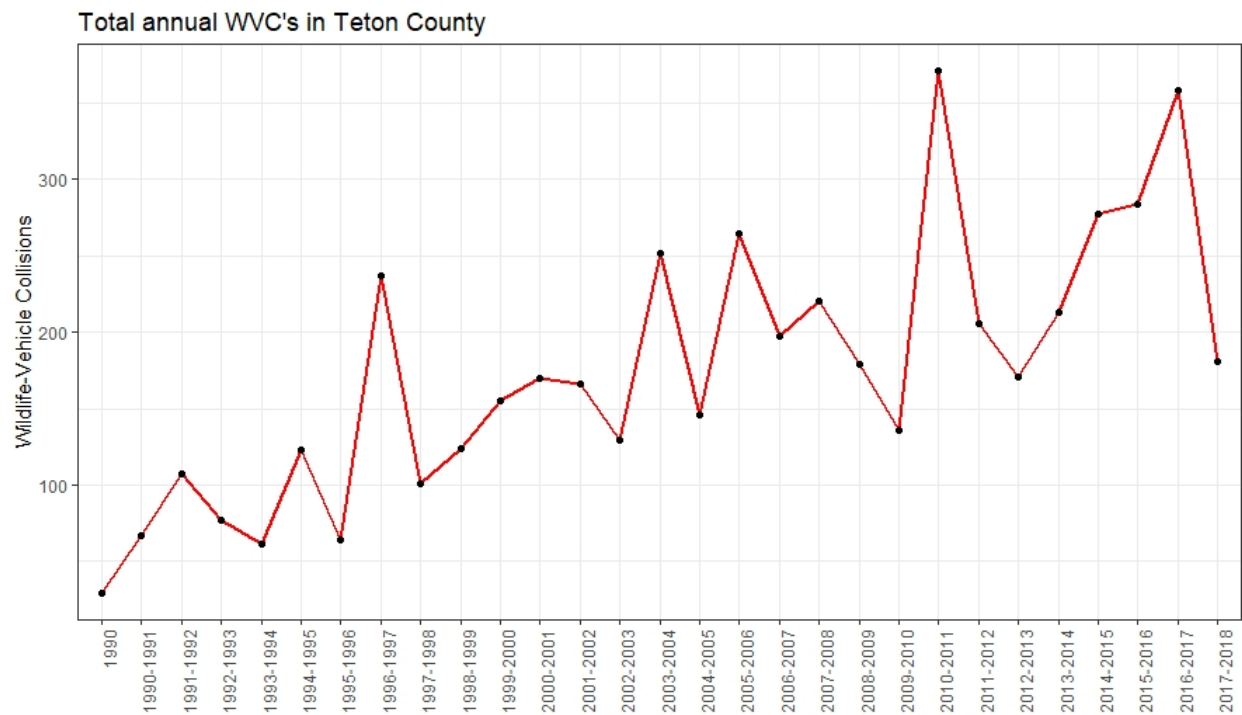


Figure 2. Annual wildlife-vehicle collisions by year in Teton County, WY (1990-2018) (annual equals May 1-April 30).

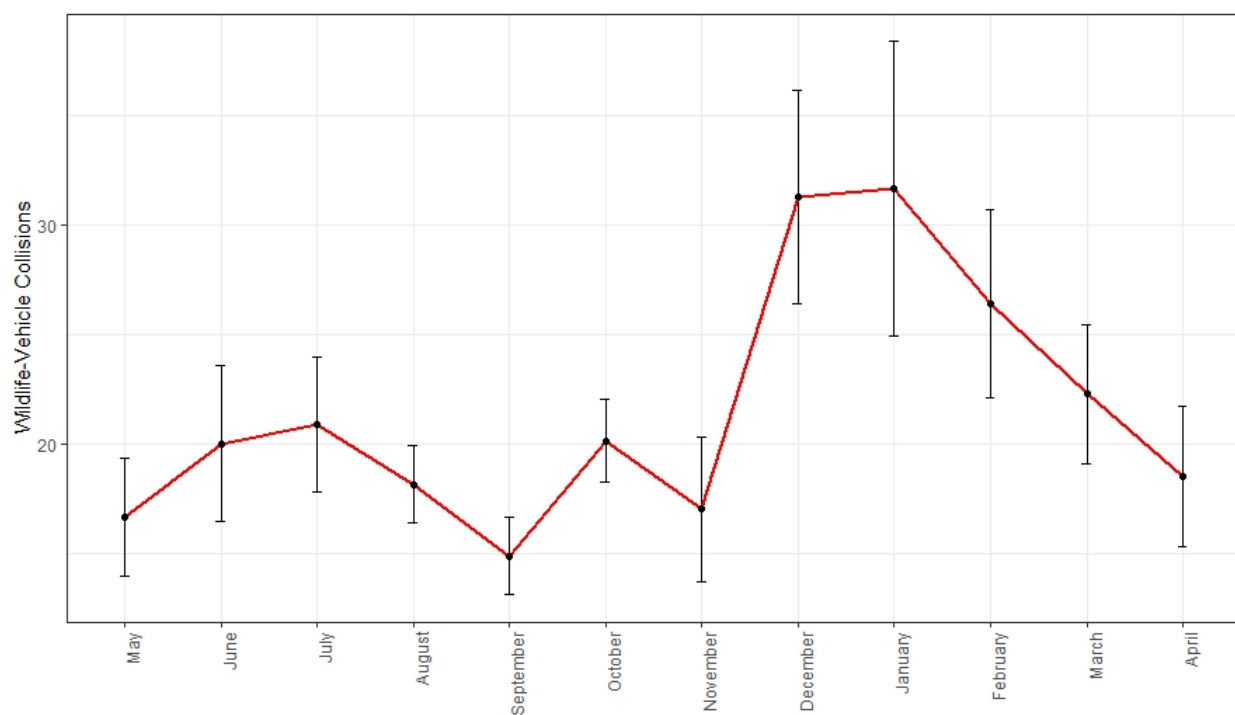


Figure 3. Mean and standard error of wildlife-vehicle collisions by month (2010-2018).

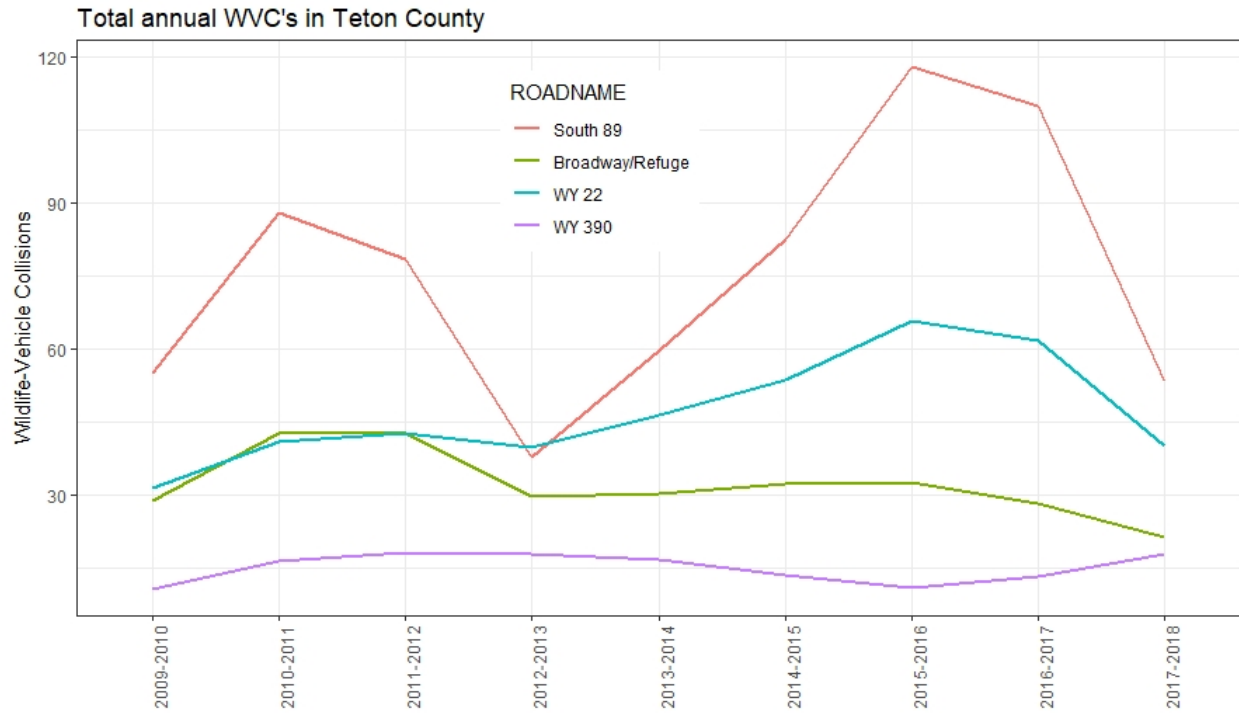


Figure 4. Annual wildlife vehicle collisions on South 89, Broadway/Refuge, WY 22 and WY 390 (2009-2018) (year equals May 1-April 30).

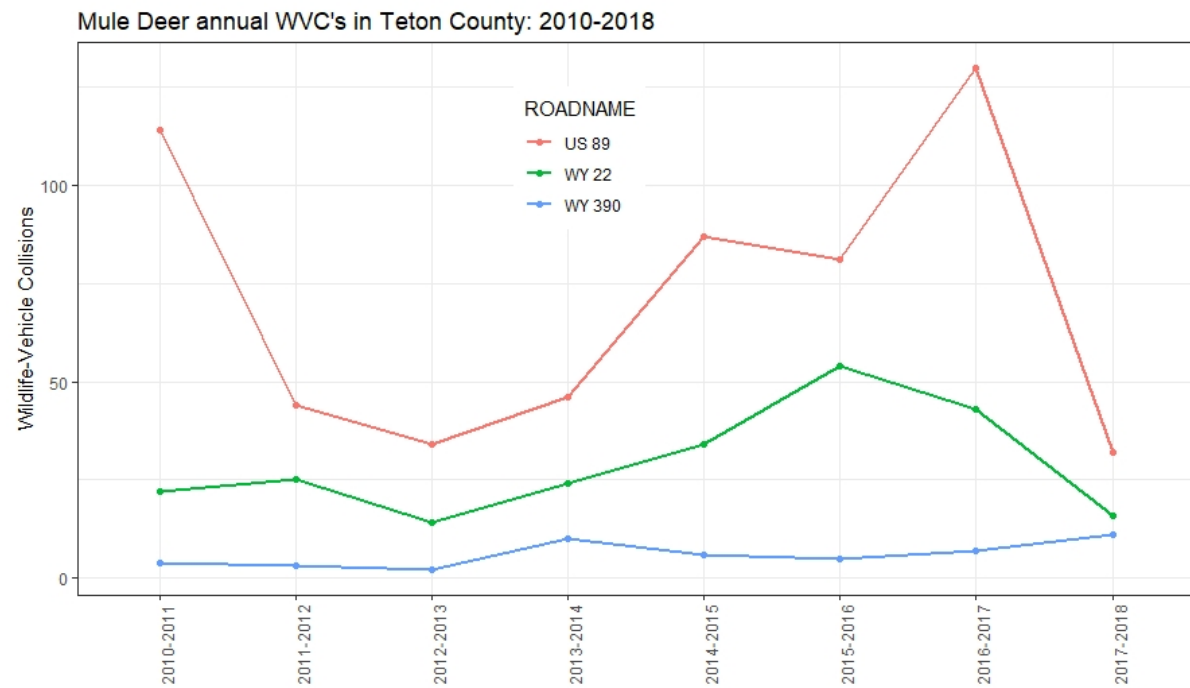


Figure 5. Annual mule deer-vehicle collisions on US 89, WY 22 and WY 390 (2010-2018) (annual equals May 1-April 30).

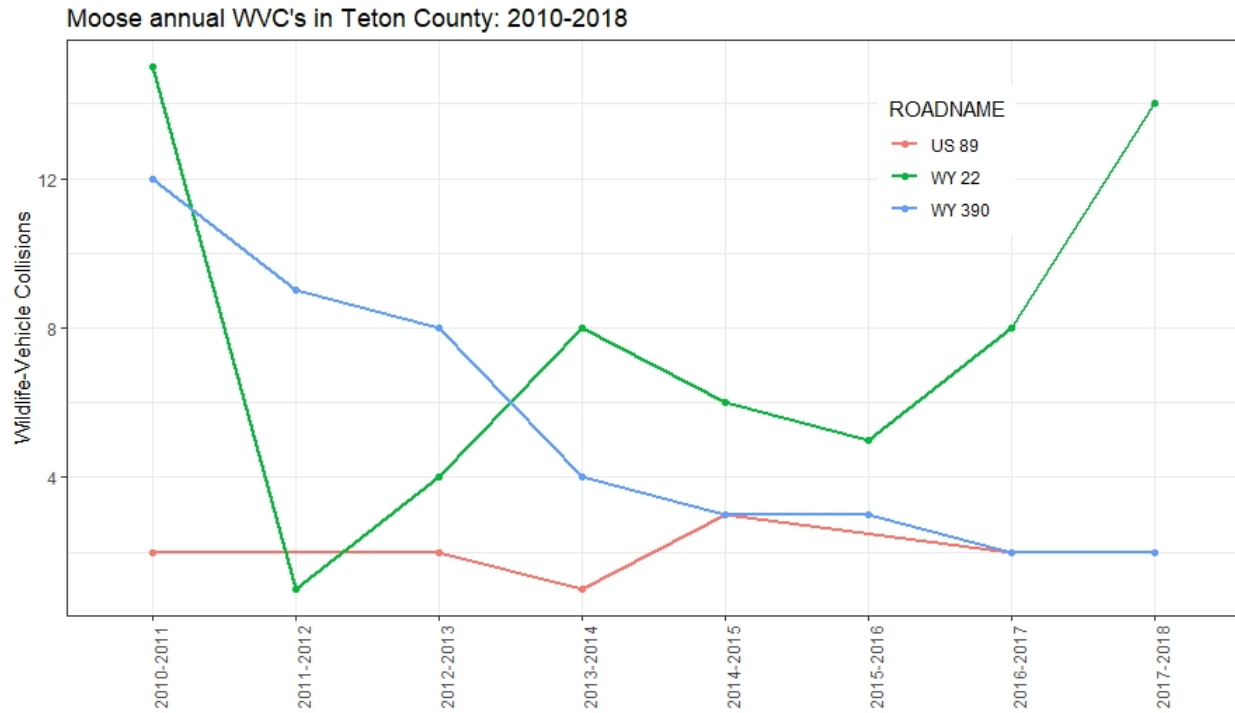


Figure 6. Annual moose-vehicle collisions on US 89, WY 22 and WY 390 (2010-2018) (annual equals May 1-April 30).

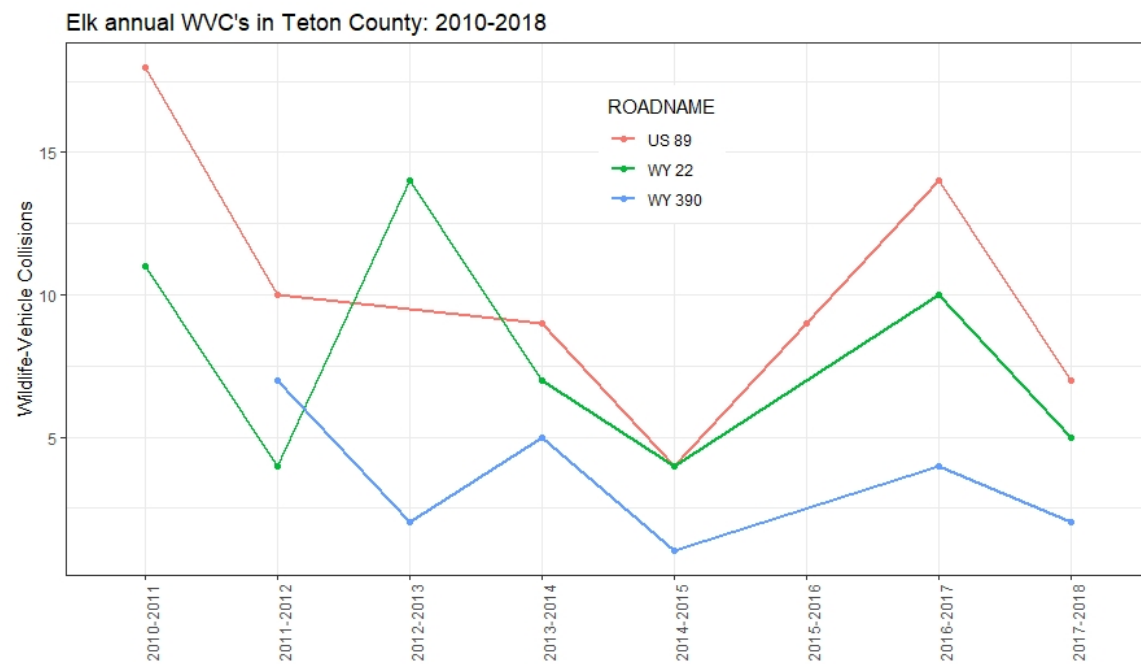


Figure 7. Annual elk-vehicle collisions on US 89, WY 22 and WY 390 (2010-2018) (annual equals May 1-April 30)

