IDAHO TRANSPORTATION DEPARTMENT

RESEARCH REPORT

IDENTIFICATION OF WILDLIFE-VEHICLE CONFLICT MITIGATION OPPORTUNITY LOCATIONS IN IDAHO

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16. Abstract Wildlife-related data and maps incorporated into the transportation process can assist environmental planners and others in avoiding, minimizing, and mitigating transportation impacts on wildlife. Phase One of this study included an ArcGIS Optimized Hot Spot Analysis (OHSA) applied to wildlife-related crash data to identify the top collision hot spots across the state. This analysis was run with various values for road segment lengths, segment buffer widths, distance bands, groupings of years of crash data, Confidence Intervals, and hot spot minimum distances for the state and Districts to select the best model values that represented the phenomenon of wildlife crashes at the District and state level. In Phase Two, each half mile segment of all ITD roads was evaluated in a GIS mapping process that included transportation factors such as inclusion in any of the above mentioned reported crash hot spots plus traffic volume, percentage of reported crashes that were wildlife-related, and ecological data such as wildlife habitat and water bodies. Each road segment received a score for its intersection with those factors, and a second OHSA was conducted on the final scores to identify the top 108 wildlife-vehicle conflict areas. The resulting 108 Wildlife-Vehicle Conflict Areas were then ranked based on the potential feasibility of constructing wildlife crossings in those areas in the future. Once ranked on feasibility, the areas became the Wildlife-Vehicle Conflict Mitigation Opportunity Locations for future wildlife mitigation efforts. These were identified for the entire state, and then individually for each District with separate OHSA analyses for each District. The map produced in Phase Two allows Idaho to be proactive in predicting where wildlife need to move and to plan projects and secure funding for those projects in a systematic, timely manner. This tool can start conversations between project teams, including engineers, environmental planners, project managers, and other project team members in order to effectively collaborate on potential wildlife mitigation projects. This interactive approach to providing data is one of the best ways to ensure wildlife are considered in transportation planning.		
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Chelsea Merriman, the ITD/IDFG Transportation Technical Assistance Liaison, brought a fresh perspective to the study and provided comments and revisions to the report.

Research Team and Technical Advisory Committee

Each ITD research project is overseen by a Technical Advisory Committee (TAC), which is led by an ITD project sponsor and project manager. The TAC is responsible for monitoring project progress, reviewing deliverables, ensuring that study objectives are met, and facilitating implementation of research recommendations, as appropriate. ITD's Research Program Manager appreciates the work of the following TAC members in guiding this study.

- Project Sponsor: Idaho Transportation Department
- Project Manager: Julie Hausknecht
- Research Team: Wildlife Connectivity Institute: Patricia Cramer and Idaho Transportation Department: Will Thoman
- TAC Members: Idaho Transportation Department: Scott Rudel, Alissa Salmore, and Nikolaus Sterbentz

Table of Contents

List of Tables

List of Figures

List of Abbreviations and Acronyms

AADT	average annual daily traffic
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BMP	best management practice
CAADT	commercial average annual daily traffic
DOI	Department of the Interior
DOT	Department of Transportation
ESA	Endangered Species Act
FHWA	Federal Highway Administration
GIS	geographic information systems
GPS	global positioning system
I	Interstate
IDFG	Idaho Department of Fish and Game
IPaC	Information for Planning and Consultation
ITD	Idaho Transportation Department
ITIP	Idaho Transportation Investment Program
MP	milepost
NHDPlus	National Hydrography Dataset Plus
OHSA	Optimized Hot Spot Analysis
QC	quality control
SH	State highway
SHS	State Highway System
SO	Secretarial Order
SWAP	State Wildlife Action Plan
TAC	Technical Advisory Committee
TAMS	Transportation Asset Management System
US	United States highway
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WVC	wildlife-vehicle collision

Glossary

Term	Definition
Area	Abbreviated term for Wildlife-Vehicle Conflict **Areas** which were the 108 locations identified in the Optimized Hot Spot Analysis of transportation and ecological factors, not including feasibility factors.
Carcass Hot Spot	Phase One product. These hot spots were the result of the ArcGIS Optimized Hot Spot Analysis modeling on reported carcasses from the IDFG Roadkill & Salvage Database from the years 2013 to 2022.
Collision	This term is used in this report to reference the act of a vehicle colliding with wildlife; wildlife-vehicle collisions.
Crash	This term is used in this report to reference the reported crashes dataset used in the wildlife-vehicle collision analysis or the hot spot location results.
Distance Band	The distance the ArcGIS Optimized Hot Spot Analysis model looks out in the analysis neighborhood to evaluate the crash data points or other data for clustering.
Factors	Datasets used to model aspects of the interactions between transportation infrastructure, the natural world, and project planning considerations that determine where wildlife mitigation projects are both most need and most likely able to be built.
Hot spot	The resulting aggregated road segments that the ArcGIS Optimized Hot Spot Analysis modeled as a group that has a higher incidence of the factor modeled than neighboring road segments. In this study the hot spots are defined in the two Phases as; Phase one the reported **Wildlife-Vehicle Collision Hot Spots,** based on crashes per mile per year that were within the 90% Confidence Interval and higher; in the Phase Two modeling process these were based on the total points each half-mile segment had from two types of factors modeled with respect to road, and were within the 90% Confidence Interval.
IDFG Roadkill & Salvage Database	IDFG's public reporting roadkill and salvage database. First created after the wildlife collision salvage law (ID Title 36, Chapter 5 § 36-506) went into effect in 2012.
Input features	In ArcGIS, these are files that have polygons or points that are input into the Optimized Hot Spot Analysis spatial tool to identify hot spots of the point value being evaluated, such as the collisions, or numerical score of road segments.
IPLAN	ITD's web-based portal linking directly to ITD's authoritative data sources; through which ITD personnel, business partners, and others can access and publish geospatial information pertaining to transportation in Idaho.
ITD-administered roads	These are the roads ITD is directly responsible for the maintenance, planning, and construction of projects. This includes Interstates, U.S. Highways, and State Highways, all of which are included in the State Highway System (see definition below).

KABCO Injury Classification Scale	The KABCO scale is a five-category injury classification used by law enforcement to rate the severity of injuries in traffic crashes. ITD uses: K = Fatal injury, A = Incapacitating (serious) injury, B = Non-incapacitating (minor) injury, C = Possible injury, and O = No injury.
Locations	Abbreviated term for Wildlife-Vehicle Conflict Mitigation Opportunity **Locations** which were the 108 Wildlife-Vehicle Conflict Areas ranked based on feasibility factors of applying mitigation strategies in the near future.
Mitigation	Efforts to adapt the road infrastructure to minimize wildlife-vehicle collisions and promote wildlife connectivity. Efforts can be simple retrofits to existing structures, or the placement of wildlife crossing structures.
Optimized Hot Spot Analysis	A spatial tool that identifies statistically significant spatial clusters of high values (hot spots) and low values (cold spots) using the Getis-Ord Gi* statistic.
Parameters	The features of the Optimized Hot Spot Analysis model that the user can decide their input value. In this study the primary parameters include: the road segment polygon length and buffer width; the distance band or search distance the model looks out from each road segment; the minimum Confidence Interval results to accept as output; and the years of the crash data to analyze.
Permeability	The ability of the landscape to facilitate wildlife movement among resources.
Research Team	Dr. Patricia Cramer of the Wildlife Connectivity Institute, Ms. Julie Hausknecht ITD Wildlife Biologist and Project Manager for this study, and Mr. William Thoman of ITD Headquarters' GIS Analyst.
Retrofit	Conduct modifications to existing infrastructure to accommodate wildlife passage. In the context of this report this can vary from adding fence to existing abutments of bridges and culverts to funnel wildlife to use them to pass beneath the road, to adding soil pathways along a waterway to allow for terrestrial movement beneath the road.
State Highway System	Includes all ITD-administered roads: Interstates, U.S. Highways, and Idaho State Highways.
Technical Advisory Committee	The TAC included Scott Rudel, Alissa Salmore, and Nikolaus Sterbentz, who were responsible for monitoring project progress, reviewing deliverables, ensuring that study objectives are met, and facilitating implementation of research recommendations, as appropriate.
TAMS	Transportation Asset Management System; an enterprise computer system that tracks life cycles and expenses for ITD equipment, road maintenance projects and operations, creates timesheets for operations employees, and maintains all of ITD's data on pavement.
Ungulate	A hoofed typically herbivorous quadruped mammal with a chambered stomach.
WebCars	ITD's crash database and analysis reporting system.
Wildlife crossing structures	These are culvert or bridge structures built specifically to allow wildlife movement beneath and above roads. They can be wildlife underpasses, or overpasses.

Wildlife overpass	A culvert or bridge structure built into the road with the intention to funnel wildlife over the highway, and vehicles move beneath.
Wildlife underpass	A culvert or bridge structure that is constructed to allow wildlife to move beneath the road. Existing structures built for other purposes are not considered wildlife underpasses, but could be retrofit (see definition below) for wildlife passage.
Wildlife-vehicle collisions	The phenomena of collisions with wildlife, reported and unreported.
Wildlife-Vehicle Collision Hot Spot	Phase One product. The results of Phase One modeling, these hot spots had higher incidences of crashes/mile/year than neighboring road segments.
Wildlife-vehicle conflict	The phenomenon of multiple effects of roads and traffic on wildlife, including collisions, road avoidance, habitat fragmentation, and isolation from necessary resources.
Wildlife-Vehicle Conflict Areas	Phase Two product. The resulting aggregated road segments that the ArcGIS Optimized Hot Spot Analysis modeled as a group that had higher overall point scores of the transportation and ecological factors than neighboring road segments. Does not include feasibility factors.
Wildlife-Vehicle Conflict Mitigation Opportunity Locations	Phase Two product. The final ranking of the Wildlife-Vehicle Conflict Areas based on scores that evaluated each area for feasibility of creating wildlife crossing structures in the near future. These locations included all factors and were the final products of the study.

EXECUTIVE SUMMARY

The goal of this study*, Identification of Wildlife-Vehicle Conflict Mitigation Opportunity Locations in Idaho* was to encourage continued collaborative efforts with Idaho Transportation Department (ITD) and partnering agencies to proactively identify areas where large wild mammal movements need to be safely accommodated across ITD-administered roads (State Highway System [SHS]). ITD and partnering agencies understand that addressing wildlife-vehicle conflict will help to reduce wildlife-vehicle collisions and help protect Idaho's wildlife species both large and small. This study addressed the potential to reduce both wildlife-vehicle collisions and wildlife-vehicle conflict. **Wildlife-vehicle collisions** (WVCs) is a term to describe the phenomena of collisions with wildlife, reported and unreported. **Wildlife-vehicle conflict** is the phenomenon of multiple effects of roads and traffic on wildlife, including collisions, road avoidance, habitat fragmentation, and isolation from necessary resources. This study analyzed multiple data sources to address both these phenomena with respect to wild ungulates (hooved animals such as deer [*Odocoileus* spp.], elk [*Cervus canadensis*], pronghorn [*Antilocapra americana*], etc.) and medium to large carnivores, such as bear (*Ursus* spp.), Canada lynx (*Lynx canadensis*), mountain lion (*Puma concolor*), etc. Future goals for the implementation of this study's results are to help Idaho protect motorists from future WVCs and to protect and restore wildlife connectivity across Idaho roads.

This two-phase study had two primary objectives. The objective of Phase One was to map hot spots of reported wildlife-vehicle collisions on ITD-administered roads; it addressed WVCs of the past. In Phase Two the objective was to use a holistic approach to identify locations where ungulate and larger carnivore wildlife need to move across ITD-administered roads in addition to the collision hot spots, thus it addressed the potential for wildlife-vehicle conflict with respect to larger mammals.

The ArcGIS Optimized Hot Spot Analysis (OHSA) using the Getis-Ord GI* statistic was used to identify hot spots on ITD-administered roads for various factors. The base input feature was a simplified version of ITD's SHS where roads were divided into half mile road segments. In Phase One the second input feature was the reported wildlife-vehicle collisions. These collisions from 2018 through 2022 were summed for each half mile road segment. The OHSA identified statistically significant spatial clustering of the road segments with the highest wildlife related collision rates, the hot spots. Collision hot spots were identified at the statewide and ITD District (District) levels (Figure 0-1).

The Phase Two modeling brought together the Phase One collision hot spots and eight additional transportation and ecological factors that represented the potential for large mammal wildlife-vehicle conflict. These factors were quantified and weighted through a consensus process among the research team, Dr. Patricia Cramer, Ms. Julie Hausknecht, and Mr. William Thoman and the Technical Advisory Committee (TAC). Road segments were scored with points for each of those factors; a final sum was calculated out of a maximum of 100 points. A second OHSA was conducted on each road segment's total points. The resulting 108 Wildlife-Vehicle Conflict Areas were evaluated for the feasibility of constructing wildlife crossing structures by assigning a maximum of 30 points based on three feasibility factors. The Wildlife-Vehicle Conflict Areas were then ranked based on the areas' final scores in statewide rankings

and individual District rankings to identify the final Wildlife-Vehicle Conflict Mitigation Opportunity Locations (Locations) for future potential wildlife mitigation efforts.

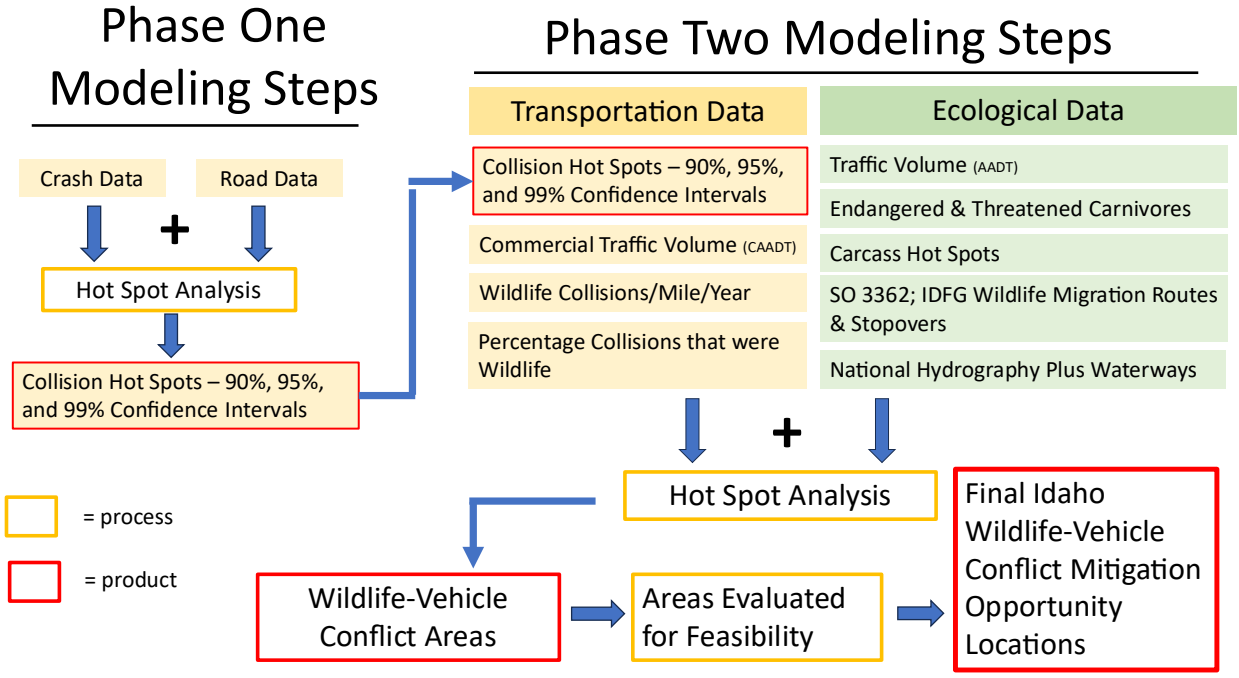

Figure 0-1. The flow diagram of Phase One and Phase Two modeling to identify the final Wildlife-Vehicle Conflict Mitigation Opportunity Locations.

Figure 0-2 identifies the top 108 Locations based on Phase Two modeling results for the statewide analysis. These can also be viewed on ITD's ArcGIS IPLAN web-based portal.

The Locations presented in this report on both a statewide level and District level allow for environmental planners, project managers, decision makers, and other readers to gain a more complete picture of areas most relevant to wildlife vehicle conflict in the state and to help support efforts to mitigate roads for wildlife movement. The mitigation strategies can vary from retrofits of existing structures such as placing wildlife exclusion fences to existing bridges, to building wildlife crossing structures. The study's resulting maps and lists of top areas can be used to help secure funding for transportation projects that include mitigation for wildlife. This study is a guide to ITD personnel, partnering agencies, and the public to further explore these areas for potential solutions.

The Locations presented are not all known areas where large wild mammals need to cross Idaho's highways. Rather, the results of modeling certain factors presented in maps throughout this report, are a summary of potential areas where landscape connectivity needs to be protected or restored for these animals. Users of this information are strongly encouraged to incorporate additional data and field visits to their evaluations of these areas.

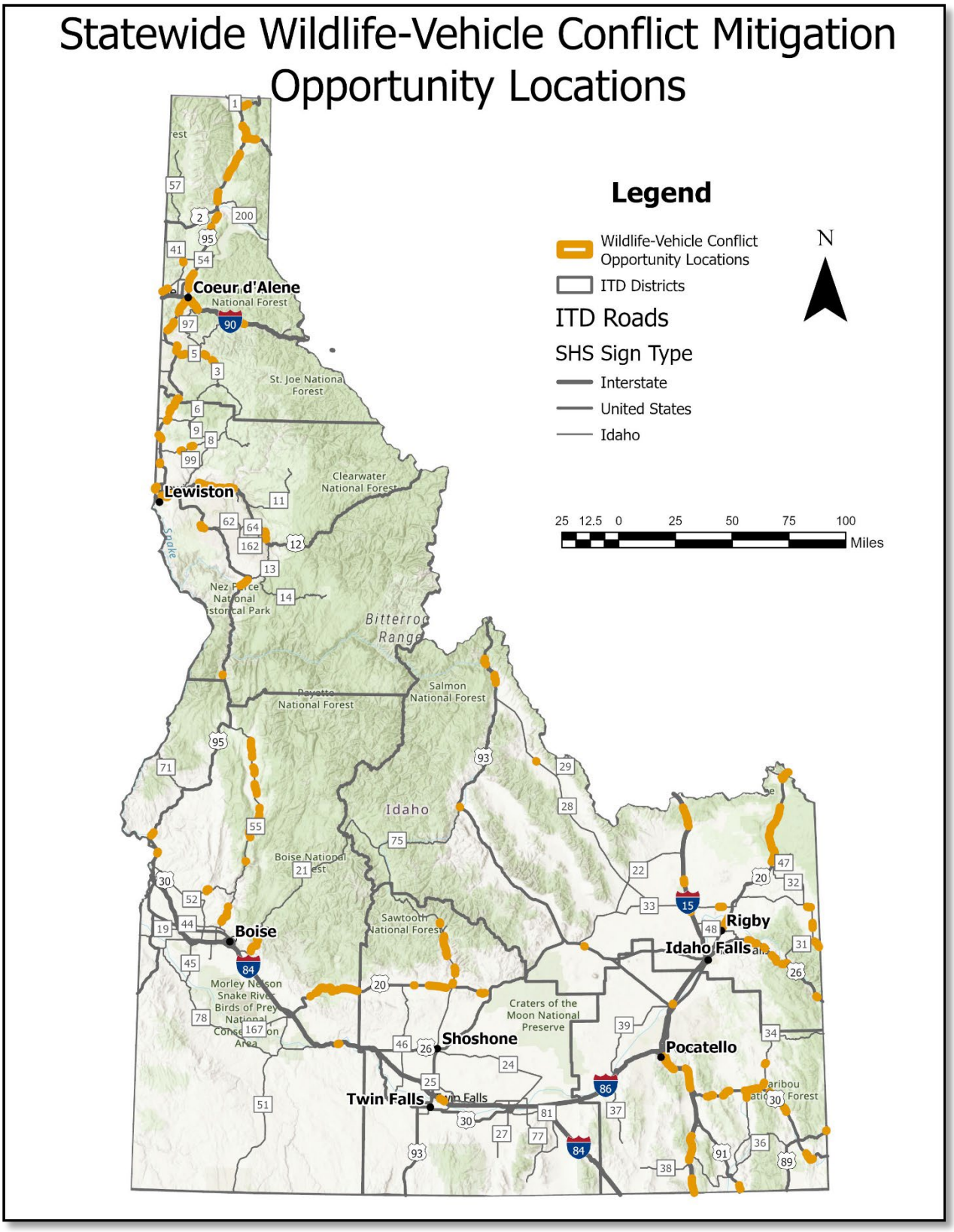

Figure 0-2. The 108 Wildlife-Vehicle Conflict Mitigation Opportunity Locations for Idaho.

1. INTRODUCTION

Introduction and Objectives

Idaho Transportation Department (ITD) and partnering agencies such as Idaho Department of Fish and Game (IDFG) understand there is a need to identify large mammal wildlife-vehicle conflict priority areas across the state to better address the challenges of roads, traffic, and wildlife. The term **wildlife-vehicle collision (WVC**) indicates the general phenomenon of collisions with wildlife. It does not specify if it refers to reported collisions with wildlife, or in general collisions with wildlife, or if it refers to carcasses, or to all phenomena. **Wildlife-vehicle conflict** is a term that includes the consequences of roads and traffic on wildlife that are not only collisions, but brings in effects such as habitat fragmentation, large amounts of traffic that restrict wildlife from even approaching a road, the avoidance of roads by certain species such as pronghorn (*Antilocapra americana*), the effects of roads on smaller animals, and other implications for the survival of wildlife populations and ecosystems (van der Ree 2015, Figure 1-1). This report explicitly describes each term when referenced.

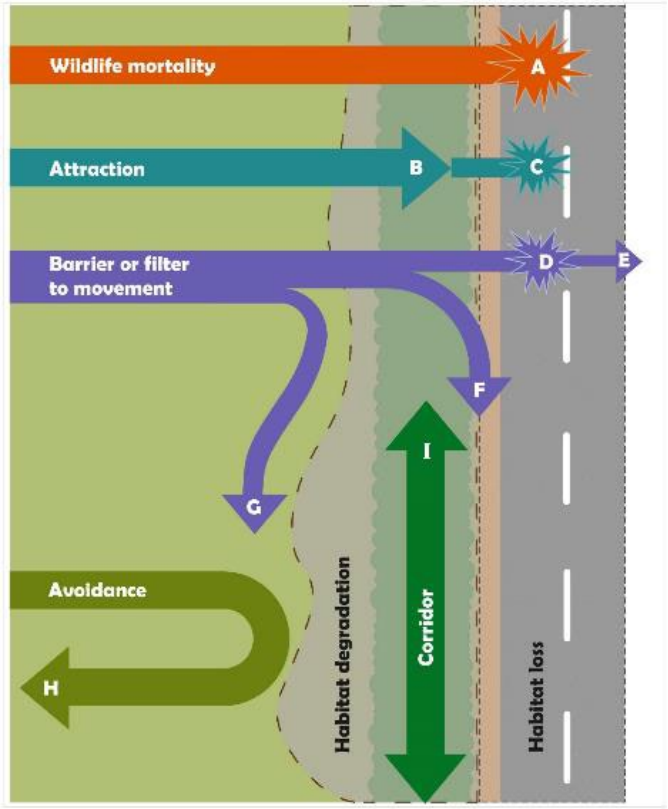

Figure 1-1. Impacts of roads on individual wildlife, populations and ecosystems. Habitat is lost to build the road and habitat adjacent to the road is degraded. The most obvious impact of roads and traffic on wildlife is mortality due to wildlife-vehicle collisions (A). Some species are attracted to resources (e.g., carrion, spilled grain or heat for basking) on the road or roadside (B) which, depending on the animal's ability to avoid traffic, may result in death due to vehicle collision (C). The barrier or filter effect reduces the movement of animals across the road and a proportion of individuals that attempt to cross are killed (D) and some make it across (E), while others are deterred by the road (F) or degraded roadside habitat (G). Other species actively avoid the road or degraded habitat (H). By contrast, some species use the roadside vegetation as habitat and/or as a corridor for movement (I). (Reprinted from the Handbook of Road Ecology (van der Ree et al. 2015) with permission from R. van der Ree.).

An ITD-sponsored study completed in 2014 identified top areas of wildlife collisions and wildlife-vehicle conflict statewide (Cramer et al. 2014, Figure 1-2). In 2023, there was a need to update the geographic information systems (GIS) database with recent data and hot spot analyses of where more current top WVC areas were located in the state, and where wildlife-vehicle conflict may need to be addressed. The goal of this 2023 to 2025 study was to help ITD and partnering agencies identify where wildlife movement may need to be restored or protected. Maps of these identified areas can help to facilitate proactive

transportation planning and ITD funding applications to help develop mitigation that protects motorists and promotes permeability for various wildlife species across Idaho roads throughout the state.

There were two primary objectives of this study:

1. Assemble and gather data related to wildlife-vehicle conflict to create a comprehensive GIS dataset that can be used to identify areas with the highest potential for wildlife-vehicle conflicts.

2. Identify Wildlife-Vehicle Conflict Areas that have high opportunity for wildlife mitigation. These areas were located by combining GIS data on transportation and ecological factors and ranking based on feasibility factors. The resulting areas were considered the top potential areas that would benefit from including wildlife mitigation measures in the transportation planning process at both the state and ITD District (District) levels. These are the Wildlife-Vehicle Conflict Mitigation Opportunity Locations.

The goals of this study align with ITD's mission statement to provide for motorists' safety, their mobility, and their economic opportunity. This study is intended to help reduce WVCs, which would make Idaho roads safer and to provide greater mobility by identifying the locations where wildlife mitigation would be most cost-effective.

The study was conducted by the research team: Dr. Patricia Cramer of the Wildlife Connectivity Institute, Julie Hausknecht, ITD Wildlife Biologist and Project Manager for this study, and William Thoman, ITD Headquarters' GIS Analyst. The Technical Advisory Committee (TAC) members were consulted throughout the development of the study and helped to guide both the analyses and the final products.

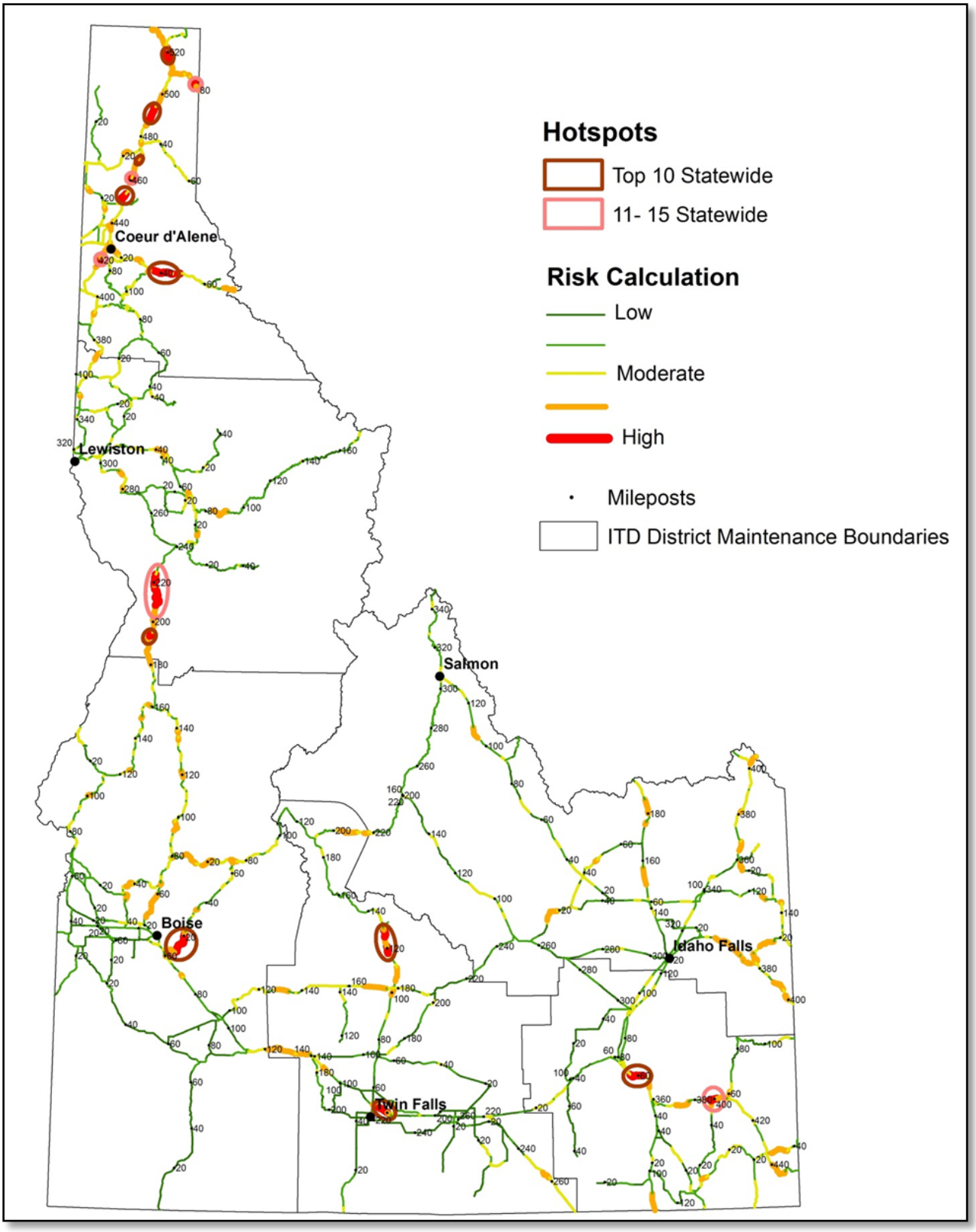

Figure 1-2. The 2014 Idaho Top Wildlife-Vehicle Collision Priority Road Segments (Cramer et al. 2014).

Scientific Approach and Products of This Study

This two-phase study modeled data to identify the top areas on ITD-administered roads where large mammal wildlife species, roads, and vehicles were in conflict and the top areas where potential mitigation opportunities exist.

This study focused on the State Highway System (SHS) which is made up of the ITD-administered roads. This includes Interstates, U.S. Highways, and State Highways (Figure 1-3).

The challenge of WVCs in Idaho was studied to better understand temporal and spatial patterns of the collisions and the costs to society. The ITD reported wildlife-vehicle crash data were obtained, analyzed, and summarized to provide the context for the need for this study (Chapter 2).

The ArcGIS Optimized Hot Spot Analysis (OHSA) using the Getis-Ord Gi* statistic was used to evaluate the SHS in half mile road segments. In Phase One the OHSA was used to determine hot spots on ITD-administered roads for reported wildlife-vehicle collisions. The collision hot spots were based on road segment clusters with the greatest concentration of wildlife collisions per mile per year (Chapter 3).

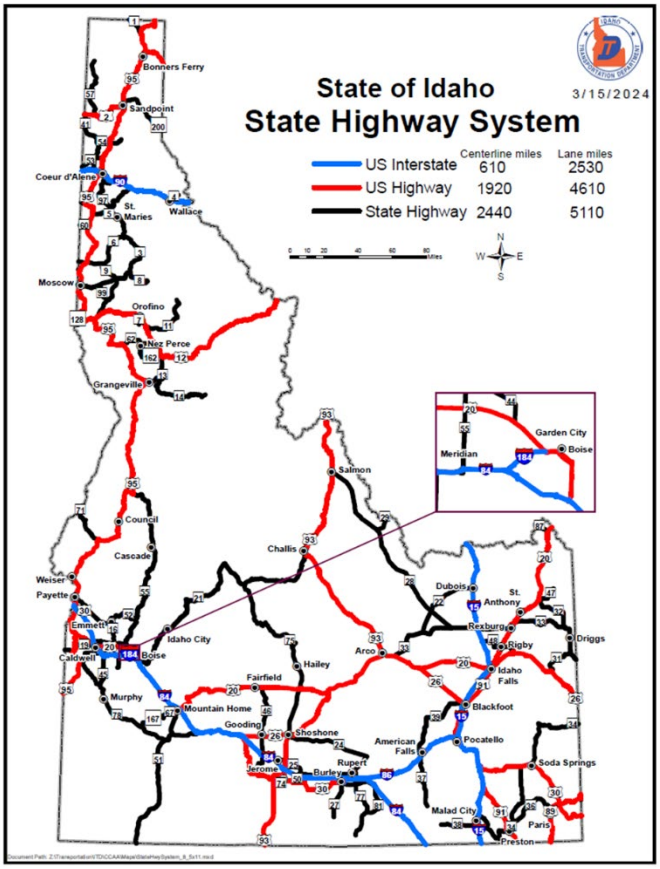

Figure 1-3. This study analyzed collisions on ITD-administered roads, including Interstates, U.S. Highways, and State Highways known as the State Highway System (SHS).

In Phase Two (Chapter 4) every half mile segment of ITD-administered roads were evaluated for inclusion in a Phase One hot spot, plus eight additional transportation and ecological georeferenced data layers or factors. These data were chosen to represent the potential for wildlife-vehicle conflict with large wild mammals such as ungulates and large carnivores (bears [*Ursus* spp.] and mountain lions [*Puma concolor*]). The quantification of those data layers and how each half mile road segment intersected with them resulted in a score for each road segment. The road segments were then analyzed with a second OHSA of those scores. The resulting 108 Wildlife-Vehicle Conflict Areas were then ranked based on the potential feasibility of constructing wildlife crossings in those areas in the future. Once ranked on feasibility, the areas became the Wildlife-Vehicle Conflict Mitigation Opportunity Locations (Locations) for future wildlife mitigation efforts. These were identified for the entire state, and then individually for each District with separate OHSA analyses for each District.

This study resulted two key deliverables: (1) this final report and (2) multiple newly created GIS layers uploaded to IPLAN, which is a web-based portal on ITD's branded deployment of ArcGIS Online. The end products include an interactive web mapping application with the input data layers and resulting products of the analyses that are available to ITD and partnering agencies. The interactive and adaptive maps were uploaded to ITD's IPLAN dashboard. The public webpage will have access to a simplified application to view the overall results but without the complexity needed for the transportation planning process of the agency version. The applications will include a landing page to explain the study and methods and a dashboard mapping application which will highlight relevant information about the Wildlife-Vehicle Conflict Mitigation Opportunity Locations.

The final conclusions of the study (Chapter 5) demonstrate how the results of this study compared between the two phases of the study, the past 2014 study (Cramer et al. 2014), and how results can be implemented. The appendices present some details of the methodology, data, maps, and tables to complement the chapters' presentations. There is a separate Supplemental Information Source Document guidance on the specific methodology used in this study.

Study Challenges

During the study, there were challenges with data sources that limited the utility of the model to accurately identify areas of the state where wildlife-vehicle conflict was predicted. The Phase One crash data were limited by the willingness of drivers of vehicles involved in collisions to report those collisions. For example, drivers of tractor trailer trucks typically do not report their collisions with wildlife. As the Phase Two OHSA iterations progressed, it became apparent that the severe limitations of inputs of statewide ungulate and carnivore habitat maps limited the utility of the model to accurately identify areas within the state where wildlife-vehicle conflict was predicted. The research team added data layers that were originally not considered because of their lack of statewide data coverage. The modeling in Phase Two also initially did not identify some locally known top areas were wildlife-vehicle conflict occurs within the state such as Rocky Point on US-30 in District 5. To ensure all these types of areas were analyzed, additional data were included such as commercial traffic volume, to help identify areas where semitruck drivers may be directly striking wildlife and not reporting those incidents. These changes over the months and years of modeling helped to adapt the model process and results to best represent what ITD personnel and others know of problem areas for wildlife on ITD-administered roads across the state. These adaptations are detailed in the proceeding chapters.

Implementation

The study results form a basis for future decision making, and are not based in policy or management recommendations. The maps, hot spot list rankings, etc., are for identifying where there is potential to mitigate for wildlife-vehicle conflict, not a mandate as to how or when to implement wildlife mitigation projects.

Model outputs from this study do not identify all known locations where wildlife need to move across roads, but rather display how a model of transportation and ecological factors along with feasibility rankings translates into maps of wildlife connectivity across ITD-administered roads and wildlife-vehicle conflict. Users of this information are strongly encouraged to incorporate other data sources and ground-truth these locations.

This study helps place ITD and partnering agencies in a more favorable position to compete for wildlife passage specific funding. Since the passing of the Bipartisan Infrastructure Law in 2021, multiple grant opportunities to compete for Federal Highway Administration (FHWA) funds became available that could be used to build wildlife crossing structure mitigation. These grants included funding for creating wildlife mitigation as part of the 2021 Infrastructure Investment and Jobs Act's Wildlife Crossings Pilot Program (Pub. L. 117-58) and potential future Wildlife Road Crossings Program Reauthorization Act of 2025 (introduced in 2025). The study products can also help ITD and partnering agencies best direct time and resources to areas the data identified as top potential locations for reducing WVCs and promoting wildlife permeability. The mitigation could entail simple retrofits such as placing terrestrial wildlife pathways along water ways under existing bridges and in culverts, to standalone wildlife crossing structure projects.

The study results can help ITD collaborate with IDFG to achieve many goals of the 2023 State Wildlife Action Plan (SWAP; IDFG 2023). The SWAP goals include:

> "Improvement of motorist safety by informing, designing, implementing, and maintaining infrastructure projects to reduce WVCs, especially with big game; to inform, design, install, and maintain measures to enhance motorist awareness and reduce WVC risks; construct or upgrade bridges and culverts to benefit fish and wildlife movements; and reconnect seasonal ranges where transportation systems have interrupted migration routes (e.g., crossing structures, wildlife-friendly fencing, and conservation easements)."

With limited funds to address wildlife in transportation, it's critical for ITD and its partner agencies to take available data on transportation and wildlife to identify areas that can both make the roads safer for drivers by reducing WVCs, and increase habitat permeability to allow wildlife to move across the landscape with reduced risk of collisions. The research team and the TAC that supported the development of this study worked to include many layers of information and analyses on where wildlife is located along with other factors in Phase Two of this study, and hope it leads to concrete actions that will help protect wildlife and motorists on Idaho roads.

2. THE CHALLENGE OF WILDLIFE VEHICLE COLLISIONS IN IDAHO

The challenge of WVCs in Idaho was examined through crash and carcass data to understand the depth and scope of the problem, the distribution of those collisions and changes over time, and the cost to society for those collisions. This was done to provide context for the need for this study, the resulting maps and actions to reduce these collisions, and provide for increased wildlife movement across roadways.

Reported Wildlife-Vehicle Collision Numbers: Two Approaches

Approach One: Accounting for Only the Most Severe Injury

Collisions are reported by law enforcement with a severity code that identifies the collision type based on the most severe injury (highest degree of injury) of the people involved, or if there was a fatality. This allows for an evaluation of the severity and cost of the collisions with wildlife. Table 2-1 below, presents the number of reported collisions with wildlife under each collision's most severe injury code in each District for 2022, the most recent crash reports available at the time of the analysis in 2023, when 1,626 collisions with wildlife were reported.

Table 2-1. Reported wildlife related collisions in 2022, by District. Crash data are organized based on reporting the single most severe collision severity injury or fatality in each collision.

District	Fatal	A Injury: Suspected Serious Injury	B Injury: Suspected Minor Injury	C Injury: Possible Injury	Property Damage Only	Total
District 1	0	4	21	14	367	406
District 2	0	1	6	4	114	125
District 3	0	2	11	10	229	252
District 4	0	1	10	6	221	238
District 5	0	1	14	18	270	303
District 6	1	4	14	11	272	302
Totals	1	13	76	63	1,473	1,626

Approach Two: Accounting for All Injuries

There is also an evaluation method that includes the number of all human injuries and fatalities involved in a single collision in addition to the person with the most severe injury or death. For instance, if a collision had the rating of the most serious type of injury, Type A, it could also have two additional people involved in the collision who were also injured but whose injuries were classified at lower severity values, such as

Type B and Type C, which would not be included in coding or valuing the collision. In Idaho, reporting officers includes these data in their reports, allowing for a more detailed analysis that gives value to all injuries or fatalities. Steve Rich, ITD Research Analyst Principal of the Office of Highway Safety, calculated the number of people involved for each severity type (including "Property Damage only – no apparent injuries" type) for every reported collision with wildlife for every year from 2013 through 2022 (Table 2-2). Within that ten year range a total of 21,888 people were involved in reported wildlife collisions statewide. Using this method, the 2022 total of 1,626 reported collisions with wildlife was readjusted to represent the 2,583 individuals involved in the collisions.

Table 2-2. Total number of people injured or involved in reported collisions with wildlife for each severity type in Idaho, 2013 to 2022.*

Injury Type	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Fatal Injury	1	0	1	1	2	2	0	0	1	1	9
Type A Suspected Serious Injury	7	10	12	11	12	15	23	10	18	15	133
Type B Suspected Minor Injury	50	82	95	69	77	66	70	66	69	90	734
Type C Possible Injury	107	97	104	99	90	99	111	102	86	81	976
No Apparent Injury (Property Damage Only)	1,770	1,577	2,061	2,128	1,917	1,739	2,007	2,019	2,375	2,390	19,983
Unknown (incomplete information)	0	33	0	3	3	0	2	0	6	6	53
Total people	1,935	1,799	2,273	2,311	2,101	1,921	2,213	2,197	2,555	2,583	21,888

*Collision estimates received from Steve Rich, ITD Research Analyst Principal, Office of Highway Safety.

Costs to Society Associated with the 2022 Reported Collisions with Wildlife

FHWA and each state Department of Transportation (DOT) assign values for societal costs of collisions for each collision severity type (Harmon et al. 2018; Rich 2024). This allows states to assign a monetary value on collisions in accordance with the cost of living of that state and the preference of the DOT's traffic safety department for specific approaches to applying and tallying collision costs and conducting benefit-cost analyses. In accordance with Idaho's methods, the overall cost estimate to the Idaho public (cost to society) for reported collisions with wildlife can be estimated using the ITD collision severity codes for

each collision and multiplying those numbers with the ITD collision severity monetary values, and in addition, the FHWA collision severity values.

Idaho's 2022 estimated costs for the different severities of collisions were obtained from Steve Rich in April of 2024. The FHWA collision severity codes, known as the KABCO Injury Classification Scale, and values were taken from Harmon et al. (2018) and updated for 2022 using the United States Inflation Calculator. See Table 2-3 below for both the ITD and FHWA collision severity types and values.

Table 2-3. ITD and FHWA 2022 collision unit costs for each collision severity type.*

Injury Type	ITD 2022 Value of This Collision Type	FHWA 2022 Value of This Collision Type
Fatal Injury (K)	$12,626,000.00	$13,707,275.00
Type A Injury Suspected Serious Injury (A)	$603,839.00	$794,860.00
Type B Injury Suspected Minor Injury (B)	$164,467.00	$240,778.00
Type C Injury Possible Injury (C)	$83,982.00	$152,291.00
No Apparent Injury (Property Damage Only; O)	$4,254.00	$14,441.00

*This value is given to each collision type, which is categorized by the single most severe injury or fatality in a collision. FHWA collision costs and injury types (KABCO) from Harmon et al. 2018.

With the number of reported collisions with wildlife per year and the number of people who were classified with each severity type for those collisions, the ITD and FHWA costs can be applied to calculate the value of wildlife-related reported collisions annually for each agency set of collision values.

Steve Rich calculated the number of people involved in reported collisions with wildlife and the severity of their injuries or lack of injuries by District for 2022. The 2022 ITD and FHWA values of each of those collision injuries for everyone involved were calculated for each District (Table 2-4).

Table 2-4. The number of people injured or killed in reported collisions with wildlife and the property damage only collisions for 2022 by District and their estimated cost to society based on ITD and FHWA 2022 collision costs.

	Number of Each Type of Collision Reported in 2022							Calculated Cost to Society (2022 inflation-adjusted Dollars)	
District	Fatal	Type A	Type B	Type C	Property Damage Only	Unknown	Total	ITD	FHWA
1	0	5	27	19	572	4	627	$11,489,001.00	$21,629,087.00
2	0	2	6	4	177	0	189	$3,283,444.00	$6,199,609.00
3	0	2	11	10	384	1	408	$5,490,342.00	$11,306,532.00

	Number of Each Type of Collision Reported in 2022							Calculated Cost to Society (2022 inflation-adjusted Dollars)	
4	0	1	11	12	334	1	359	$4,841,744.00	$10,094,204.00
5	0	1	17	21	477	0	516	$7,192,769.00	$14,974,554.00
6	1	4	18	15	446	0	484	$21,158,972.00	$29,945,770.00
Total	**1**	**15**	**90**	**81**	**2,390**	**6**	**2,583**	**$53,456,273.00**	**$94,149,756.00**

In 2022 there were **1,626** reported crashes with wildlife in Idaho. Within those crashes, there were **2,583** people involved. The societal cost of those crashes, using ITD crash cost values, was estimated to cost the Idaho public over **$53 million**. When the FHWA crash values were updated for 2022 and used in these calculations, the cost to society was over **$94 million**.

Fatal and Injury Collisions with Wildlife

During the ten years from 2013 through 2022 there were nine reported fatal collisions with wildlife (red crosses in Figure 2-1) and 1,492 injury collisions identified in a heat map with yellow indicating higher collision concentration (Figure 2-1). While ITD crash data collection does not require reporting the species of the animal, the research team paired collision narratives with fatal collision entries. Of the nine fatalities between 2013 and 2022, three collisions involved deer, one narrative mentioned a pronghorn, and one described a moose (*Alces alces*) as the animal involved. Other narratives did not indicate the species of animal. Two of the fatal collisions involved motorcyclists.

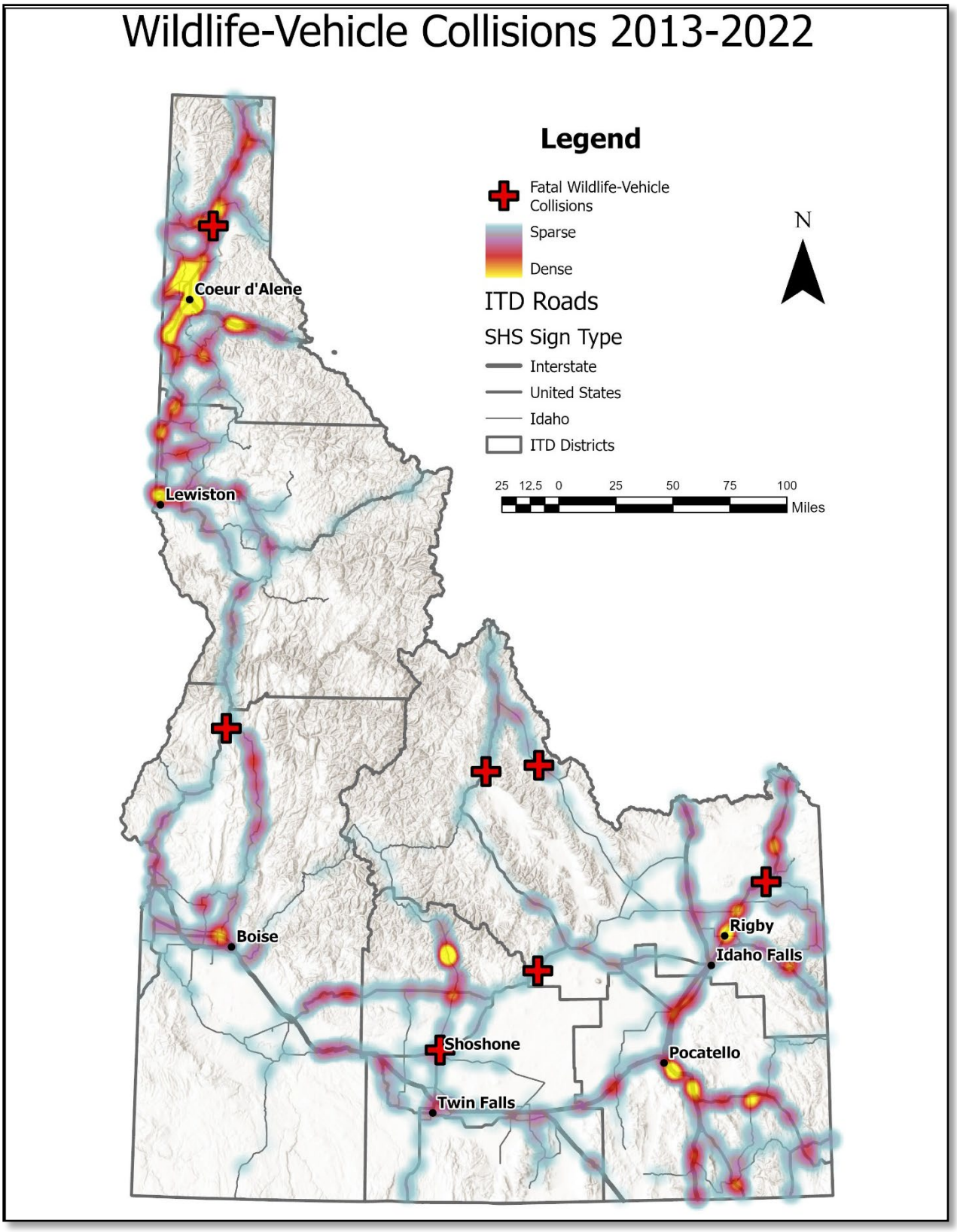

Figure 2-1. A heat map of locations of fatal collisions (red crosses) and all reported injury collisions with wildlife in Idaho between 2013 and 2022. Yellow indicates the most intense areas for numbers of injury collisions.

Total Reported Collisions with Wildlife Over Time

From 2013 through 2022, there were 21,888 collisions in Idaho where "Animal-wild" was reported in one or more event columns of crash data (Steve Rich, ITD Research Analyst Principal, personal communication). Each of those year's reported collisions is presented below (Figure 2-2). Reported collisions with wildlife have risen steadily since 2019, with the exception of 2020, the first year of the COVID-19 pandemic. This is likely due to travel restrictions during that time.

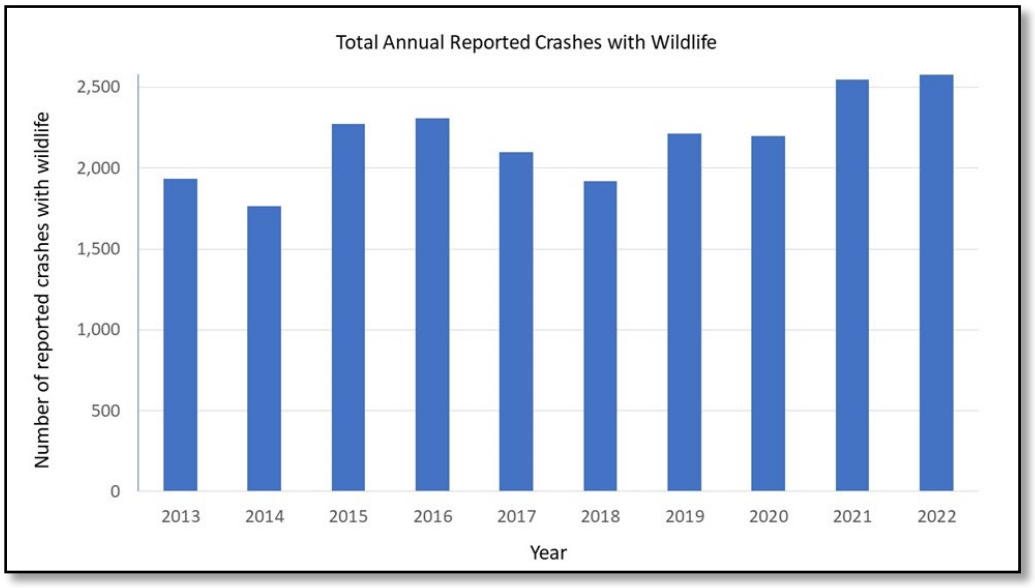

Figure 2-2. The number of reported collisions with wildlife for each year from 2013 through 2022 (Rich 2024).

Total Reported Collisions with Wildlife by County

As this study was conducted to primarily assist ITD and its partnering agencies incorporate potential wildlife mitigation into transportation projects the focus was on a statewide level or District level. However, the research team wanted to demonstrate another way collision with wildlife could be identified. So, wildlife-vehicle collisions reported between 2013 and 2022 were also parsed out by county (Figure 2-3) to help elucidate which counties had the highest numbers of reported crashes with wildlife. This approach helps to evaluate the scope of the problem on a county level rather than on a District level and may assist County or local municipalities identify potential locations to incorporate wildlife mitigation. Kootenai County, which includes the city of Coeur d'Alene, had the greatest number of wildlife-vehicle reported collisions. Ada County, which includes the City of Boise, had the second highest number of reported wildlife-vehicle collisions.

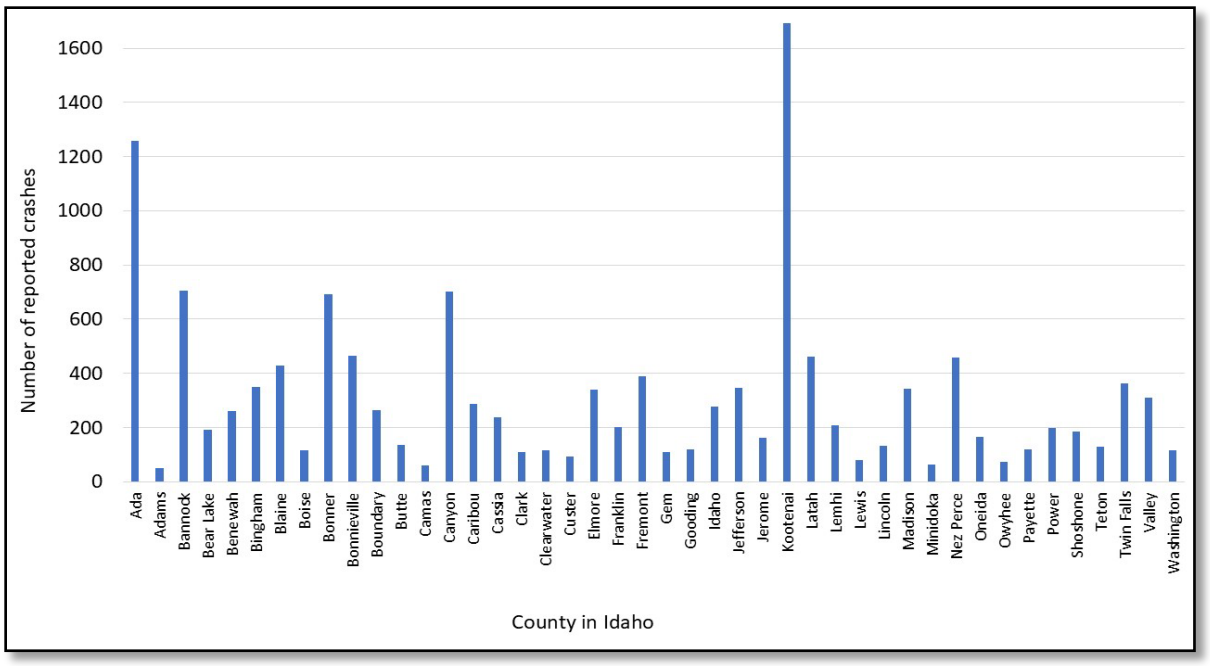

Figure 2-3. The number of reported collisions with wildlife from 2013 through 2022 in each Idaho county.

Idaho Values of Wildlife Killed in Reported Collisions

Wild animals killed in vehicle collisions have a value to society. However, estimated collision costs do not include these values. To calculate a general value of the wild animals killed in reported collisions, the values of specific large wild animals were obtained from the Idaho Penal Code, Table 2-5. The average value of an ungulate was calculated by subtracting the individual animal value from the trophy animal value for the specific species, dividing the result by two, and adding it to the individual animal value. All collected grizzly bear (*Ursus arctos*) data assumed a value of $10,000 per animal.

Table 2-5. Values of individual wild animals based on Idaho Code, Title 36, Chapter 14, Section 36-1404 General Penal Provisions.

Species	Individual Animal	Trophy Animal	Average Value*
Elk	$750	$5,000	$2,875
Bighorn Sheep Mountain Goat Moose	$1,500	$10,000	$5,750
Mule Deer White-tailed Deer	$400	$2,000	$1,200
Pronghorn	$400	$2,000	$1,200
Grizzly Bear	$1,500	$10,000	$10,000

*Average valued calculated as a mid-range between individual and trophy animal.

In states where crash data includes species identification, 95% of reported collisions include either mule deer (*Odocoileus hemionus*) or white-trailed deer (*O. virginianus*). (Cramer et al. 2022). Using this statistic,

we can take the average value of a single deer and multiple it by 95% of the collisions to obtain an average annual deer value of collisions. In 2022, there were 1,626 collisions reported with wildlife. Ninety-five percent of those equates to 1,545 collisions that were potentially with deer. If the average value of deer is taken, $1,200, and multiplied by these collisions, it equates to an approximate value of $1,854,000.00 for deer killed in reported collisions in Idaho in 2022. This is a low estimate; there were far more deer and other wildlife killed along Idaho's roads than reported collisions (see carcass section below), and some collisions include the death of more than one animal. The approximate value also does not take into consideration the other animal types killed in reported collisions. Carcass data collection research has shown that the number of large wild animals killed is from 5.6 times greater (Olson 2013) to 10 times greater than reported in collisions (Donaldson 2017, Donaldson and Lafon 2008). These studies looked at the animal carcasses along roads and compared the collision reports along those roads. Thus, this estimate of $1.854 million is likely to be many times higher if those animals killed and not in reported collisions are taken into account. These values should be considered when estimating the cost of wildlife-related collisions.

Mule Deer Densities Over Time

An analysis of collisions with wildlife requires consideration of the number of animals of the predominant species involved in collisions changes over time, how those numbers could affect the number of collisions, and how the collisions could affect the population of animals. IDFG plotted the estimated Idaho mule deer population, (Toby Boudreau, IDFG, personal communication; Figure 2-4). IDFG does not have estimates for the white-tailed deer population or the elk (*Cervus canadensis*) population (Toby Boudreau, personal communication). It can be seen from Figure 2-4 that mule deer population estimates have been decreasing since 2021. This would be expected to result in lower numbers of reported collisions with mule deer since 2021. However, as presented in Figure 2-2, reported collisions with wildlife have been increasing since 2020.

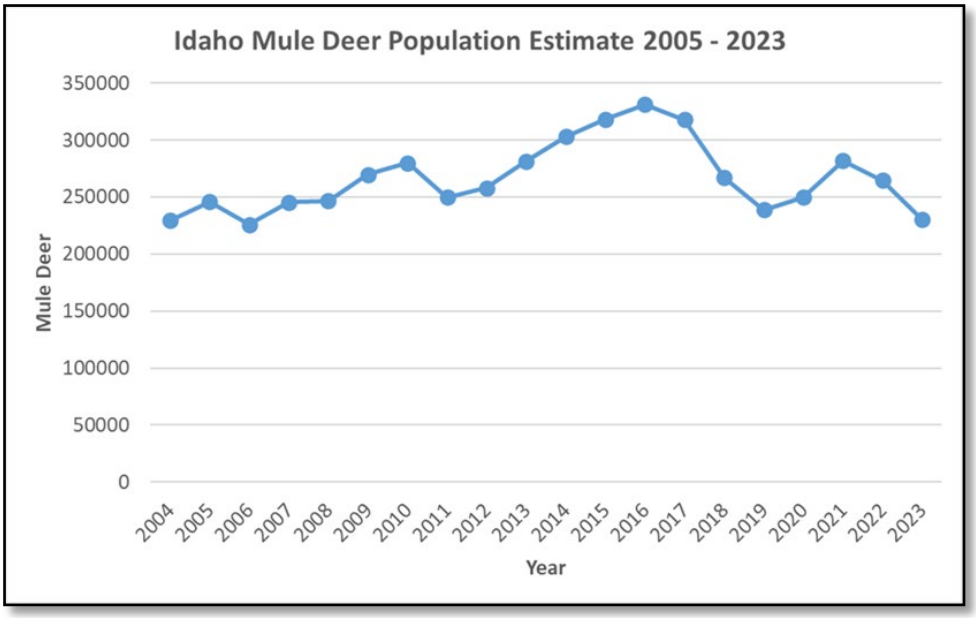

Figure 2-4. The Idaho mule deer population estimates 2004 to 2023 (IDFG 2024).

Idaho's Transportation and Wildlife Mitigation

The collision statistics presented in this chapter indicates that Idaho continues to have an increasing problem with WVCs. Idaho has been addressing this challenge in part, with wildlife mitigation features across the state. Figure 2-5 presents a map of the ITD wildlife mitigation projects that have been constructed or are planned for construction across Idaho. Appendix A lists these past projects in greater detail. There are several additional projects that were under the design stage as this study was completed. In 2024, the FHWA Wildlife Crossings Pilot Program granted ITD funds to construct three wildlife underpasses and fencing along US-30 at Rocky Creek (District 5). There were additional projects underway as well. One of the goals of this study is to expand this map of projects in the coming years.

In Idaho, the first wildlife crossings were built in the late 1970s on US-30 east of Lava Hot Springs. Three bridges designated as wildlife underpasses were constructed for mule deer and elk herds to safety pass under US-30. ITD has continued to plan and build wildlife crossing structures ever since, with an estimated 18 structures statewide. Most of those structures are wildlife underpasses, however Idaho now has two wildlife overpasses. The first, Cervidae Peak Wildlife Crossing, was constructed in Fall 2023 and is located about ten miles east of Boise on SH-21 (District 3). Cervidae Peak is primarily used for mule deer and elk to safely migrate to their winter range in the Boise River Wildlife Management Area. The second overpass was a community lead effort to turn a decommissioned and abandoned bridge, Osburn Bridge, into a wildlife overpass. Osburn Bridge was left intact and modified with fencing to allow large ungulates to safely cross over I-90 (District 1). This was a recently completed project (Fall 2025) and is not reflected in Figure 2-5 below. The overpass's future may be limited as it is scheduled for removal in 2032 due to maintenance and safety concerns.

In order to keep wildlife and the travelling public safe on ITD-administered roads, ITD conducts other wildlife mitigation projects statewide. These projects include installing exclusion or barrier fencing, implementing reduced speed zones, installing advanced warning or wildlife detection systems as well as erecting temporary or permanent wildlife crossing signage. Culvert replacement projects, although primarily constructed to remove barriers and increase fish passage and/or resiliency can also be retrofitted to install benches or shelves for wildlife passage.

ITD also conducts transportation corridor studies on how wildlife interacts with our roadways and how roads might impact wildlife movements and migrations as well as fragment habitat connectivity. These corridor studies, although conducted with similar methodology to this study, may produce different hot spots results because the studies are concentrated on a small area compared to the state or District level that is identified in this study.

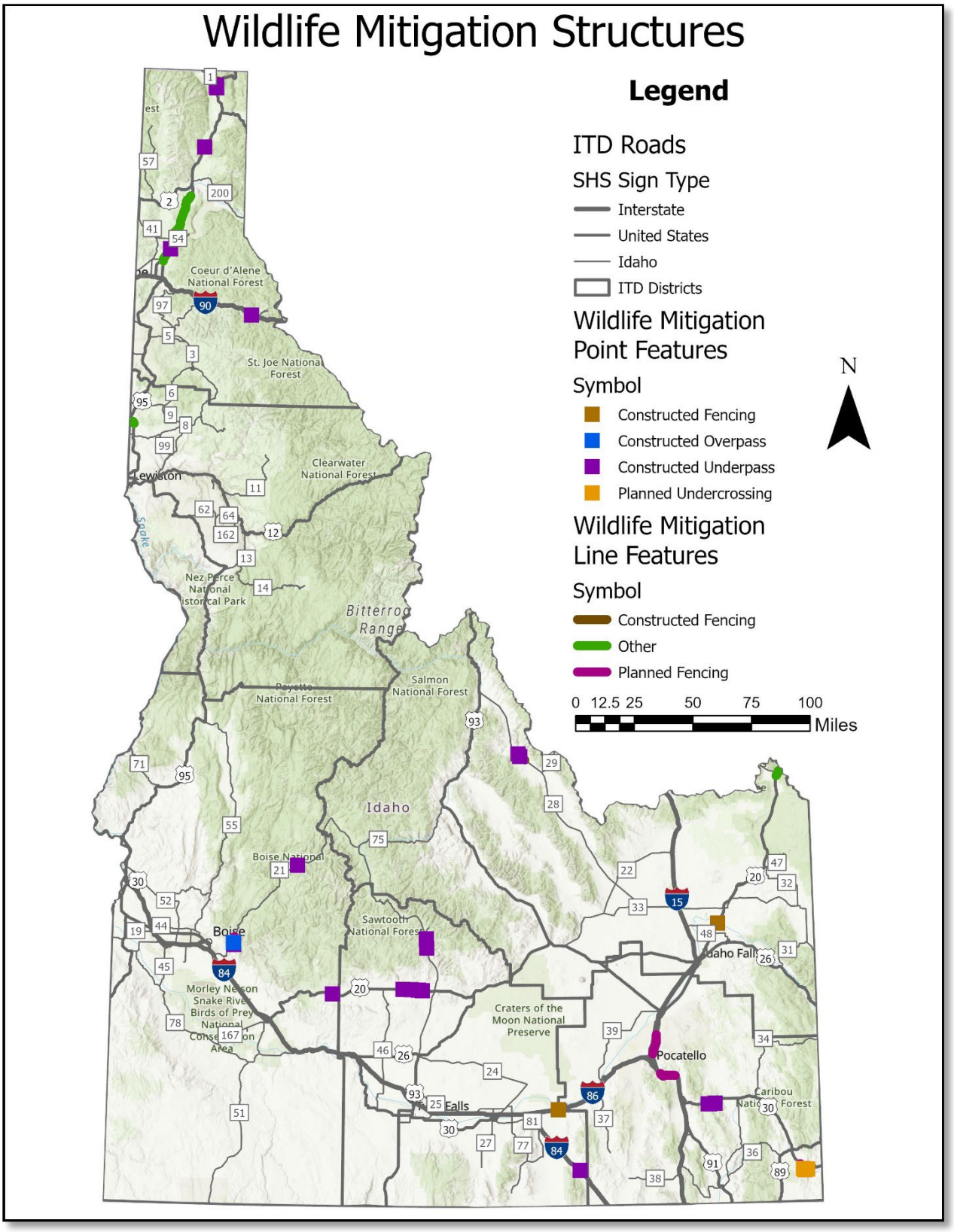

Figure 2-5. ITD's existing and future wildlife mitigation projects to minimize WVC in Idaho as of 2025.

3. PHASE ONE – OPTIMIZED HOT SPOT MODELING OF REPORTED COLLISIONS WITH WILDLIFE AND WILDLIFE CARCASSES

Introduction

In Phase One, the modeling focused on reported collisions with wildlife from 2013 through 2022 and reported carcasses of wildlife from 2010 through 2022. The objectives of Phase One of the study were originally:

1. Assemble ITD and IDFG wildlife-vehicle conflict data to create a comprehensive database in GIS that can be used to identify areas with potential wildlife-vehicle conflicts.

2. Using the ArcGIS Optimized Hot Spot Analysis spatial tool, develop a map of prioritized locations of WVCs based on wildlife-vehicle crash data.

3. Develop a second map that incorporates carcass data, transportation data, IDFG movement and migration data of select species, and other data to identify additional areas of potential wildlife-vehicle conflicts that are not based solely on crash data.

4. Prioritize Wildlife-Vehicle Conflict Areas that would benefit from mitigation measures during transportation project planning.

As this study progressed it became increasingly difficult to fulfill the above objectives due to the limitations in available data and other challenges. During modeling, the maps of global positioning system (GPS) collar data of modeled migration and movement patterns of select populations of mule deer, elk, and pronghorn as well as range maps for sensitive species were not sufficient on a statewide scale. The eventual objectives of the study were split into a two-phase study. Phase One intended to evaluate **wildlife-vehicle collisions** by modeling reported wildlife-vehicle crash data and carcass data for their respective statewide and District hot spots (original objectives one and two above). Phase Two intended to address the **wildlife-vehicle conflict** phenomena (original objectives three and four above) and will be explained in further detail in Chapter 4.

Phase One was focused on modeling the collisions with wildlife and reported carcasses which created the framework for Phase Two. Phase Two examined multiple additional factors related to the overall phenomena of wildlife-vehicle conflict. ITD as a transportation agency is mandated to make the roads safer for motorists, thus, the primary focus was on collisions which was also the primary objective of the study. The study only concentrated on the SHS which are ITD-administered roads including Interstates, U.S. Routes, and State Highways.

Optimized Hot Spot Modeling Methods

In Phase One the reported collisions with wildlife were analyzed with the ArcGIS OHSA spatial tool using the Getis-Ord Gi* statistic. The OHSA was used to identify sections of ITD-administered roads with the highest number of past reported collisions with wildlife in statistically significant clusters based on crash data; first from 2013 through 2022, and then shorter periods of 2013 to 2018, and 2018 to 2022. These analyses examined past collisions in an effort to address the future potential for WVCs and the need to provide for motorists' safely. The carcass data were also analyzed with the OHSA to identify areas where the greatest number of reported carcasses were concentrated for large mammals such as ungulates (moose, deer, elk, bighorn sheep [*Ovis canadensis*]) and large carnivores (such as bear and mountain lion) in Idaho. The details of the methods are presented in a Supplemental Information Source Document.

The results of Phase One of the study can assist ITD and its partner agencies to pursue solutions and funding that are meant to address safety for motorists from wildlife related collisions. The locations of these collision hot spots can also indicate where ungulates (deer, elk, moose, pronghorn, and bighorn sheep) and large carnivores (black bear [*Ursus americanus*], grizzly bear, and mountain lion) are at risk of being involved in vehicle collisions. The carcass hot spot mapping of these larger mammals and other animals such as birds of prey in Phase One of this study identified areas that may not be where the most collisions are reported, but where the various larger mammal species are most recorded as being killed.

There were three major steps in the methods completed in Phase One: road and crash data preparation; OHSA of wildlife crash data; and OHSA of wildlife carcass data. These steps were conducted from the fall of 2023 through July of 2024. Each of the methods used in these steps is described briefly below and in further detail in Supplemental Information Source Document.

Crash and Roads Data Preparation

There were two key data components needed for the hot spot analysis: a shapefile of ITD-administered roads, and an extraction of ITD's WebCars crash database which contained reported collisions with animals that are classified as "wild." The roads GIS layer was prepared with all roads represented with one centerline. All road segments were then buffered so each segment was one quarter mile wide. The roads were then segmented into half mile road segments for one road layer, and one mile road segments for a second layer, each for different runs of the model. The crash data were placed into a Microsoft Excel document. The crash database was queried to select only ITD-administered roads, and only wildlife-vehicle collisions. Wildlife-vehicle crash data were merged with the road segments so that each segment had point data representing the total number of collisions that were known to occur in that segment for that period of time. The specific methods necessary to finalize the roads layer and crash data are presented in Supplemental Information Source Document in the Roads Data Preparation and Crash Data Preparation sections.

The Optimized Hot Spot Analysis Using the Geti-Ord Gi* Statistic

Once the data were prepared, they were brought into the ArcGIS OHSA spatial tool with the Getis-Ord Gi* statistic. Road segments were paired with the reported wildlife collisions in those segments. The model then was input with the field of the collision count per half mile road segment for the hot spot analysis. The top hot spots based on collisions per mile were identified with the OHSA. The groupings of hot spots were based on 90%, 95%, and 99% Confidence Intervals. The hot spot polygons were then color coded by the GIS Analyst to represent these Confidence Intervals.

In the OHSA there are five parameters to assess the changes in their values and the contribution they make to the most accurate hot spot prioritization. Through months of OHSA analyses with different values for these five parameters described below and consultation with the TAC, the parameter values were finalized for the ITD's ArcGIS IPLAN web-based portal map of wildlife-vehicle reported collision hot spots statewide and for each District (Table 3-1).

Table 3-1. Parameters that were adjusted to conduct the most accurate OHSA of Idaho wildlife-vehicle collisions.

Parameter	Set Value	Justification
Road Segment Length	Half mile road segment	Half mile road segments were able to absorb smaller fragments of segments near intersections and boundaries and remain "intact" rather than become fragmented. One mile road segments resulted in fragmented hot spots when there was a road intersection or the road came to a state boundary.
Buffer distance	200 meters (656 feet, 0.12 of a mile) segment width	This is the distance the model reaches out from the center line created earlier, to represent the road outward in both directions. This results in road segments with the width of quarter mile.
Distance Band	One mile	This is the distance the model looks out from the half mile road segments to adjacent road segments. This results in more accurate model results than longer and shorter distances revealed. Half mile distance bands made the hot spots too small; with a half mile distance band the longer hot spots were broken up into multiple hot spots, and they competed overall and with each other for priority. One point five mile distance band resulted in many of the same hot spots and lengths as one mile distance bands.
Years of Crash Data	2013 to 2022	There was modeling of 10 years of data (2013 to 2022) to allow comparisons with the prior ITD 2014 Study which used 10 years of data. However, to best represent more recent collisions after several wildlife mitigation projects, Covid 19 pandemic changes, landscape and wildlife populations changes, and to be in line with how traffic safety engineers examine crash data, modeling also examined the years of data from 2013 to 2018 and from 2018 to 2022.
Confidence Intervals	95% and 99% Confidence Intervals	Confidence Intervals represents a level of certainty of the modeling results. The model also output 90% Confidence Intervals, these results were kept as part of our OHSA. However, the higher certainty Confidence Interval hot spots provided over 100 results which were enough for this study. Thus only 95% and 99% Confidence Intervals were included in the hot spots.

Hot spots at the 95% and 99% Confidence Interval were chosen to move forward with the analyses. Once hot spots were identified by the model the individual road segments in each hot spot had to be joined together as one polygon and the Getis Ord GI* statistics on the hot spot calculated. This joining of the road segments dissolved the individual road segment boundaries resulting in one continuous polygon segment. The mileage within each hot spot was calculated. Hot spots had to meet a 0.8 mile threshold to be included in the next step. This was done so that each grouped hot spot would have to include more than one segment. Due to data cleaning, a few smaller segments were merged with adjoining ones to avoid having 0.1 mile segments. A few segments were thus more than a half mile in length but none more than 0.8 mile. The final step was to calculate the collisions per mile per year for each grouped hot spot.

There were additional steps in the OHSA such as the test for spatial autocorrelation in the data that in turn helped to select the distance band values. Specific instructions on these more detailed steps are provided in a Supplemental Information Source Document under the Optimized Hot Spot Analysis section.

Additional Data to Help Interpret the Findings

The TAC was interested in learning several mapped factors across Districts that were then included in the maps to help interpret the results. These additional parameters were included in an IPLAN map popup menu table for users when a certain hot spot was selected. The city boundaries were included in the hot spot maps and attribute tables so users could evaluate the options available in more urban versus less developed areas. Federal lands, Tribal lands, and state lands were also incorporated into the maps, attribute tables, and popup menu to show where there were areas protected from development. The number of collisions of the three injury types and fatal collisions (discussed in Chapter 2) were also calculated for each hot spot and included in the attribute table and popup table. These complementary data were provided to assist ITD personnel, partnering agencies, and others in evaluating how future transportation planning may affect wildlife and for the potential of wildlife mitigation measures inclusion in those plans.

Results of Optimized Hot Spot Analysis of Wildlife-Vehicle Collisions

List of Statewide Wildlife-Vehicle Collision Hot Spots

The statewide hot spot analysis identified hot spots of reported collisions with wildlife for crash data from 2018 to 2022 across the state with the parameter values listed in Table 3-1, hot spots in the 95% and 99% Confidence Intervals, and only hot spots of two or more miles in length. The decision to make a two mile threshold for inclusion in the final hot spots was based on discussions with the TAC as to the minimum size of hot spot that was most helpful in informing the transportation planning process. The rankings of the hot spots were based on reported collisions per mile per year. The model produced 41 hot spots statewide that met the criteria listed above. See Table 3-2 and Figure 3-1 below.

Table 3-2. The statewide 41 hot spots for reported wildlife collisions, based on collisions per mile per year, using 2018 to 2022 crash data, half mile road segment, one mile distance band, and a minimum size of two miles per hot spot.

Hot Spot Rank	Name	Highway, Mileposts (MP)	District	Length (miles)	Number of Collisions	Collisions/Mile/Year	Collision Types Reported
1	US-95 West Side of Coeur d'Alene Lake	US-95 MP 411.9 – 419.4	1	7.5	84	2.24	4 A injury collisions, 12 B injury collisions, 8 C injury collisions
2	I-90 North Side of Coeur d'Alene Lake	I-90 MP 12.5 – 19.4	1	7.0	76	2.17	2 B injury collisions, 6 C injury collisions
3	SR-75 Hailey to Ketchum	SH-75 MP 117.3 – 126.7	4	9.5	103	2.17	6 B injury collisions, 8 C injury collisions
4	I-15 Pocatello	I-15 MP 62.9 – 71.2 and I-15 Business Loop MP 0.1 – 5.5	5	10.24	111	2.08	2 A injury collisions, 6 B injury collisions, 16 C injury collisions
5	US-95 Northwest Coeur d'Alene Lake	US-95 MP 421 – 429.3	1	8.5	83	1.95	2 B injury collisions
6	US-20 Rigby to Rexburg	US-20 MP 322.3 – 328.8	6	6.57	63	1.89	12 B injury collisions, 4 C injury collisions
7	SH-75 Bellevue	SR-75 MP 108.8 – 111.2	4	2.5	23	1.84	2 B injury collisions, 2 C injury collisions
8	US-20 Ashton Hill – Caldera Face	US-20 MP 363.3 – 366.2	6	3.0	27	1.80	4 B injury Collisions
9	US-20 Idaho State Centennial Trail	US-20 MP 129.6 – 135	3	5.5	46	1.67	6 B injury collisions, 12 C injury collisions
10	US-95 South Sand Point – Lake Pend Oreille	US-95 MP 468.5 – 471.4	1	3.0	25	1.67	2 B injury collisions
11	I-90 Cataldo-Coeur d'Alene River, Kootenai – Shoshone County Line	I-90 MP 34.3 – 41.2	1	7	58	1.66	14 B injury collisions, 10 C injury collisions
12	SH-55 Donnelly – North Lake Cascade	SR-55 MP 127.4 – 129.8	3	2.5	20	1.60	2 B injury collisions, 2 C injury collisions
13	US-95 North Coeur d'Alene to Chilcot	US-95 MP 432 – 446.4	1	14.65	119	1.58	2 A injury collisions, 10 B injury collisions, 4 C injury collisions
14	US-95 North Moscow – Viola	US-95 MP 350.1 – 352.5	2	2.5	19	1.52	4 B injury collisions

Hot Spot Rank	Name	Highway, Mileposts (MP)	District	Length (miles)	Number of Collisions	Collisions/Mile/Year	Collision Types Reported
15	US-20 South of Island Park	US-20 MP 367.8 – 376.7	6	9.0	68	1.51	12 B injury collisions
16	I-15 South Malad Summit	I-15 MP 20.9 – 24.8	5	4.0	30	1.50	4 B injury collisions, 2 C injury collisions
17	I-15 North of Spencer – Caribou – Targhee National Forest	I-15 MP 185 – 187	6	2	17	1.50	2 Type B Injury collisions, 4 Type C injury collisions.
18	US-95 Lewiston – Clearwater River North	US-95 MP 317.8 – 320.8	2	3.0	23	1.47	2 B injury collisions, 6 C injury collisions
19	SH-34 & US-30 West Soda Springs	SH-34 MP 49.6 – 50.4 and US-30 MP 385.6 – 400.5	5	3.88	28	1.44	8 B injury collisions
20	US-30 South Soda Springs – Caribou – Bear Lake County Border	US-30 MP 410.6 – 413	5	2.5	18	1.44	2 A injury collisions, 4 C injury collisions
21	I-15 Market Lake Wildlife Refuge	I-15 MP 140 – 142	6	2	14	1.40	2 B injury collisions, 4 C injury collisions
22	SH-41 Twinlow – Spirit Lake	SH-41 MP 12 – 18.9 and SH-54 MP 0 – 0.1	1	7.16	50	1.40	2 B injury collisions, 8 C injury collisions
23	SH-54 Atho – Farragut State Park	SR-54 MP 10.1 – 12.5	1	2.5	17	1.35	2 B injury collisions, 2 C injury collisions
24	US-95 Kootenai – Benewah County Line	US-95 MP 397 – 399.9	1	3.0	20	1.33	2 B injury collisions, 4 injury collisions
25	US-20 and SH-33 Intersection – Rexburg	US-20 MP 331.4 – 334.3 and SH-33 MP 75.7 – 78.3	6	5.74	38	1.32	2 A injury collisions, 4 B injury collisions, 2 C injury collisions
26	I-15 South Inkom	I-15 MP 51.4 – 57.8	5	6.8	45	1.32	2 B injury collisions, 2 C injury collisions
27	I-15 North of Spencer – Beacon Hill	I-15 MP 180 – 183.4	6	3.5	23	1.31	2 B injury collisions, 12 C injury collisions
28	US-30 West of Lava Hot Springs	US-30 MP 366.6 – 370	5	3.5	23	1.31	6 C injury collisions
29	US-95 North Sandpoint	US-95 MP 476.1 – 482.9	1	6.66	45	1.31	6 C injury collisions

Hot Spot Rank	Name	Highway, Mileposts (MP)	District	Length (miles)	Number of Collisions	Collisions/Mile/Year	Collision Types Reported
30	US-30 McCammon – Portneuf River	US-30 MP 360.5 – 362.9	5	2.5	16	1.28	2 B injury collisions, 4 C injury collisions
31	US-20 Targhee Pass	US-20 MP 403.8 – 406.2	6	2.5	16	1.28	No reported injury collisions
32	I-15 Camas National Wildlife Refuge	I-15 MP 153.5 – 155.9	6	2.5	16	1.28	2 B injury collisions, 2 C injury collisions
33	I-15 and SH-36 Malad City	I-15 MP 14.9 – 16.8 and SH 36 MP 100 – 100.2	5	2.2	14	1.27	No reported injury collisions
34	SR-54 East of Sprit Lake	SH-54 MP 1.6 – 4.5	1	3	19	1.27	2 A injury collisions, 2 B injury collisions, 2 C injury collisions
35	US-95 Benewah – Latah County Line	US-95 MP 368.1 – 372	2	4	25	1.25	12 B injury collisions, 2 C injury collisions
36	US-95 Setters – Southwest Coeur D'Alene Lake	US-95 MP 408 – 410.3	1	2.5	15	1.20	2 B injury collisions, 2 C injury collisions
37	US-95 Naples South of Bonners Ferry	US-95 MP 497.1 – 501	1	4	24	1.20	4 C injury collisions
38	SH-55 Northeast of Eagle Dry Spring	SH-55 MP 47.7 – 50.1	3	2.5	15	1.20	2 B injury collisions
39	US-30 and I-86 Pocatello	US-30 MP 331 – 332.3 and I-86 MP 57.7 – 59.6	5	3.5	20	1.18	2 B Injury collisions and 6 C Injury collisions
40	US-95 Lewiston	US-95 MP 308.8 – 311.7	2	3.5	20	1.14	2 B Injury collisions and 4 C Injury collisions
41	I-15 McCammon	I-15 MP 46.9 – 48.8 and I-15 Business Loop MP 4.4 – 4.5	5	2.16	10	0.90	No Injury collisions

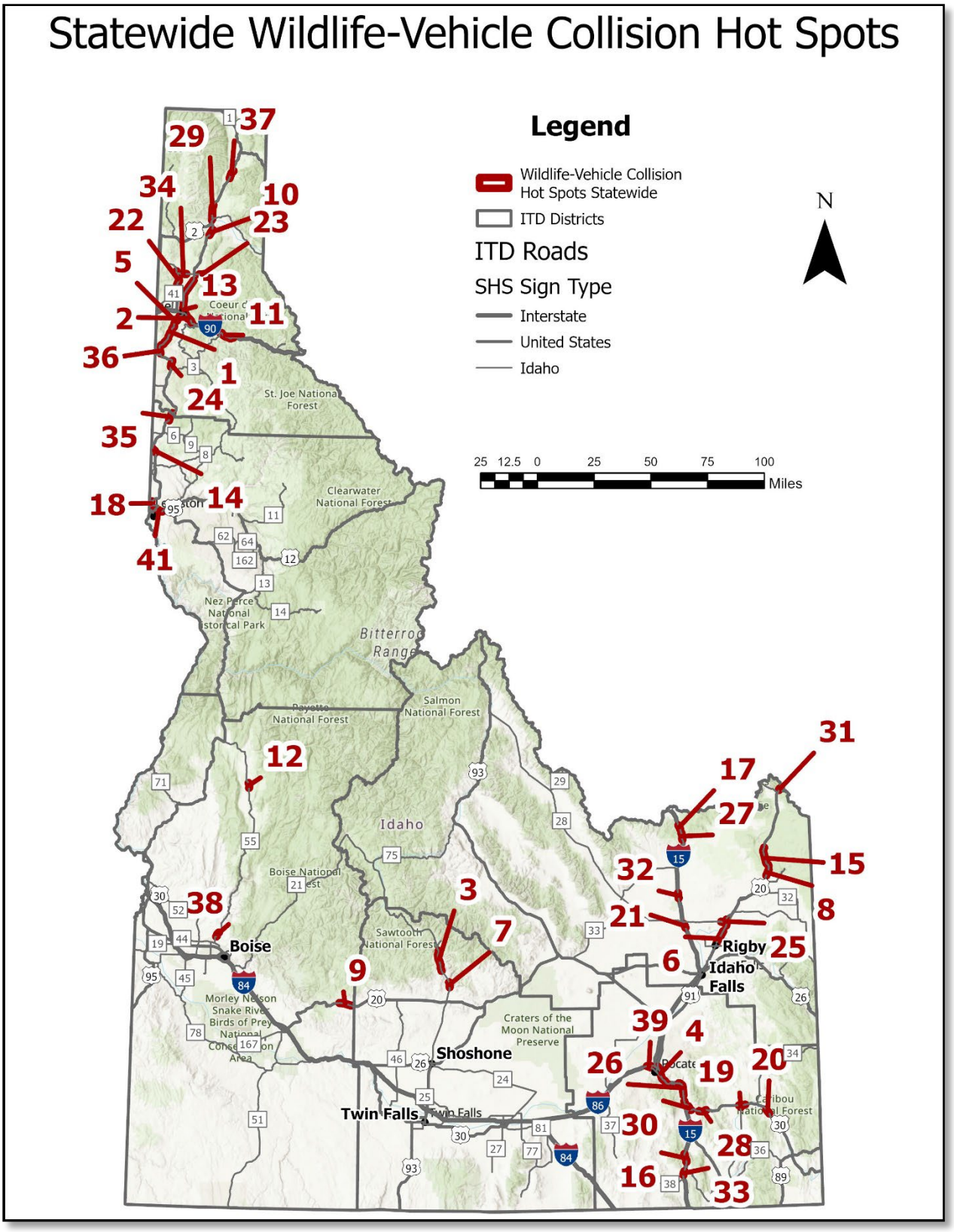

Figure 3-1. The 41 reported Wildlife-Vehicle Collision Hot Spots for Idaho in red, based on 2018 to 2022 crash data.

District Level Collision Hot Spots

The OHSA was also applied to roads and crash data in each specific District, to produce the top collision hot spots within a District without regard to roads and collisions outside of the District. When the state was considered as a whole, District 1 had a predominance of the top collision hot spots which obscured hot spots that may be significant from each of the other District's planning perspective. Districts 2 and 4 had very few statewide hot spots. This was due in large part to their rural nature and less motorists on their roads than in Districts 1, 3, 5, and 6. District hot spots are unique to these individual District model runs, and are not the same hot spots as those in the Districts when the hot spot analysis was run statewide, although there are of course overlaps. As with the statewide analyses, the OHSA dictated how many hot spots in the modeling rose to the level of the 95% and 99% Confidence Intervals; there was no pre-ordained minimum or maximum number of hot spots to be generated. All Wildlife-Vehicle Collision Hot Spots identified below were based on 2018 to 2022 data. Refer to Table 3-3 through Table 3-8, and Figure 3-2 through Figure 3-7.

Table 3-3. District 1 Coeur d'Alene Wildlife-Vehicle Collision Hot Spots.

Hot Spot Rank	Name	Highway, Mileposts (MP)	Length (Miles)	Collisions/Mile/Year	Collision Types Reported per Hot Spot
1	I-90 Coeur d'Alene	I-90 MP 13 – 18.9	6.0	2.37	2 B injury collisions, 6 C injury collisions
2	US-95 West Coeur d'Alene Lake	US-95 MP 412.4 – 418.4	6.0	2.30	2 A injury collisions, 10 B injury collisions, 6 C injury collisions
3	US-95 Northwest Coeur d'Alene Lake	US-95 MP 421.9 – 428.9	7.0	2.14	2 B injury collisions
4	US-95 North Coeur d'Alene to Hayden	US-95 MP 434 – 438.4	4.5	2.00	2 B injury collisions
5	US-95 Hayden	US-95 MP 439.5 – 442.2	3.0	1.82	2 C injury collisions
6	I-90 Cataldo – Coeur d'Alene River	I-90 MP 34.8 – 40.7	6.0	0.87	10 B injury collisions, 8 C injury collisions

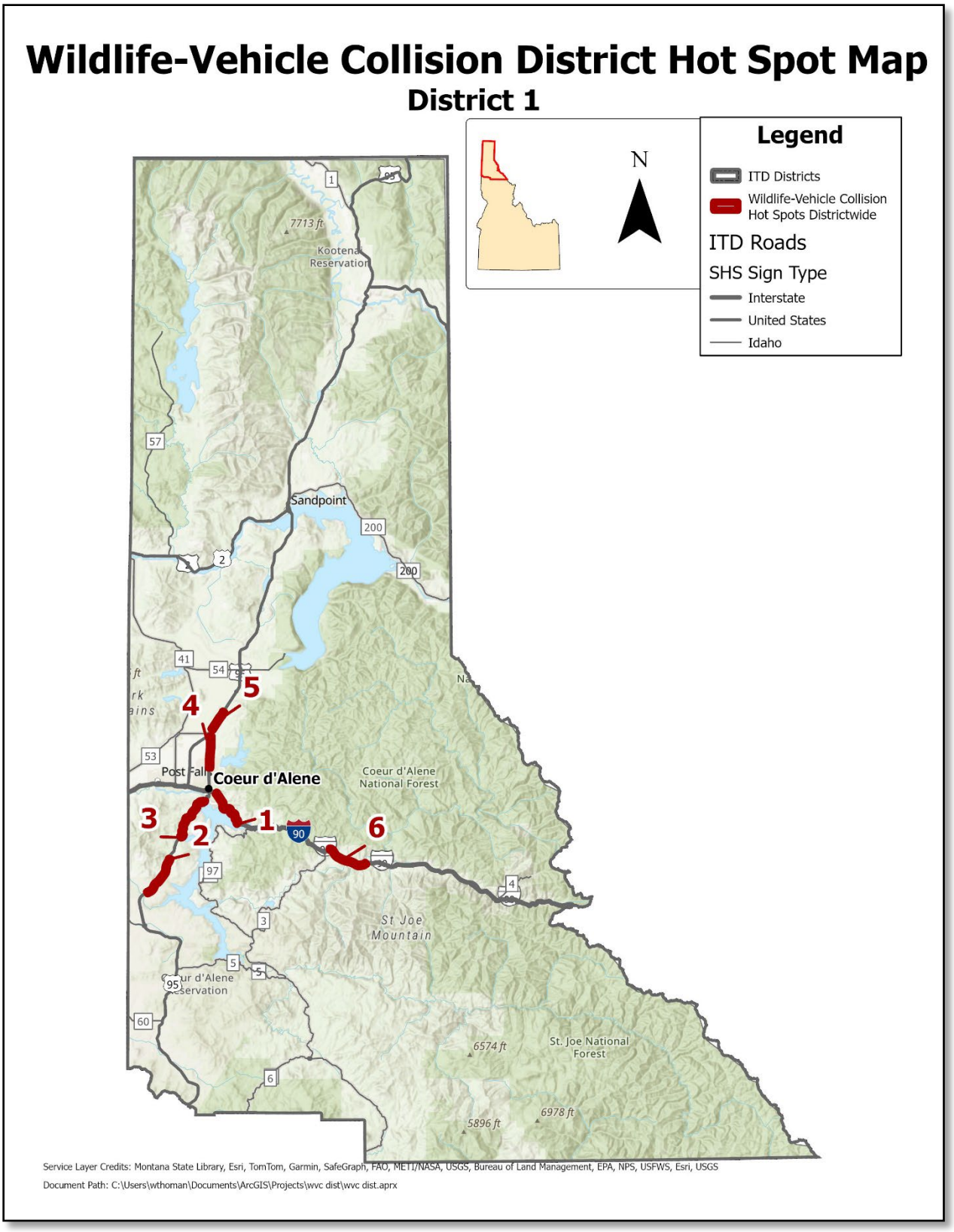

Figure 3-2. District 1 Coeur d'Alene Wildlife-Vehicle Collision Hot Spots based on 2018 to 2022 crash data.

Table 3-4. District 2 Lewiston Wildlife-Vehicle Collision Hot Spots.

Hot Spot Rank	Name	Highway, Mileposts (MP)	Length (Miles)	Collisions/Mile/Year	Collision Types Reported per Hot Spot
1	US-95 North Moscow – Viola	US-95 MP 349.6 – 352.5	3.0	1.40	4 B injury collisions
2	US-95 North Lewiston – State Line Hatwal Creek	US-95 MP 317.3 – 321.3	4.0	1.25	2 B injury collisions, 8 C injury collisions
3	US-95 Mineral Mountain	US-95 MP 368.1 – 372	4.0	1.15	12 B injury collisions, 2 C injury collisions
4	US-95 Lewiston – Clearwater River North	US-95 MP 307.3 – 311.7	4.5	1.07	2 B injury collisions, 4 C injury collisions
5	SH-8 East of Troy	SH-8 MP 9.4 – 12.8	3.5	0.86	4 C injury collisions

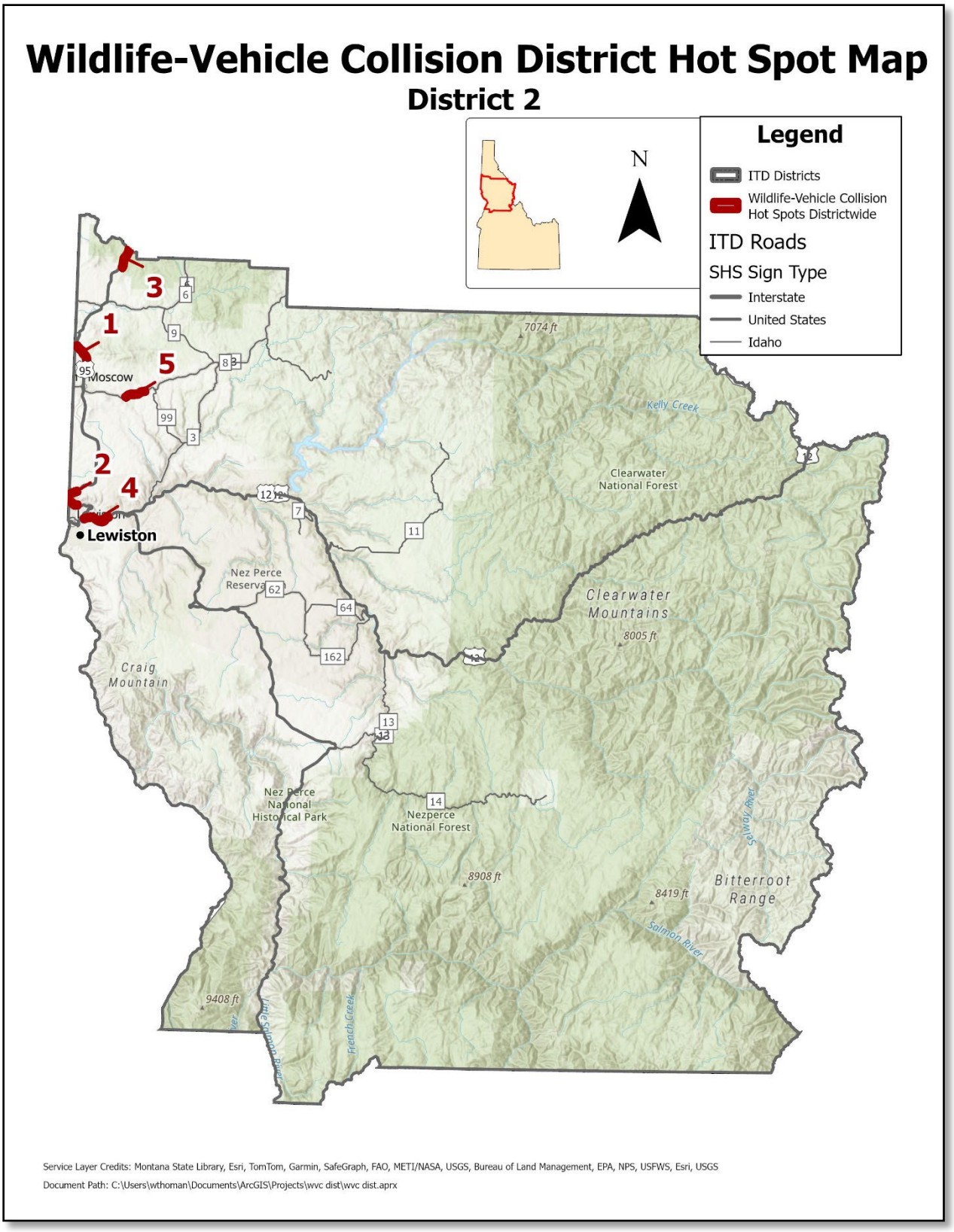

Figure 3-3. District 2 Lewiston Wildlife-Vehicle Collision Hot Spots based on 2018 to 2022 crash data.

Table 3-5. District 3 Boise Wildlife-Vehicle Collision Hot Spots.

Hot Spot Rank	Name	Highway, Mileposts (MP)	Length (Miles)	Collisions/Mile/Year	Collision Types Reported per Hot Spot
1	US-20 Idaho Camas Prairie – State Centennial Trail	US-20 MP 129.1 – 135	6.0	1.57	6 B injury collisions, 12 C injury collisions
2	SH-55 Donnelly – North Lake Cascade	SH-55 MP 127.4 – 130.3	3.0	1.40	2 B injury collisions, 2 C injury collisions
3	SH-21 Lucky Peak	SH-21 MP 19.2 – 21.6	2.5	1.28	2 A injury collisions
4	US-95 Weiser	US-95 MP 82.9 – 86.3	2.5	1.28	2 C injury collisions
5	SH-55	SH-55 MP 47.7 – 50.1	2.5	1.20	No injury collisions
6	SH-55 North Eagle Dry Creek	SH-55 MP 119.9 – 122.8	3.0	0.93	No injury collisions

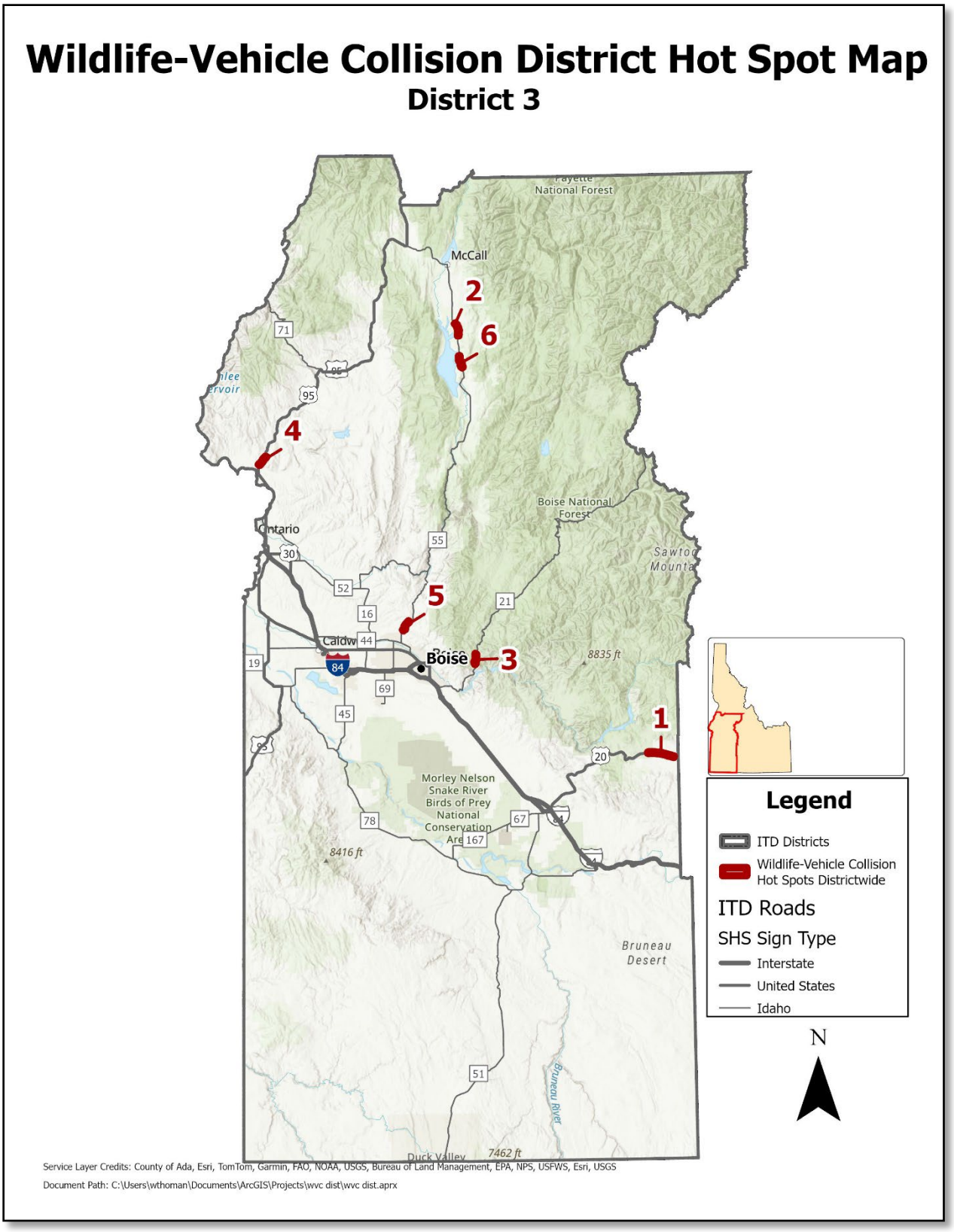

Figure 3-4. District 3 Boise Wildlife-Vehicle Collision Hot Spots based on 2018 to 2022 crash data.

Table 3-6. District 4 Shoshone Wildlife-Vehicle Collision Hot Spots.

Hot Spot Rank	Name	Highway, Mileposts (MP)	Length (Miles)	Collisions/Mile/Year	Collision Types Reported per Hot Spot
1	SH-75 Hailey to South Ketchum	SH-75 MP 117.3 – 126.7	9.5	2.17	6 B injury collisions 8 C injury collisions
2	SH-75 Bellevue	SH-75 MP 108.3 – 111.2	3.0	1.67	2 B injury collisions, 2 C injury collisions
3	SH-75 Shoshone – Big Wood River	SH-75 MP 74.7 – 77.1	2.5	1.28	1 fatal collision, 2 B injury collisions, 2 C injury collisions

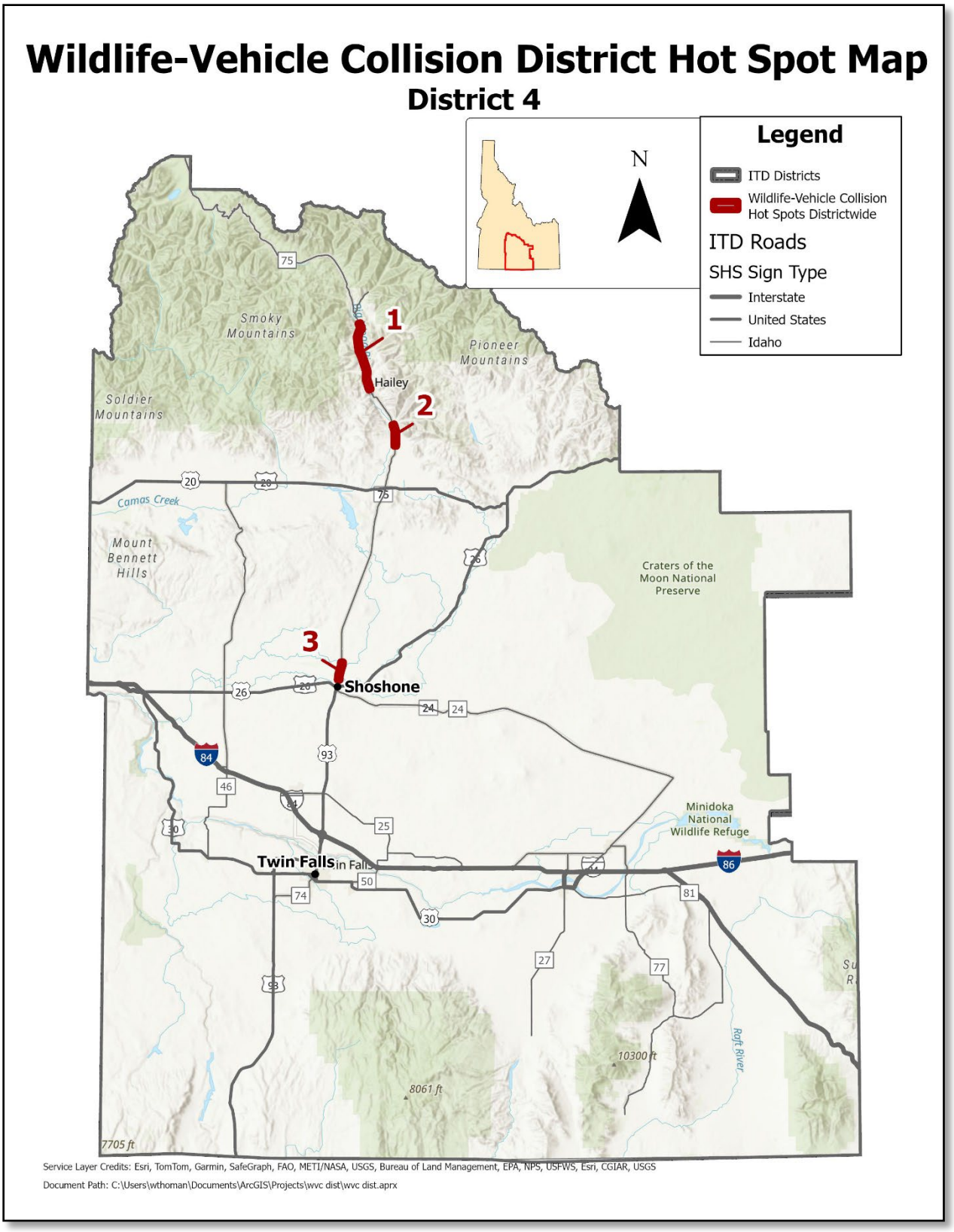

Figure 3-5. District 4 Shoshone Wildlife-Vehicle Collision Hot Spots based on 2018 to 2022 crash data.

Table 3-7. District 5 Pocatello Wildlife-Vehicle Collision Hot Spots.

Hot Spot Rank	Name	Highway, Mileposts (MP)	Length (Miles)	Collisions/Mile/Year	Collision Types Reported per Hot Spot
1	I-15 Pocatello	I-15 MP 62.9 – 71.2 and I-15 Business Loop MP 0.1 – 5.5	10.2	2.08	2 A injury collisions, 6 B injury collisions, 16 C injury collisions
2	SH-34 & US-30 West Soda Springs	SH-34 MP 49.6 – 50.4 and US-30 MP 386.1 – 400.5	3.4	1.54	6 B injury collisions
3	I-15 South Malad Summit	I-15 MP 20.9 – 24.8	4.0	1.5	4 B injury collisions, 2 C injury collisions
4	I-15 South Income	I-15 MP 51.9 – 57.8 and I-15 Business Loop MP 0.8 – 0.9	6.3	1.40	2 B injury collisions, 2 C injury collisions
5	US-30 and I-86 Pocatello	US-30 MP 331 – 332.3 and I-86 MP 58.2 – 59.6	2.8	1.35	2 B injury collisions, 4 C injury collisions

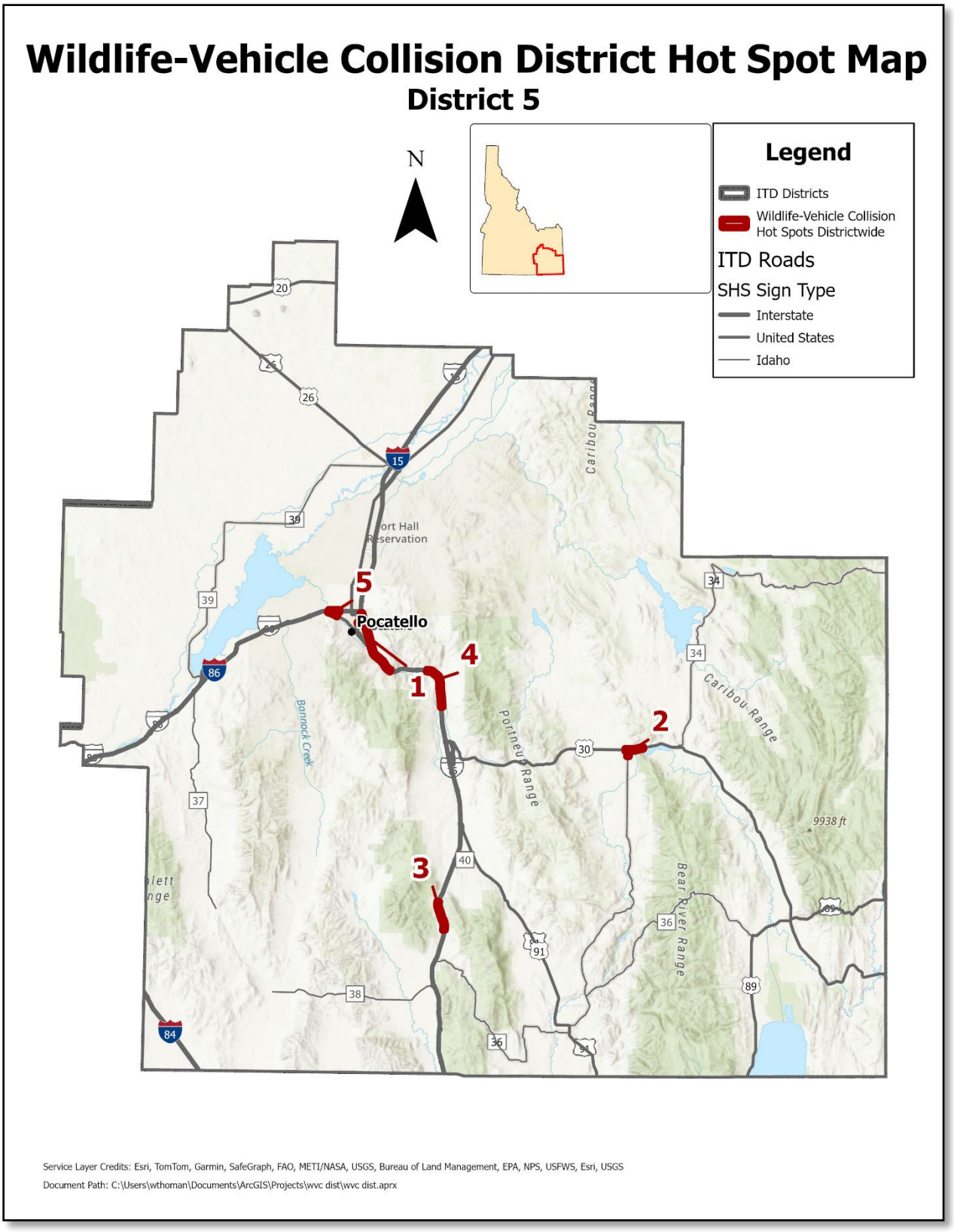

Figure 3-6. District 5 Pocatello Wildlife-Vehicle Collision Hot Spots based on 2018 to 2022 crash data.

Table 3-8. District 6 Rigby Wildlife-Vehicle Collision Hot Spots.

Hot Spot Rank	Name	Highway, Mileposts (MP)	Length (Miles)	Collisions/Mile/Year	Collision Types Reported per Hot Spot
1	US-20 Snake River South of Rexburg	US-20 MP 322.3 – 328.8	6.6	1.89	12 B injury collisions, 4 C injury collisions
2	US-20 Ashton Hill – Caldera South Slope	US-20 MP 363.3 – 366.2	3.0	1.80	4 B injury collisions
3	I-15 South of Humphrey in the Caribou-Targhee National Forest	I-15 MP 185 – 186.9	2	1.50	2 B injury collisions, 4 C injury collisions
4	US-20 South of Island Park	US-20 MP 366.8 – 376.7	10.0	1.46	14 B injury collisions
5	I-15 Mariel Lake Wildlife Refuge	I-15 MP 140 – 142	2	1.40	2 B injury collisions, 4 C injury collisions
6	US-20 and SH-33 West of Rexburg	US-20 MP 331.4 – 334.4 and SH-33 MP 75.7 – 78	5.74	1.32	2 A injury collisions, 4 B injury collisions, 2 C injury collisions
7	I-15 North of Spencer – Caribou-Targhee National Forest	I-15 MP 180 – 183	3.0	0.60	2 B injury collisions, 12 C injury collisions
8	I-15 South of Dubois Camas National Wildlife Refuge North	I-15 MP 153.5 – 156.4	3.0	1.20	2 B Injury collisions, and 2 C injury collisions
9	I-15 South of Dubois	I-15 MP 158.5 – 160.9	2.5	1.20	2 A injury collisions
10	US-20 Targhee Pass	US-20 MP 403.3 – 406.2	3.0	1.13	No injury collisions
11	US-26 Poplar & Snake River	US-26 MP 354 – 356.4	2.5	1.04	4 C injury collisions

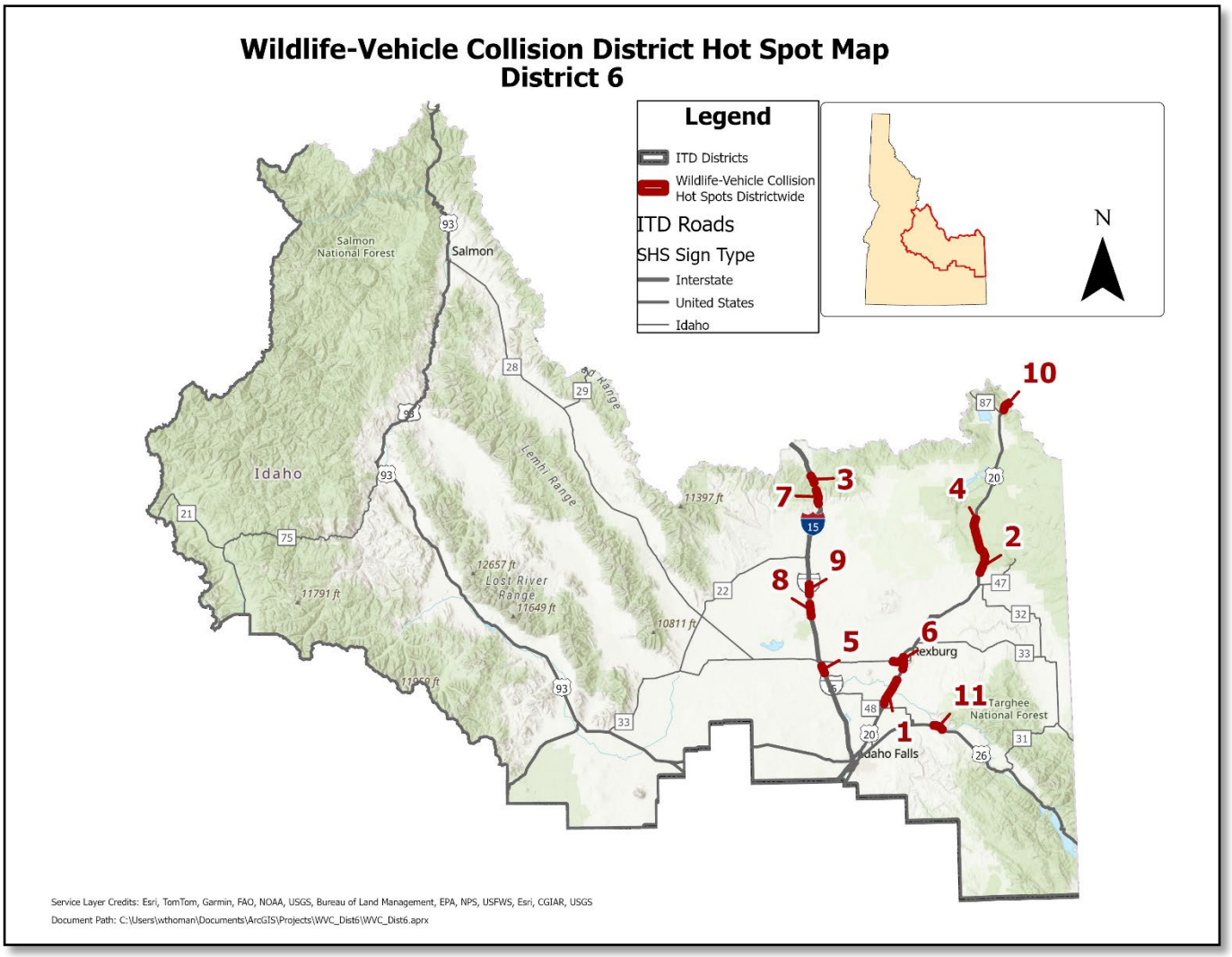

Figure 3-7. District 6 Rigby Wildlife-Vehicle Collision Hot Spots based on 2018 to 2022 crash data.

Results of Optimized Hot Spot Analysis of Wildlife Carcasses

Wildlife carcass data were modeled in a separate OHSA with the same parameters used for the collision hot spot modeling. The only difference in this analysis was the number of wildlife carcasses was substituted for wildlife collisions. Carcass data are collected more opportunistically rather than the more consistently collected crash data. ITD maintenance personnel, other agency personnel, and the general public collect and report these carcasses and upload the information to an internally accessible (ITD and IDFG) Wildlife-Vehicle Collision (WVC) Application or a publicly accessible IDFG website; the IDFG Roadkill & Salvage Database. The carcass data can be used to interpret general trends of the species most involved in collisions overall, and the majority of species recorded in specific locations. These findings assist decision makers on determining what types of mitigation is necessary for specific species in specific areas. The carcass dataset used in the analysis starts in 2013; however, earlier years of carcass data have also been uploaded into the database. Initially all carcass data included in the dataset were analyzed, however

the research team decided to evaluate carcass data only within the date range of 2013 to 2022 to match the OHSA on the wildlife-vehicle crash data. The extent of the problem of WVCs is better illustrated in Table 3-9, and Figure 3-8 and Figure 3-9. However, this is not a comprehensive list of reported or documented carcasses along ITD-administered roads for the 10 year range.

Table 3-9. Reported carcasses of wildlife along ITD-administered roads from 2013 to 2022, grouped by taxa.

Species	Total	Species	Total
Ungulates			
White-tailed Deer (*Odocoileus virginianus*)	11,503	Pronghorn (*Antilocapra americana*)	254
Mule Deer (*Odocoileus hemionus*)	9,016	Bighorn Sheep (*Ovis canadensis*)	39
Elk (*Cervus canadensis*)	3,035	American Bison (*Bos bison*)	2
Moose (*Alces americanus*)	894	Mountain Goat (*Oreamnos americanus*)	1
Large Carnivores			
Coyote (*Canis latrans*)	368	Bobcat (*Lynx rufus*)	72
American Black Bear (*Ursus americanus*)	139	Gray Wolf (*Canis lupus*)	21
Mountain Lion, Cougar, or Puma (*Puma concolor*)	96	Grizzly Bear (*Ursus arctos*)	4
Meso and Small Carnivores			
Skunks and Stink Badgers (*Mephitidae* spp.)	389	American Marten (*Martes americana*)	21
Striped Skunk (*Mephitis mephitis*)	265	American Mink (*Vison vison*)	21
American Badger (*Taxidea taxus*)	208	Long-tailed Weasel (*Mustela frenata*)	14
Red Fox (*Vulpes vulpes*)	83	Mustela sp. (*Mustela* spp.)	6
True Foxes (*Vulpes* spp.)	64	North American Wolverine (*Gulo gulo*)	3
Northern River Otter (*Lontra canadensis*)	49	Ermine (*Mustela erminea*)	1
Birds of Prey			
Great Horned Owl (*Bubo virginianus*)	236	Turkey Vulture (*Cathartes aura*)	6
Owl (*Strigiformes* spp.)	203	American Kestrel (*Falco sparverius*)	6
Barn Owl (*Tyto alba*)	200	Falcon (*Falconiformes* spp.)	5
Short-eared Owl (*Asio flammeus*)	41	Long-eared Owl (*Asio otus*)	4
Red-tailed Hawk (*Buteo jamaicensis*)	37	Sharp-shinned Hawk (*Accipiter striatus*)	3
Golden Eagle (*Aquila chrysaetos*)	30	Accipitridae Family (*Accipitridae*)	3
Swainson's Hawk (*Buteo swainsoni*)	24	Prairie Falcon (*Falco mexicanus*)	2
Great Gray Owl (*Strix nebulosa*)	18	Barred Owl (*Strix varia*)	2
Bald Eagle (*Haliaeetus leucocephalus*)	14	Cooper's Hawk (*Accipiter cooperii*)	1
Northern Harrier (*Circus cyaneus*)	8	Bird Hawks (*Accipiter* spp.)	1
Rough-legged Hawk (*Buteo lagopus*)	8	Osprey (*Pandion haliaetus*)	1
Northern Saw-whet Owl (*Aegolius acadicus*)	7	Peregrine Falcon (*Falco peregrinus*)	1
Burrowing Owl (*Athene cunicularia*)	7	Snowy Owl (*Bubo scandiacus*)	1

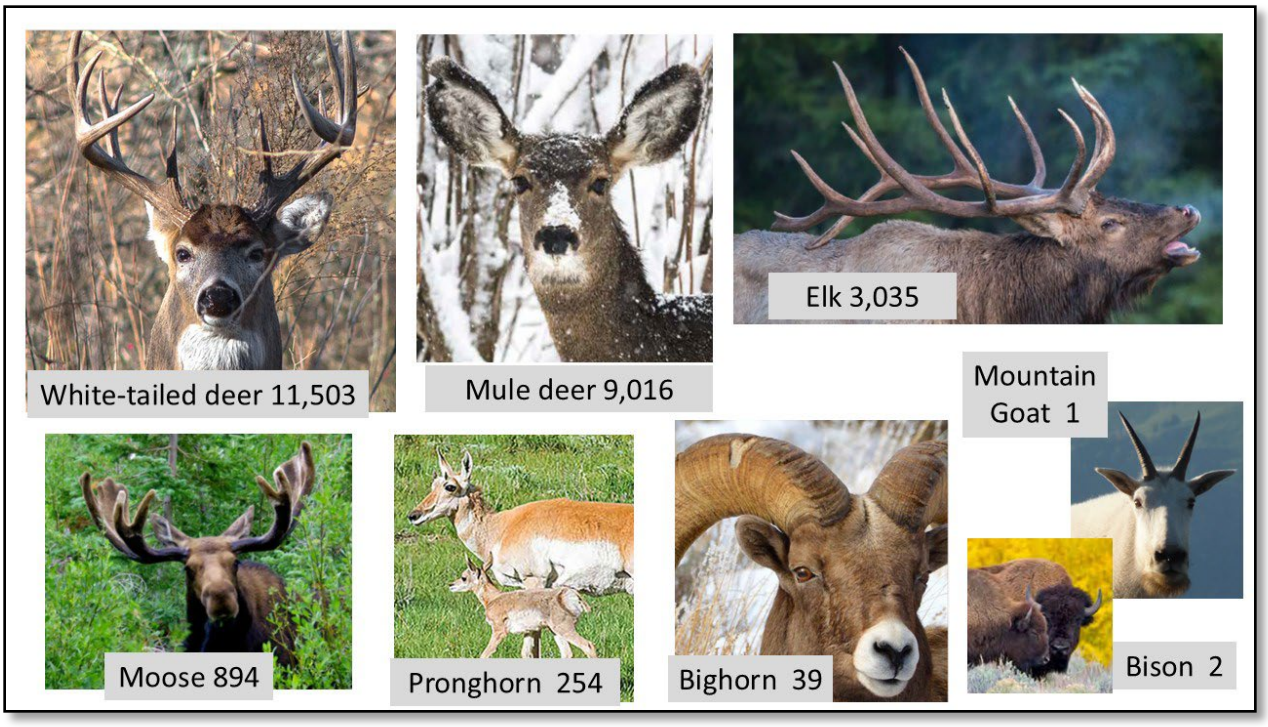

Figure 3-8. Carcass counts of ungulate species most often documented killed along ITD-administered roads from 2013 to 2022. Photo credit: Idaho Department of Fish and Game.

Figure 3-9. Carcass counts of carnivore and raptor species most often documented killed along ITD-administered roads from 2013 to 2022. Photo credits attributed on each picture.

An OHSA was conducted using the same parameters and thresholds as used for the crash data. The OHSA was conducted with the data for all wildlife carcasses, and a separate OHSA was conducted for each of the following: mule deer, elk, bighorn sheep, moose, all ungulates combined, large carnivores, birds of prey, and meso and small carnivores. The top hot spots for these groupings are presented in Table 3-10 and Figure 3-10, below.

This analysis was done as an exploratory step to examine problem areas as demonstrated by OHSA of reported carcasses. However, the field "Reported By" was erroneously used to filter the carcass data to the year range of the study as opposed to the correct "Observed" date field. As past paper reports have been uploaded years after the initial observation, these dates can coincide, but there are a significant number of carcass reports where these differ by years. This error for how carcass information was included in the model was rectified in Phase Two. These initial Phase One results were included in this report as they still provide a helpful picture of areas of concern, and the majority of carcass reports were reported as the same date they are observed. While useful, it must be acknowledged that this OHSA lacks the statistical rigor of other analyses. However, Table 3-10 below were useful in informing further analyses in this study.

Table 3-10. The top five carcass hot spots that were two or more miles long of select wildlife species across Idaho from 2013 to 2022 carcass data, using the "Reported by" field as the dates the carcasses were reported.

Animal	Rank	Location and Milepost (MP)	District	Carcasses	Length (Miles)	Carcass/ Mile/Year
Mule Deer	1	SH-21 Northeast of Cervidae Peak MP 2 – 21.1	3	837	14.5	5.78
	2	US-30 Rocky Point MP 440.6 – 448	5	306	7.5	4.08
	3	I-15 Pocatello MP 62 – 65.3	5	114	3.5	3.26
	4	US-89 Montpelier MP 26.8 – 30.2	5	94	3.5	2.69
	5	I-84 Twin Falls Shoshone Falls MP 175.6 – 180.3	4	104	4.0	2.60
Elk	1	SH-53 Hauser Lake Washington State Line MP 0 – 2	1	33	2	1.65
	2	US-93 Fourth of July Creek MP 327.7 – 330.1	6	37	2.5	1.48
	3	SH-75 North of Haily MP 117.3 – 126.7	4	136	9.5	1.43
	4	I-15 Market Lake Wildlife Refuge MP 140 – 143 & SH 33 MP 59 – 60	6	52	4.2	1.24
	5	US-30 Southeast of Soda Springs MP 408.6 – 412	5	39	3.5	1.11
Bighorn Sheep	1	US-93 South of Fourth of July Creek MP 316.7 – 320.1	6	10	3.5	0.29
Moose	1	US-95 North of Sandpoint MP 486.6 – 492.5	1	36	6	0.60
	2	US-20 Snake River MP 325.4 – 328.3	6	14	3.0	0.47
	3	SH-33 Victor Southeast with Wyoming State Line MP 152.9 – 155	6	10	2.25	0.45

Animal	Rank	Location and Milepost (MP)	District	Carcasses	Length (Miles)	Carcass/ Mile/Year
	4	SH-54 Spirit Lake MP 2.6 – 5.5	1	13	3.0	0.43
	5	US-95 North of Sandpoint MP 480 – 482.4	1	9	2.5	0.36
All Ungulates	1	SH-21 Lucky Peak Areas MP 2.5 – 22.1	3	911	15	6.07
	2	US-30 Rocky Point Area MP 440.6 – 447.5	5	338	7	4.83
	3	Bonners Ferry Area US-95 MP 485.1 – 530; US-2 MP 64.4 – 77.8; SH-1 MP 520 – 522	1	2,630	60	4.38
	4	I-15 Pocatello MP 62.9 – 65.3	5	101	2.5	4.04
	5	US-30 Soda Springs – Soda Point Reservoir MP 402.6 – 405	5	95	2.5	3.8
Large Carnivores	1	SH-87 Henry's Lake MP 5.6 – 7.5	6	6	2	0.3
Birds of Prey	1	SH-28 Northwest of Mud Lake MP 26.6 – 30.4	6	20	3.9	0.52
	2	I-84 Wendell MP 156.6 – 159.7; SH-46 MP 99.9 – 100.1	4	11	2.8	0.39
	3	I-15 McCammon MP 47.4 – 49.8	5	8	2.5	0.32
	4	I-84 West of Jerome MP 160.6 – 164.7	4	11	3.5	0.31
	5	I-86 Massacre Rock State Park & Snake River MP 29.2 – 31.1	5	4	2.0	0.20
Meso & Small Carnivore	1	SH-87 Henry's Lake MP 2.1 – 5	6	24	3.0	0.8
	2	US-20 Island Park MP 386.3 – 389.7	6	26	3.5	0.74
	3	US-20 Ashton Hill MP 355.8 – 366.7; SH 47 MP 0 – 0.5	6	63	11.5	0.55
	4	US-20 Chester Falls River MP 351.8 – 355.2	6	17	3.5	0.49
	5	US-95 Weiser MP 86.8 – 90.2	3	12	2.5	0.48
All Carcasses	1	SH-21 Lucky Peak MP 2.5 – 22.1	3	945	17.5	5.4
	2	US-30 Rocky Point MP 439.6 – 448	5	353	8.5	4.15
	3	I-15 South Pocatello MP 61.9 – 65.3	5	118	3.5	3.37
	4	Sandpoint and Northern Idaho –US-2 Main Route MP 0.1 – 80.1; SH-41 MP 36.1 – 39; SH-57 MP 0 – 0.1; SH-200 MP 29.9 – 46.3; SH-200 Business Loop MP 44.6 – 46.1; US-95 MP 474.5 – 538.4; SH-1 MP 0 – 522.8	1	4,246	137.55	3.09
	5	SH-75 North Hailey MP 116.8 – 127.2	4	324	10.5	3.09

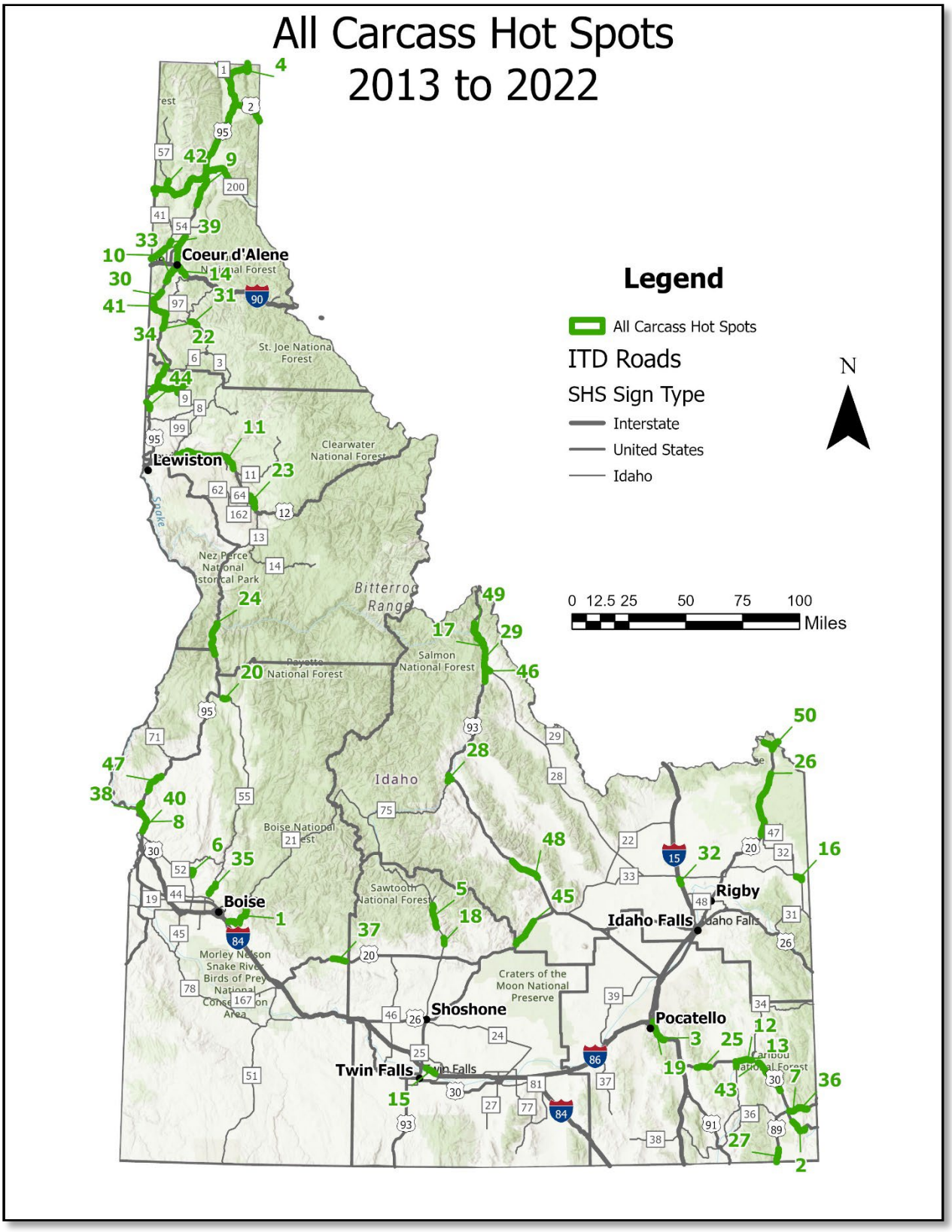

Figure 3-10. All Carcass Hot Spots statewide that are two or more miles in length, from 2013 to 2022 data. Ranked according to carcasses per mile per year.

Phase One Conclusions

The Phase One study results identified hot spots where reported collisions with wildlife and reported carcasses were most numerous. The crash data are the most consistently collected and overall, the most robust of all datasets that may help identify areas of WVCs. These data and maps can assist ITD and partnering agencies in the identification of where wildlife mitigation efforts could best reduce the risk of WVCs for motorists, based on past crash and carcass data. These maps and rankings can also be used to pursue transportation safety funding, and wildlife-related funding to help reduce these collisions.

The results of Phase One modeling were the base from which Phase Two moved forward. This helped to maintain the traffic safety aspect of the study, thus keeping the results within the mission statement of ITD to provide for safe travel and mobility in Idaho.

4. PHASE TWO – IDENTIFICATION OF WILDLIFE-VEHICLE CONFLICT MITIGATION OPPORTUNITY LOCATIONS

Introduction

In Phase Two multiple additional data sources were combined with the collision hot spot maps generated in Phase One and analyzed to predict where wildlife-vehicle conflict mitigation opportunities may exist. Wildlife-vehicle conflict addresses where wildlife may need to cross roads, but do not attempt to move over the road at grade because traffic volumes are high enough to create a "virtual" fence to movements. Or wildlife do cross certain roads successfully and there are few reported crashes and carcasses at those location, and other phenomenon that are not represented in the crash data. Thus, there may be few crash or carcass data in those locations to indicate the area is important for wildlife movement. Wildlife-vehicle conflict examines where a target species resides nearby but may be avoiding the road area all together and also addresses the fragmentation of habitat and how wildlife are not able to move to necessary resources. In Phase Two, the research team began to address these and other concerns on a statewide and District level.

The goals of Phase Two of the modeling process and the overall primary objectives of the study were to:

1. Assemble and gather wildlife-vehicle conflict data to create a comprehensive database in GIS that can be used to identify areas with the highest potential for wildlife-vehicle conflicts.

2. Identify wildlife-vehicle conflict hot spots which are also defined as Wildlife-Vehicle Conflict Areas. Rank these areas to assess which areas have the greatest opportunity for wildlife mitigation projects, which resulted in the Wildlife-Vehicle Conflict Mitigation Opportunity Locations.

While the results of Phase One were useful for identifying areas of increased risk for WVCs, other factors relating to conflict between wildlife and transportation were not reflected in the results. Noticeably, certain areas with higher commercial semitruck traffic and higher carcass counts had disproportionately lower collision rates. This is due to the fact that commercial truck drivers typically don't report collisions to law enforcement as often as passenger car drivers. There are also locations where federally protected species and their movements across the landscape are a concern for ITD and are important to consider in future transportation projects. These and many other considerations were represented by 12 georeferenced datasets and maps and brought together in Phase Two. Each dataset was mapped and the various values within that dataset were quantified with points. Factors brought together for a final tally of points per each half mile road segment were classified as either transportation related, or ecological related. Transportation data included safety factors related to collisions, Phase One data, and commercial traffic volume while the ecological data were indicators of where wildlife may reside near or need to cross roads (Figure 4-1).

The OHSA was conducted on the transportation and ecological factors based on points. Each transportation and ecological data layer was intersected with the ITD-administered roads data layer to evaluate the number of points to assign to each half mile road segment for each transportation and

ecological factor. After tallying all transportation and ecological factor points per each half mile road segment, the OHSA was conducted on all half mile road segments of all ITD-administered roads, with the 95% to 99% Confidence Interval hot spots chosen as the top transportation and ecological factor hot spots.

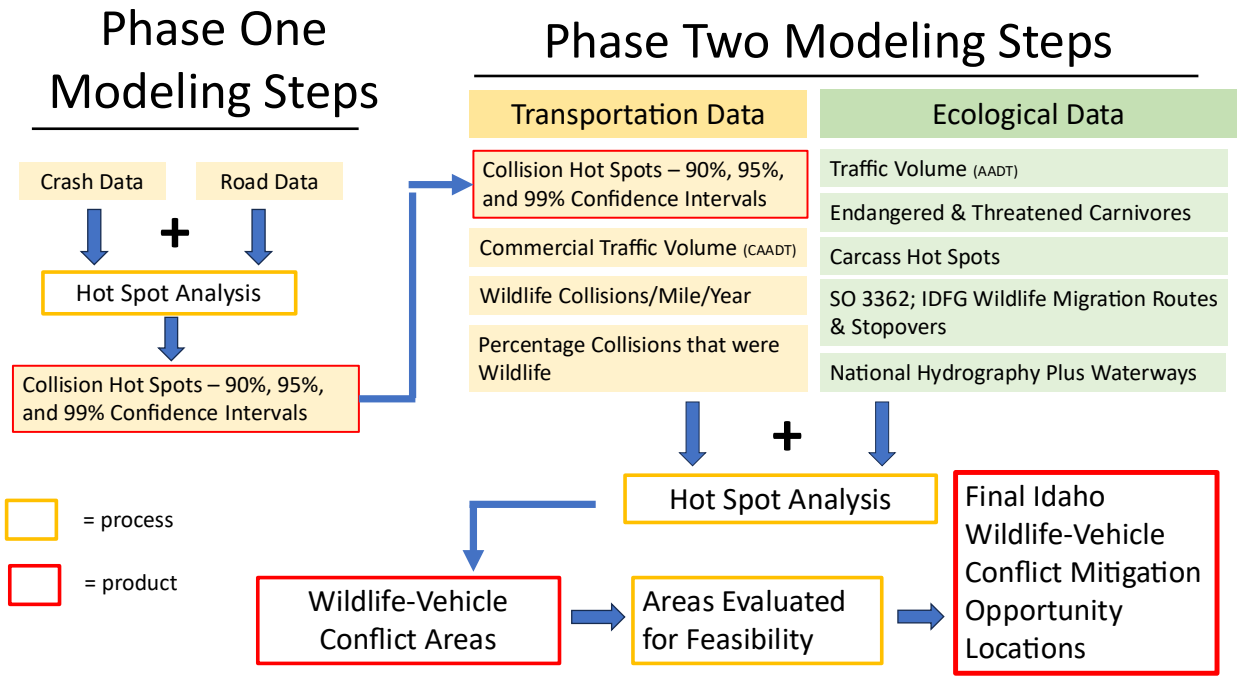

Figure 4-1. The flow diagram of Phase One and Phase Two modeling to identify the final Wildlife-Vehicle Conflict Mitigation Opportunity Locations.

The final step in Phase Two was to take the transportation and ecological factor hot spots, which were then named the state's Wildlife-Vehicle Conflict Areas, and rank them with respect to three feasibility factors based on land ownership/management, urbanization, and the potential for mitigation projects to be constructed. This was to elevate areas where there was the greatest opportunity to construct wildlife crossing structures or other mitigation in the future. The final areas including feasibility factors were then called Idaho's Wildlife-Vehicle Conflict Mitigation Opportunity Locations (Figure 4-1). Details of all these steps and decisions made are described in this chapter and in a Supplemental Information Source Document.

Phase Two Methods

The methodology used in Phase Two was developed with the advice and review of the TAC and other ITD personnel who were knowledgeable about the data and situations in the field. The TAC was able to review the modeling process and provided input on what they thought were the most appropriate inputs and the results of the modeling.

This Phase Two effort was based on Idaho's first study to identify these types of areas (Cramer et al. 2014), and methods developed in similar studies in Nevada (Cramer and McGinty 2018), Utah (Cramer et al. 2019), Arizona (Williams et al. 2021), New Mexico (Cramer et al. 2022), and Washington (Michalak et al. 2025). The approach was to gather multiple geospatial datasets that were georeferenced for mapping and select which datasets to include in the model. The datasets were selected based on the pertinence to wild large mammal movements in relation to roads, the need to reduce WVCs, and restore and protect wildlife permeability which is the degree to which the landscape can facilitate wildlife movement in search of resources. This approach was developed by scoring Idaho landscapes with the assignment of points to factors within the maps that could help inform where large mammal wildlife may be present, may need to cross roads, or could be involved in collisions with little crash data to support those actions.

All GIS layers for the nine factors below were scored in a point system (Table 4-1).

There were four transportation factors including:

(1) Wildlife-Vehicle Collision Hot Spots (from Phase One),
(2) commercial traffic volume (commercial average annual daily traffic [CAADT]),
(3) wildlife collisions per mile per year, and
(4) percentage of all collisions that were wildlife-related.

There were five ecological factors including:

(1) traffic volume (average annual daily traffic [AADT]),
(2) the United States Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) threatened and endangered large carnivores,
(3) Carcass Hot Spots,
(4) IDFG Wildlife Migration Routes and Stopovers (Secretarial Order 3362 Improving Habitat Quality in Western Big-Game Winter Range and Migration Corridors), and
(5) United States Geological Survey (USGS) National Hydrography Plus Dataset.

The four transportation factors totaled a maximum value of 50 points. The five ecological factors also totaled a maximum of 50 points. Together, the maximum points a half mile road segment could be scored was 100 points. Each half mile road segment of ITD-administered roads was evaluated for the intersection of these nine transportation and ecological factors (Table 4-1) with that segment and the road segment was given a final score of points out of 100 total maximum points. This equalizing of the transportation and ecological factors helped create model results that were of equal importance for traffic and motorist safety as well as large mammal movements across ITD-administered roads. The OHSA was then run for each half mile road segment of the ITD-administered roads with the final point scores for each half mile road segment as the input factor to evaluate. Meaning the OHSA was run in the same manner as in Phase One, with the collisions replaced by total points as the factor to identify for hot spots. The resulting hot spots from the OHSA of the 100 transportation and ecological factors points, which were assigned the name Wildlife-Vehicle Conflict Areas.

In the final analysis of this project, those Areas were then ranked based on the feasibility for implementing wildlife crossing mitigation projects in those areas.

These three feasibility factors included:

(1) USGS land cover or use,
(2) state and federal land ownership/management, and
(3) planned and approved ITD transportation projects based on ITD's seven-year project plan, the Idaho Transportation Investment Program (ITIP).

This latter factor was an effort to strategize the inclusion of potential wildlife crossing structures and other mitigation within planned and approved ITD transportation projects. These final three factors added up to 30 points to each Wildlife-Vehicle Conflict Area. This assisted in ranking the Areas across the state and within Districts for opportunity locations to mitigate for wildlife-vehicle conflict. These final areas were called the Wildlife-Vehicle Conflict Mitigation Opportunity Locations. The details of the methods for these analyses are provided below and additional information is provided in a Supplemental Information Source Document.

In Table 4-1 the nine transportation and ecological factors used to identify the top areas to mitigate in the second OHSA are presented with the number of points each factor was assigned, along with the feasibility factors that were used to rank the Areas that were identified in the OHSA and based on the nine transportation and ecological factors. Details on why these factors were chosen and what they represent are presented below the table.

Table 4-1. Factors used to first create the hot spots identified as the Wildlife-Vehicle Conflict Areas and then the factors used to rank them based on feasibility, resulting in Wildlife-Vehicle Conflict Mitigation Opportunity Locations in Idaho.

Data Factors	Max. Points	Why it is Important
Transportation Factors		
Wildlife-Vehicle Collision Hot Spots (Phase One)	20	This addresses motorist safety because of large mammals and their presence and potential to move across roads. It also is targeted toward safety funding for projects.
Commercial Traffic Volume = CAADT	10	Drivers of semitrucks do not typically report collisions with wildlife. Used to compensate for lower collision rates.
Wildlife collisions per mile per year	10	To help road segments that may have a high collision rate with wildlife, but are not within a hot spot.
Percentage of collisions that were wildlife related	10	Areas away from urban areas where wildlife collisions can be 50% or more of all reported collisions.
Total Transportation Factors Points	**50**	
Ecological Factors		
Traffic Volume = AADT	10	Represents areas where the traffic volume may be too high for animals to try to cross the road.
USFWS IPaC for Threatened and Endangered Species	10	Grizzly bear, North American wolverine, and Canada lynx current ranges and designated or potential critical habitat.
Carcass Hot Spots for Large Mammals	10	An effort to incorporate additional wildlife information with greater than 25,000 carcass records.

Data Factors	Max. Points	Why it is Important
SO 3362; IDFG Wildlife Migration Routes and Stopovers	10	Although not collected statewide, it could help highlight places where there is a need to mitigate.
USGS National Hydrography Dataset Plus (NHDPlus)	10	Areas where streams, rivers, and wetlands are intersected by roads.
Total Ecological Factors Points	**50**	
Total Transportation and Ecological Factors Points	**100**	
Feasibility Factors		
USGS Land Cover	10	Identify natural areas to better locate where mitigation opportunities have the greatest potential for success.
State and Federally Protected Lands (ownership/management)	10	Protection against future development is necessary for wildlife crossing structure locations.
Idaho Transportation Investment Program (ITIP) Projects	10	The potential to add wildlife mitigation to larger planned and approved ITD transportation projects.
Total Feasibility Factors Points	30	
Total Factors Points in the Analysis	**130**	

The factor data inputs are presented below under the headings of transportation factor data, ecological factor data, and feasibility factor data. Each data source is described as to its relevance to wildlife-vehicle conflict in Idaho, the number of maximum points that were assigned to that factor data layer, how the assignment of points was evaluated, and what it represents.

Transportation Factor Data

Wildlife-Vehicle Collision Hot Spots from Phase One

The half mile road segments of all ITD-administered roads were evaluated for their inclusion in the Phase One statewide collision hot spot map. The higher the confidence the model has in the hot spot, the higher the points for that half mile road segment. This gives value to areas with a known collision history that is among the top problem areas within the state.

Points

20 points

How it Was Evaluated

Each half mile road segment was evaluated to determine if it was in a collision hot spot, and if so, what the confidence level is for that hot spot and then the half mile road segment was given points accordingly. The higher the model's Confidence Interval, the more confident the statistical analyses conducted are correct in indicating the importance of that hot spot for collisions per mile per year.

- 99% Confidence Interval = 20 points

- 95% Confidence Interval = 15 points
- 90% Confidence Interval = 10 points

What it Represents

The hot spot analysis represents motorist safety in relation to large mammals within the state. These hot spots also represent large mammal movement areas. This factor received the greatest number of points of all nine factors.

Commercial Traffic Volume (CAADT)

In earlier iterations of the modeling of hot spots, one of the worst WVC areas in the state did not rise to the level of a statewide priority before this factor was included. Data for this area, Rocky Point, along US 30 in southeastern Idaho (District 5) demonstrated that over 50 percent of the traffic volume consisted of commercial semitruck traffic. The drivers of these vehicles typically do not report collisions with wildlife and are large enough to keep moving on once animals are hit. This is problematic when basing a hot spot analysis on collision reports. The wildlife-vehicle conflict analysis was designed to help locate these areas using data other than crash data. Thus, the data on the percentage of commercial average annual daily traffic (CAADT) otherwise known as commercial traffic volume was incorporated to help include additional points to areas with higher than state average commercial traffic on these roads, to help compensate for the lack of wildlife-vehicle collision reports.

Points

10 Points

How it was Evaluated

The research team contacted ITD Principal Research Analyst and Roadway Data Manager, Margaret Pridmore, in ITD's Roadway Data Section to ask how the commercial traffic data could be analyzed to help with the objectives of adding this factor. The 2023 summaries of percentages of different types of vehicles on Idaho's roads parsed out by "Road Type" were provided, Table 4-2 below. According to FHWA (2013), commercial semitrucks are classified into two separate groups "Single Unit Trucks" and "Combination Unit Trucks" These two groups were summed to create the state "Average Percentage Commercial Vehicles" for each route type. As identified in Table 4-2, rural interstates had the highest percentage of commercial traffic volume, 26.32%.

Table 4-2. 2023 vehicle summaries table identifies percentages of CAADT per route type based on Single Unit Trucks and Combination Unit Trucks classifications.

Route Type*	Motorcycles	Passenger Cars	Light Trucks	Buses	Single Unit Trucks	Combination Unit Trucks	Average % Commercial Vehicles
Urban Interstate	0.24	67.49	19.1	0.25	3.49	9.43	12.92

Route Type*	Motorcycles	Passenger Cars	Light Trucks	Buses	Single Unit Trucks	Combination Unit Trucks	Average % Commercial Vehicles
Urban Arterial: includes other freeways/expressways, other principal arterials, and minor arterials	0.43	71.61	23.61	0.39	2.43	1.53	3.96
Urban Other: includes major collectors, minor collectors, and locals	0.63	67.46	26.74	0.45	3.43	1.29	4.72
Rural Interstate	0.24	52.18	21.03	0.23	3.56	22.76	26.32
Rural Arterial: includes other freeways/expressways, other principal arterials, and minor arterials	0.82	53.08	34.0	0.36	5.95	5.79	11.74
Rural Other: includes major collectors, minor collectors, and locals	1.01	48.58	39.96	0.32	6.36	3.77	10.13

*Route type classification definitions from the Idaho Transportation Department Systems Procedures (2025).

The models used the 2020 United States Census Urban Area data layer to delineate where roads are considered inside urban areas, and intersect this with all ITD-administered roads. See Figure 4-2 below for those urban areas in Idaho.

Thresholds were set for percentage of CAADT on each half mile road segment based on percent Average Commercial Vehicle from the table above. The US Census urban versus rural designations were used and were paired with different road types: urban interstate, arterial, and other roads and rural interstate, arterial and other roads. The binary evaluation of the percentage of commercial traffic was then set for each of these road types based on the state average for those road types, below.

- If the Route is an Interstate, within a rural area, and CAADT > 26%, then score = 10 points
- If the Route is an Interstate, within an urban area, and CAADT > 13%, then score = 10 points
- If the Route is not an Interstate, it is an arterial or other road, within a rural area, and CAADT > average of 12%, then score = 10 points
- If the Route is not an Interstate, it is an arterial or other road, within an urban area, and CAADT > 4% then score = 10 points

Otherwise, the road segment receives no points.

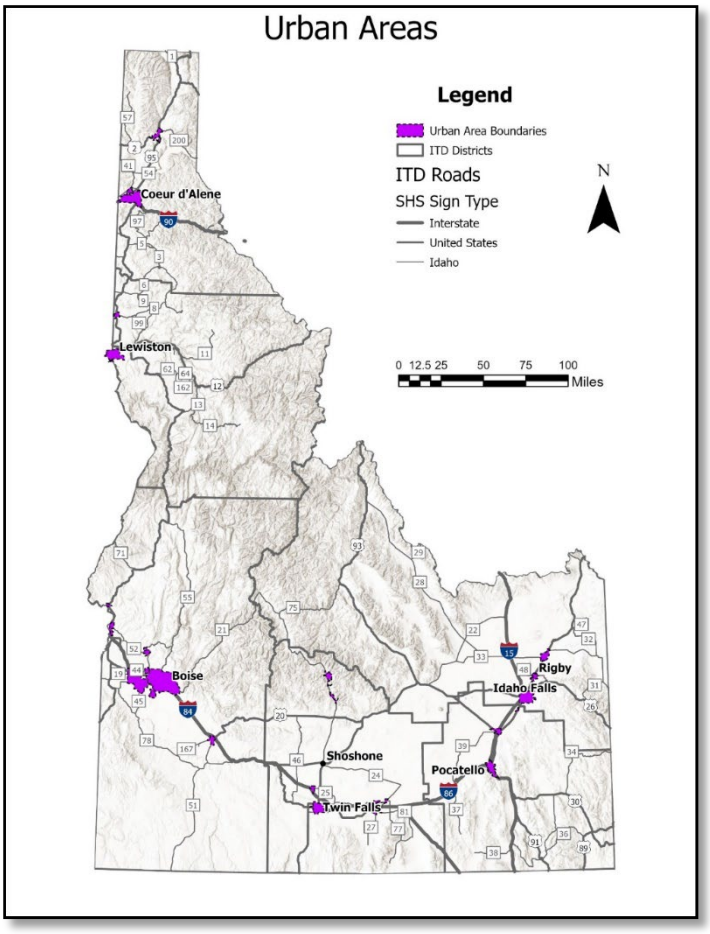

Figure 4-2. 2020 United States Census Bureau Designated Urban Areas in Idaho.

What it Represents

This evaluation of routes in urban and rural settings allows the model to help account for routes where commercial vehicle traffic, which is largely semitruck traffic, is a higher percentage of the traffic than the state average for that type of route. This allows the model to help compensate for the lack of WVC reporting with these types of vehicles, and thus better identify wildlife-vehicle conflict in certain areas than modeling with only crash data could do so.

Wildlife Collisions Per Mile Per Year

The scoring of wildlife collisions per mile per year is to help half mile road segments that may have a high collision rate with wildlife but are not located within a wildlife-vehicle collision hot spot. This may occur if the segment has a high collision rate, but neighboring segments do not, and thus the segment is too short to meet the two mile threshold the team decided on for elevating hot spots to be included in the final map. An area where a bridge or culvert along a riparian area is not useable by ungulates is a typical place where these hot spots could occur. The wild animals may quickly appear on the road at the end of a bridge or culvert and become involved in collisions. Additionally, it could be an area where wild animals are

moving along the end of a fence and getting hit in a specific spot. This analysis helps to identify those singular areas, which also may be important for planning in future ITD transportation projects.

The research team calculated the WVC rate in terms of wildlife collisions per mile per year for each of our half mile road segments and then examined the distribution of this rate over the entirety of our data (Figure 4-3).

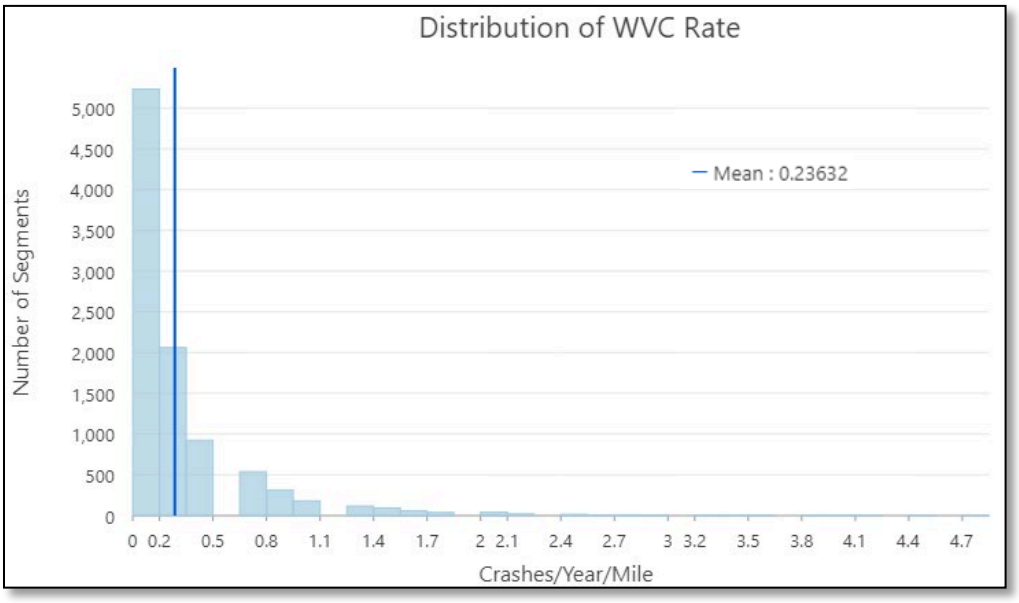

Figure 4-3. Distribution of WVCs per year per mile for each of our segments

Points

10

How it Was Evaluated

The cutoff values for points of each of these classes of collision rates were taken from the collision hot spots: statewide collision hot spots five through eight had between 0.90 and 0.99 wildlife collisions per year; collision hot spots nine through thirteen had rates of 0.8 and 0.89 per mile per year. This is where the cutoff was made for the top number of points (10 points) for the rate of wildlife collisions per mile per year. The 35th hot spot had 0.60 wildlife collisions per mile per year, so this was the cutoff for the second-tier category of points (seven points). In the individual Districts, the lowest collision rate per year was 0.43 wildlife collisions per mile per year. This helped determine that 0.40 wildlife collisions per mile per year was the cut off for the third tier of points (five points).

If the half mile road segment averages:

- > 0.88 collisions per year = 10 points
- = 0.60 – 0.88 collisions per year = 7 points
- = 0.40 – 0.59 collisions per year = 5 points
- < 0.40 collisions per year = 0 points

What it Represents

This represents areas where WVCs may be a problem for a small length of road. In the original statewide collision hot spot analysis, the cut off for hot spots to identify as top areas was for hot spots of two or more miles long. This brings smaller hot spots back into the analyses. This analysis is more holistic and focused on wildlife factors at smaller scales more than the collision analysis did in Phase One.

Percentage of Collisions That Were Wildlife-Related

Phase One focused on the overall number of collisions per road segment and as a result was biased towards urban areas with higher populations more vehicle miles traveled leads to more wildlife collisions overall. The research team wanted to account for rural areas where wildlife collisions while being fewer in number, made up a larger percentage of collisions. For example, US-95 between Potlach and Moscow had a half mile road segment that had 11 collisions, and every single one reported collision was wildlife related.

Points

10

How it Was Evaluated

Each half mile road segment was evaluated for the total number of collisions over 10 years (2013 to 2022), and the overall total number of wildlife collisions. The percentage of wildlife collisions was calculated for each half mile road segment. Some segments (363 out of 4,461 segments that had WVC) had only one collision on a segment of road that was wildlife related. The TAC determined to exclude segments with under three wildlife-related collisions total in order to avoid over-emphasizing these segments. Summary statistics of all road segments and their percentage of total collisions that were wildlife-related were plotted (Figure 4-4). The greatest majority of road segments had less than five percent of all collisions that were wildlife related, with a mean of 18.20 percent wildlife collisions per half mile road segment.

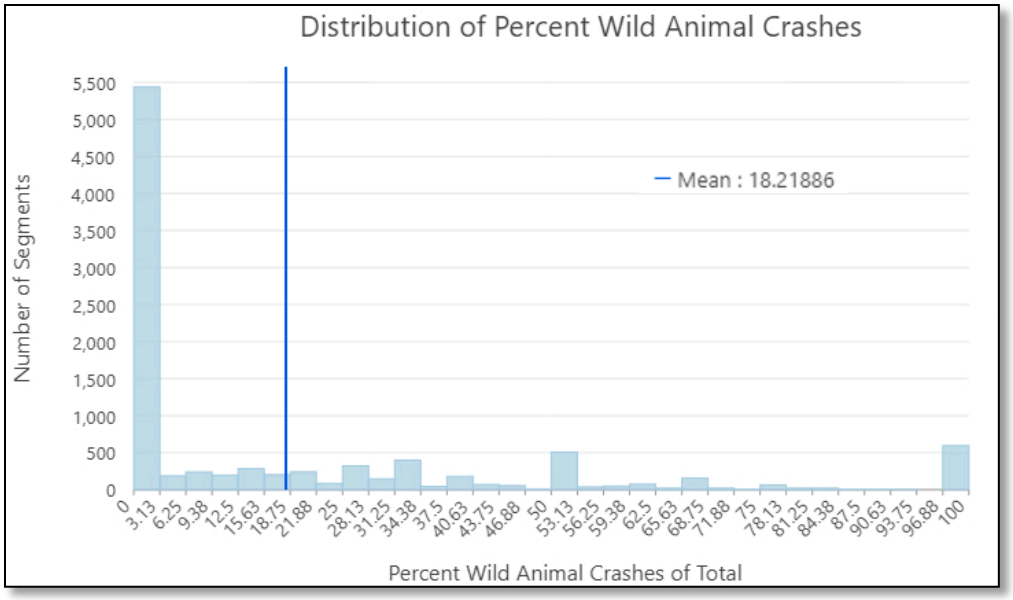

Figure 4-4. Summary statistics for all half mile road segments of ITD-administered roads and the percentage of collisions that were wildlife-related.

A definition query was placed on the road segments to include only those with two or more collisions and at least one wildlife collision. Some segments only had one wildlife-related collision, and this 100% rate would distort scoring. The distribution of those road segments and their percent wildlife related collisions is displayed below (Figure 4-5). The high number of road segments with the percentage value of 50.05 indicated road segments that probably had two collisions and one wildlife collision. The mean value was 34.2 percent of all collisions that were wildlife related.

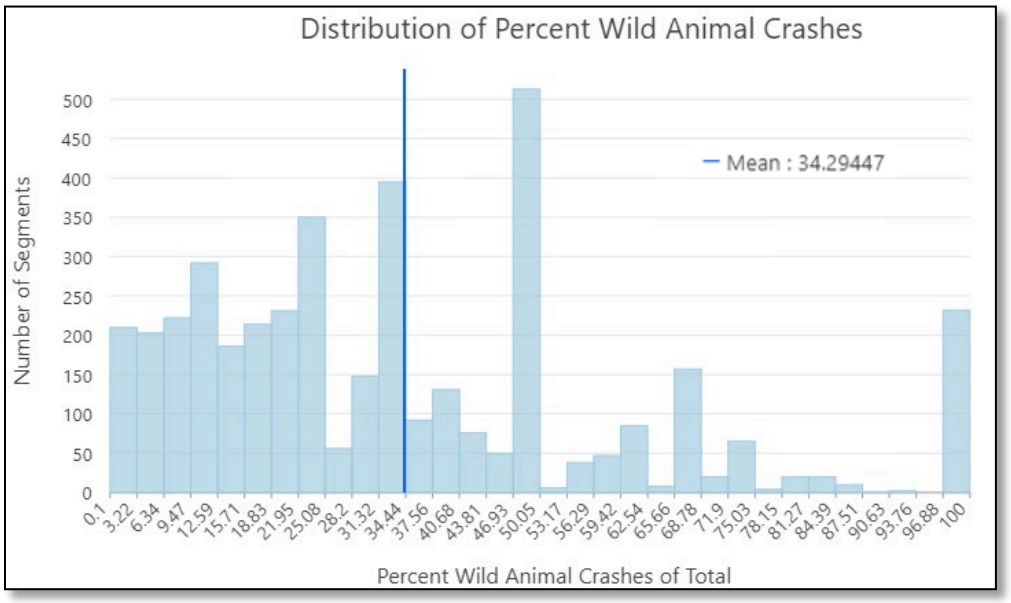

Figure 4-5. Summary statistics of half mile road segments that were selected for having at least two collisions and one wildlife related collision (crash).

A definition query was used to display road segments that had three or more total collisions, and one or more wildlife collisions, see histogram below (Figure 4-6). There were far less road segments with 50% or more wildlife-related collisions. The relative number of road segments with approximately 33% wildlife-related collisions remained the same as the analysis above, with a mean of 30.6 percent. When the results were plotted on a map, there were far less selected road segments than when the threshold was a minimum of two collisions per segment. The results were used to identify roads with a wildlife-vehicle collision problem, with more than one or two wildlife-related collisions in ten years.

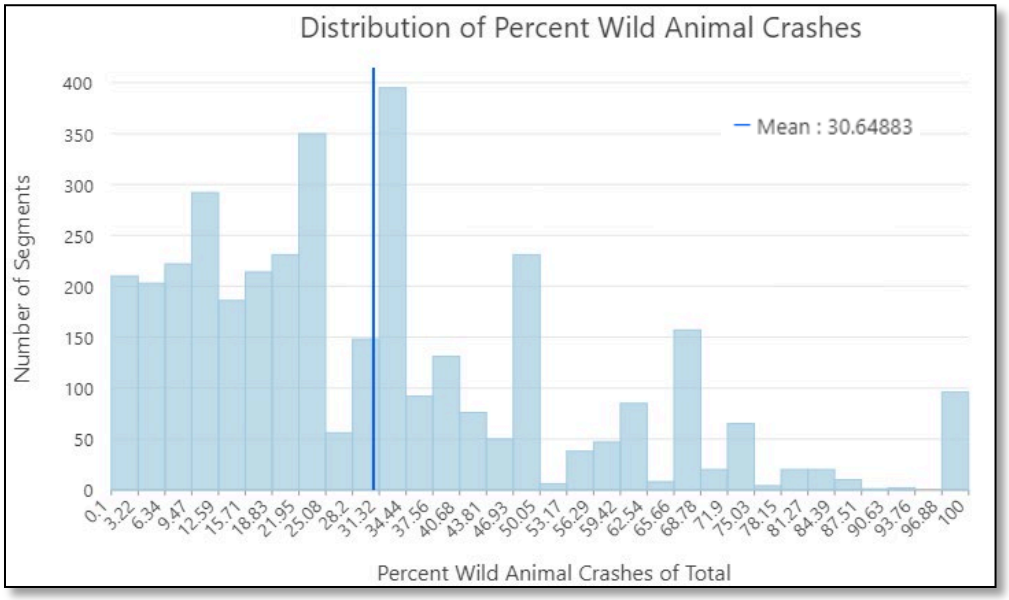

Figure 4-6. Half mile road segments with three or more total collisions and at least one wildlife related collision.

The research team decided from this analysis of the distribution histogram to establish intervals for scoring the different percentage values. The subset of segments with three or more collisions were assigned the following points for percentage of wildlife-related collisions values. The highest number of points went to road segments where 70 percent or more of their collisions were wildlife related. There were only about 200 road segments statewide with this high value. These were the areas with the greatest risk of a WVC. The second category of road segments began with the mean of 30.6 percent of collisions that were wildlife and went up to 69.9 percent of all collisions were wildlife-related (n = 1,338). The third category started at 15.0 percent of collisions and went to 29.9 percent (n = 975). The fourth category had all road segments with less than 15.0 percent wildlife collisions (n = 1,083).

The display above demonstrates how collision percentages were evaluated for each road segment. These road segments had to have a minimum of three total collisions, and at least one wildlife-related collision.

- Wildlife-related collisions ≥70% = 10 points
- Wildlife-related collisions between 30.0 – 69.9% = 8 points
- Wildlife-related collisions between 15.0 – 29.9 % = 4 points
- Wildlife-related collisions <15% = 0 points

What it Represents

The percent of wildlife collisions represents the risk of a WVC occurring in areas with less vehicles but higher rates of wildlife-related collisions than more populated areas at the suburban-wildland interface.

Ecological Factor Data

Traffic Volume (AADT)

In the modeling, the traffic volume (calculation based on average annual daily traffic [AADT]) metric compensates for areas where the traffic volume is high enough to create a "moving" barrier, preventing wildlife from attempting to cross the road. These highways have lower wildlife collisions in large part because wildlife avoid crossing the road or their populations have been extirpated from the area. The traffic volume was placed in the ecological factor category of data because it represents an ecological phenomenon, the lack of successful movement across roads by wildlife. Washington state's Wildlife Habitat Connectivity Action Plan (Michalak et al. 2025) also placed traffic volume under ecological. Seiler (2003) proposed a model of traffic volume thresholds at which wildlife movement across road is not as dangerous for medium to large mammals, then at traffic volumes that are dangerous, and finally, when traffic volumes represent a near complete barrier (Figure 4-7). Charry and Jones (2009) also conducted a meta-analysis of published work on traffic volume effects on various wildlife species, and the model Seiler proposed aligns with these works. Charry and Jones also looked at traffic volume effects on smaller and slow-moving species such as reptiles. However, this study is focused on large mammals.

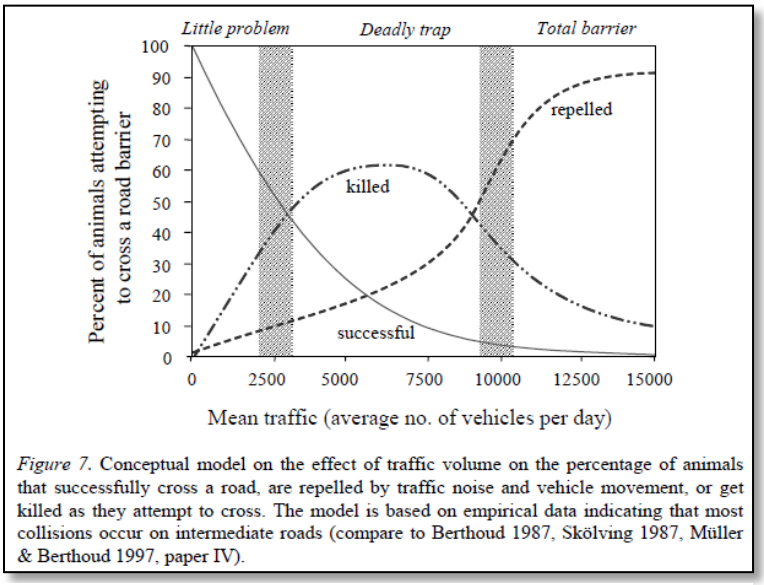

Figure 7. Conceptual model on the effect of traffic volume on the percentage of animals that successfully cross a road, are repelled by traffic noise and vehicle movement, or get killed as they attempt to cross. The model is based on empirical data indicating that most collisions occur on intermediate roads (compare to Berthoud 1987, Skölving 1987, Müller & Berthoud 1997, paper IV).

Figure 4-7. Traffic volume effects on wildlife attempts to cross roads (Seiler 2003).

Points

10 points

How it Was Evaluated

The traffic volume for the most recent year (2024) was taken and averaged for every half mile road segment. There were four categories created for the AADT.

- AADT > 10,000 = 10 points
- AADT between 7,500 – 10,000 = 7 points
- AADT between 2,000 – 7,499 = 5 points
- AADT < 2,000 = 1 point

These AADT categories were based on past work in Idaho (Cramer et al. 2014), Arizona (Williams et al. 2021), New Mexico (Cramer et al. 2022) among other states, and a summary statistic plotting of the number of road segments with these various traffic volumes in Idaho. The highest AADT was 144,500 on I-84 in Boise. The statistics of the Idaho traffic volume per half mile road segment are displayed in Figure 4-8. The x-axis is the AADT amount. The y-axis is the number of half mile road segments with that traffic volume. The mean was 5,000 vehicles per day.

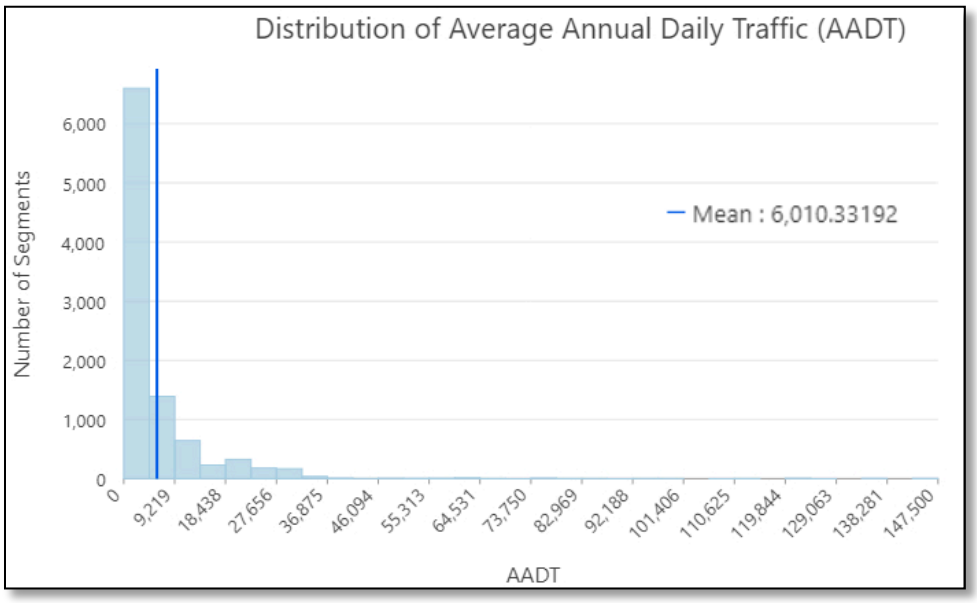

Figure 4-8. The number of half mile road segments (y-axis) with the corresponding traffic volumes (x-axis) on ITD-administered roads.

What it Represents

The traffic volume represents a type of barrier for wildlife as they attempt to cross roads; the higher the traffic volume, the more difficult it is for individuals and herds to safely cross resulting in hesitation or complete avoidance. It also represents the impermeability of a road, the higher the traffic volume, the less permeable, and thus, the more the location would be deserving of a wildlife underpass or overpass, given other factors.

United States Fish and Wildlife Service Information for Planning and Consultation List

When ITD projects are planned, the US Fish and Wildlife Service (USFWS) must be consulted via the Information for Planning and Consultation (IPaC) List which identifies threatened and endangered species that need to be considered under the Endangered Species Act (ESA) compliance. There are three USFWS threatened and endangered medium to large carnivores in Idaho: the grizzly bear, North American wolverine (*Gulo gulo*), and Canada lynx. Their wide-ranging movements make them more susceptible to collisions with vehicles than more locally present wild animals such as resident deer, and other USFWS listed species. Their presence in an area can be a factor in providing wildlife mitigation such as wildlife underpasses. The USFWS range maps are helpful in identifying these locations.

Points

10 Points

How it Was Evaluated

The ITD-administered roads were intersected with these three species' potential habitat range maps. The evaluation was binary: the half mile road segment received the full number of points (10 points) if it intersected with any or all of these species' maps from the USFWS IPaC of the ranges and critical habitat (if designated) of grizzly bear, Canada lynx and North American wolverine (Figure 4-9). There will were no points assigned otherwise. The roads were not buffered for this evaluation.

What it Represents

These three ESA protected large carnivores were included because they represent a higher risk to Idaho motorists when these species attempt to cross roads as opposed to smaller and aquatic protected animals which were not included. Also, all ITD projects are required to comply with the ESA, so this approach is in accordance with ITD's environmental clearance process with compliance under the ESA.

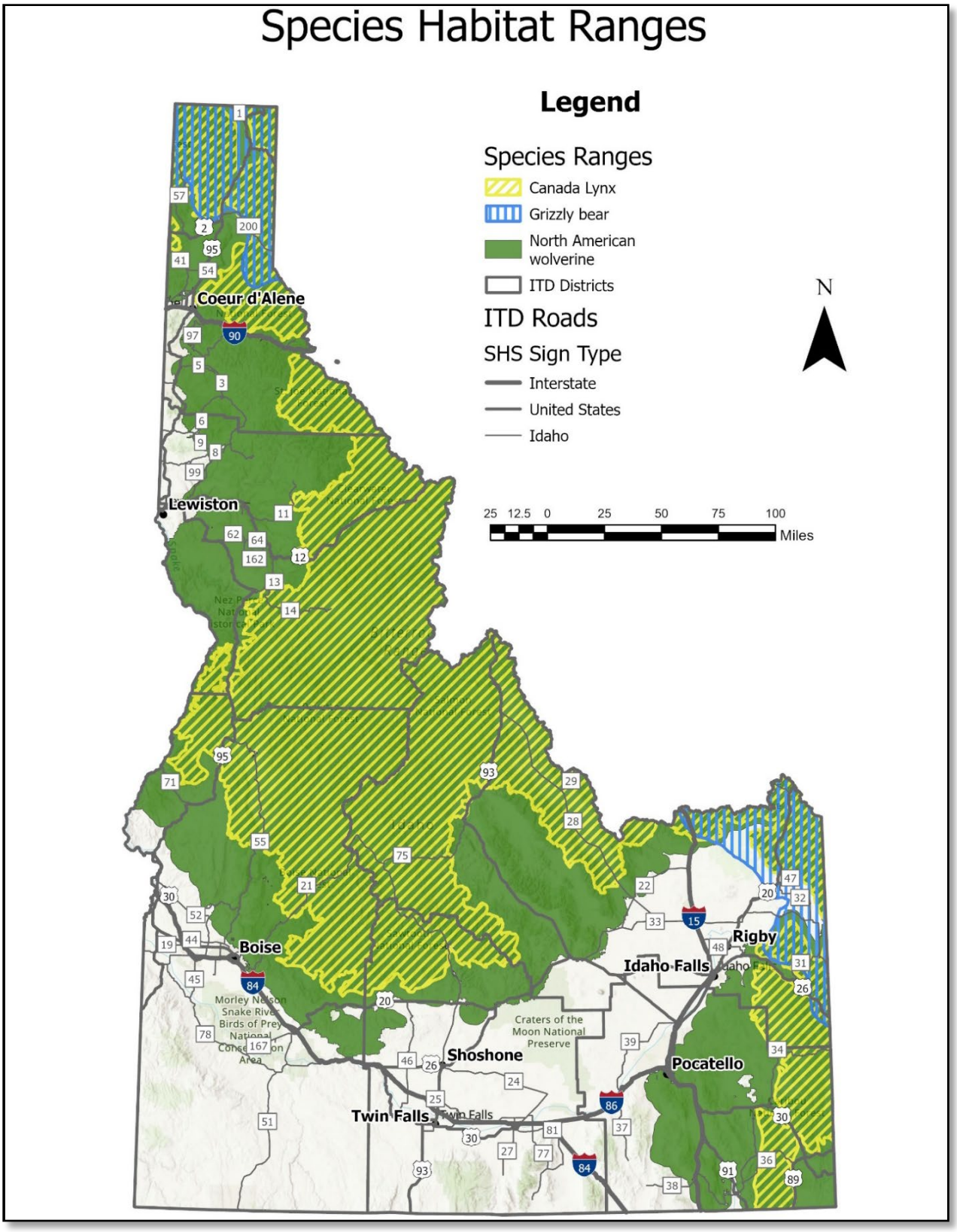

Figure 4-9. The USFWS IPaC maps of ranges and critical habitat (if designated) of grizzly bear, Canada lynx, and North American wolverine (USFWS IPaC).

Carcass Data Hot Spot Analyses

Carcass data are collected more opportunistically and differently across Idaho when compared to the crash data. The date range for carcass data collection also differs from the crash data. Since these data are not systematically collected across the state, it was not initially included in the overall modeling and identification of top areas for wildlife-vehicle conflict. However, as the model iterations proceeded, it was evident that having only the three USFWS threatened and endangered carnivore species to represent the habitat and potential for wildlife-vehicle conflict for all ungulates and large carnivores was not enough to produce accurate results. The research team reconsidered carcass data to help enrich the model's wildlife locations and potential to be involved in vehicle collisions. When the 2013 to 2022 carcass database was filtered to represent only ungulates and large carnivores, it was found to contain over 25,000 data points across the state (Table 4-3). A sampling of the carcass data points across the states revealed that the overwhelming majority (94%) of the carcass reports were from citizens seeking salvage permits from IDFG to remove a carcass from the road. When plotted, the carcass data points showed a fair representation of carcasses across all Districts (Figure 4-10). After this discovery, the research team decided to include these carcass data to enrich the model and improve accuracy.

Points

10 Points

How it Was Evaluated

The wild animal carcass data (2013 to 2022) extracted from the IDFG Roadkill & Salvage Database were grouped into 13 classes (Table 4-3). An updated, Phase Two OHSA of wildlife carcasses was conducted for each one of the carcass groupings for the entire state (Figure 4-11) and for each District. The value of carcasses per mile per year was averaged over all the half mile road segments within each hot spot.

Each half mile road segment was evaluated with respect to these Carcass Hot Spots. A spatial query determined if the half mile road segment was in a Carcass Hot Spot with a 95% to 99% Confidence Interval. If the hot spot was within a one of those Confidence Intervals, the road segment received 10 points. Otherwise, it received no points.

Table 4-3. Species of carcass data used to model ungulates and medium/large carnivores' Carcass Hot Spots.

Species	Count
White-tailed deer (*Odocoileus virginianus*)	11,503
Mule Deer (*Odocoileus hemionus*)	9,016
Elk (*Cervus canadensis*)	3,035
Moose (*Alces alces*)	894
Pronghorn (*Antilocapra americana*)	254
Deer (*Odocoileus* spp.)	143
American Black Bear (*Ursus americanus*)	132
Mountain Lion, Cougar, or Puma (*Puma concolor*)	96
Rocky Mountain Bighorn Sheep (*Ovis canadensis canadensis*)	24
Gray Wolf (*Canis lupus*)	21
Bighorn Sheep (*Ovis canadensis*)	15
Black Bear (*Ursus americanus*)	7
Grizzly Bear (*Ursus arctos*)	4
American Bison (*Bison bison*)	2
Mountain Goat (*Oreamnos americanus*)	1
Total records used	25,147

What it Represents

Carcass data help us understand the species killed by vehicle strikes on specific road segments. This supplements the crash data which is typically not as robust or specific as the carcass data. It can assist in the decision-making process of what mitigation actions might be necessary in that location.

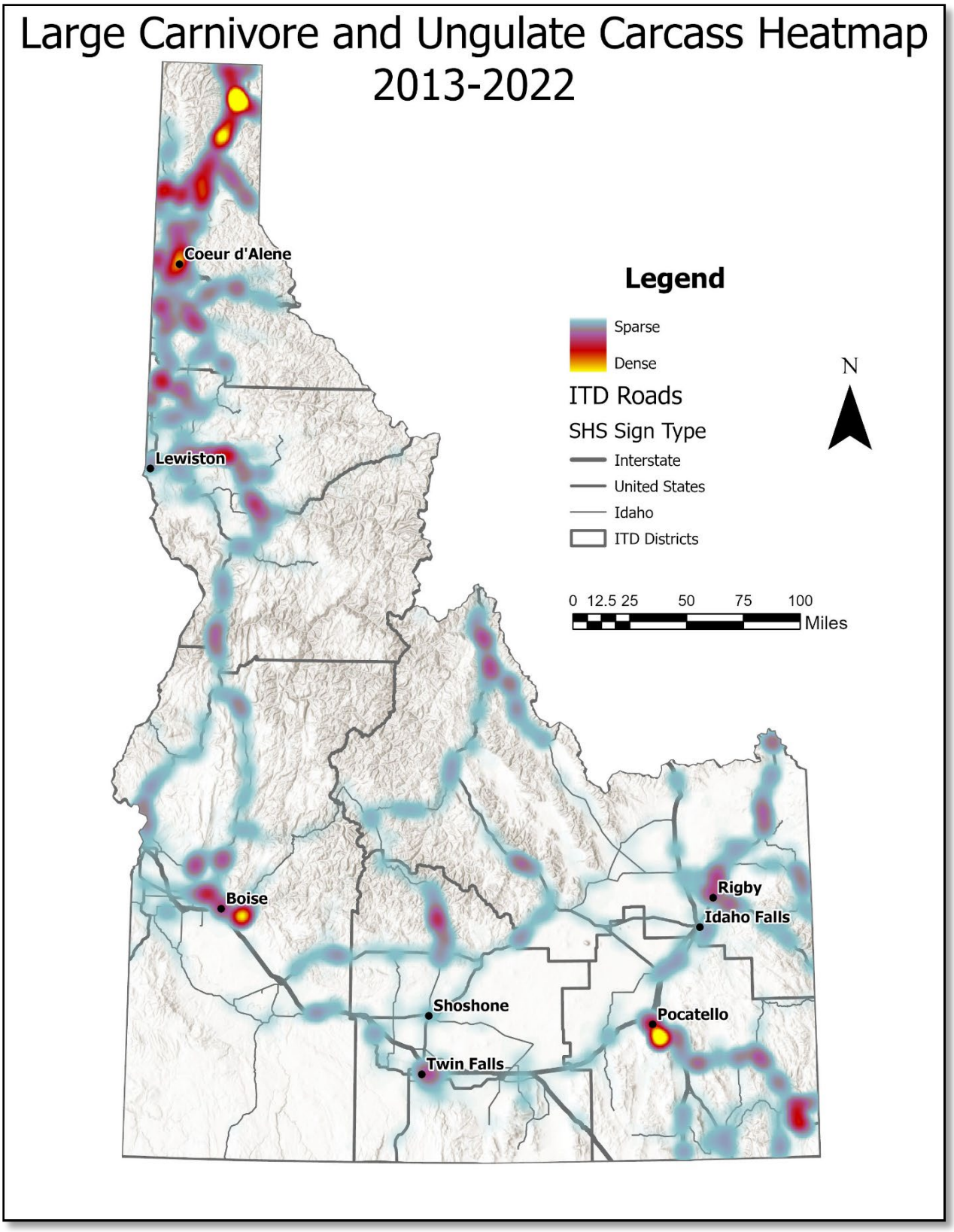

Figure 4-10. A heat map of the data points of ungulate and medium/large carnivore carcasses reported from 2010 through 2022 in Idaho.

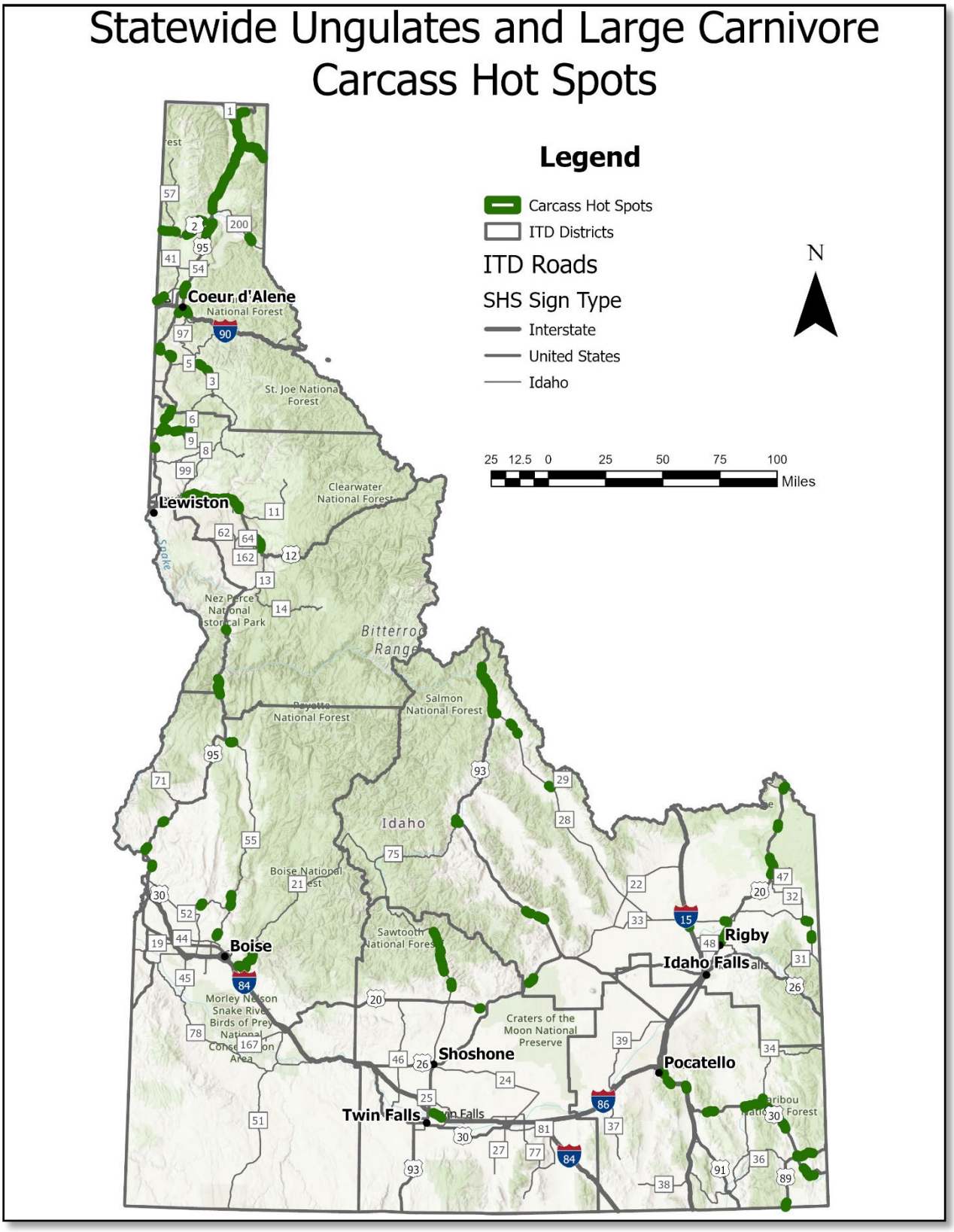

Figure 4-11. Carcass Hot Spots for ungulates and carnivores in Idaho. Data from 2013 through 2022.

Idaho Department of Fish and Game Ungulates Migration Routes and Stopovers

IDFG collared and monitored hundreds of mule deer, elk, and pronghorn individuals across several populations within the southern part of the state with support under the Federal Secretarial Order 3362 (SO 3362), Habitat Quality in Western Big-Game Winter Range and Migration Corridors. SO 3362 is a 2018 United States Department of the Interior (DOI) Secretarial Order that directed all Department of Interior Agencies under its jurisdiction to improve habitat quality in the western big-game winter ranges and migration corridors for mule deer, elk, and pronghorn. The mandate directs DOI agencies to work with 11 western states and their partnering agencies, in Idaho that would be ITD, IDFG and FHWA, to identify, conserve, and enhance these critical habitats through funding, data collection, and collaborative, non-regulatory efforts. The primary objective is to restore and enhance degraded winter ranges and migration corridors, which are essential for the survival of big-game populations. The telemetry data from the collars were analyzed with a Brownian bridge movement model to evaluate the most important migration and movement pathways for these herds. (See the 2023 Idaho Action Plan (V5.0) Improving Big Game Winter Range and Migration Routes and areas of importance to IDFG). The telemetry data were not collected systematically across the state, and favor the southern Idaho populations of these species, thus they were not included in the first round of modeling. However, as the modeling runs revealed the lack of specific data on mule deer, elk, and pronghorn affected model accuracy, it was evident that surrogate data were needed. The combined data map of all the migration pathways IDFG mapped was brought into the model. This helped to represent areas important to wildlife that were outside of the USFWS ranges for grizzly bear, Canada lynx, and North American wolverine, which favored mountainous areas.

Points

10 points

How it Was Evaluated

The migration routes and stopovers data were color coded for prime, secondary, and tertiary migration areas (Figure 4-12). All separate populations' GIS layers were brought into a single shapefile. Roads and their 250-meter (820 feet) buffers were intersected with all migration routes and stopovers shape files for all the species and populations monitored. If a half mile road segment and its buffers bisected or was adjacent to one or more of these migration routes or stopovers, it received the full 10 points. If the half mile road segment did not bisect or was not adjacent to these migration routes or stopovers, it received no points.

What it Represents

Areas where ungulate herds in Idaho that are within the IDFG SO 3362 Habitat Quality in Western Big-Game Winter Range and Migration Corridors for protection are elevated to higher protection status than other areas within Idaho. These areas may have greater community and political support as well as opportunities for grant funding for wildlife crossing structures than other areas within Idaho. With the telemetry data, there is scientific evidence of ungulate migration routes and stopovers that need wildlife accommodations to cross roads safely.

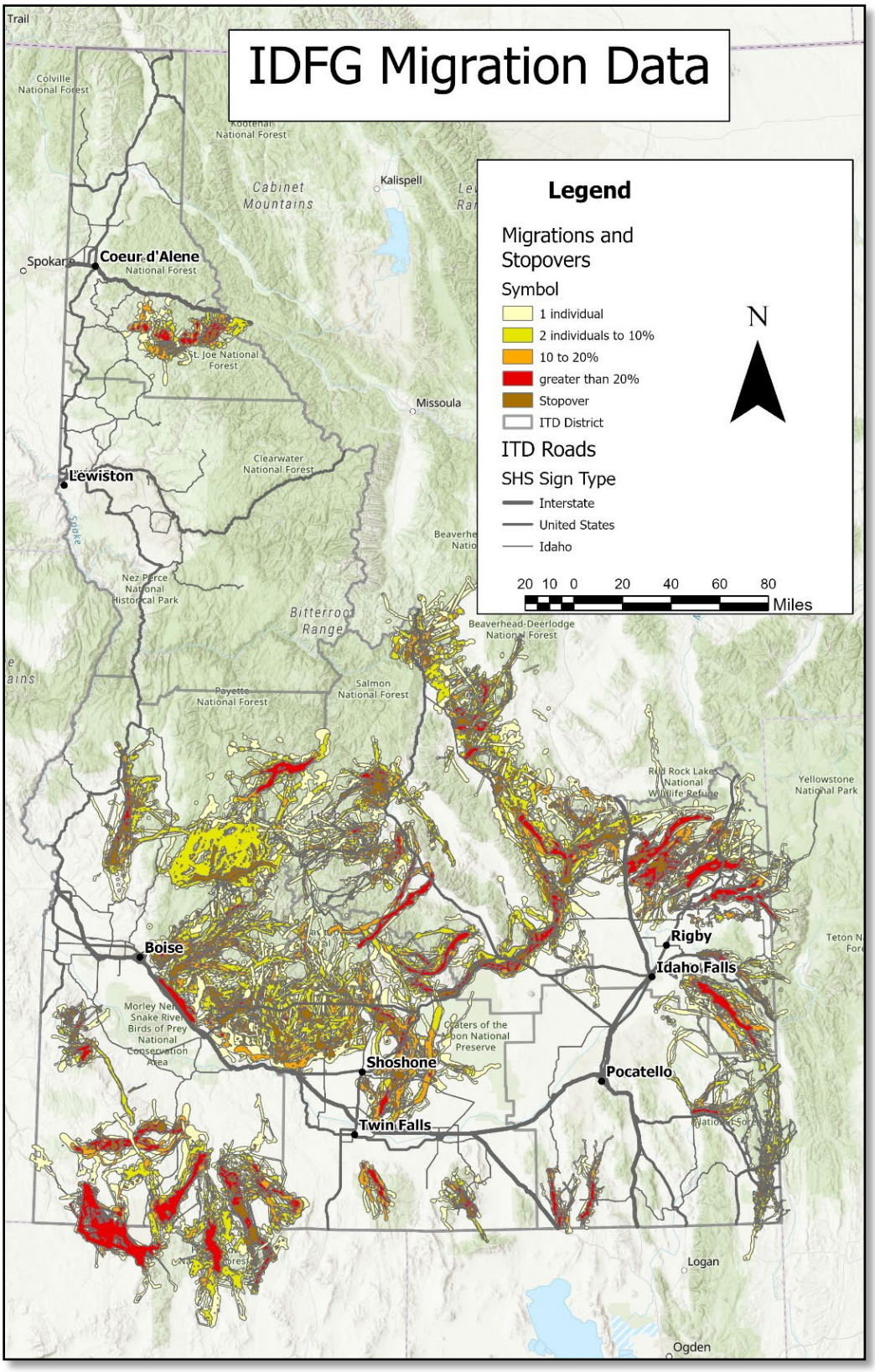

Figure 4-12. IDFG Migration and Stopovers Data of mule deer, elk, and pronghorn in conjunction with Interior Secretarial Order 3362 (USGS et al. 2024).

US Geological Survey National Hydrography Dataset Plus

The USGS National Hydrography Dataset Plus (NHDPlus) represents the water drainage network of the United States with features such as rivers, streams, canals, lakes, ponds, coastline, dams, and streams. These areas characteristically consist of riparian habitat and are important to greater biodiversity of wildlife than the drier uplands. Looking at this data layer helps to elevate areas where we can improve both aquatic and terrestrial connectivity. These areas are typically accommodated with culverts and bridges when the transportation network crosses these water bodies. Identifying these areas provides two indicators beneficial to this work: places where wildlife may have a propensity to move, and where the ITD transportation network has existing culverts and bridges that may be retrofitted or replaced to accommodate wildlife movements beneath the road. The retrofits could include cleaning culverts, constructing fish baffles, installing wildlife passage benches or shelves, reducing slope rip rap, and attaching fencing to the structures to guide wildlife to pass under the road. When these bridges and culverts are replaced, the new structures could be adapted to provide connectivity for fish and/or wildlife.

Points

10 Points

How it Was Evaluated

The NHDPlus was reclassified to represent only those water bodies that intersect roads, and that have some semblance of a natural body of water. Irrigation canals or ditches were not included, however artificial lakes or reservoirs were because of the high benefit and need for wildlife. The NHDPlus classification data is described in the dictionary of feature classes and was reclassified into included four water-body types: perennial, ephemeral, intermittent, and artificial path. These and other waterways were evaluated and appeared to best represent opportunity areas for wildlife to safely move through the landscape. This map was intersected with the ITD-administered roads, with no buffers. No buffers were used because many roads follow borders of waterways such as reservoirs but don't directly cross them, and roads in mountainous areas run parallel to rivers within valleys or canyons. If the road was represented with a buffer, it would result in many miles of the road appearing to intersect with the water body. If the water body intersected the half mile road segment, the segment received the full 10 points. Otherwise, the road segment received no points (Figure 4-13).

What it Represents

This layer represented ecological movement pathways for terrestrial and aquatic wildlife based on the need of water for survival. Also, the added benefit of the potential to retrofit or replace existing culverts and bridge for fish and wildlife movement as well as transportation structure resilience.

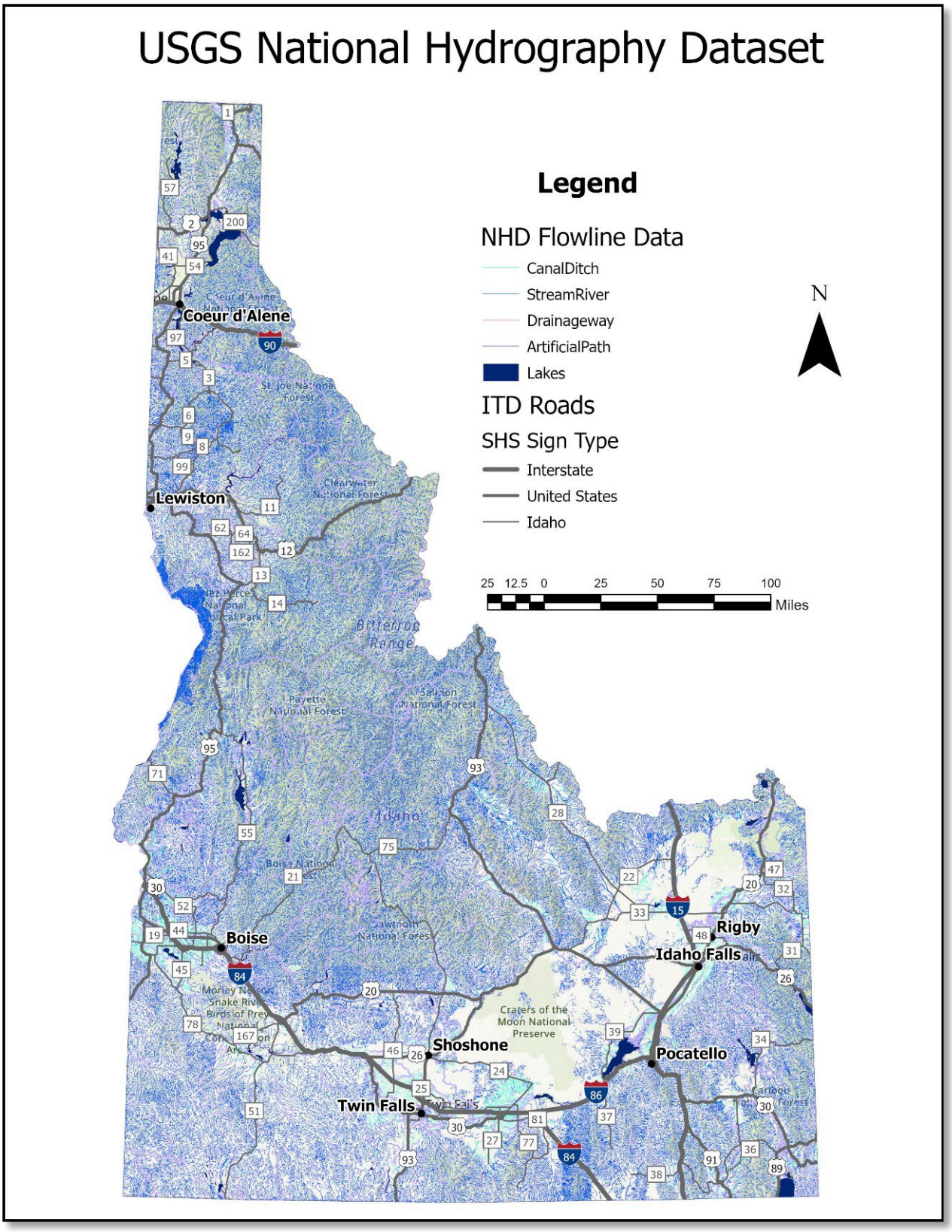

Figure 4-13. The adapted USGS National Hydrography Plus Data Set map used in the modeling.

Feasibility Factor Data

Incorporating three feasibility factors comprised of data layers that identify constructability were added as a final step in the identification for the potential for accommodate wildlife mitigation. These data layers were not necessarily collected in a standard manner statewide, or were ecological or transportation based. They represented the realities both on the ground and within the political climate of Idaho. The goal of this study was to encourage the incorporation of more wildlife crossings and other mitigation into projects. Strict scientific data analyses don't always coincide with the way funding resources, land ownership/management, and politics come together. This last addition to the points of each of the 108 top Wildlife-Vehicle Conflict Areas was to help bring the study results into the realities of accommodating wildlife in Idaho. Adding the feasibility factors results in the ranked 108 Wildlife-Vehicle Conflict Mitigation Opportunity Locations, the final product of this study.

US Geologic Survey Land Cover

The USGS Multi-Resolution Land Characteristics Consortium data layer was used because it represents both natural and human-affected areas based on 30-meter (98.4 feet) pixels. It was used to simplify the landscape of Idaho into areas that are permeable for large wildlife such as deer and elk, and into areas that are considered developed and not permeable. It then helped identify the best areas to accommodate wildlife with wildlife crossing structures under the 2025 conditions. It does not project what the land cover will be in the future.

Points

10 points

How it Was Evaluated

The research team's GIS Analyst translated these national land cover maps to just a binary representation of the landscape. The areas that were developed (in pink and red in the original dataset) were assumed to be impermeable for large wildlife; and then all other areas, both natural and agricultural were assumed to be permeable for wildlife. This newly-adjusted-to-binary land cover map was intersected with the Wildlife-Vehicle Conflict Areas with a 250-meter (820 feet) buffer on each side of the road to give a rating of how much of adjacent land is developed. The intersection function in ArcGIS then calculated the total amount of square meters there were in developed pixels in the road segment and its buffers, and divided by the total number of square meters in all the pixels within that buffered hot spot. This was done with both developed and undeveloped to obtain a percentage of development in the road segment. If the developed land percentage was 40% or greater, the road segment received no points due to its impermeable land cover. If the developed areas are less than 40% of the pixels, the road segment received the full 10 points. These areas are considered permeable to some degree. See Figure 4-14.

What it Represents

This is a representation of the permeability of the landscape within 250 meters (820 feet) of the road on each side. It helps ITD and partnering agencies identify areas where there are human development and infrastructure and thus less opportunity to install a wildlife crossing structure, and areas where there is a greater chance wildlife can get to the road area and use a potential wildlife crossing structure.

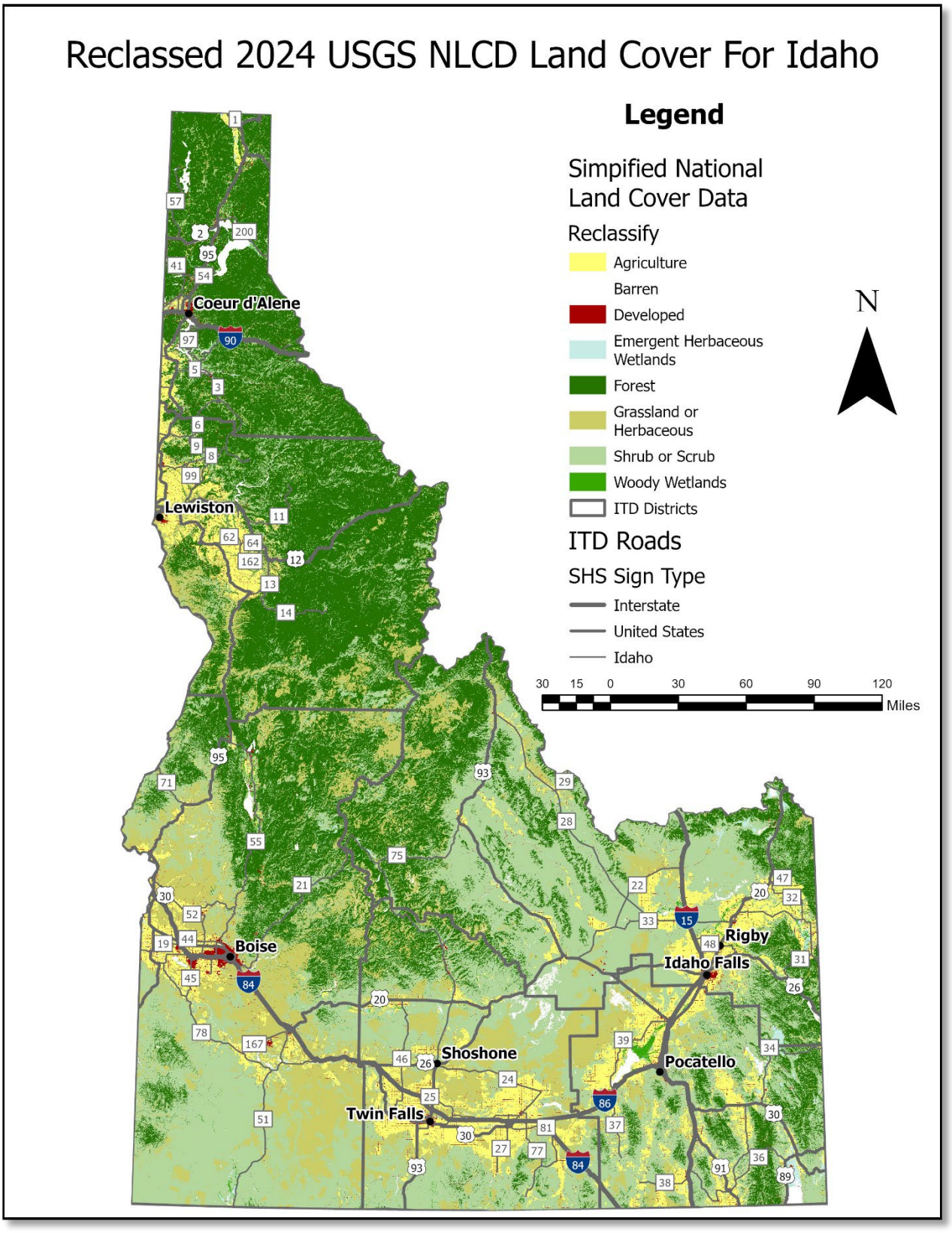

Figure 4-14. USGS Land Cover map adjusted for the binary evaluation of permeable land for larger wildlife.

State and Federally Protected Lands

The Bureau of Land Management (BLM) Idaho Surface Management Agency Data was used to identify state and federal protected and managed lands bisected and intersected by ITD-administered roads. Protected lands adjacent to wildlife crossings structures are necessary to ensure long-term protection at the entrances to these large investments. This ensures that animals can appropriately use these structures under current land conditions that are not expected to change with development since they are managed public lands. An effort was made to obtain a map with the conservation easements on land that more than a dozen Idaho non-profit land trusts manage. However, these data were not available at the time of this study, thus conservation easement lands were not included.

Points

10 points

How it Was Evaluated

The 108 Wildlife-Vehicle Conflict Areas were evaluated for these lands. For each of these Areas, if they were on interstates, a 150 feet (45 meters) buffer was measured from the edge of the pavement outward. If the Wildlife-Vehicle Conflict Area was on a US or state highway, the buffer was measured outward 50 feet (15 meters) from the center line. During the modeling, the research team targeted Areas including the buffers where land was protected on either side of the ITD-administered road. As there was difference between working with state and federal management and if these lands were on both sides or only one side of a road we scored as follows (Figure 4-15):

- Federal management on both sides = 10 points
- Federal management on one side and State management on the other = 7 points
- Federal management on one side or State management on both sides = 5 points
- State management on one side only = 2 points

What it Represents

The Wildlife-Vehicle Conflict Areas that received points in this analysis have greater opportunities for placing wildlife crossing structures than Areas with no protected publicly managed lands. This analysis helps ITD and partnering agencies find the locations where there are greater long-term opportunities for successful wildlife crossing structures and other wildlife mitigation.

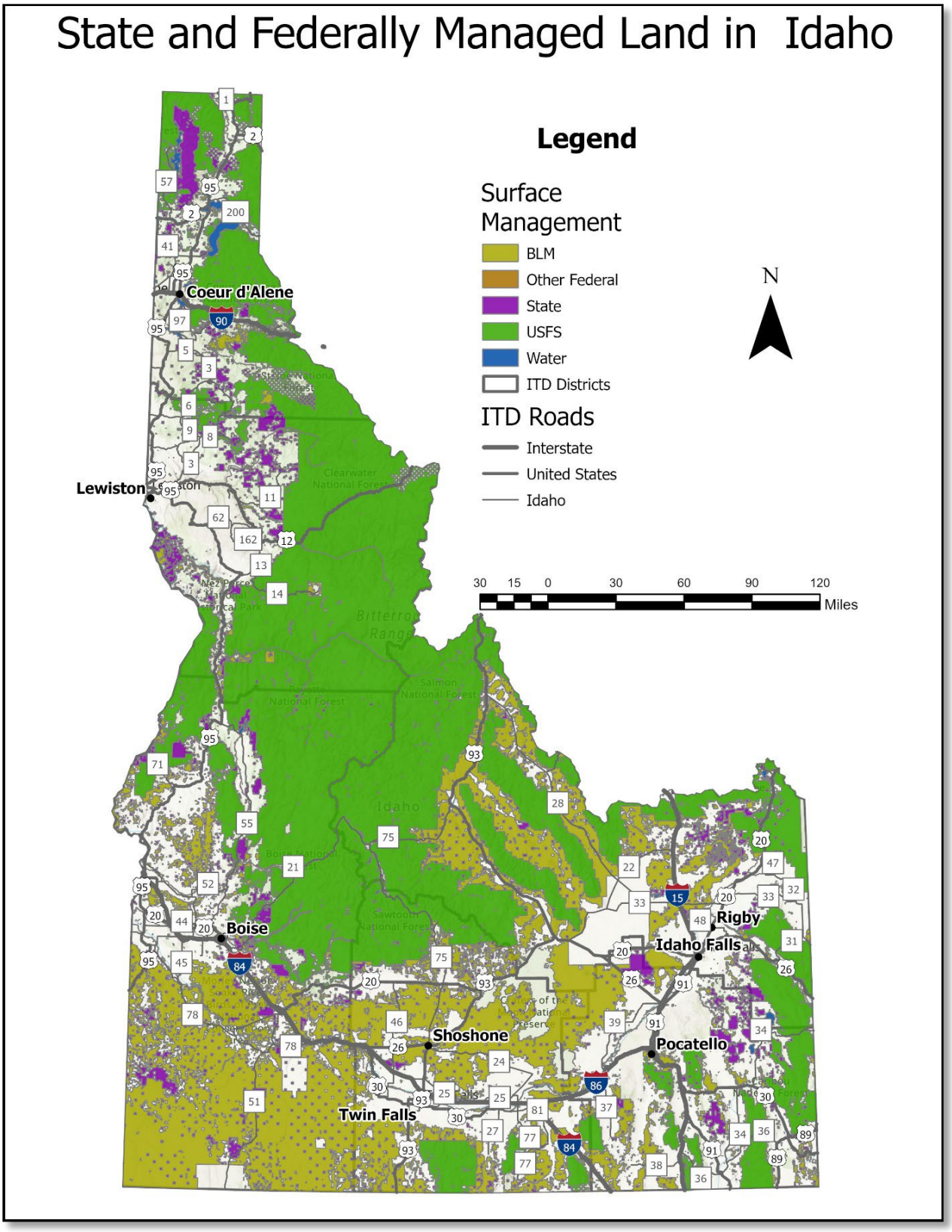

Figure 4-15. State and federally owned and/or managed lands in Idaho.

Idaho Transportation Investment Program (ITIP) Projects

The Idaho Transportation Investment Program (ITIP) is a state document that guides ITD investments through various funding programs (including state and federal funds). It consists of seven-years of individually identified statewide projects and has been approved by the Idaho Transportation Board. Planned and approved ITD transportation projects may have opportunities to accommodate wildlife. If an ITIP project overlapped with a Wildlife-Vehicle Conflict Area, there may be opportunities to include wildlife mitigations in the existing project. This includes increasing the size of a culvert to accommodate mule deer and elk, placing fences to existing bridges or future bridges, incorporating a wildlife passage bench, and other actions.

Points

10 Points

How it Was Evaluated

ITD's ITIP projects were evaluated by the Wildlife Biologist and Project Manager of the study, Julie Hausknecht of ITD if projects included a corridor or similar study or if they involved physical changes to the road, such as adding a lane, replacing a bridge, widening the road, etc. It was determined if wildlife could be accommodated based on descriptions containing key words such as wildlife, fish/aquatic organism, widening, bridge, culvert, new or re-alignment, adding new lanes, install or replace fencing, planning or corridor study, etc. Projects were eliminated if their description contained either "minor" in nature or could never involve wildlife mitigation projects based on project actions including pavement preservation/restoration, shoulder widening, bridge deck rehabilitation, traffic study, intersection improvement, turn bays, signal, sign or guardrail installation/replacement, or maintenance. Planned and approved ITD transportation projects identified in the ITIP were eliminated from consideration if they were on local roads (non-ITD SHS), if they were in a heavily urbanized area, or were already cleared environmentally, or were a segmented/phased project already under construction. Figure 4-16 displays the resulting ITIP projects with the potential to include wildlife mitigation.

The Wildlife-Vehicle Conflict Areas received the full 10 points if it contained one of these above projects. Otherwise, it received no points.

It's important to note that just because these projects are categorized where potential wildlife mitigation may be constructed as part of the project does not mean it is actually possible. The 10 feasibility points awarded to projects under this category only triggers the consideration for wildlife mitigation to be incorporated into the project but may not actually be feasible based on a number of factors including but not limited to funding, project timeline, location, etc.

What it Represents

This layer represented planned and approved ITD transportation projects where there is a potential to incorporate potential wildlife mitigation whether that is larger more complex crossings or retrofitting existing transportation infrastructure.

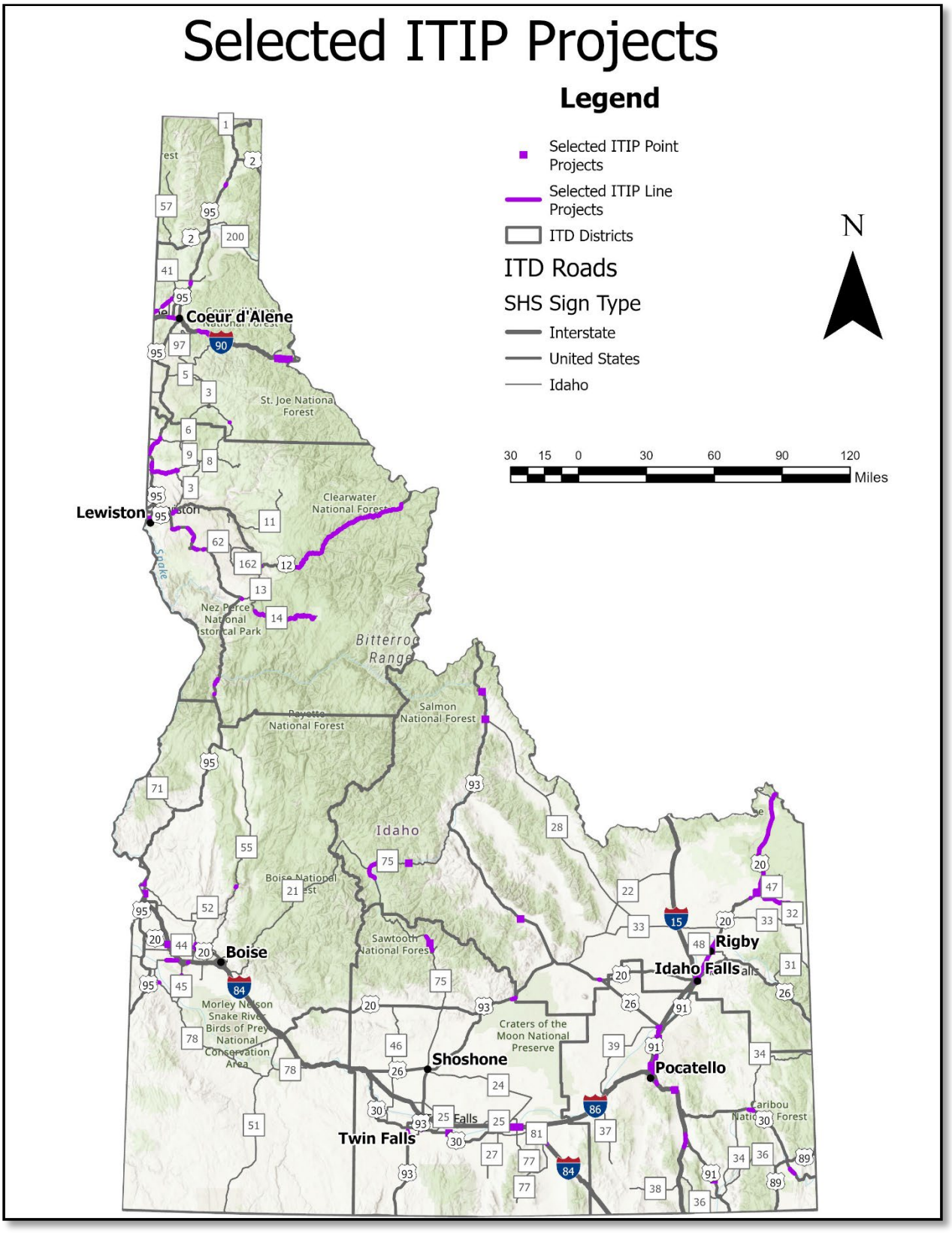

Figure 4-16. The ITIP projects included as potentially able to include wildlife mitigation.

Identifying Wildlife-Vehicle Conflict Areas and Wildlife-Vehicle Conflict Mitigation Opportunity Locations in Idaho

The final OHSA analyses was conducted on the total transportation plus ecological scores for each half mile road segment. The resulting 108 hot spots for the statewide OHSA were named Wildlife-Vehicle Conflict Areas (Areas). Separate OHSA's were also conducted individually for each District's scored half mile road segments, and these final hot spots at the District level were also named Wildlife-Vehicle Conflict Areas but identified by District. All statewide and District Areas were then scored with feasibility factors to rank them for potential opportunities to create wildlife mitigation and specifically wildlife crossing structures. Once the Areas were ranked, they became the final Idaho's Wildlife-Vehicle Conflict Mitigation Opportunity Locations (Figure 4-17). As with the OHSA in Phase One, the OHSA in Phase Two dictated how many hot spots across the state or within a District were generated at the 95% to 99% Confidence Interval. Thus, there were not the same number of hot spots across Districts.

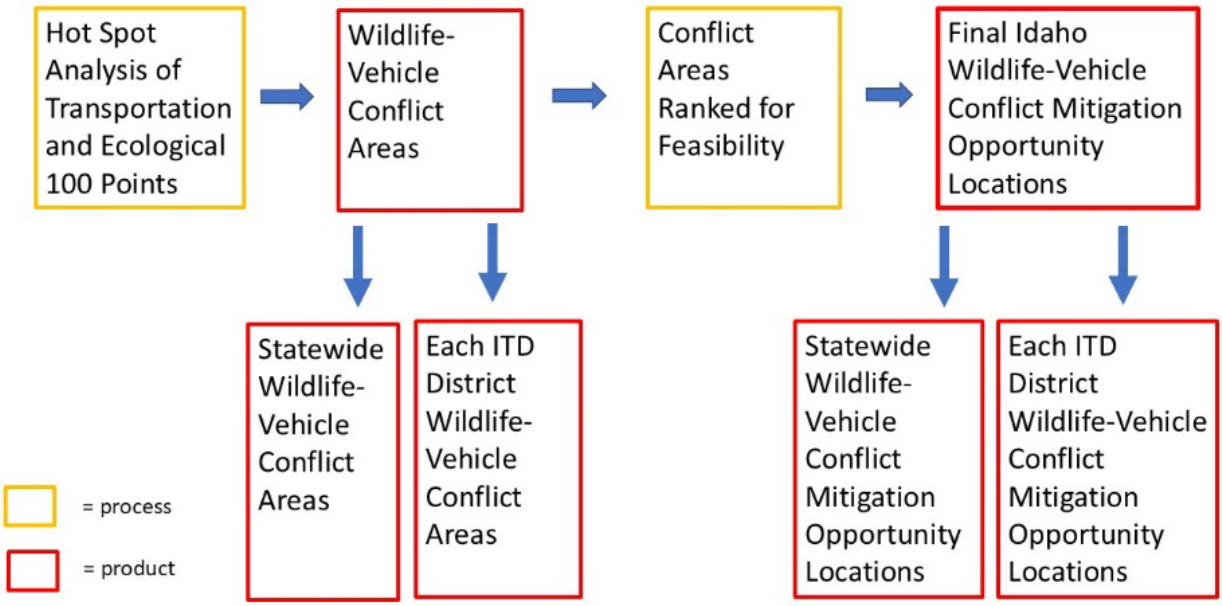

Figure 4-17. Flow diagram of the final analyses and products from Phase Two. Wildlife-Vehicle Conflict Areas are based on transportation and ecological factors whereas Wildlife-Vehicle Conflict Mitigation Opportunity Locations add in ranked feasibility factors to the Wildlife-Vehicle Conflict Areas.

Phase Two Results of Analyses of Transportation, Ecological, and Feasibility Data

The results of Phase Two are presented in two sections. The first section, for the Wildlife-Vehicle Conflict **Areas,** presents the results of OHSA of the 100 points of transportation data and ecological data. In the second section, the Areas were then ranked based on feasibility factor scoring, to produce the final Wildlife-Vehicle Conflict Mitigation Opportunity **Locations**.

Identification of Wildlife-Vehicle Conflict Areas Based on the OHSA of Transportation and Ecological Factors

The OHSA of the transportation and ecological factor points for each half mile road segment produced a total of 108 hot spots statewide at the 95% and 99% Confidence Intervals (Figure 4-18). These became the Wildlife-Vehicle Conflict Areas based on the 100-point maximum score. This analysis was also conducted for each half mile road segment of each District for individual District hot spot modeling.

The nomenclature for naming these areas followed the hierarchy of first describing if the area was within federally recognized Tribal land and if so, the name of the reservation. Secondly, the name included the nearest town or city. If a town or city was not within two miles, a natural feature of a stream or river or water body or a valley or a mountain range, followed by another town or city if the hot spot ends near another such place. All names end with the road name and MPs for the approximate beginning and end of the hot spot. If the area encompassed more than one road, the hierarchy was to name federal highways before state highways.

The tables containing the statewide and District Wildlife-Vehicle Conflict Areas are presented in the Supplemental Information Source Document.

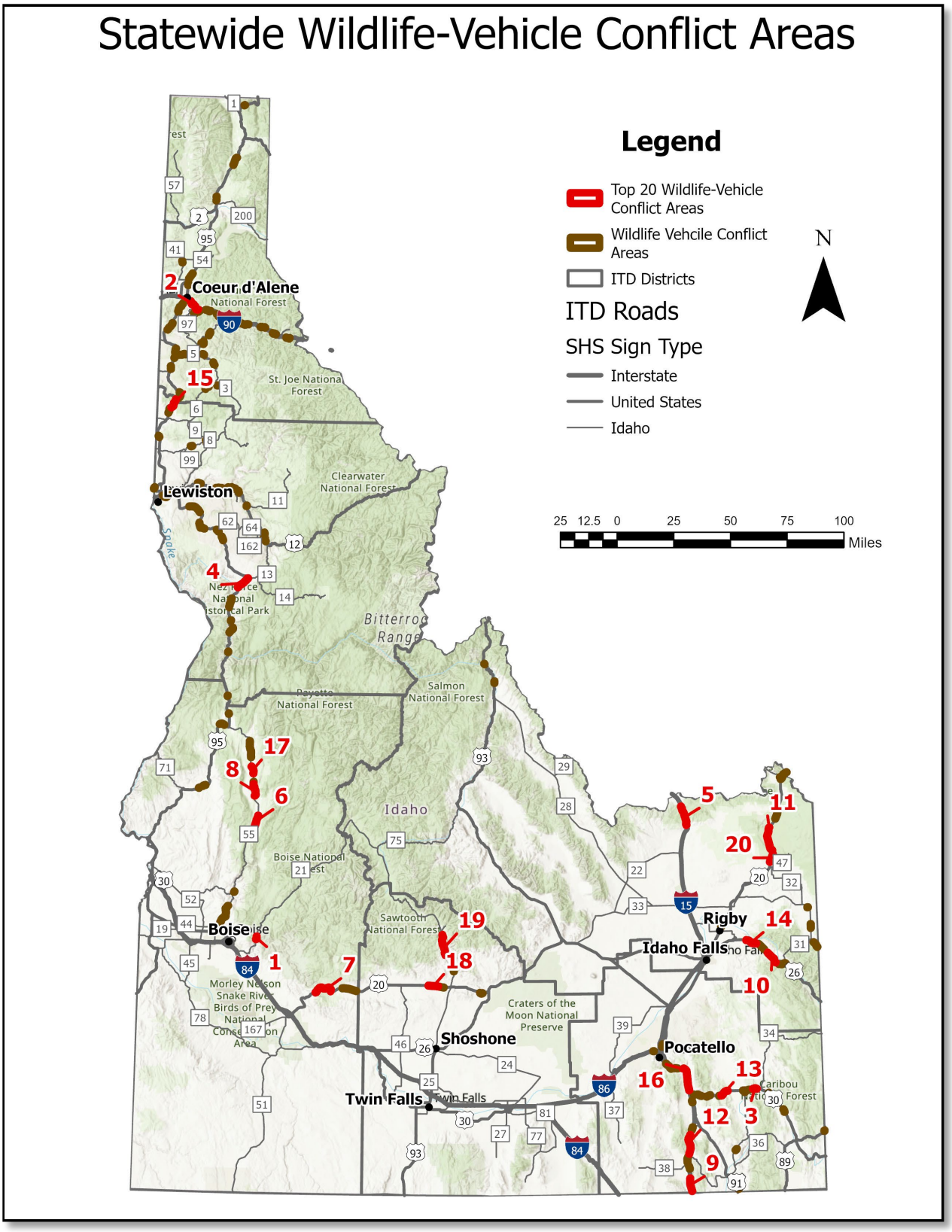

Figure 4-18. All 108 statewide Wildlife-Vehicle Conflict Areas with the top 20 statewide Areas based on the Transportation and Ecological Scores identified in red.

Identification of Wildlife-Vehicle Conflict Mitigation Opportunity Locations Based on the Feasibility Factors

In the final step of analyses, the Wildlife-Vehicle Conflict Areas were evaluated with respect to the "ease" with which ITD and partnering agencies could incorporate wildlife mitigation in that area. This resulted in the final, ITD's ArcGIS IPLAN web-based portal map of Idaho's Locations ranked as to the "opportunity" that may exist to mitigate these locations with wildlife crossing structures and other wildlife mitigation. This ranking was conducted for the state locations and each District location.

The statewide ITD's ArcGIS IPLAN web-based portal map of Wildlife-Vehicle Conflict Mitigation Opportunity Locations is presented in Figure 4-19. Table 4-4 presents all 108 statewide Locations, the Districts they are located in and several other important factors. The results of the OHSA of each District's Wildlife-Vehicle Conflict Areas that resulted in the District Wildlife-Vehicle Conflict Mitigation Opportunity Locations are presented below this figure and table.

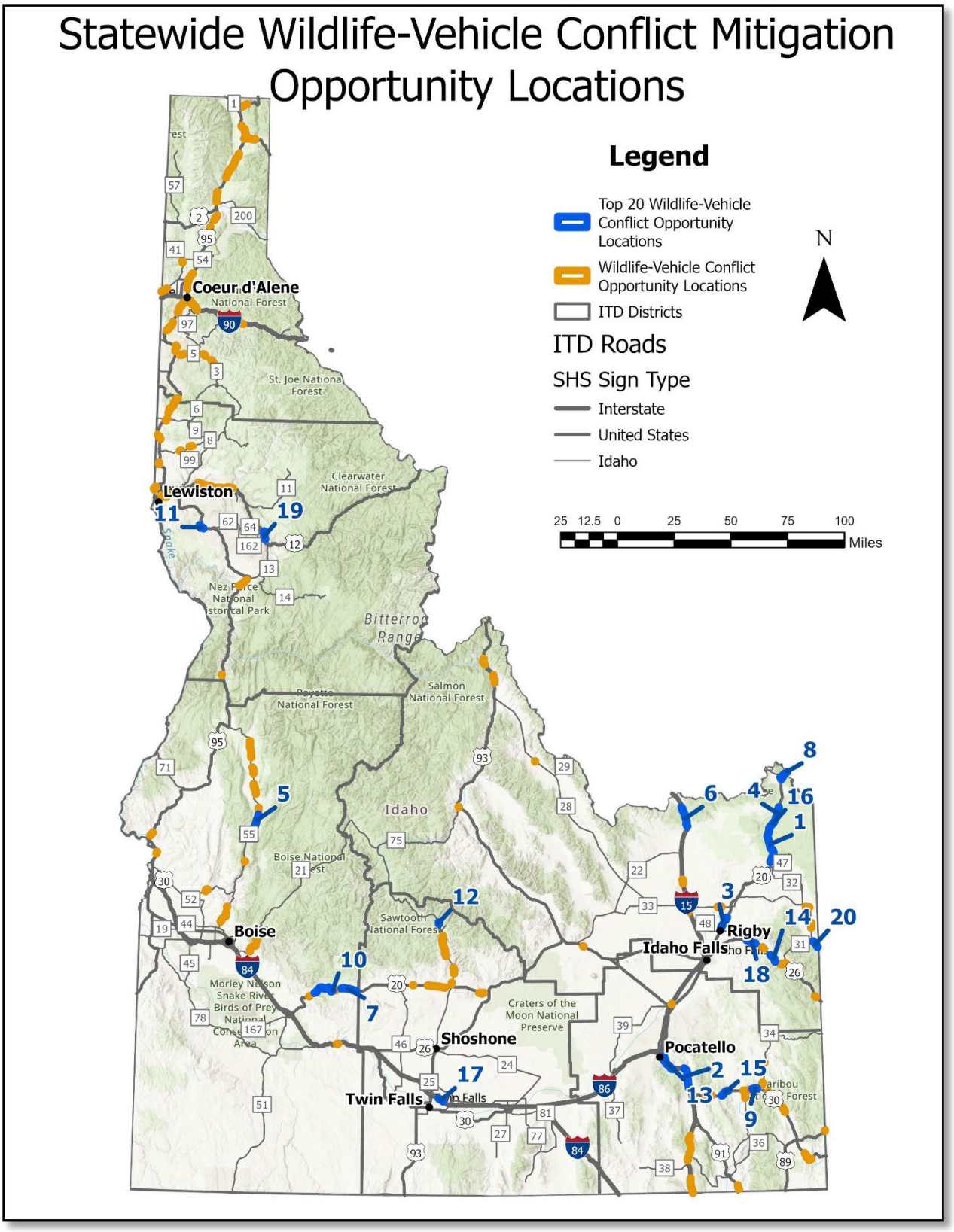

Figure 4-19. All 108 statewide Wildlife-Vehicle Conflict Mitigation Opportunity Locations with the top 20 statewide Locations after factoring in feasibility scores identified in blue.

Table 4-4. Idaho's Statewide Top 108 Wildlife-Vehicle Conflict Mitigation Opportunity Locations ranked from a score of 130 points. No distinction was given to Locations with the same total scores.

Rank*	Wildlife-Vehicle Conflict Mitigation Opportunity Location	District	Length (miles)	Transportation Score (max = 50)	Ecological Score (max = 50)	Transportation and Ecological Score (max = 100)	Rank (Transportation and Ecological)	Feasibility Score (max = 30)	Total Score (max = 130)
1	Ashton – Harriman State Park US-20 MP 363 – 380	6	17.01	40.15	32.06	72.21	1	30	102.21
2	McCammon – Inkom I-15 MP 48 – 57	5	9.53	39.84	22.68	62.53	15	30	92.53
3	Rigby – Thorton US-20 MP 323 – 328	6	5.51	38.64	21.64	60.27	19	30	90.27
4	Island Park-Buffalo River US-20 MP 384 – 389	6	5.51	34.36	25.00	59.36	22	30	89.36
5	Alpha SH-55 MP 102 – 108	3	5.51	38.27	30.46	68.73	3	20	88.73
6	Spencer – Humphrey I-15 MP 179 – 188	6	9.01	38.50	29.67	68.17	4	20	88.17
7	Wild Horse Creek US-20 MP 128 – 135	3	7.01	37.21	30.71	67.93	5	20	87.93
8	Henrys Lake to Montana State Boundary US-20 MP 402 – 406; SH-87 MP 0 – 1	6	5.51	39.91	17.73	57.64	31	30	87.64
9	Soda Springs – Alexander Reservoir US-30 MP 401 – 404	5	2.51	40.60	25.00	65.60	7	20	85.6
10	Bennett Creek – Dixie – Centennial Trail – Cat Creek US-20 MP 113 – 124	3	11.01	35.82	26.91	62.73	13	20	82.73
11	Nez Perce – Winchester US-95 MP 277 – 280	2	3.84	28.67	21.33	50.00	80	30	80
12	North of Ketchum – Dip Creek SH-75 MP 132 – 133	4	1.01	14.67	35.00	49.67	82	30	79.67
13	Portneuf-Pocatello I-15 MP 62 – 70	5	8.96	38.35	21.12	59.47	21	20	79.47
14	Conant Valley – Snake River US-26 MP 667 – 371	6	4.01	35.25	23.75	59.00	24	20	79
15	Fish Creek – Lund US-30 MP 375 – 379	5	4.01	37.75	21.25	59.00	23	20	79
16	Harriman State Park US-20 MP 380 – 382	6	2.01	21.00	27.50	48.50	84	30	78.5
17	Northeast Twin Falls I-84 MP 177 – 179	4	2.50	38.20	20.00	58.20	25	20	78.2

Rank*	Wildlife-Vehicle Conflict Mitigation Opportunity Location	District	Length (miles)	Transportation Score (max = 50)	Ecological Score (max = 50)	Transportation and Ecological Score (max = 100)	Rank (Transportation and Ecological)	Feasibility Score (max = 30)	Total Score (max = 130)
18	Poplar – Antelope Flat US-26 MP 354 – 358	6	4.51	33.00	25.00	58.00	27	20	78
19	Nez Perce East Kamiah US-12 MP 67 – 71	2	4.01	29.11	28.33	57.44	32	20	77.44
20	Victor to Wyoming State Boundary SH-33 MP 151 -154	6	3.51	30.43	27.00	57.43	33	20	77.43
21	Dry Creek Vally to McLeod Way SH-55 MP 48 – 53	3	5.51	29.09	28.18	57.27	35	20	77.27
22	Snake River – Swan Valley US-26 MP 374 – 377	6	3.16	35.00	22.14	57.14	38	20	77.14
23	Market Lake Wildlife Management Area – Sage Junction I-15 MP 141 – 142	6	1.51	48.67	8.33	57.00	39	20	77
24	Hauser SH-53 MP 1 – 3	1	3.00	29.33	26.67	56.00	44	20	76
25	South Potlatch Junction US-95 MP 361	2	0.51	31.00	25.00	56.00	45	20	76
26	North of Magic Reservoir US-20 MP 168 – 176	4	8.01	24.56	31.25	55.81	47	20	75.81
27	Alexander Junction of US-30 MP 386 – 387; MP 399 -401; & SH-34 MP 47 – 50	5	6.89	35.39	30.39	65.77	6	10	75.77
28	Orofino North Fork Clearwater River US-12 MP 38 – 40	2	2.01	30.75	25.00	55.75	48	20	75.75
29	South Donnelly SH-55 MP 127 – 130	3	3.01	47.17	18.33	65.50	8	10	75.5
30	Lucky Creek – Mores Creek SH-20 MP 19 – 22	3	3.51	16.89	38.33	55.22	49	20	75.22
31	Harpers Bend – Big Canyon Creek US-12 MP 32 – 36	2	3.51	25.86	29.29	55.14	50	20	75.14
32	Beaver Dick Park – Henrys Fork SH-33 MP 72 – 74	6	2.01	42.00	13.00	55.00	51	20	75
33	McArthur – Naples US-95 MP 492 – 502	1	10.51	22.62	27.38	50.00	81	25	75

Rank*	Wildlife-Vehicle Conflict Mitigation Opportunity Location	District	Length (miles)	Transportation Score (max = 50)	Ecological Score (max = 50)	Transportation and Ecological Score (max = 100)	Rank (Transportation and Ecological)	Feasibility Score (max = 30)	Total Score (max = 130)
34	Salmon River – Tower Creek US-93 MP 312 – 316	6	4.01	18.88	35.75	54.63	55	20	74.63
35	Cascade Reservoir – Grandmas Creek SH-55 MP 118 – 123	3	5.01	39.60	20.00	59.60	20	15	74.6
36	Southeast Coeur d'Alene I-90 MP 14 – 19	1	6.01	39.25	25.33	64.58	9	10	74.58
37	Middle Sulphur Canyon – Diamond Gulch US-30 MP 409 – 413	5	4.01	42.75	21.25	64.00	11	10	74
38	North of Timmerman Junction SH-75 MP 103 – 104	4	1.01	39.00	25.00	64.00	10	10	74
39	Malad Summit I-15 MP 22 – 26	5	4.50	37.00	26.78	63.78	12	10	73.78
40	Weiser US-95 MP 84 – 86	3	2.01	45.25	12.50	57.75	30	15	72.75
41	Crimson Ridge – South Grangeville US-95 MP 234 – 238	2	4.51	37.67	25.00	62.67	14	10	72.67
42	Camas National Wildlife Refuge – Camas I-15 MP 153 – 155	6	2.01	42.50	20.00	62.50	16	10	72.5
43	Southwest Coeur d'Alene US-95 MP 422 – 429	1	7.01	41.93	15.29	57.21	37	15	72.21
44	Deadman Flat US-20 MP 258 – 259	6	0.51	27.00	25.00	52.00	69	20	72
45	Hailey to Ketchum SH-75 MP 117 – 127	4	9.51	36.42	35.26	71.68	2	0	71.68
46	Coeur d'Alene Reservation – Deep Creek US-95 MP 364 – 373	2	8.51	40.29	20.88	61.18	17	10	71.18
47	Picabo to Carey US-20 MP 191 – 194	4	2.51	26.83	24.33	51.17	73	20	71.17
48	Wood River Valley – Bellevue SH-75 MP 108 – 111	4	3.01	38.33	22.50	60.83	18	10	70.83
49	Salmon River – North Fork Salmon River US-93 MP 325 – 328	6	3.01	14.67	36.00	50.67	74	20	70.67
50	Rocky Point US-30 MP 442 – 447	5	5.01	22.70	32.00	54.70	54	15	69.7
51	Coeur d'Alene Reservation Belgrove US-95 MP 412 – 417	1	5.01	40.50	13.40	53.90	60	15	68.9

Rank*	Wildlife-Vehicle Conflict Mitigation Opportunity Location	District	Length (miles)	Transportation Score (max = 50)	Ecological Score (max = 50)	Transportation and Ecological Score (max = 100)	Rank (Transportation and Ecological)	Feasibility Score (max = 30)	Total Score (max = 130)
52	Georgetown Summit US-30 MP 419 – 421	5	2.51	24.83	28.33	53.17	63	15	68.17
53	Lucky Peak SH-21 MP 13 – 17	3	4.51	6.44	41.67	48.11	87	20	68.11
54	Blackfoot I-15 MP 93 – 94	5	0.51	48.00	10.00	58.00	29	10	68
55	Driggs to Chapin SH-33 MP 142 – 145	6	2.51	30.00	28.00	58.00	28	10	68
56	Coeur d'Alene Reservation – St. Joe River SH-3 MP 88 – 89	1	1.51	27.00	31.00	58.00	26	10	68
57	Black Canyon SH-52 MP 37 – 39	3	2.01	15.50	32.50	48.00	89	20	68
58	Nez Perce – Agatha Clearwater River US-12 MP 24 – 28	2	4.51	16.33	31.67	48.00	90	20	68
59	Lake Fork SH-55 MP 135 – 136	3	1.51	35.67	21.67	57.33	34	10	67.33
60	Utah State Line I-15 MP 0 – 7	5	6.80	37.00	20.23	57.23	36	10	67.23
61	St. Maries SH-3 MP 82 – 84	1	2.51	19.80	35.00	54.80	53	12	66.8
62	Canyon to Kingston I-90 MP 35 – 43	1	9.01	36.89	19.78	56.67	41	10	66.67
63	Nez Perce – Big George Clearwater River US-12 MP 29 – 31	2	1.51	23.33	28.33	51.67	70	15	66.67
64	Kennedy Ford US-95 MP 360	2	0.67	33.00	13.67	46.67	94	20	66.67
65	Tetonia – Clawson SH-33 MP 133 – 135	6	2.01	21.50	35.00	56.50	42	10	66.5
66	North Franklin – Cub River US-91 MP 1 – 3	5	2.01	37.00	19.50	56.50	43	10	66.5
67	Portneuf Marsh – Lava Hot Springs US-30 MP 367 – 370	5	3.01	30.83	25.00	55.83	46	10	65.83
68	Banks – North Fork Payette River SH-55 MP 82	3	0.51	10.00	35.00	45.00	97	20	65
69	Palisades Reservoir US-26 MP 398 – 399	6	1.01	10.00	35.00	45.00	99	20	65
70	Nez Perce – Valley View Heights-Clearwater River US-95 MP 306 – 311	2	5.51	43.00	11.82	54.82	52	10	64.82
71	North of Malad City I-15 MP 15 – 16	5	1.50	27.67	26.67	54.33	56	10	64.33

Rank*	Wildlife-Vehicle Conflict Mitigation Opportunity Location	District	Length (miles)	Transportation Score (max = 50)	Ecological Score (max = 50)	Transportation and Ecological Score (max = 100)	Rank (Transportation and Ecological)	Feasibility Score (max = 30)	Total Score (max = 130)
72	Smiths Ferry SH-55 MP 95 – 98	3	3.01	32.67	21.67	54.33	57	10	64.33
73	Westmond US-95 MP 464	1	0.51	14.00	40.00	54.00	58	10	64
74	Palouse Range US-95 MP 349 – 352	2	2.51	42.33	11.67	54.00	59	10	64
75	North Sandpoint US-95 MP 478 – 482	1	4.51	21.67	31.89	53.56	61	10	63.56
76	Thorn Creek US-95 MP 334 – 338	2	1.00	43.50	10.00	53.50	62	10	63.5
77	Crystal US-95 MP 74 – 75	3	1.01	38.00	15.00	53.00	64	10	63
78	South Belvidere – Big Creek SH-55 MP 110	3	1.01	17.50	35.00	52.50	65	10	62.5
79	Cornwall to Troy SH-8 MP 12 – 13	2	1.01	32.50	10.00	42.50	102	20	62.5
80	Three-Mile Corner to Moyie Springs US-2 MP 65 – 69	1	3.51	25.86	26.43	52.29	66	10	62.29
81	Round Prairie Creek US-95 MP 526 – 529	1	2.51	25.00	27.00	52.00	67	10	62
82	Lewiston Hill – Hatwai Creek US-95 MP 318 – 324	2	2.14	40.50	11.50	52.00	68	10	62
83	South Devil Creek Reservoir I-15 MP 18 – 20	5	2.51	25.20	26.00	51.20	72	10	61.2
84	Cow Creek Road – Bennett Creek US-20 MP 110	3	0.51	10.00	31.00	41.00	103	20	61
85	East of Glenns Ferry & Snake River I-84 MP 122 – 123	3	1.01	40.50	10.00	50.50	75	10	60.5
86	Spirit Lake SH-41 MP 16 – 17	1	1.01	33.50	17.00	50.50	76	10	60.5
87	McCall – Lake Fork SH-55 MP 138 – 142	3	4.51	31.89	18.56	50.44	77	10	60.44
88	Algoma – South Sandpoint Lake Pend Oreille US-95 MP 469 – 471	1	2.51	20.40	30.00	50.40	78	10	60.4
89	Blaine US-20 MP 161	4	0.51	15.00	35.00	50.00	79	10	60
90	Nora SH-8 MP 17 – 19	2	1.51	34.33	15.00	49.33	83	10	59.33

Rank*	Wildlife-Vehicle Conflict Mitigation Opportunity Location	District	Length (miles)	Transportation Score (max = 50)	Ecological Score (max = 50)	Transportation and Ecological Score (max = 100)	Rank (Transportation and Ecological)	Feasibility Score (max = 30)	Total Score (max = 130)
91	Coeur d'Alene Reservation – East of Plummer – Little Plummer Creek SH-5 MP 2 – 5	1	2.51	25.40	23.00	48.40	85	10	58.4
92	Three-Mile Corner to North Bench US-95 MP 510 – 515	1	8.01	22.00	26.25	48.25	86	10	58.25
93	Dufort US-95 MP 465	1	0.51	18.00	30.00	48.00	91	10	58
94	Geneva – Wyoming State Boundary US-89 MP 42 – 43	5	0.51	27.00	21.00	48.00	88	10	58
95	Coeur d'Alene Reservation – North of Plummer – North Fork Rock Creek US-95 MP 398 – 400	1	3.01	23.33	24.00	47.33	92	10	57.33
96	Nez Perce – Joseph – Clearwater River US-12 MP 11-13 & US-95 MP 303	2	2.01	26.40	20.60	47.00	93	10	57
97	North of Hayden US-95 MP 435 – 442	1	8.06	34.20	22.53	56.73	40	0	56.73
98	Horse Shoe Bend Road SH-55 MP 55 – 56	3	0.51	16.50	30.00	46.50	95	10	56.5
99	Elmira US-95 MP 99	1	1.01	19.50	26.00	45.50	96	10	55.5
100	Pollock US-95 MP 185 – 186	2	0.51	10.00	35.00	45.00	98	10	55
101	Blackfoot River SH-34 MP 67 – 70	5	1.01	18.50	26.00	44.50	100	10	54.5
102	Antelope Flat US-26 MP 362 – 363	6	1.01	24.00	20.00	44.00	101	10	54
103	Soda Springs – Conda SH-34 MP 59 – 61	5	1.51	17.67	33.67	51.33	71	0	51.33
104	Centennial Trail – Old Highway 68 US-20 MP 126	3	0.51	10.00	31.00	41.00	104	10	51
105	East Lenore – Clearwater River US-12 MP 28 – 29	2	0.51	10.00	25.00	35.00	105	10	45
106	Land of the Yankee Fork State Park US-93 MP 244 – 245	6	0.51	10.00	25.00	35.00	106	10	45
107	Lemhi Valley SH-28 MP 101	6	0.51	10.00	21.00	31.00	107	10	41
108	Orofino US-12 MP 40 – 41	2	0.51	11.00	15.00	26.00	108	0	26

* Rank based on final score out of 130 points

Transportation and Ecological Factors Scores Ratio

The interactive maps available on ITD's IPLAN web-based portal allow users to click on a specific Wildlife-Vehicle Conflict Opportunity Locations from the above map (Figure 4-19) and a pop-up menu delivers much of the data presented in Table 4-4 above as well as many other factors. If users of the data wanted to better understand if it was the transportation score or the ecological score of the area that led it to be elevated to a top Location, the research team's GIS Analyst presented a different kind of map below, Figure 4-20. This map is the result of taking the ecological score and dividing it by the transportation score. If the ratio resulted in a value from 0 to 0.9, the score was more heavily weighted toward transportation, and the Location was represented in red. If the ratio value was 0.91 to 1.1, the weighting of the scores was relatively equal and the Location was represented in black. If the ratio resulted in value of 1.11 or greater, the ratio was more heavily weighted toward the ecological score, and the Location was represented in green. This map helps readers of this report understand the relative importance of the transportation and ecological data for each Wildlife-Vehicle Conflict Mitigation Opportunity Location.

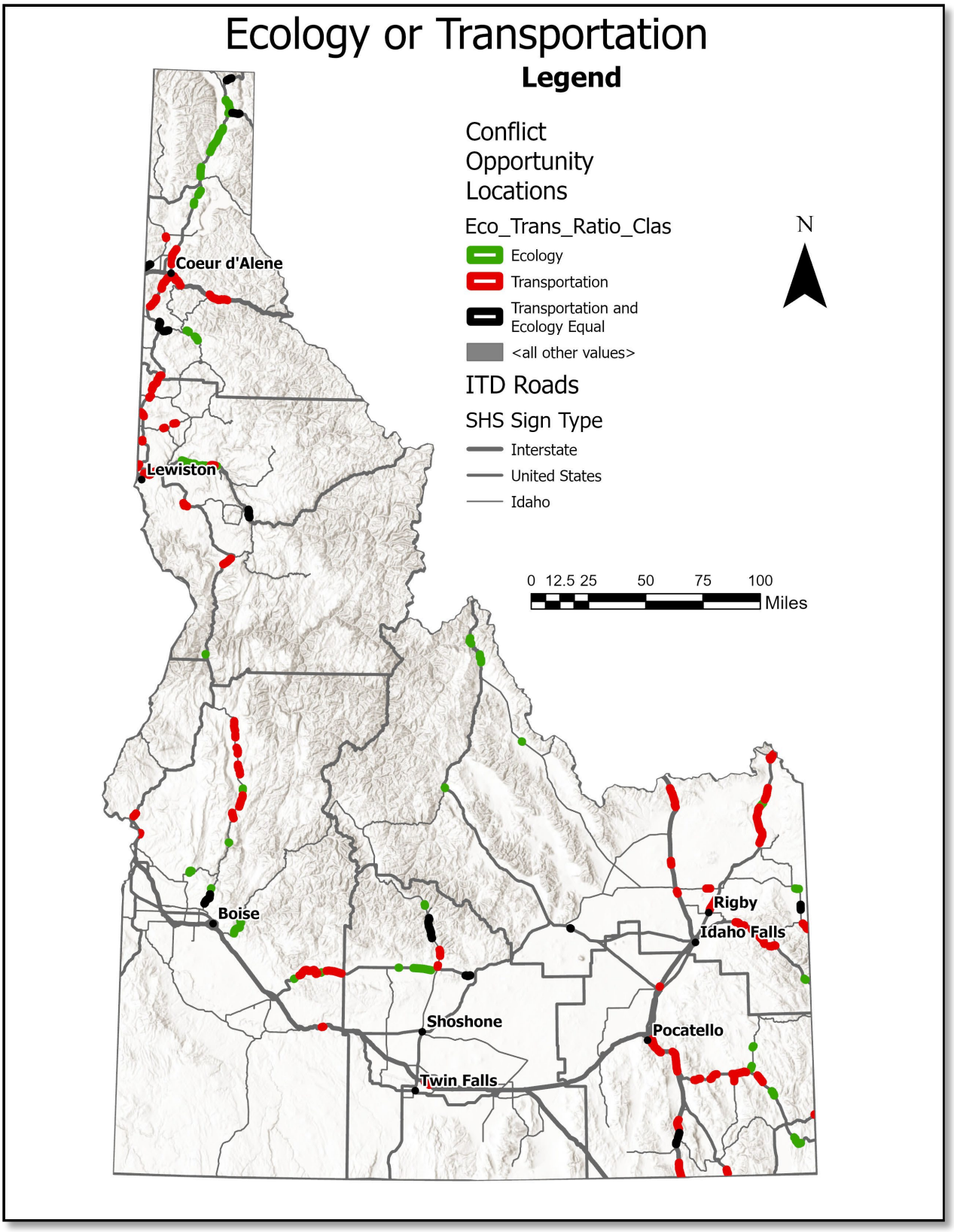

Figure 4-20. The transportation and ecological factors ratio values of the statewide Wildlife-Vehicle Conflict Mitigation Opportunity Locations.

District Level Wildlife-Vehicle Conflict Mitigation Opportunity Locations in Idaho

Within each District, Wildlife-Vehicle Conflict Areas were ranked according to their scores when feasibility factor points were assigned. The areas for each District were determined in the OHSA of the transportation factor and ecological factor points. The top 95% to 99% Confidence Interval hot spots of that OHSA became each District's Areas; the model determined how many hot spots rose to this level, rather than a pre-assigned number per District. Thus, some Districts have more hot spots than others. See Table 4-5 through Table 4-10 and Figure 4-21 through Figure 4-26.

Table 4-5. District 1 Coeur d'Alene Top Wildlife-Vehicle Conflict Mitigation Opportunity Locations based on Maximum Score out of 130 points.

Rank	District 1 Wildlife-Vehicle Conflict Mitigation Opportunity Locations	Total Score out of 130 points
1	McArthur Lake – Paradise Valley US-95 MP 494.6 – 501.5	71.79
2	Southwest Coeur d'Alene US-95 MP 422– 428.3	69.85
3	Southeast Coeur d'Alene I-90 MP 13.5 – 16.5	69.58
4	Coeur d'Alene Reservation – Belgrove US-95 MP 413 – 417.4	68.00
5	Canyon to Kingston I-90 MP 35.3 – 444	66.67
6	South Sandpoint US-95 MP 469.5 – 471	66.00
7	North of Hayden US-95 MP 440 – 442.5	64.17
8	Moyie Springs – Fly Creek US-2 MP 65.9 – 68.8	62.67
9	St. Maries SH-3 MP 82 – 83.6	59.67
10	Coeur d'Alene Reservation East of Plummer SH-5 MP 2 – 3.5	59.00
11	Three-Mile Corner – Fleming Creek US-95 MP 510 – 515.5: US-2 MP 64 – 65	58.77
12	Hauser SH-53 MP 1 – 3	56.00
13	North of Hayden US-95 MP 436 – 437.9	52.50
14	Kootenai Indian Reservation US-95 MP 516 – 517	52.50

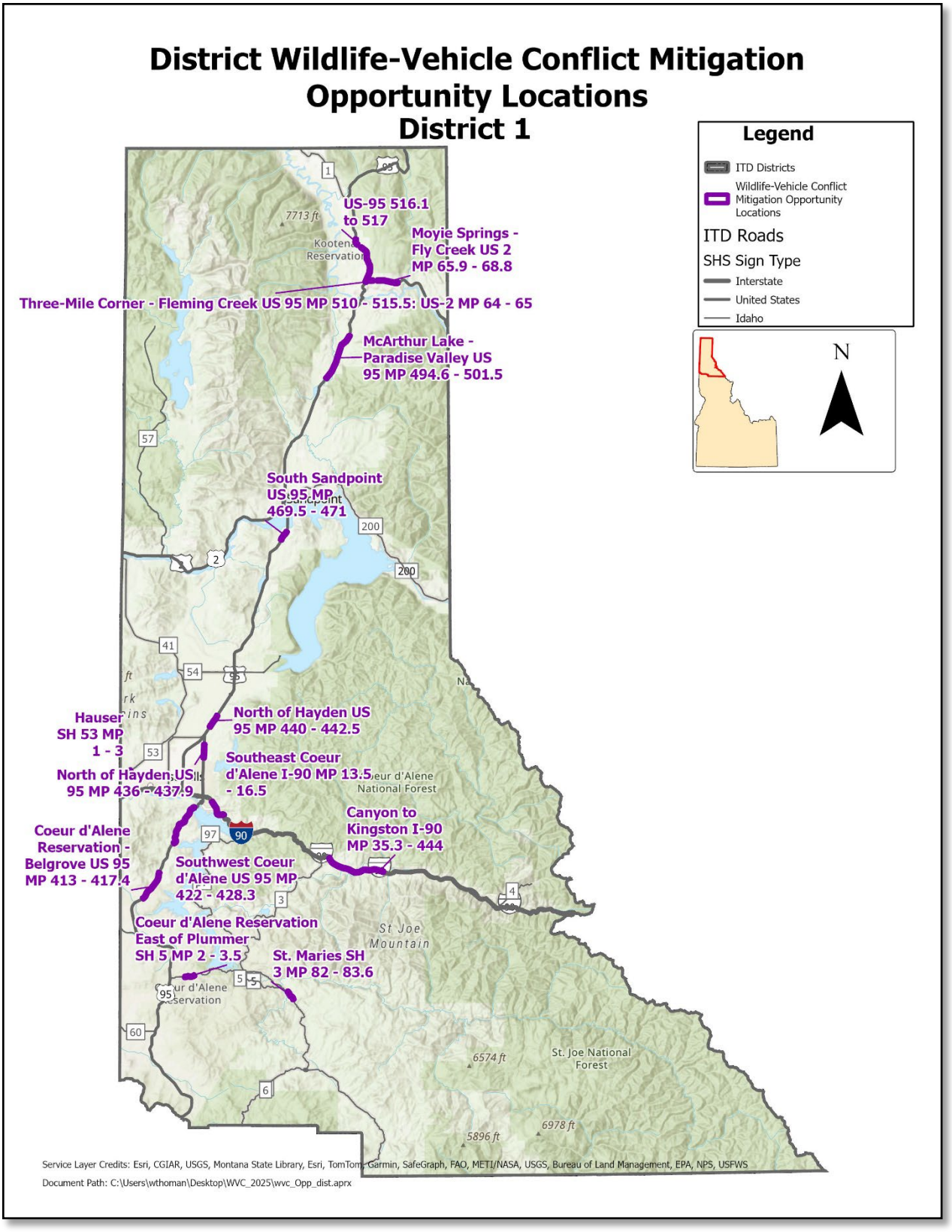

Figure 4-21. District 1 Coeur d'Alene top Wildlife-Vehicle Conflict Mitigation Opportunity Locations.

Table 4-6. District 2 Lewiston Top Wildlife-Vehicle Conflict Mitigation Opportunity Locations based on Maximum Score out of 130 points.

Rank	District 2 Wildlife-Vehicle Conflict Mitigation Opportunity Locations	Total Score out of 130 points
1	Nez Perce – Winchester US-95 MP 277 – 280	80.00
2	Nez Perce East Kamiah US-12 MP 67 – 71	77.44
3	South Potlatch Junction US-95 MP 361	76.00
4	Orofino North Fork Clearwater River US-12 MP 38 – 40	75.75
5	Harpers Bend-Big Canyon Creek US-12 MP 32 – 36	75.14
6	Coeur d'Alene Reservation – Deep Creek US-95 MP 364 – 372	73.53
7	North of Hayden US-95 MP 233.6 – 238	72.67
8	Nez Perce Lapwai Creek US-95 MP 288 – 289	70.00
9	Nez Perce – Agatha Clearwater River US-12 MP 24 -28	68.00
10	Kennedy Ford US-95 MP 360 & SH-6 MP 104	66.67
11	Nez Perce – Valley View Heights-Clearwater River US-95 MP 306 – 311	64.82
12	Hauser SH-53 MP 1 – 3 & US-95 349.1 – 352	64.00
13	Cornwall to Troy SH-8 MP 11 – 13	63.67
14	Thorn Creek US-95 MP 334 – 338.7	63.50
15	Lewiston Hill – Hatwai Creek US-95 MP 318 – 324	62.00
16	Nez Perce – Big George Clearwater River US-12 MP 28 – 31	60.00
17	Nora SH-8 MP 17 – 19	59.33
18	Nez Perce – Joseph – Clearwater River US-12 MP 11.7 – 13	56.75
19	Pollock US-95 MP 185 – 186	55.00
20	North of Pollock – Grouse Creek US-95 MP 187 – 188	50.00
21	Nez Perce Jaques – Culdesac US-95 MP 292	46.00

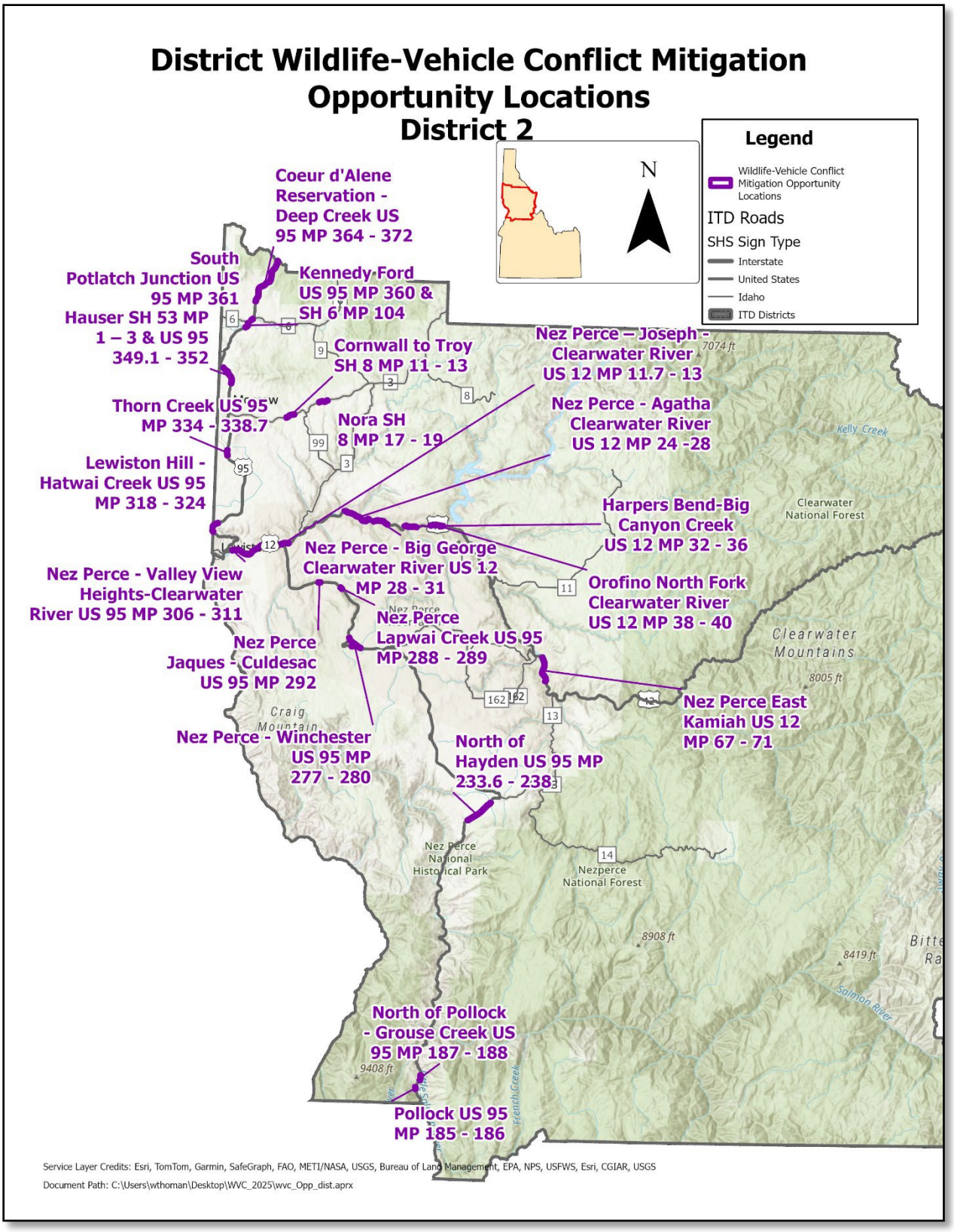

Figure 4-22. District 2 Lewiston top Wildlife-Vehicle Conflict Mitigation Opportunity Locations.

Table 4-7. District 3 Boise Top Wildlife-Vehicle Conflict Mitigation Opportunity Locations based on Maximum Score out of 130 points.

Rank	District 3 Wildlife-Vehicle Conflict Mitigation Opportunity Locations	Total Score out of 130 points
1	Wild Horse Creek US-20 MP 128.6 – 135.5	90.79
2	Alpha SH-55 MP 102 – 108	88.73
3	Bennett Creek – Dixie – Centennial Trail – Cat Creek US-20 MP 114 – 124.5	82.73
4	Dry Creek Valley SH-55 MP 47.6 – 50.6	79.09
5	Lucky Creek – Mores Creek SH-21 MP 18.7 – 22.1	76.33
6	Cascade Reservoir – Grandmas Creek SH-55 MP 117 – 122.3	73.18
7	Weiser US-95 MP 83 – 86	72.75
8	Black Canyon SH-52 MP 36.6 – 39	70.17
9	South Donnelly SH-55 MP 127 – 131	69.71
10	Mount Maria – Payette River SH-55 MP 68 – 68.6	66.00
11	Lucky Peak SH-21 MP 10.7 – 16.6	65.92
12	Banks-North Fork Payette River SH-55 MP 82	65.00
13	Crystal US-95 MP 74 – 75.4	65.00
14	Smiths Ferry SH-55 MP 94.8 – 98	64.33
15	North Horse Shoe Bend SH-55 MP 64.7 – 65.6	63.50
16	Notus US-20 MP 14	63.00
17	East of Glenns Ferry & Snake River I-84 MP 122 – 123	60.50
18	McCall – Lake Fork SH-55 MP 138-142	60.44
19	South Belvidere – Big Creek SH-55 MP 109 – 111	59.00
20	West of New Meadows US-95 MP 158	58.00
21	Eagle SH-44 MP 14.5 – 18 & MP 42	58.00
22	Lake Fork SH-55 MP 135 – 137	57.40
23	Cow Creek Road – Bennett Creek US-20 MP 110.5 – 111.4	56.00
24	Bennett Mountains US-20 MP 112.6 – 113	54.00
25	Horse Shoe Bend Road SH-55 MP 54 – 56	53.60
26	Malad River US-20 MP 126.1 – 126.5	51.00
27	Cascade Reservoir SH-55 MP 123	35.00

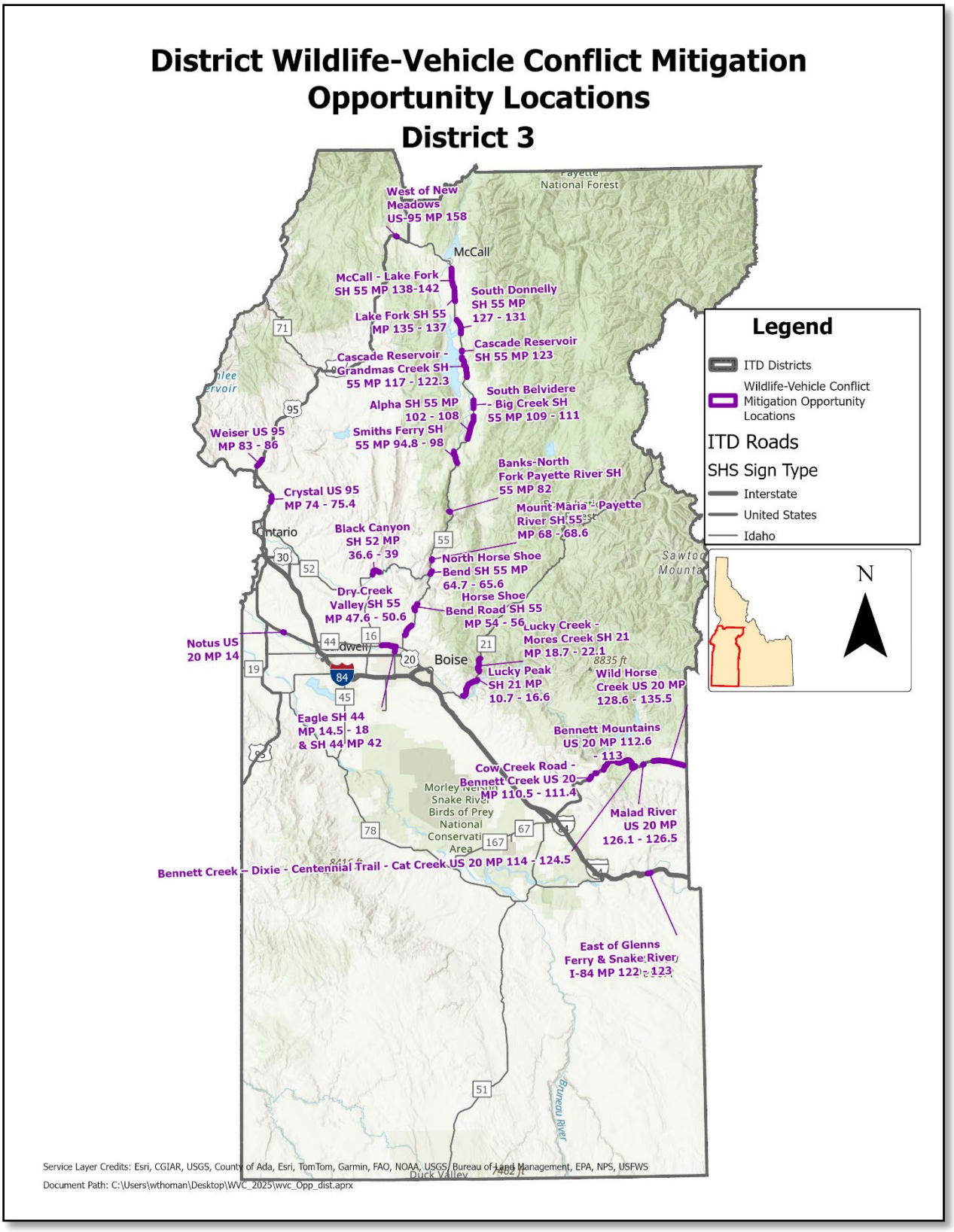

Figure 4-23. District 3 Boise top Wildlife-Vehicle Conflict Mitigation Opportunity Locations.

Table 4-8. District 4 Shoshone Top Wildlife-Vehicle Conflict Mitigation Opportunity Locations based on Maximum Score out of 130 points.

Rank	District 4 Wildlife-Vehicle Conflict Mitigation Opportunity Locations	Total Score out of 130 points
1	North of Ketchum – Eagle Creek SH-75 MP 129.8 – 135.7	79.00
2	Northeast Twin Falls I-84 MP 176.6 – 180	75.86
3	North of Magic Reservoir US-20 MP 167 – 176	73.89
4	Hailey to Ketchum SH-75 MP 116.8 – 127.2	70.33
5	South of Timmerman Junction SH-75 MP 99.3 – 100.7	70.33
6	Picabo to Carey US-20 MP 191 – 195	70.00
7	Wood River Valley – Bellevue SH-75 MP 108.3 – 111.2	69.86
8	North of Buhl Clear Lakes Road SH-46 MP 88.7 – 90.1	67.67
9	North of Timmerman Junction SH-75 MP 102.8 – 104.7	63.00
10	North of Shoshone – Milner Goodling Canal SH-75 MP 75.7 – 76.1	63.00
11	Meadow Creek I-84 MP 255.7 – 257	60.00
12	Blaine US-20 MP 159.6 – 162.5	53.83
13	Hill City West US-20 MP 136.6 – 138.5	53.25
14	Corral Creek US-20 MP 144 – 146.5	52.40
15	Hill City – Corral US-20 MP 140 – 143.5	49.57

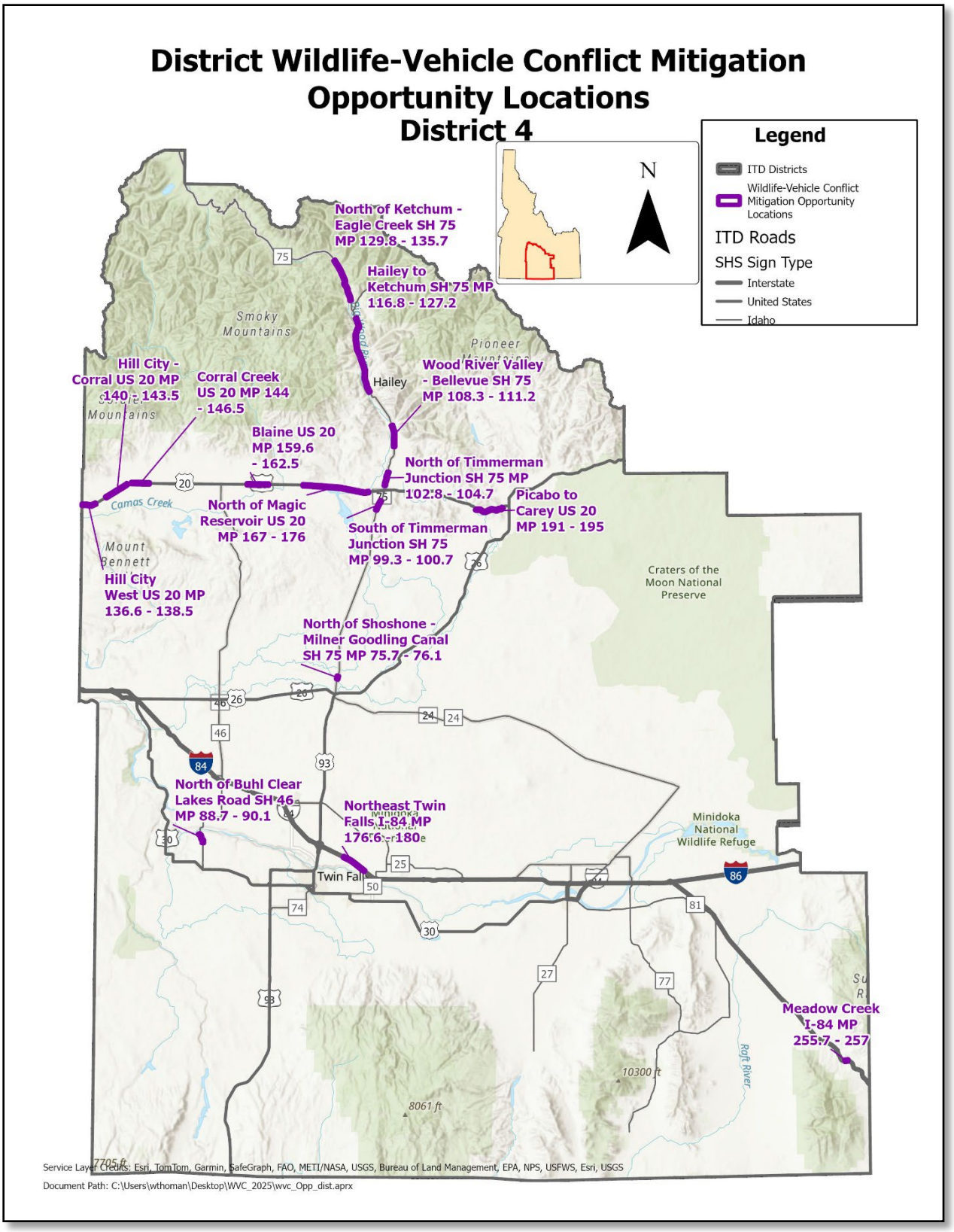

Figure 4-24. District 4 Shoshone top Wildlife-Vehicle Conflict Mitigation Opportunity Locations.

Table 4-9. District 5 Pocatello Top Wildlife-Vehicle Conflict Mitigation Opportunity Locations based on Maximum Score out of 130 points.

Rank	District 5 Wildlife-Vehicle Conflict Mitigation Opportunity Locations	Total Score out of 130 points
1	McCammon to Inkom I-15 MP 48 – 57	92.53
2	Soda Springs – Alexander Reservoir US-30 MP 401.6 – 404	85.60
3	Fish Creek – Lund US-30 MP 375.6 – 379	82.43
4	Pocatello I-15 MP 62 – 70 & BUS Loop I-15 MP 0 – 1.5	79.47
5	West of Soda Springs US-30 MP 385 – 401 & SH-34 MP 47 – 50.5	75.77
6	Middle Sulphur Canyon – Diamond Gulch US-30 MP 409 – 413	74.00
7	Malad Summit I-15 MP 22 – 26.3	73.78
8	Rocky Point US-30 MP 441.6 – 446.5	69.70
9	North of Malad City I-15 MP 15 – 15.8	69.00
10	Georgetown Summit US-30 MP 418.6 – 421	68.17
11	Fort Hall Tribal Land I-15 MP 93.4 – 93.8	68.00
12	North Franklin – Cub River US-91 MP 1.6 – 3	67.00
13	Utah State Line I-15 MP 0.9 – 6.8	66.75
14	Portneuf Marsh – Lava Hot Springs US-30 MP 367.6 – 370.5	65.83
15	South Devil Creek Reservoir I-15 MP 18 – 20.3	61.20
16	Blackfoot River SH-34 MP 69.8 – 70.2	58.00
17	Soda Springs – Conda SH-34 MP 60.3 – 61.2	45.50

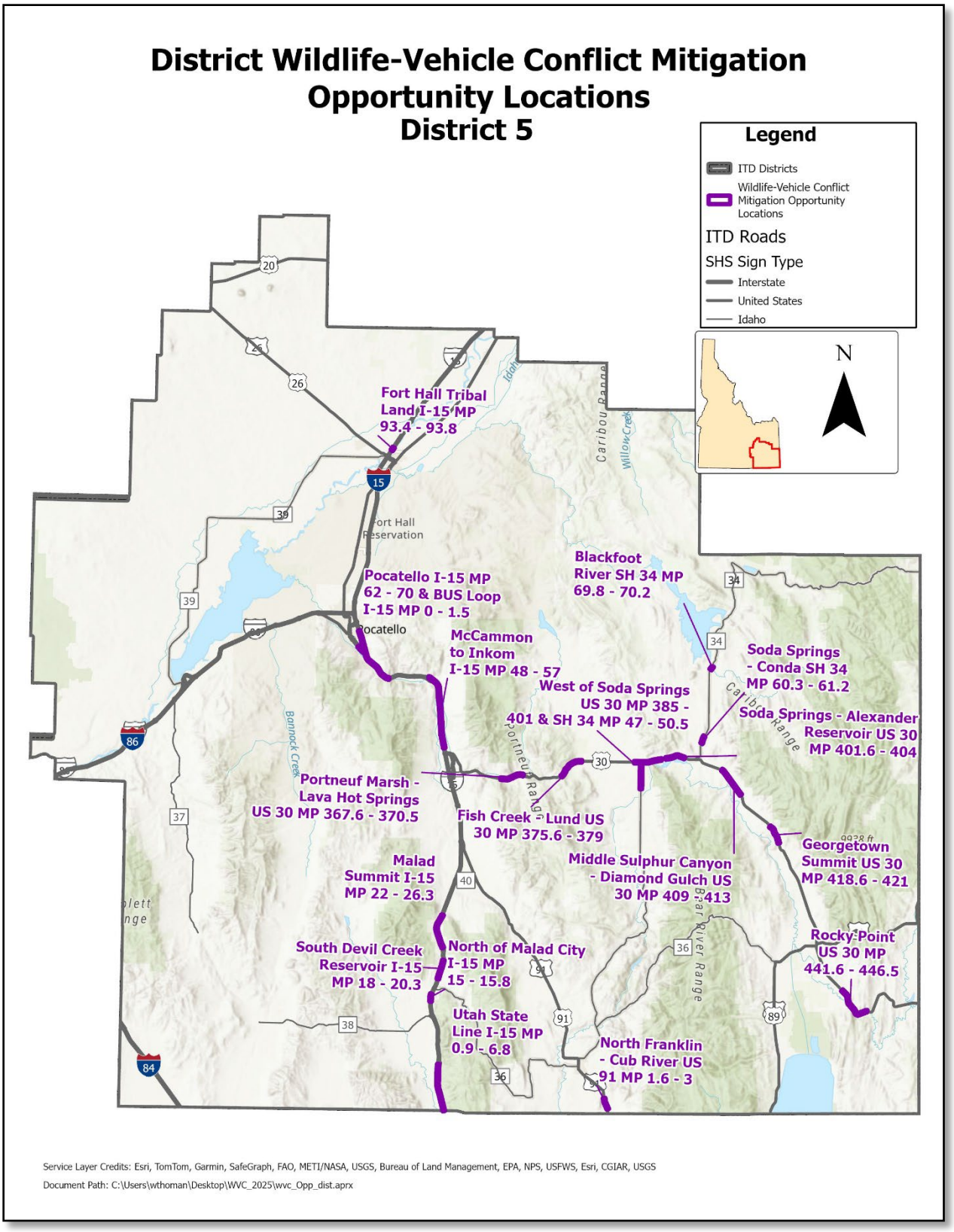

Figure 4-25. District 5 Pocatello top Wildlife-Vehicle Conflict Mitigation Opportunity Locations.

Table 4-10. District 6 Rigby Top Wildlife-Vehicle Conflict Mitigation Opportunity Locations based on Maximum Score out of 130 points.

Rank	District 6 Wildlife-Vehicle Conflict Mitigation Opportunity Locations	Total Score out of 130 points
1	Ashton to Harriman State Park US-20 MP 363 – 380	103.38
2	Henrys Lake to Montana State Boundary US-20 MP 402 – 406; & SH-87 MP 0 – 1	93.09
3	Rigby – Thorton US-20 MP 323 – 328	91.18
4	Island Park – Buffalo River US-20 MP 384 – 389	89.36
5	Swan Valley US-26 374 – 376.5	88.20
6	Spencer – Humphrey I-15 MP 179 – 188	88.17
7	Harriman State Park US-20 MP 380 – 382	86.00
8	Market Lake Wildlife Refuge I-15 MP 140 – 143	83.67
9	Conant Valley – Snake River US-26 MP 667 – 371	80.57
10	Poplar US-26 MP 354 – 358	78.63
11	Victor to Wyoming State Boundary SH-33 MP 151 – 154	77.67
12	Salmon River – Tower Creek US-93 MP 311 – 316	76.11
13	Beaver Dick Park – Henrys Fork SH-33 MP 72 – 74	75.00
14	Camas National Wildlife Refuge I-15 153.5 – 155.4	72.50
15	Driggs to Chapin SH-33 MP 142 – 145	72.20
16	Salmon River – North Fork Salmon River US-93 MP 325 – 328	72.00
17	Lemhi Valley SH-28 MP 91.8 – 92.2	68.00
18	Tetonia – Clawson SH-33 MP 133 – 135	65.33
19	Palisades Reservoir US-26 MP 399	65.00

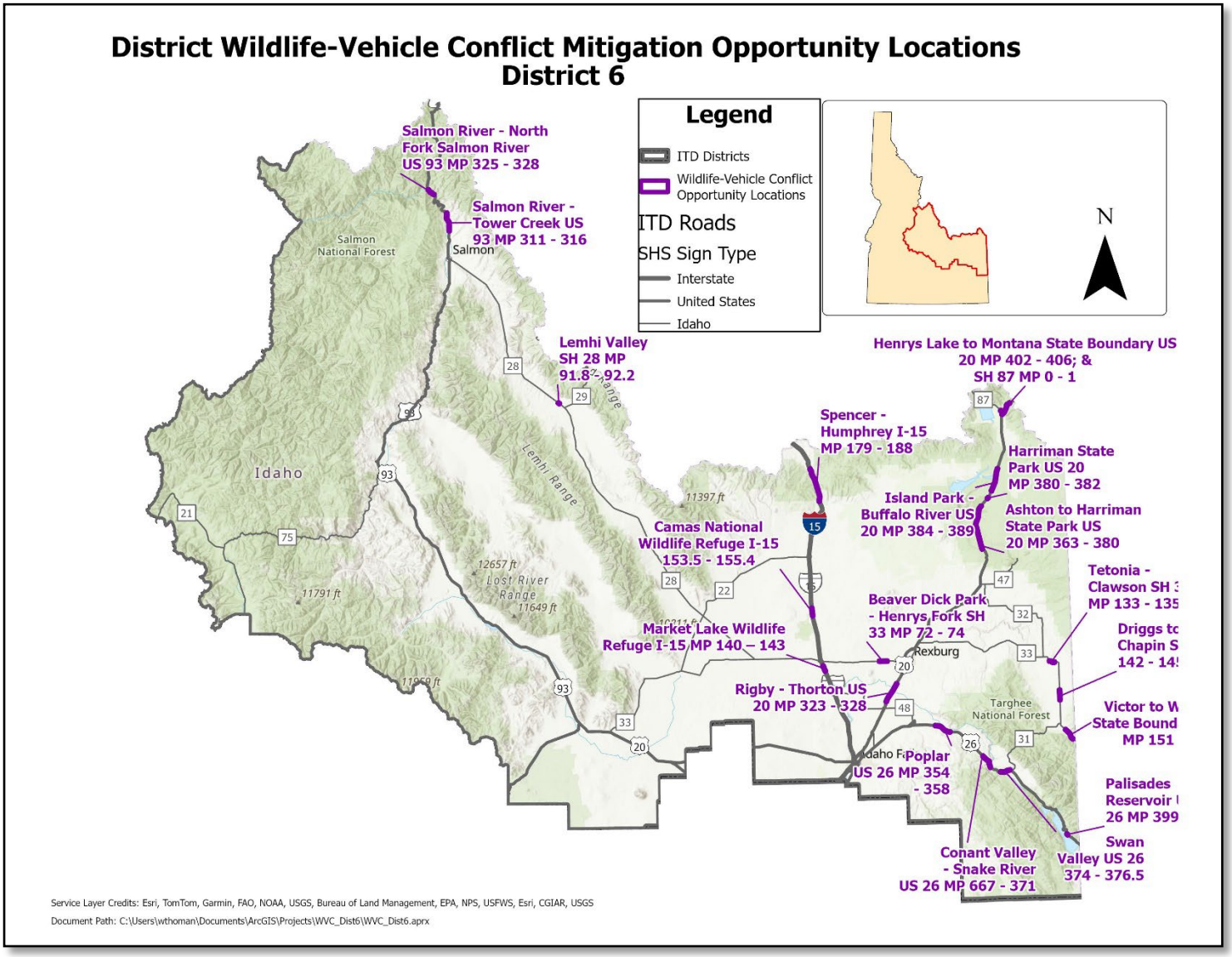

Figure 4-26. District 6 Rigby top Wildlife-Vehicle Conflict Mitigation Opportunity Locations.

Phase Two Conclusions and Recommendations

The Phase Two modeling and ranking resulted in the top statewide and individual District areas where wildlife-vehicle conflict is a concern and has the greatest potential to be mitigated with wildlife crossing structures based on land use, land ownership/management, and planned ITD ITIP projects. The final Wildlife-Vehicle Conflict Mitigation Opportunity Locations are those areas where proposed ITD projects, land ownership/management, and development provide clarity on the feasibility of constructing or incorporating wildlife mitigation. The transportation and ecological hot spots – also referred to as Wildlife-Vehicle Conflict Areas can all be considered places where potential wildlife mitigation such as retrofits of existing structures as well as new mitigation can be considered. Not all locations will need new structures; many of the top locations are in areas where existing culverts and bridges over water bodies have the potential to provide wildlife passage. There are different options for these retrofits, from adding wildlife-exclusion fence to the bridge or culvert abutments to guide wildlife beneath roads at bridges and culverts, to incorporating a bench or shelf within rip rap to form a pathway for terrestrial movement of both wildlife and humans. This study is a guide to ITD personnel, partnering agencies, and the public to further explore these areas for potential solutions.

5. CONCLUSIONS

This study presented several different methods to examine the challenge of wildlife-vehicle conflict. Comparisons of the results produced in Phase One and Phase Two of this study can be compared to each other and with the results from the original 2014 Cramer et al. study. These comparisons can also help ITD and partnering agencies evaluate areas that were consistently top areas of concern for wildlife-vehicle conflict in 2014 as well as today. A brief overview of these comparisons is presented below.

Top Wildlife-Vehicle Collision Hot Spots, Carcass Hot Spots, and Wildlife-Vehicle Conflict Mitigation Opportunity Locations per District

A synthesis based on analyzing the results of the Wildlife-Vehicle Collision Hot Spot analysis and Carcass Hot Spot analyses (Phase One) and Wildlife-Vehicle Conflict Mitigation Opportunity Locations (Phase Two) for each District revealed the top areas of concern that repeatedly rose to the highest rankings within each phase of the study when each District's data were modeled without reference to the entire state. These three different hot spot analyses (collisions, carcasses, and conflict) used different factors to model. However, the conflict modeling used the first two datasets along with seven other transportation and ecological factors plus three feasibility factors. The goal of comparing the top areas of concern in each District is to identify known locations where collisions with wildlife are a problem, carcass data were collected, and where additional data sources identify as potential areas of concern that could potentially be mitigated for wildlife in the future.

Within some Districts, the suburban-wildland interface presents a "perfect storm" of wildlife presence near human development and more heavily traveled highways. Thus, these areas' collisions occur in places that are also prime wildlife habitat as factored in the Phase Two OHSA using ecological factors like waterways, endangered carnivore ranges, and high traffic and ungulate migration routes and stopovers, etc.

There is one District where there is less overlap between the top collision hot spots and Wildlife-Vehicle Conflict Mitigation Opportunity Locations. The collision hot spots in District 2 do not coincide with the Locations. The top collision hot spots from Phase One in District 2 are near developed areas like Moscow and Lewiston, and the Locations are located outside of these areas in more wildland areas like near US-12, east of Lewiston.

The differences in collision hot spots and conflict locations demonstrate the importance of including factors that are important to areas of the state where there is less development. As human densities decrease further from the developed areas, wildlife populations typically increase and outside of developed areas there is a greater chance the lands are publicly owned in Idaho. Therefore, in this study's modeling those areas were assigned more points to roads with these factors. It is also important to note that the points added for Phase Two Locations were based on factors that are, in most locations, the opposite of collision factors. For example, in the suburban-wildland interface there are more collisions

reported than in rural areas. However, the rural areas have greater potential for the land to be publicly owned by state or federal agencies. These rural areas with publicly owned lands nearby received more points when feasibility factors were evaluated and therefore rose to the top of Locations as opposed their rankings in the collision-only analyses.

The two phases of the study produced two different kinds of results that can be used by practitioners in transportation, environmental, Tribal, and public communities to address precise needs and funding resources specific to transportation and/or ecology.

It is very important for District personnel to be able to synthesize the results of Phase One and Phase Two to understand and compare the top locations of both collision hot spots and Locations within in each District to better present the data to various departments within ITD, pursue funding opportunities, and collaborate with state and federal partnering agencies.

District 1

In District 1, most ITD-administered roads around Lake Coeur d'Alene were consistently identified in the various OHSA results including Wildlife-Vehicle Collision Hot Spots, Carcass Hot Spots, and Wildlife-Vehicle Conflict Mitigation Opportunity Locations, specifically on I-90 to the east of Coeur d'Alene and on US-95 to the south of Coeur d'Alene. These locations plus an additional location on US-2 are listed below.

- The stretch of I-90 from Canyon to Kingston from MP 35 – 43
- The Sand Point area, especially US-95 from MP 469 – 471 at the southern end of Sand Point along Lake Pend Oreille
- US-95 in the northern Sand Point area from MP 478 – 482
- US-95 in the locations north of the McArthur Lake Area from MP 492 – 502
- US-2 at the Three – Mile Corner to Moyie Springs from MP 510 – 515.5.

District 2

In District 2, these locations below were consistently identified in the various OHSA results including Wildlife-Vehicle Collision Hot Spots, Carcass Hot Spots, and Wildlife-Vehicle Conflict Mitigation Opportunity Locations.

- The Deep Creek area along US-95 on the Coeur d'Alene Reservation from MP 364 – 373
- North of Moscow along the Palouse Range on US-95 from MP 349 – 352

Two other locations in District 2 were consistently identified in the OHSA results for Wildlife-Vehicle Collision Hot Spots and Wildlife-Vehicle Conflict Mitigation Opportunity Locations but not in the Carcass Hot Spot results.

- North of Lewiston on US-95 from MP 319 – 324
- On US-12 on the Nez Perce Reservation near Agatha along the Clearwater River from MP 24 – 28.

District 3

In District 3, the locations below were consistently identified in the various OHSA results including Wildlife-Vehicle Collision Hot Spots, Carcass Hot Spots, and Wildlife-Vehicle Conflict Mitigation Opportunity Locations. In fact, the Lucky Peak – Cervidae Peak area on SH 21 was number one in the state for Carcass Hot Spots in the Phase One modeling for mule deer and all ungulates with six carcasses per mile per year.

- The Lucky Peak – Cervidae Peak area along SH-21 from MP 2.5 – 22
- Along US-85 near Crystal from MP 74 – 75
- Along US-95 near Weiser from MP 84 – 86
- On SH-55 in the Eagle – Dry Creek Valley from MP 48 – 53
- From the town of Eagle southward on SH-55 from MP 41.6 – 42.9
- Along US-20 in the Wild Horse Creek area from MP 128 – 135.

District 4

In District 4, the locations below were consistently identified in the various OHSA results including Wildlife-Vehicle Collision Hot Spots, Carcass Hot Spots, and Wildlife-Vehicle Conflict Mitigation Opportunity Locations. Also, the Hailey to Ketchum area on SH-75 is a top location for ungulate carcasses.

- SH-75 north of Ketchum to Dip Creek from MP 132 – 133
- SH-75 from Hailey north to Ketchum from MP 117 – 127
- On I-84 northeast of Twin Falls from MP 177 – 179.

District 5

In District 5, the locations below were consistently identified in the various OHSA results including Wildlife-Vehicle Collision Hot Spots, Carcass Hot Spots, and Wildlife-Vehicle Conflict Mitigation Opportunity Locations.

- I-15 near Pocatello from MP 62 – 71
- I-15 from McCammon south to the north of Inkom from MP 48 – 57
- The Soda Springs area along US-30 from MP 386.1 – 400.5 and MP 408.6 – 412 and along the Alexander Reservoir from MP 401.6 – 404
- On SH-34 west of Soda Springs from MP 49.6 – 50.4
- Along US-30 in the Middle Sulphur Canyon – Diamond Gulch area from MP 409 – 127
- I-15 from the Utah State Line from MP 0 – 7, to North of Malad City from MP 15 – 16, north to South Devil Creek Reservoir from MP 18 – 20, and the Malad Summit from MP 22 – 26.

One other location in District 5 was consistently identified in the OHSA results for Carcass Hot Spots and Wildlife-Vehicle Conflict Mitigation Opportunity Locations but not in the Wildlife-Vehicle Collision Hot Spot results. Also, this specific area was identified as number two in the state for ungulate carcasses, with 4.8 carcasses per mile per year.

- US-30 in the Rocky Point area from MP 442 – 447.

District 6

In District 6, the locations below were consistently identified in the various OHSA results including Wildlife-Vehicle Collision Hot Spots, Carcass Hot Spots, and Wildlife-Vehicle Conflict Mitigation Opportunity Locations.

- US-20 from Ashton to Harriman State Park in the Island Park Area from MP 380 – 382
- Along US-20 in the Island Park area to the Buffalo River from MP 384 – 389
- North of Island Park in the Henrys Lake to Montana State Boundary on US-20 from MP 402 – 406 and SH-87 from MP 0 – 1
- On US-20 from Rigby across the Snake River north to Thorton north to Rexburg MP 322 – 328
- Camas National Wildlife Refuge – Camas I-15 from MP 153 – 155
- I-15 from Market Lake Wildlife Management Area north to Sage Junction from MP 141 – 142
- US-26 from Poplar to Antelope Flat from MP 354 – 358
- US-26 in the Swan Valley from MP 374 – 376.5.

Two other locations in District 6 were consistently identified in the OHSA results for Wildlife-Vehicle Collision Hot Spots and Wildlife-Vehicle Conflict Mitigation Opportunity Locations but not in the Carcass Hot Spot results.

- US-26 in the Conant Valley along the Snake River from MP 367 – 371
- On I-15 toward the Montana border from Spencer to Humphrey from MP 179 – 187.

Comparing Phase Two Results with the 2014 Study Results

The study methods were very similar to the methods used in the earlier 2014 study by Cramer et al. The one difference was that at that time (2014), ArcGIS's Kernel Density Analysis was the only tool available for predicting hot spots. The OHSA was not yet invented. It is of value for Idaho to compare those top hot spots from 2014 with this study's current top hot spot areas, see Figure 5-1 to observe several of the top hot spot areas for wildlife-vehicle conflict in 2014 that remain the same top Wildlife-Vehicle Mitigation Opportunity Locations in 2025.

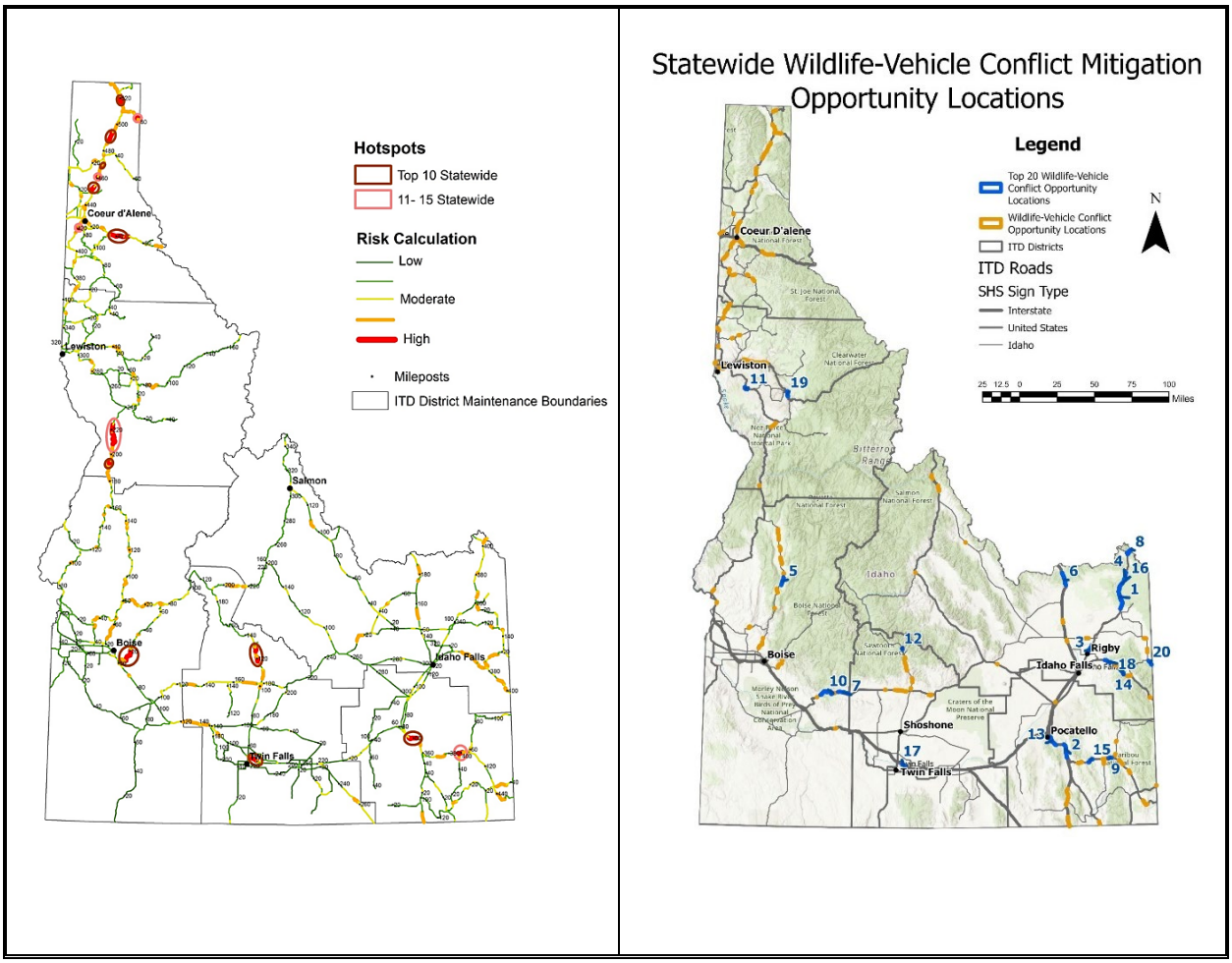

Figure 5-1. Comparison of Idaho's top hot spots for wildlife-vehicle conflict in the 2014 study (Cramer et al. 2014) and this study's top Wildlife-Vehicle Conflict Mitigation Opportunity Locations.

These comparisons highlight areas that were and still are concerning for wildlife collisions and habitat connectivity. These areas then and now present the potential opportunity to construct wildlife mitigation projects. In no particular order, the following list are locations identified in the 2014 and current study that continue to be a challenge:

- District 1: South of Sand Point – Algoma US-95 MP 469
- District 1: Coeur d'Alene US-95 South of City
- District 3: Lucky Peak SH-21 MP 10 – 20
- District 4: Hailey to Ketchum SH-75 MP 118 – 129
- District 5: Inkom I-15 north and south of town
- District 5: Soda Springs US-30 and SH-34

It is worth noting that the 2014 study did not identify statewide hot spots within District 6 due to the lack of carcass collection in that District prior to the study, which resulted in lower overall wildlife-vehicle conflict scores when the full data source points were summed statewide. However, when the District was modeled for hot spots without other statewide areas, there were wildlife-vehicle conflict top areas that

coincided with this 2025 Wildlife-Vehicle Conflict Mitigation Opportunity Locations, most notably US-20 near Island Park area.

In Summary

The OHSA of the various factors that identify Wildlife-Vehicle Conflict Areas (Phase Two) across Idaho developed results largely consistent with the hot spot modeling of crash data (Phase One), with additional locations the collision hot spot modeling did not include. These collision and conflict hot spots are Idaho's top areas to concentrate mitigation efforts to protect and restore wildlife and habitat connectivity and help protect motorists from collisions with wildlife.

The study had some challenges related to data sources. The analysis generated maps from models that relied on outside sources for the data to create those maps. Each one of those data sources, from wildlife-vehicle collisions to stream locations had limitations. For data modeling to be scientific the data should consistently be sampled across the state when identifying top areas of wildlife-vehicle conflict; therefore, any data not collected statewide in a systematic fashion was not initially used. However, as the OHSA iterations progressed in Phase Two, it became apparent that the severe limitations of inputs of statewide ungulate and carnivore habitat maps limited the utility of the model to accurately identify areas of the state where wildlife-vehicle conflict was predicted. The research team ultimately decided to adapt the model and added two wildlife-related data layers of information that were not derived from uniform sampling intensity collected systematically across the state. These were the only data sources available at the time of modeling that were available for this study. The first of these datasets was IDFG maps of ungulate migration and stopovers collected with support under the DOI SO 3362. IDFG fitted GPS collars on select herds of mule deer, elk, and pronghorn in Idaho, and while the resulting data were very useful for identifying where those animals moved, it did not assist in predicting all species of ungulates movements across the entire state. There are limitations to the funding and other resources within IDFG that prevent statewide population monitoring at this level. The second data source the research team used at this later stage was the large mammal carcass locations available in IDFG Roadkill & Salvage Database. The carcass database had over 31,000 points which were overwhelmingly the result of citizens across the state registering salvage permits for carcasses. These data helped to identify both areas where wildlife were believed to be killed along roads, and what species were involved in those collisions. The study lacked empirical species specific data prior to the addition of these two databases.

There were other types of adaptations made throughout the modeling process. For example, when collision modeling and earlier iterations of wildlife-vehicle conflict modeling did not identify US-30 at Rocky Point (District 5) as a top area, the research team investigated. This area was number two in the state for the number of ungulate carcasses with 4.8 carcasses per mile per year. Through over two decades of collaboration, ITD and IDFG and other partnering agencies have secured conservation easements and federal grant funding through the Wildlife Crossings Pilot Program to build three wildlife underpasses and concurrent fencing. It is a known semitruck commercial route and the drivers of those semitrucks are also known not to report their collisions with wildlife. The research team investigated the factor values in this

area and decided to include the percentage of commercial vehicle traffic (CAADT) as a factor in the model to help compensate for the lack of collision reporting in this area and other areas with similar amounts of commercial vehicle traffic. This type of adaptation was conducted on each data layer available.

Additionally, the lack of collision reporting by drivers of semitrucks skews the wildlife-vehicle crash data toward areas that are more likely to have higher percentages of the traffic volume (AADT) classified as private vehicles such as cars, pickup trucks, and motorcycles. This study attempted to compensate for reporting biases by determining areas of higher commercial truck traffic than average for each road types and assigning more points to roads with greater-than-average commercial traffic volume.

With these and other limitations, the research team want to clarify that the results are a foundation for transportation planning, not necessarily policy or management recommendations. The maps, hot spot list rankings, etc., are for identifying where there is potential to mitigate wildlife-vehicle conflict, not a mandate as to how or when to do this.

Actions that could evolve from this study to mitigate roads for wildlife do not all need to be as ambitious as installing standalone wildlife crossing structures. Field visits to these areas will assist in identifying potential opportunities to retrofit existing bridges and culverts with simple modifications for wildlife mitigation. District Environmental Planners and other ITD personnel should also consider solutions that may be more costly or have lengthy timelines, such as standalone wildlife mitigation projects such as wildlife overpasses or underpasses to reduce WVCs and provide wildlife and habitat connectivity. If needed, there are funding opportunities from both the federal government and non-profit organizations to assist in funding these projects. There are many opportunities to use the maps and data provided here to further integrate wildlife mitigation considerations into the transportation planning process. The IPLAN website featuring these materials as well as this report both contribute to the process of restoring and protecting Idaho's landscapes for wildlife movement, and in reducing WVCs.

What's Been Accomplished since 2014

With the recent completion of several large, complex wildlife underpasses and overcrossings within the state, Idaho is in a good position to continue that momentum. ITD should continue to demonstrate how wildlife can be accommodated along transportation corridors. Since the 2014 Report, ITD has formed a collaborative partnership with IDFG, Idaho Department of Lands (IDL), and other state agencies, to improve efficiency in transportation project delivery, the understanding of baseline knowledge, and the incorporation of wildlife mitigation during the transportation planning process. ITD will need to continue to promote productive collaborations with state and federal agencies at both the headquarters and District level to identify priority projects where wildlife mitigation could be considered.

One recommended direction for ITD collaboration from the 2014 Report was to create an Interagency Wildlife Connectivity Committee. In 2022, the Wildlife and Fish Passage Team of Idaho (WildPath) was created to facilitate collaboration between Idaho state agencies pertaining to evaluating wildlife crossing and fish passage needs statewide. This facilitates communication between interested agencies,

coordinates efforts in wildlife and fish passage within the transportation system, identifies priority areas for coordination, and prepares grant applications to bring the greatest benefit to the state.

IDFG and ITD have worked to collect thousands of instances of carcass data from both ITD and IDFG personnel reporting and IDFG Salvage reports.

ITD tracks projects identified in their ITIP where wildlife mitigation opportunities may be incorporated into a previously approved project. WildPath meets regularly to facilitate intra-state ongoing collaborative efforts to evaluate, plan, and implement transportation projects that consider improvements to motorist safety, wildlife movements and migration, associated additional resources benefits, and infrastructure resilience.

Future Needs

ITD should develop a set of best management practices (BMP) and guidelines for reducing WVCs while promoting wildlife connectivity across or under roads. This should be a formally developed set of guidelines that would be useful to planning and engineering teams by detailing where different mitigation actions could work, where they should and should not be used, and the pros and cons of each location of concern.

Although ITD and IDFG have made progress in wildlife related crash and carcass data collection with both the introduction of an internal WVC Application and by creating a platform where the public can report roadkill and comply with Idaho salvage laws and permitting, consistent and reliable data collection on a statewide basis can still be improved. TAMS carcass data, collected by ITD maintenance personnel on a different platform, is now uploaded manually to the IDFG Roadkill & Salvage Database monthly, but could be done automatically and on a daily basis. ITD and IDFG have plans to improve future collision data collection and to provide training for personnel that use the internal WVC Application.

There were no statewide species habitat or range maps used in this study because the available habitat maps were coarser than could be useful to the OHSA. It is important to develop and introduce empirical data that more precisely define known ranges of large ungulates, bears, or other large mammals near or crossing roads on a statewide and/or annual scale. This type of data should be considered in any future similar studies.

Although ITD has hosted a workshop to introduce ITD and state agency personnel to the updates within the ITD IPLAN mapping tool, annual recurrent training for new employees or employees that require a refresher should also be offered. Personnel within ITD and any interested partners should receive regular training for accurate collection of wildlife related crash or carcass data, how to work collaboratively with data to make informed decisions on mitigation needs and methods, and how to proactively define and mitigate priority Wildlife-Vehicle Conflict Mitigation Opportunity Locations throughout the state.

Many of the above actions could be included in future research projects, which could include the following types of research or programming:

1. GIS mapping procedures by natural resources agencies and academics should incorporate accurate, field-based data on wildlife locations, habitat, and movement patterns in relation to roads. These higher resolution maps could be included in future iterations of this study and be used to corroborate the results of this study in selecting areas of highest WVC concern.

2. Wildlife mitigation, especially wildlife crossing structure efforts should be monitored using systematic scientific approaches to evaluate the overall performance of crossing structures, including their ability to facilitate crossings by the target species, increase wildlife use over time (including use by a diversity of species), and decrease wildlife related collisions in the area. Systematic analyses of camera-trapping photos such as calculating and reporting of structure success rates, repel rates, daily average of use per species, and reductions in collisions and carcasses in the study areas, are the methods used to quantify wildlife crossings and to help evaluate the efficacy of wildlife infrastructure and provide evidence to the public that these structures work and are cost-effective. These efforts also help agencies manage the infrastructure adaptively to ensure they continue to perform as intended.

3. A benefit-cost analysis of *all* actions conducted by ITD to reduce wildlife related collisions could help to quantify the success of each action type.

This study provided the identification of locations for many future opportunities for ITD and partnering agencies. This study resulted in a mapping tool that can be used in transportation planning for triaging and prioritizing where funding and social capital needs can be applied to facilitate maximum yields in reducing areas were wildlife-vehicle conflicts occurs within the state.

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APPENDIX A. EXISTING WILDLIFE MITIGATION IN IDAHO

Idaho has and continues to address wildlife-vehicle conflict in transportation planning. Table A-1 details the efforts that have resulted in various wildlife mitigation efforts and future plans for ITD transportation projects identified in the ITIP. This list includes over and underpasses, fencing, and other types of mitigation efforts. Also, a map of all existing (and some future planned) wildlife crossing structures, fences, and other mitigation efforts is presented in Figure 2-5 in section Idaho's Transportation and Wildlife Mitigation of Chapter 2 above.

Table A-1. ITD's existing and future wildlife mitigation projects to minimize WVC in Idaho as of 2025.

Project Name	ITD Road	Wildlife Mitigation Type	Progress	Target Species
ITD District 1 Coeur d'Alene/IDFG Region 1 Panhandle				
US-95 Chilco Wildlife Crossing	US-95	Wildlife Underpass	Constructed	Deer, Elk, Moose
US-95 Copeland Concrete Box Culvert	US-95	Wildlife Underpass	Constructed	Deer, Elk, Moose
US-95 Copeland Concrete Box Culvert	US-95	Wildlife Underpass	Constructed	Deer, Elk, Moose
US-95 Copeland Concrete Box Culvert	US-95	Wildlife Underpass	Constructed	Deer, Elk, Moose
US-95 Copeland Fencing Extension	US-95	Fencing	Constructed	Deer, Elk, Moose
I-90 Osburn Overpass	I-90	Wildlife Overpass	Constructed	Ungulates
I-90 Osburn Underpass	I-90	Wildlife Underpass	Constructed	Ungulates
US-95 McArthur Lake Bridge	US-95	Wildlife Underpass	Constructed	Ungulates, Wolverine
US-95 McArthur Lake Fence Extension	US-95	Fencing	In Planning	Ungulates, Wolverine
US-95 Garwood to Sagle	US-95	Other – Wildlife Corridor Study	Finished	Ungulates
ITD District 2 Lewiston/IDFG Region 2 Clearwater Lewiston				
North of Moscow Wildlife Warning System	US-95	Other – Break the Beam Warning System	Constructed	Deer
ITD District 3 Boise/IDFG Region 3 Southwest Nampa				
SH-21 Cervidae Peak Wildlife Overcrossing	SH-21	Wildlife Overpass	Constructed	Mule Deer, Elk, Pronghorn
SH-21 Cervidae Peak Fence Extension	SH-21	Fencing	In Planning	Mule Deer, Elk, Pronghorn
SH-21 Lucky Peak Wildlife Undercrossing and Fencing	SH-21	Wildlife Underpass and Fencing	Constructed	Mule Deer, Elk, Pronghorn
SH-21 Five Mile Creek	SH-21	Wildlife Underpass	Constructed	Mule Deer, Elk
ITD District 4 Shoshone/IDFG Region 4 Magic Valley				
North of Hailey, Reduced Speed Zones	SH-75	Other – Reduced Speed Zone	Constructed	Mule Deer, Elk
SH-75 near Hailey, East Fork of Wood River, near Greenhorn Gulch, Bridge Extension	SH-75	Wildlife Underpass – Bench	Constructed	Riparian Corridor for Canada Lynx
I-84 Meadow Creek	I-84	Wildlife Underpass	Constructed	Mule Deer
Hospital Bridge Big Wood River	SH-75	Wildlife Underpass – Bench	Constructed	Mule Deer
US-20 Rock Creek	US-20	Wildlife Underpass – Bench	Constructed	Mule Deer

Project Name	ITD Road	Wildlife Mitigation Type	Progress	Target Species
US-20 Willow Creek	US-20	Wildlife Underpass – Bench	Constructed	Mule Deer
US-20 Camas Prairie Three Culvert Replacements	US-20	Wildlife Underpass	In Planning	Deer
Raft River Bridges Wildlife Exclusion/Funnel Fencing	I-86	Fencing	Constructed	Deer, Elk
ITD District 5 Pocatello/IDFG Region 5 Pocatello				
Fish Creek Pass Bridge 1	US-30	Wildlife Underpass	Constructed	Mule Deer, Elk
Fish Creek Pass Bridge 2	US-30	Wildlife Underpass	Constructed	Mule Deer, Elk
Fish Creek Pass Bridge 3	US-30	Wildlife Underpass	Constructed	Mule Deer, Elk
Fish Creek Pass Wildlife Fence	US-30	Fencing	Constructed	Mule Deer, Elk
I-15 Blackrock Gap Wildlife Fence	I-15	Fencing	In Planning	Ungulates
I-15 Blackrock Gap Inkom Wildlife Barrier Fence Extension	I-15	Fencing	In Planning	Elk
I-15 Fort Hall Winter Elk Barrier Fence	I-15	Fencing	In Planning	Elk
Bannock Hills Barrier Fence	I-15	Fencing	In Planning	Elk
Rocky Point Wildlife Passage West	US-30	Wildlife Underpass	In Planning	Mule Deer
Rocky Point Wildlife Passage Middle	US-30	Wildlife Underpass	In Planning	Mule Deer
Rocky Point Wildlife Passage East	US-30	Wildlife Underpass	In Planning	Mule Deer
Rocky Point Wildlife Passage Fence	US-30	Fencing	In Planning	Mule Deer
ITD District 6 Rigby/IDFG Region 6 Upper Snake Idaho Falls & Region 7 Salmon				
Targhee Pass Animal Detection System	US-20	Other – Animal Detection System	In Planning	Ungulates, Large Carnivores
SH-28 Wildlife Fence	SH-28	Fencing	Constructed	Deer, Moose, Pronghorn
Lemhi Nine Bridges; Two with Fencing	SH-28	Wildlife Underpass and Fencing	Constructed	Deer, Moose, Pronghorn
SH-28 Wildlife Fence Extension	SH-28	Fencing	Constructed	Deer, Moose, Pronghorn
SH-28 Wildlife Fence Extension	SH-28	Fencing	Constructed	Deer, Moose, Pronghorn
US-20 Lorenzo Bridge Wildlife Fencing	US-20	Fencing	Constructed	Ungulates